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GENERAL NOTICE

NOTICE 264 OF 2005

SOUTH AFRICAN MARITIME SAFETY AUTHORITY

DRAFT MERCHANT SHIPPING (TRAINING AND CERTIFICATION) (FISHING AND MARINE MOTORMAN) REGULATIONS: PUBLICATION FOR COMMENT

The South African Maritime Safety Authority (SAMSA) publishes for public comment the proposed regulations and syllabuses set out in the accompanying Schedule. Written submissions should reach SAMSA **on or before 31 March 2005** (**Note:** late submissions may be disregarded). These should be addressed to the Chief Executive Officer (for the attention of Mr C Briesch) and may be either:

- hand-delivered to SAMSA, Block E Hatfield Gardens, 333 Grosvenor Street, Hatfield, Pretoria; or
- mailed to SAMSA, PO Box 13186 Hatfield 0028; or
- faxed to (012) 342 3160; or
- e-mailed to cbriesch@samsa.org.za.

Telephonic enquiries should be directed to Mr C Briesch at (012) 342 3049. Attention is invited to the explanatory note following the regulations in Part A of the Schedule.

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PART 1

PRELIMINARY

Title and commencement

1. (1) These regulations are called the Merchant Shipping (Training and Certification) (Fishing and Marine Motorman) Regulations, 2005.

(2) These regulations commence on <<date>>.

Interpretation

2. (1) In these regulations the expression "the Act" means the Merchant Shipping Act, 1951 (Act No. 57 of 1951), and, unless the context indicates otherwise, any expression given a meaning by the Act has the given meaning, and—

"accredited" means accredited by the Authority;

"accredited maritime training provider" means a maritime training provider that has been accredited in terms of regulation 40(2);

"approved" means approved by the Authority;

"approved training" means maritime training programmes or courses that have been approved in terms of regulation 41;

"candidate" means a person desiring certification in terms of these regulations;

"chief engineer officer" means the senior engineer officer responsible for the mechanical propulsion and the operation and maintenance of the mechanical and electrical installation of a vessel;

"certification" means a certificate of competency or qualification, and includes an endorsement; and **"certificate"** has a corresponding meaning;

"certificated", in relation to—

(a) a deck officer on any particular kind of vessel, means holding valid appropriate certification that entitles the holder to serve as an officer in charge of a navigational watch on the kind of vessel concerned; and

(b) an engineer officer on any particular kind of vessel, means holding valid appropriate certification that entitles the holder to serve as an officer in charge of an engineering watch on the kind of vessel concerned;

"deck officer" means a ship's officer serving in the deck department on a vessel;

"endorsement" means a document that is appended to a certificate of competency and that either extends or restricts the terms of the certificate;

"engineer officer" means a ship's officer serving in the engine department on a vessel;

"equivalent certificate" has the meaning given by regulation 4(1);

"examiner" means a person appointed as an examiner under section 77(4) of the Act;

"fishing vessel" means a vessel that is used wholly or principally for the taking, catching or capturing of fish or other living resources of the sea or seabed for financial gain or reward;

"GT", in relation to a vessel, means its gross tonnage calculated in accordance with the Tonnage Regulations, 1986;

"holder", in relation to a certificate or other document, means the person identified as holder by that certificate or document;

"in-service training" means any training of a candidate (whether on or off a vessel) that is conducted by or on behalf of the candidate's employer during the candidate's period of employment with the employer;

"length" has the meaning it has in regulation 2 of the Tonnage Regulations, 1986;

"limited waters" means—

(a) the internal and territorial waters of the Republic;

(b) the exclusive economic zone of the Republic; and

(c) if the Republic has entered into an agreement with another State for the purposes of this paragraph, the waters under the jurisdiction of that other State that are covered by the agreement;

"near-coastal voyage" has the meaning it has in regulation 1(1) of the Merchant Shipping (Training and Certification) Regulations, 1999;

"pleasure vessel" means a vessel that is used solely for sport or recreation;

"port operations area" has the meaning it has in regulation 1(1) of the Merchant Shipping (Training and Certification) Regulations, 1999;

"propulsion power", in relation to a vessel, means the total maximum continuous rated output power in kilowatts of all the vessel's main in-board propulsion machinery that appears on the vessel's registration certificate or other official document;

"qualifying service" means the seagoing service that is claimed by a candidate for the purpose of qualifying for certification in terms of these regulations;

"rating" means a seaman other than a ship's officer;

"Registrar" means the Registrar of Seafarers designated in terms of regulation 5(1) of the Merchant Shipping (Training and Certification) Regulations, 1999;

"seagoing service" means service on vessels operating in limited or unlimited waters;

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

"specified by the Authority" means specified by the Authority in a marine notice;

"STCW-F Convention" means the International Convention on Standards of Training, Certification and Watchkeeping for Fishing Vessel Personnel, 1995, and includes any subsequent amendment to the Convention that is specified by the Authority;

"the Code" means the *Code for South African Maritime Qualifications*, published by the Authority;

"unlimited voyage" has the meaning it has in regulation 1(1) of the Merchant Shipping (Training and Certification) Regulations, 1999;

"unlimited waters" means the waters beyond limited waters;

"valid", in relation to a certificate or other document, means a certificate or document that is current and that has not been suspended or cancelled.

(2) Any reference in these regulations to assessment at a particular level is to read as a reference to assessment at that particular level, as described in regulation 16(1).

Introduction to certification

3. (1) These regulations prescribe the conditions to be met and the standards of competence required for the issue of the certification specified in column 2 of the following table:

Item	Column 1	Column 2
	Capacity	*Appropriate certification in terms of these regulations*
MASTERS AND DECK OFFICERS		
1	Officer in charge of a navigational watch on fishing vessels of less than 24 metres in length operating in unlimited waters	Certificate of Competency as Deck Officer (Fishing < 24 metres)
2	Master of a fishing vessel of less than 24 metres in length operating in limited waters	Certificate of Competency as Skipper (Fishing < 24 metres)
3	Master of a fishing vessel of less than 24 metres in length operating in unlimited waters	Certificate of Competency as Skipper (Fishing < 24 metres) together with the Unlimited Waters Command Endorsement
4	Officer in charge of a navigational watch on fishing vessels of 24 metres or more in length operating in unlimited waters	Certificate of Competency as Deck Officer (Fishing ≥ 24 metres)
5	Master of a fishing vessel of 24 metres or more in length operating in limited waters	Certificate of Competency as Skipper (Fishing ≥ 24 metres)
6	Master of a fishing vessel of 24 metres or more in length operating in unlimited waters	Certificate of Competency as Skipper (Fishing ≥ 24 metres) together with the Unlimited Waters Command Endorsement

Item	Column 1	Column 2
	Capacity	***Appropriate certification in terms of these regulations***
ENGINEER OFFICERS		
7	Chief engineer officer of a fishing vessel of less than 350 kW propulsion power	Certificate of Competency as Marine Motorman Grade 2
8	Second engineer officer of a fishing vessel of less than 750 kW propulsion power	
9	Officer in charge of an engineering watch on fishing vessels of less than 2 000 kW propulsion power	
10	Chief engineer officer of a fishing vessel of less than 750 kW propulsion power	Certificate of Competency as Marine Motorman Grade 1
11	Second engineer officer of a fishing vessel of less than 2 000 kW propulsion power	
12	Officer in charge of an engineering watch on fishing vessels of any kilowatt propulsion power	
13	Chief engineer officer of a vessel of less than 350 kW propulsion power operating in a port operations area	
14	Second engineer officer of a vessel of 1 500 kW propulsion power or more operating in a port operations area	
15	Chief engineer officer of a vessel of less than 350 kW propulsion power on near-coastal voyages	
16	Second engineer officer of a vessel of less than 750 kW propulsion power on near-coastal voyages	
17	Officer in charge of an engineering watch on vessels of less than 750 kW propulsion power on unlimited voyages	

Item	Column 1	Column 2
	Capacity	*Appropriate certification in terms of these regulations*
18	Chief engineer officer of a fishing vessel of less than 2 000 kW propulsion power	Certificate of Competency as Marine Motorman Higher Grade
19	Second engineer officer of a fishing vessel of any kilowatt propulsion power	
20	Chief engineer officer of a vessel of less than 750 kW propulsion power on near-coastal voyages or operating in a port operations area	
21	Officer in charge of an engineering watch on vessels of less than 750 kW propulsion power on unlimited voyages	
22	Chief engineer officer of a fishing vessel of any kilowatt propulsion power	Certificate of Competency as Chief Engineer Officer (Fishing)
RATINGS		
23	Rating forming part of a navigational watch on fishing vessels of any length	Certificate of Qualification as Able Seaman (Fishing)

(2) A person is qualified for the purposes of the Act to serve in a capacity specified in an item in column 1 of the table in subregulation (1) if—

(a) in the case of a master or ship's officer, the person—

(i) holds a valid certificate of competency specified in column 2 of the item;

(ii) holds an equivalent certificate; or

(iii) has been authorised under section 83(2) of the Act to serve in the specified capacity; and

(b) in the case of a rating, the person holds—

(i) a valid certificate of qualification specified in column 2 of the item;

(ii) an equivalent certificate; or

(iii) a valid certificate issued under the authority of the government of another country, that the Authority is satisfied qualifies the person to serve in the specified capacity.

(3) To avoid doubt—

(a) the ranking of the waters limitation entitles the holder of a certificate for unlimited waters to serve in the certificated capacity also on vessels operating in limited waters;

(b) the ranking of the vessel length limitation entitles the holder of a certificate for a specified vessel length to serve in the certificated capacity also on vessels of lesser length;

(c) the ranking of the voyage limitation entitles—

(i) the holder of a certificate for unlimited voyages to serve in the certificated capacity also on vessels engaged on near-coastal voyages or in port operations; and

(ii) the holder of a certificate for near-coastal voyages to serve in the certificated capacity also on vessels engaged in port operations; and

(d) the holder of a certificate of competence as Skipper (Fishing < 24 metres) or Skipper (Fishing ≥ 24 metres) (whether or not the Unlimited Waters Command Endorsement is also held) is entitled to serve in any deck officer capacity also on fishing vessels operating in unlimited waters.

Equivalent certificates

4. (1) An ***equivalent certificate*** is a valid certificate that—

(a) was issued under the Act before the commencement of these regulations; and

(b) is taken, in terms of regulation 23 of the Merchant Shipping (Safe Manning) Regulations, 1999, to be equivalent to the specified certificate in terms of these regulations.

(2) The holder of an equivalent certificate must exchange it for the corresponding certificate in terms of these regulations in the manner and within the time specified by the Authority.

PART 2

ADMINISTRATION

Registrar of seafarers

5. The Registrar has the following functions under these regulations:

(a) to issue certification in terms of these regulations;

(b) to keep record of the certification and of all related matters;

(c) to respond to requests to verify the authenticity or validity of the certification;

(d) to perform functions incidental to any of the previously described functions.

Senior examiners

6. (1) The Authority may, for the purposes of these regulations, designate in writing one or more examiners as a senior deck or engineer examiner.

(2) In addition to his or her powers and functions as an examiner, a senior examiner has the supervisory and other responsibilities stated in his or her instrument of designation.

Quality assurance

7. The Authority must implement a quality assurance system that covers at least the functions of the Registrar and the examiners in terms of these regulations.

Syllabus committee

8. (1) The Authority may establish a committee (the ***syllabus committee***) to advise it about the implementation and operation of these regulations and the Code.

(2) The syllabus committee consists of—

(a) the chair, who must be a senior examiner designated in writing for the purpose by the Authority; and

(b) not more than eight other members appointed in writing by the Authority, being persons representing the interests of participants in the Republic's maritime industry and maritime training establishments.

(3) The Authority may give the syllabus committee written directions about—

(a) the way in which the committee is to carry out its work; and

(b) procedures to be followed in relation to its meetings.

(4) The syllabus committee must take account of the directions given to it by the Authority.

Approvals and accreditations

9. (1) Every approval or accreditation given in terms of these regulations—

(a) must be given in writing;

(b) must state the date on which it takes effect and expires and the conditions (if any) on which it is given; and

(c) may, after reasonable notice, be altered or cancelled.

(2) Every approval or accreditation, or alteration or cancellation of an approval or accreditation, given in terms of these regulations must be notified by marine notice.

PART 3

CERTIFICATION

Division 1—General

Dates and places for level 3 assessments

10. (1) The Authority must publish at least annually in a marine notice the dates on which and the places where level 3 assessments are to be held.

(2) However, these dates and places may be varied by arrangement between the examiner and candidate concerned.

How to apply

11. (1) Application for certification in terms of these regulations must be made in the form and manner specified by the Authority and be accompanied by the appropriate documents given in Annex 1.

(2) If the certification concerned requires level 3 assessment, the application must be made not less than 14 days before the intended date for the assessment.

Examiner may verify eligibility

12. Before applying for certification, a candidate may give the examiner the relevant information and documents (for example, certificates of discharge, testimonials, training records and watchkeeping certificates) and request the examiner to verify his or her eligibility for certification in terms of these regulations.

Proficiency in English

13. A candidate is not entitled to any certification in terms of these regulations as a master or ship's officer unless the candidate proves, to the satisfaction of the examiner, that his or her proficiency in written and spoken English is of standard appropriate to the routine and emergency duties and responsibilities of a holder of the kind of certification concerned.

Unsatisfactory conduct

14. (1) If the Authority is satisfied that a candidate's record of conduct during qualifying service is unsatisfactory, the Authority—

(a) must refuse the application for certification; and

(b) may require that the candidate obtain a further period of appropriate seagoing service, not exceeding 24 months, before he or she may reapply for certification.

(2) Unsatisfactory conduct includes conduct of the following kind:

(a) signing a crew agreement, as mentioned in section 102 of the Act, and failing, without reasonable excuse, to join the vessel concerned;

(b) absence without leave or desertion from a vessel;

(c) misconduct on board a vessel.

Bribery

15. A candidate who has been convicted of bribery as described in section 314 of the Act or upon whom a penalty for such bribery has been imposed under section 324 of the Act is disqualified from obtaining any certification in terms of these regulations for a period expiring 12 months after the date of the conviction or imposition of the penalty, as the case may be.

Assessment levels

16. (1) For the purposes of these regulations, a candidate is to be assessed at one or more of the following levels of assessment (listed below from lowest to highest) to meet the appropriate standard of competence specified in the Code:

(a) level 1—candidates required to complete in-service training are assessed at this level during the in-service training programme;

(b) level 2—candidates required to complete approved training are assessed at this level while undergoing training at an accredited maritime training provider;

(c) level 3—all candidates for certificates of competency are assessed at this level by way of an oral examination conducted by an examiner.

(2) To avoid doubt, a candidate who is required to be assessed at more than one level of assessment may not be assessed at a higher level before he or she has been assessed as competent at the lower level.

Level 2 assessment

17. (1) This regulation applies to examinations that form part of assessment at level 2.

(2) The Authority must designate in writing one or more examiners to—

(a) moderate examination question papers and memoranda;

(b) moderate examination scripts;

(c) re-mark examination scripts, if requested by the maritime training provider concerned; and

(d) consult with the relevant instructors or assessors of the maritime training provider concerned, when a negative trend or defect is detected in a memorandum or in examination scripts.

(3) For each of the subjects Celestial Navigation; Chartwork; and Naval Architecture (master and deck officer certification only), the minimum aggregate pass-mark is 60 per cent. For the other subjects the minimum aggregate pass mark is 50 per cent.

(4) In the case of doubt about a candidate's final mark for the subjects Celestial Navigation; Chartwork; Naval Architecture; and Engineering Knowledge, the examiner's decision is final.

Level 3 assessment

18. (1) The main object of the level 3 assessment is to assesses a candidate's competence in the practical aspects of a seafarer's duties and responsibilities.

(2) The assessment is to be conducted by an examiner in the presence of another approved person.

(3) (a) If a candidate passes the assessment and complies with all the other requirements for the issue of the certification concerned, the examiner must issue the candidate with a certificate of pass in the approved form.

(b) The certificate—

(i) is valid from its date of issue for a period of six months;

(ii) during this period, serves as interim certification (pending the issue of the original appropriate certification by the Registrar); and

(iii) must be surrendered to the Authority when the holder is issued with the original certification.

(4) If a candidate fails the assessment, the examiner must give the candidate a written notice, signed by the examiner, stating—

(a) the details of the assessment;

(b) the date the assessment was failed;

(c) the conditions (if any) imposed by the examiner; and

(d) the requirement to produce the notice when next applying for level 3 assessment.

(5) If the examiner fails a candidate because of a significant deficiency in the candidate's practical knowledge, the examiner may require that the candidate perform a further period of appropriate seagoing service, not exceeding six months, before he or she may reapply for the certification concerned.

(6) If a candidate, without reasonable excuse, fails to appear for the assessment at the appointed time and place, the examiner must fail the candidate by default.

Mislaid, lost or destroyed certificates

19. If certification issued in terms of these regulations is at any time mislaid, lost or destroyed, the Registrar may issue replacement certification on application made by the holder of the certification in the form and manner and including the information and accompanied by the documents specified by the Authority.

Division 2—Certificates

Subdivision 1—Masters and deck officers

Deck Officer (Fishing < 24 metres)

20. For the certificate of competency as Deck Officer (Fishing < 24 metres), a candidate must—

(a) be at least 18 years of age;

(b) have performed seagoing service of not less than 12 months in the deck department on fishing vessels of 12 metres or more in length;

(c) have performed, during the required seagoing service, bridge watchkeeping duties under the supervision of a certificated deck officer for a period of not less than six months; and

(d) have completed approved training and been assessed at levels 2 and 3 to meet the standard of competence specified in the Code.

Skipper (Fishing < 24 metres)

21. (1) For the certificate of competency as Skipper (Fishing < 24 metres), a candidate must—

ALTERNATIVE A

(a) have performed seagoing service of not less than 12 months as officer in charge of a navigational watch on fishing vessels of 12 metres or more in length while holding as a minimum the certificate of competency as Deck Officer (Fishing < 24 metres) or an equivalent certificate; and

(b) have completed approved training and been assessed at levels 2 and 3 to meet the standard of competence specified in the Code,

or

ALTERNATIVE B

(a) have performed seagoing service of not less than 12 months as officer in charge of a navigational watch on fishing vessels of 12 metres or more in length while holding as a minimum the small vessel certificate of competence as Coastal Skipper (> 9 metres)[1]; and

(b) have completed approved training and been assessed at levels 2 and 3 to meet the standard of competence specified in the Code,

or

ALTERNATIVE C

(a) have performed seagoing service of not less than 12 months as officer in charge of a navigational watch on fishing vessels of 12 metres or more in length while holding as a minimum the certificate of competency as Deck Officer (Fishing ≥ 24 metres) or an equivalent certificate; and

(b) have completed approved training and been assessed at level 3 to meet the standard of competence specified in the Code,.

(2) For the purposes of paragraph (b) of ALTERNATIVES A and B in subregulation (1), the syllabus in the Code must cover at least the material set out in the appendix to Regulation II/2 of the STCW-F Convention.

Deck Officer (Fishing ≥ 24 metres)

22. (1) For the certificate of competency as Deck Officer (Fishing ≥ 24 metres), a candidate must—

(a) be at least 18 years of age;

(b) have performed seagoing service of not less than 12 months in the deck department on fishing vessels of 12 metres or more in length;

(c) have performed, during the required seagoing service, bridge watchkeeping duties under the supervision of a certificated deck officer for a period of not less than six months; and

(d) have completed approved training and been assessed at levels 2 and 3 to meet the standard of competence specified in the Code.

(2) For the purposes of subregulation (1)(d), the syllabus in the Code must cover at least the material set out in the appendix to Regulation II/2 of the STCW-F Convention.

Skipper (Fishing ≥ 24 metres)

23. (1) For the certificate of competency as Skipper (Fishing ≥ 24 metres), a candidate must—

[1] This certification is issued under the Merchant Shipping (Small Vessel Safety) Regulations, 2002.

(a) have performed seagoing service of not less than 12 months as officer in charge of a navigational watch on fishing vessels of 12 metres or more in length while holding as a minimum the certificate of competency as Deck Officer (Fishing ≥ 24 metres) or Skipper (Fishing < 24 metres), or an equivalent certificate; and

(b) have completed approved training and been assessed at levels 2 and 3 to meet the standard of competence specified in the Code.

(2) For the purposes of subregulation (1)(b), the syllabus in the Code must cover at least the material set out in the appendix to Regulation II/3 of the STCW-F Convention.

Unlimited Waters Command Endorsement

24. (1) For the Unlimited Waters Command Endorsement, a candidate must—

(a) hold the certificate of competency as Skipper (Fishing < 24 metres) or Skipper (Fishing ≥ 24 metres), or an equivalent certificate; and

(b) have completed approved training and been assessed at levels 2 and 3 to meet the standard of competence specified in the Code.

(2) For the purposes of subregulation (1)(b), the syllabus in the Code must cover at least the material set out in the appendix to Regulation II/1 of the STCW-F Convention.

Subdivision 2—Engineer officers

Marine Motorman Grade 2

25. (1) For the certificate of competency as Marine Motorman Grade 2, a candidate must—

(a) be at least 18 years of age;

(b) subject to subregulation (2), have performed seagoing service of not less than 12 months in the engine-room department on vessels of 100 kW propulsion power or more, of which not less than three months must have been served on vessels other than naval vessels; and

(c) have completed approved training and been assessed at levels 2 and 3 to meet the standard of competence specified in the Code.

(2) For a candidate holding a qualification as artisan in an approved trade that was obtained before commencing seagoing service, the period of 12 months in subregulation (1)(b) is reduced to six months.

Marine Motorman Grade 1

26. (1) For the certificate of competency as Marine Motorman Grade 1, a candidate must—

ALTERNATIVE A

(a) subject to subregulation (2)(a), have performed seagoing service of not less than 12 months as an officer in charge of an engineering watch on vessels of 350 kW propulsion power or more while holding as a minimum the certificate of competency as Marine Motorman Grade 2 or an equivalent certificate; and

(b) have completed approved training and been assessed at levels 2 and 3 to meet the standard of competence specified in the Code,

or

ALTERNATIVE B

(a) subject to subregulation (2)(b), have performed seagoing service of not less than 24 months in the engine-room department on vessels of 2 000 kW propulsion power or more; and

(b) have completed approved training and been assessed at levels 2 and 3 to meet the standard of competence specified in the Code.

(2) However, if the candidate holds a qualification as artisan in an approved trade that was obtained before commencing seagoing service—

(a) the period of 12 months in paragraph (a) of ALTERNATIVE A in regulation (1) is reduced to six months; and

(b) the period of 24 months in paragraph (a) of ALTERNATIVE B in regulation (1) is reduced to 18 months.

(3) For the purposes of paragraph (b) of ALTERNATIVES A and B in subregulation (1), the syllabus in the Code must cover at least the material set out in the appendix to Regulation II/5 of the STCW-F Convention appropriate to second engineer officers on fishing vessels of 750 kW propulsion power or more.

Marine Motorman Higher Grade

27. (1) For the certificate of competency as Marine Motorman Higher Grade, a candidate must—

(a) have performed seagoing service of not less than 12 months as officer in charge of an engineering watch on vessels of 750 kW propulsion power or more while holding as a minimum the certificate of competency as Marine Motorman Grade 1 or an equivalent certificate; and

(b) have completed approved training and been assessed at levels 2 and 3 to meet the standard of competence specified in the Code.

(2) For the purposes of subregulation (1)(b), the syllabus in the Code must cover at least the material set out in the appendix to Regulation II/5 of the STCW-F Convention appropriate to chief engineer officers on fishing vessels of 750 kW propulsion power or more.

Chief Engineer Officer (Fishing)

28. (1) For the certificate of competency as Chief Engineer Officer (Fishing), a candidate must—

ALTERNATIVE A

(a) have performed seagoing service of not less than six months as officer in charge of an engineering watch on fishing vessels of 2 000 kW propulsion power or more while holding as a minimum the certificate of competency as Marine Motorman Higher Grade or an equivalent certificate; and

(b) have completed approved training and been assessed at levels 2 and 3 to meet the standard of competence specified in the Code,

or

ALTERNATIVE B

(a) have performed seagoing service of not less than six months as officer in charge of an engineering watch on fishing vessels of 2 000 kW propulsion power or more while holding as a minimum the certificate of competency as Engineer Officer[2]; and

(b) have completed approved training and been assessed at levels 2 and 3 to meet the standard of competence specified in the Code.

(2) For the purposes of paragraph (b) of ALTERNATIVES A and B in subregulation (1), the syllabus in the Code must cover at least the material set out in the appendix to Regulation II/5 of the STCW-F Convention appropriate to chief engineer officers on fishing vessels of 750 kW propulsion power or more.

Subdivision 3—Ratings

Able Seaman (Fishing)

29. For the certificate of qualification as Able Seaman (Fishing), a candidate must—

(a) be at least 18 years of age;

(b) have performed seagoing service of not less than 12 months in the deck department on fishing vessels of 12 metres or more in length;

(c) have completed, during the required seagoing service, on-board in-service training and been assessed at level 1 to meet the standard of competence specified in the candidate's approved training record book; and

(d) have completed approved training and been assessed at level 2 to meet the standard of competence specified in the Code.

[2] This certification is issued in terms of the Merchant Shipping (Training and Certification) Regulations, 1999.

Subdivision 4—Miscellaneous

Proficiency in Survival Craft (Local)

30. For the certificate of qualification entitled Proficiency in Survival Craft (Local), a candidate must—

(a) be at least 18 years of age;

(b) have performed seagoing service of not less than six months on vessels of 12 metres or more in length; and

(c) have completed approved training and been assessed at level 2 to meet the standard of competence specified in the Code.

Division 3—Recognition of non-fishing certification

Recognition of naval bridge watchkeeping certificate

31. (1) This regulation applies if a candidate—

(a) holds of a valid naval bridge watchkeeping examination board certificate; and

(b) has seagoing service, performed not earlier than 10 years before the date of the application for certification, of not less than 12 months as officer in charge of a navigational watch on South African naval vessels of 24 metres or more in length.

(2) For the certificate of competency as Deck Officer (Fishing ≥ 24 metres), the candidate must—

(a) have performed seagoing service of not less than six months in the deck department on fishing vessels of 12 metres or more in length;

(b) have performed, during the required seagoing service, bridge watchkeeping duties under the supervision of a certificated deck officer for a period of not less than two months; and

(c) have completed approved training covering the subjects Naval Architecture, Ship's Power Plant, Personnel Management and Ship's Business, and Fishing Technology and been assessed at levels 2 and 3 to meet the standard of competence specified in the Code.

Master and deck officer (non-fishing) certification endorsements

32. (1) The holder of certification specified in column 1 of an item in the table below may apply to the Authority for the certification specified in column 2 of the item, if he or she—

(a) has performed seagoing service of not less than six months in the deck department on fishing vessels of 12 metres or more in length;

(b) has performed, during the required seagoing service, bridge watchkeeping duties under the supervision of a certificated deck officer for a period of not less than one month; and

(c) has completed approved training covering the subject Fishing Technology and been assessed at level 2 to meet the standard of competence specified in the Code:

Item	Column 1	Column 2
	Certificate of competency	*Appropriate endorsement in terms of these regulations*
1	Skipper (Coastal)	Master of a fishing vessel of less than 24 metres in length operating in limited waters
2	Mate (Coastal)	Officer in charge of a navigational watch on fishing vessels of 24 metres or more in length operating in limited waters
3	Master (Coastal)	Master of a fishing vessel of 24 metres or more in length operating in limited waters
4	Deck Officer	Officer in charge of a navigational watch on fishing vessels of 24 metres or more in length operating in unlimited waters
5	Chief Mate	Master of a fishing vessel of 24 metres or more in length operating in unlimited waters
6	Master	

(2) The application must be made in the form and manner, include the information and be accompanied by the documents specified by the Authority.

Division 4—Revalidation

Certificates of competency to be revalidated

33. (1) A certificate of competency issued in terms of these regulations, and any corresponding equivalent certificate, is not valid for seagoing service unless revalidated at intervals not exceeding five years to establish continued professional competence in accordance with subregulation (2).

(2) Continued professional competence is established—

(a) by having completed approved refresher training and been assessed at level 2 to meet the standard of competence specified in the Code; and

(b) by having—

(i) performed seagoing service, appropriate to the certificate held, of not less than 12 months during the preceding five years;

(ii) performed functions considered by the Authority to be equivalent to the seagoing service mentioned in subparagraph (i); or

(iii) performed seagoing service in a supernumerary capacity appropriate to the certificate held of not less than three months and been assessed at level 3 to meet the standard of competence specified in the Code.

(3) Application for revalidation must be made in the form and manner, include the information and be accompanied by the documents specified by the Authority.

PART 4

QUALIFYING SERVICE

Proof of qualifying service

34. (1) A candidate has the onus of producing proof of qualifying service to the satisfaction of the examiner.

(2) The examiner may require a candidate to explain, to the examiner's satisfaction, any periods of discontinuity in the candidate's qualifying service.

Qualifying service on foreign vessels

35. Qualifying service performed on foreign vessels does not to count towards satisfying the seagoing service requirements for certification in terms of these regulations unless the service has been verified to the examiner's satisfaction.

Misrepresenting qualifying service

36. (1) If the Authority finds that a candidate has wilfully misrepresented qualifying service, the candidate is disqualified from certification in terms of these regulations until he or she has made up any deficiency in qualifying service plus an additional 12 months of the appropriate seagoing service.

(2) To avoid doubt, additional seagoing service performed because of subregulation (1) does not count towards satisfying the seagoing service requirements for any other certification (whether in terms of these regulations or otherwise under the Act).

Calculating qualifying service

37. Qualifying service is calculated from the day of engagement on a vessel to the day of discharge from the vessel and consists of the calendar days between the days of engagement and discharge, both days inclusive, reckoning 30 days to a month and 12 months to a year.

Non-fishing service

38. (1) Qualifying service performed exclusively in the deck department on vessels, other than fishing vessels, of 12 metres or more in length counts in full towards satisfying the seagoing service requirements for the certificates of competency as Deck Officer (Fishing < 24 metres) and Deck Officer (Fishing ≥ 24 metres).

(2) However, this service counts only if the candidate—

(a) has seagoing service of not less than six months in the deck department on fishing vessels of 12 metres or more in length; and

(b) has performed, during the required seagoing service, bridge watchkeeping duties under the supervision of a certificated deck officer for a period of not less than six months.

Validity of qualifying service

39. For the purpose of satisfying the seagoing service requirements for certification in terms of these regulations, a candidate's qualifying service must have been performed not earlier than 10 years before the date of the final assessment for the certification concerned or within such other period as the Authority may allow in special circumstances.

PART 5

TRAINING

Accreditation of maritime training providers

40. (1) To be accredited as a maritime training provider authorised to conduct approved training in terms of these regulations, a maritime training provider must—

(a) have appointed instructors who—

(i) have an appreciation of the training programme and an understanding of the specific training objectives for the particular type of training to be conducted;

(ii) are qualified in the task for which the training is to be provided;

(iii) if using a simulator—

(aa) have received appropriate guidance in instructional techniques involving the use of simulators; and

(bb) have gained practical operational experience on the particular type of simulator to be used;

(b) have appointed training supervisors, appropriate to the approved training programmes and courses to be conducted by the provider, who have a thorough knowledge of each approved training programme and course they are to supervise including its specific objectives;

(c) have appointed assessors who have received appropriate training in assessment methods and practice and—

(i) have an appropriate level of knowledge and understanding of the competence to be assessed;

(ii) are qualified in the task for which the assessment is to be made;

(iii) have received appropriate guidance in assessment methods and practice;

(iv) have gained practical assessment experience; and

(v) if they are to conduct assessment involving the use of simulators, have gained practical assessment experience on the particular type of simulator to be used, under the supervision and to the satisfaction of an experienced assessor;

(d) maintain records of all certificates issued to students who complete their maritime training at the provider, incorporating details of the training received and the relevant dates, together with their full names and dates and places of birth;

(e) make available information about the status of such certificates and about approved training programmes and courses as appropriate;

(f) continuously monitor its training and assessment activities through a quality-standards system to ensure achievement of its defined objectives including those concerning the qualifications and experience of its instructors and assessors;

(g) undergo evaluation at intervals not exceeding three years, by suitably qualified persons who are not themselves involved in the training or assessment activities concerned, so as to verify that the administrative and operational procedures at all levels within the provider are managed, organised, undertaken, supervised and monitored internally in order to ensure their fitness for purpose and achievement of stated objectives.

(2) Application for accreditation must be made in the form and manner, include the information and be accompanied by the documents specified by the Authority.

Approval of maritime training programmes and courses

41. For approval in terms of these regulations, a training programme or course must—

(a) be structured in accordance with written programmes that—

(i) are based on the relevant syllabuses in the Code; and

(ii) include such methods and media of delivery, procedures, and course material as are necessary to achieve the standard of competence specified in the Code; and

(b) be conducted, monitored, evaluated and supported by persons qualified in accordance with regulation 40(1)(a), (b) and (c).

In-service training

42. (1) Anyone conducting in-service training, whether on or off a vessel, that is intended to be used in qualifying for certification in terms of these regulations must—

(a) have an appreciation of the training programme and an understanding of the specific training objectives for the particular type of training being conducted;

(b) be qualified in the task for which the training is being conducted; and

(c) if conducting training using a simulator—

(i) have received appropriate guidance in instructional techniques involving the use of simulators; and

(ii) have gained practical operational experience on the particular type of simulator being used.

(2) Anyone who is responsible for supervising in-service training that is intended to be used in qualifying for certification in terms of these regulations must have a thorough understanding of the training programme and the specific objectives for each type of training being conducted.

(3) Anyone conducting in-service assessment of the competence of a candidate, whether on or off a vessel, that is intended to be used in qualifying for certification in terms of these regulations must—

(a) have an appropriate level of knowledge and understanding of the competence to be assessed;

(b) be qualified in the task for which the assessment is being made;

(c) have received appropriate guidance in assessment methods and practice;

(d) have gained practical assessment experience; and

(e) if conducting assessment involving the use of simulators, have gained practical assessment experience on the particular type of simulator under the supervision and to the satisfaction of an experienced assessor.

(4) If the Authority is satisfied that an in-service training programme meets the requirements of these regulations, the Authority may approve the programme.

Training record book

43. (1) In-service training that is to be conducted on board a vessel must be set out in an approved training record book.

(2) A duly completed approved training record book is evidence that the book's holder has completed the training recorded in it.

PART 6

FINAL

Transitional

44. Before <<date>>, the requirements for the issue of certification prescribed by the regulations repealed by regulation 45 continue to have effect in relation to those persons who commenced seagoing service or approved training before the commencement of these regulations.

Repeals

45. These regulations are repealed, subject to regulation 44:

(a) the Examination Regulations for Certificates of Competency for Fishermen, 1993, published by Government Notice No. R 2317 of 1 December 1993, as amended by Government Notice No. R. 1468 of 29 September 1995;

(b) the Examination Regulations for Certificates of Competency as Marine Motormen, 1993, published by Government Notice No. R 2314 of 1 December 1993.

Consequential amendments

46. Each regulation that is specified in Annex 2, 3 and 4 is amended as set out in the applicable items of the Annex concerned.

ANNEX 1

(Regulation 11(1))

DOCUMENTS TO ACCOMPANY APPLICATION FOR CERTIFICATION

"X" indicates a requirement to produce the specified document(s). Certificates that are required to be produced must be valid.

Item	Documents	Certification										
		Masters and deck officers					Engineer officers				Ratings	Other
		Unlimited Waters Command Endorsement	Skipper (Fishing ≥ 24 metres)	Deck Officer (Fishing ≥ 24 metres)	Skipper (Fishing < 24 metres)	Deck Officer (Fishing < 24 metres)	Chief Engineer Officer (Fishing)	Marine Motorman Higher Grade	Marine Motorman Grade 1	Marine Motorman Grade 2	Able Seaman (Fishing)	Proficiency in survival craft (local)
1	Proof of identity	X	X	X	X	X	X	X	X	X	X	X
2	2 x Black & white photographs (passport size)	X	X	X	X	X	X	X	X	X	—	—
3	Testimonials	X	X	X	X	X	—	—	—	—	—	—
4	Previous certificate of competency	X	X	X	X	—	X	X	X	—	—	—
5	Trainee watchkeeper certificate	—	—	X	—	X	—	—	—	—	—	—
6	Watchkeeping certificate	—	X	—	X	—	—	—	—	—	—	—
7	Eyesight certificate	X	X	X	X	X	—	—	—	—	X	—
8	Medical certificate	X	X	X	X	X	X	X	X	X	X	X
9	First aid at sea certificate	—	—	X	X	X	X	X	X	X	X	—
10	Ship captain's medical training certificate	X	X	—	—	—	—	—	—	—	—	—

Item	Documents	Certification										
		Masters and deck officers					Engineer officers				Ratings	Other
		Unlimited Waters Command Endorsement	Skipper (Fishing ≥ 24 metres)	Deck Officer (Fishing ≥ 24 metres)	Skipper (Fishing < 24 metres)	Deck Officer (Fishing < 24 metres)	Chief Engineer Officer (Fishing)	Marine Motorman Higher Grade	Marine Motorman Grade 1	Marine Motorman Grade 2	Able Seaman (Fishing)	Proficiency in survival craft (local)
11	Fire-fighting course certificate	X	X	X	X	X	X	X	X	X	X	—
12	Advanced fire-fighting course certificate	X	X	X	X	—	X	X	—	—	—	—
13	Certificate of proficiency in survival craft (local)	X	X	X	—	—	X	X	—	—	X	—
14	Certificate of proficiency in liferafts	—	—	—	X	X	—	—	X	X	—	—
15	Pre-sea training course certificate	—	—	X	—	X	—	—	X	X	X	X
16	Restricted marine radiotelephone operator's certificate	—	X	X	X	X	—	—	—	—	—	—
17	GMDSS general operator's certificate	X*	—	—	—	—	—	—	—	—	—	—
18	Documentary proof of pass at an accredited maritime training provider	X	X	X	X	X	X	X	X	X	X	X
19	Approved training record book	—	—	—	—	—	—	—	—	—	X	—
20	Proof of seagoing service	X	X	X	X	X	X	X	X	X	X	X
21	Receipt for certification fee	X	X	X	X	X	X	X	X	X	X	X

* Only required for the endorsement to the certificate of competency as Skipper (Fishing ≥ 24 metres).

EXPLANATORY NOTES

(1) A testimonial is a document, satisfactory to the examiner, testifying to a candidate's character (including sobriety), experience, ability and general good conduct on board a vessel. A testimonial must be signed by the master of the vessel concerned or by the person having responsibility for the operation of the vessel.

(2) A trainee watchkeeper certificate is a certificate signed by the master of the vessel or vessels on which qualifying service was performed stating that the candidate performed the required supervised watchkeeping duties for not less than eight hours in every 24 hours during the period of qualifying service covered by the certificate, and stating that the candidate has not, during that period, served more than two months as helmsman. The certificate must be in accordance with the form of certificate given in the Code.

(3) A watchkeeping certificate is a certificate signed by the master of the vessel or vessels on which qualifying service was performed stating that the candidate performed watchkeeping duties for not less than eight hours in every 24 hours during the period of qualifying service covered by the certificate, and stating that the candidate has not, during that period, served more than two months as helmsman. The certificate must be in accordance with the form of certificate given in the Code

(4) An eyesight certificate is the eyesight certificate mentioned in regulation 3 of the Merchant Shipping (Eyesight and Medical Examination) Regulations, 2004.

(5) A medical certificate is the medical certificate mentioned in regulation 3 of the Merchant Shipping (Eyesight and Medical Examination) Regulations, 2004.

(6) A First Aid at Sea Certificate is the certificate mentioned in regulation 2(b) of the Merchant Shipping (Medical Training) Regulations, 1992.

(7) A Ship Captain's Medical Training Certificate is the certificate mentioned in regulation 2(c) of the Merchant Shipping (Medical Training) Regulations, 1992.

(8) A fire-fighting course certificate is a certificate attesting successful completion of approved training in fire-fighting. The certificate is valid from the date of completing the course for a period of five years.

(9) An advanced fire-fighting course certificate is a certificate attesting successful completion of approved training in advanced fire-fighting. The certificate is valid from the date of completing the course for a period of five years.

(10) A certificate of proficiency in survival craft (local) is the certificate of qualification mentioned in regulation 30.

(11) A certificate of proficiency in liferafts is the certificate of qualification mentioned in regulation 34 of the Merchant Shipping (Training and Certification) Regulations, 1999.

(12) A pre-sea training course certificate is a certificate attesting the successful completion of the approved training mentioned in regulation 4(1)(g) of the Merchant Shipping (Safe Manning) Regulations, 1999.

(13) A restricted marine radiotelephone operator's certificate and a GMDSS general operator's certificate are certificates of proficiency issued by the Independent Communications Authority of South Africa.

(14) Proof of qualifying service may be given by producing one or more of the following:

(a) a Seaman's Record Book;

(b) a certificate of discharge;

(c) a declaration by an employer stating the seagoing service performed during the period of employment.

In addition, for engineer officer certification, proof of qualifying service may be given by one or more testimonials, signed by the chief engineer officer or master of the vessel or vessels on which the service was performed, stating—

(d) the vessel's name, official number, type of propulsion machinery and propulsion power (in kilowatts);

(e) the nature of duties performed by the candidate;

(f) the period the candidate performed watchkeeping duties or, for vessels of 750 kW propulsion power or more, that the candidate performed watchkeeping for not less than eight hours in every 24 hours during the period of qualifying service covered by the testimonial; and

(g) the candidate's actual rank when performing watchkeeping duties.

(15) Documentary proof of pass at an accredited maritime training provider is a document issued by the provider concerned attesting the successful completion of stated approved training.

ANNEX 2

(Regulation 46)

AMENDMENT OF SHIP'S OFFICERS MEDICAL TRAINING REGULATIONS, 1992

1. In this Annex "the Regulations" means the Ship's Officers Medical Training Regulations, 1992, published by Government Notice No. R. 2666 of 25 September 1992, as amended by Government Notice No. R. 533 of 25 March 1994.

2. Regulation 1 of the Regulations is amended—

(a) by the substitution for the definition of "approved" of the following definition:

"'approved' means approved by the Authority;";

(b) by the deletion of the definition of "department"; and

(c) by the addition of the following definition:

"'training and certification regulations' means the regulations under the Act relating to the training and certification of masters and seamen.".

3. The following regulations are substituted for regulations 2 and 3, respectively, of the Regulations:

"Application

2. These regulations apply to every person who, in terms of the training and certification regulations, is required to hold one or more of the following certificates:

(a) the Elementary First Aid Certificate;

(b) the First Aid at Sea Certificate;

(c) the Ship Captain's Medical Training Certificate.

General

3. (1) The medical training of masters and seamen in the merchant and fishing fleet shall be based upon approved training programmes.

(2) These regulations shall refer to the following:

(a) The Elementary First Aid Certificate course.

(b) The First Aid at Sea Certificate course.

(c) The Ship Captain's Medical Training Certificate course.".

4. Regulation 4 of the Regulations is amended by the substitution in subregulation (1) for the expressions "Department" and "Director-General" of the expression "Authority".

5. The following regulations are substituted for regulations 6 and 7, respectively, of the Regulations:

"Period of validity

6. The certificates referred to in **regulation 2** shall be valid for five years from the date of passing the terminal examination.

Where to apply

7. Candidates wishing to apply for admission to the certificate courses referred to in regulation 3(2) must apply at the approved institutions notified from time to time by marine notice.".

6. The following regulations are substituted for regulations 9 and 10, respectively, of the Regulations:

"Syllabuses for courses

9. The syllabuses for the certificate courses referred to in regulation 3(2) are given in the *Code for South African Maritime Qualifications*, published by the Authority.".

Title

10. These regulations are called the Merchant Shipping (Medical Training) Regulations, 1992.".

7. The Regulations are amended by the deletion of Annexures 1 to 4.

ANNEX 3

(Regulation 46)

AMENDMENT OF MERCHANT SHIPPING (TRAINING AND CERTIFICATION) REGULATIONS, 1999

1. In this Annex "the Regulations" means the Merchant Shipping (Training and Certification) Regulations, 1999, published by Government Notice No. 1547 of 30 December 1999, as amended by Government Notices Nos. R. 502 of 26 April 2002 and 1196 and 1197 of 15 October 2004.

2. Regulation 1 of the Regulations is amended—

(a) by the substitution in subregulation (1) for the definition of "fishing vessel" of the following definition:

> "'fishing vessel' means a vessel that is used wholly or principally for the taking, catching or capturing of fish or other living resources of the sea or seabed for financial gain or reward;";

(b) by the substitution in subregulation (1) for the definition of "GT" of the following definition:

> "'GT', in relation to a ship, means its gross tonnage calculated in accordance with the Tonnage Regulations, 1986;";

(c) by the insertion in subregulation (1) after the definition of "IGC Code" of the following definition:

> "'length' has the same meaning as in regulation 2 of the Tonnage Regulations, 1986;"; and

(d) by the insertion in subregulation (1) after the definition of "unlimited voyage" of the following definition:

> "'valid', in relation to a certificate or other document, means a certificate or document that is current and that has not been suspended or cancelled;".

3. Regulation 2 of the Regulations is amended—

(a) by the substitution for subregulation (1) of the following subregulation:

> "(1) These regulations prescribe the conditions to be met and the standards of competence required for the issue of the certification described in subregulations (3) to (7).";

(b) by the substitution for the words preceding paragraph (a) of subregulation (2) of the following words:

> "A person is qualified as a master, ship's officer or rating for the purposes of the Act and entitled to serve in the capacity and perform the functions involved at the level of responsibility specified in his or her certificate on a ship of the type,

tonnage and power and means of propulsion so specified while engaged on the particular voyage concerned, if—";

(c) by the substitution for subparagraph (iii) of subregulation (2)(a) of the following subparagraph:

"(iii) a valid certificate as such, issued by or on behalf of the government of another country, and has been authorized under section 83(1) of the Act to serve in the capacity concerned; and"; and

(d) by the substitution for subparagraph (iv) of subregulation (2)(b) of the following subparagraph:

"(iv) any other certificate issued by or on behalf of the government of another country which, in the opinion of the Authority, qualifies the person to serve in the capacity concerned.".

4. Regulation 47 of the Regulations is amended by the substitution for paragraph (a) of the following paragraph:

"(a) completed at least three months' sea service or port operations service on ships of any tonnage; and".

5. Regulation 50 of the Regulations is amended by the substitution for paragraph (b) of the following paragraph:

"(b) completed at least three months' sea service in the catering department on ships of the following kind:

(i) ships (other than fishing vessels) of 100 GT or more on unlimited or near-coastal voyages;

(ii) fishing vessels of 24 metres or more in length.".

6. The following regulation is substituted for regulation 60 of the Regulations:

"Fishing certification endorsements

60. (1) (a) Subject to subregulation (3), the holder of a certificate of competency specified in column 1 of an item in the following table may apply to the Authority for the endorsement specified in column 2 of the item:

Item	Column 1	Column 2
	Certificate of competency	*Endorsement in terms of these regulations*
1	Skipper (Fishing ≥ 24 metres)	Master of a ship of less than 500 GT on near-coastal voyages
2	Deck Officer (Fishing ≥ 24 metres)	Chief mate/officer in charge of a navigational watch on ships of less than 500 GT on near-coastal voyages

Item	Column 1	Column 2
	Certificate of competency	*Endorsement in terms of these regulations*
3	Skipper (Fishing < 24 metres)	Master of a ship of less than 100 GT on near-coastal voyages
		Master of a ship of less than 200 GT operating within a port operations area
Note: The certificates listed in column 1 do not include the certificates issued in terms of regulation 4(2) of the Merchant Shipping (Training and Certification) (Fishing and Marine Motorman) Regulations, 2005.		

(b) The application shall be accompanied by—

(i) documentary proof that the applicant has been assessed at level 3 in practical knowledge covering the subjects naval architecture, business law, personnel management, and ship's power plant, at the level appropriate to the endorsement concerned; and

(ii) the relevant supplementary documents specified in the annex.

(2) (a) Subject to subregulation (3), the holder of a certificate of competency specified in column 1 of an item in the following table may apply to the Authority for the endorsement specified in column 2 of the item:

Item	Column 1	Column 2
	Title of certificate of competency	*Endorsement in terms of these regulations*
1	Fisherman Grade 2	Master of a ship of less than 500 GT on near-coastal voyages
2	Fisherman Grade 3	Chief mate/officer in charge of a navigational watch on ships of less than 500 GT on near-coastal voyages
3	Fisherman Grade 4	Master of a ship of less than 100 GT on near-coastal voyages
		Master of a ship of less than 200 GT operating within a port operations area
4	Fisherman Grade 4 (Skipper)	Master of a ship of less than 100 GT on near-coastal voyages
		Master of a ship of less than 200 GT operating within a port operations area
Note: The certificates listed in column 1 include the equivalent certificates issued in terms of regulation 4(2) of the Merchant Shipping (Training and Certification) (Fishing and Marine Motorman) Regulations, 2005.		

(b) The application shall be accompanied by—

(i) documentary proof that the applicant has—

(aa) passed, at an accredited institution, the theoretical examinations in the subjects naval architecture, business law, and personnel management, at the levels, respectively, of master (coastal) for the fisherman grade 2, mate (coastal) for the fisherman grade 3, and skipper (coastal) for the fisherman grade 4 and fisherman grade 4 (skipper); and

(bb) been assessed at level 3 in practical knowledge covering the subjects referred to in item (aa), at the level appropriate to the endorsement concerned; and

(ii) the relevant supplementary documents specified in the annex; however, if the applicant produces documentary proof of having successfully completed a fishing course that has been certified by the examiner as equivalent to the course contemplated in the annex, the Registrar shall accept such documentary proof instead of the relevant document specified in the annex.

(3) An endorsement issued in terms of subregulation (1) or (2) shall have effect only in relation to ships of the following kind:

(a) diamond mining vessels;

(b) fishery research and patrol vessels;

(c) pollution patrol and combating vessels;

(d) tugs, dredgers, hoppers or self-propelled floating cranes;

(e) seismic or oceanographic survey vessels.".

7. Regulation 71 of the Regulations is amended by the repeal of subregulations (2) and (3).

ANNEX 4

(Regulation 46)

AMENDMENT OF MERCHANT SHIPPING (SAFE MANNING) REGULATIONS, 1999

1. In this Annex "the Regulations" means the Merchant Shipping (Safe Manning) Regulations, 1999, published by Government Notice No. 1548 of 30 December 1999, as amended by Government Notices Nos. R. 501 of 26 April 2002 (as corrected by Government Notice No. R. 893 of 28 June 2002) and R. 545 of 30 April 2004.

2. Regulation 1 of the Regulations is amended—

(a) by the insertion in subregulation (1) after the definition of "certificated" of the following definition:

> "'chief engineer' means the senior engineer officer responsible for the mechanical propulsion and the operation and maintenance of the mechanical and electrical installation of a ship;";

(b) by the deletion in subregulation (1) of the definition of "defined fishing zone";

(c) by the substitution in subregulation (1) for the definition of "fishing vessel" of the following definition:

> "'fishing vessel' means a vessel that is used wholly or principally for the taking, catching or capturing of fish or other living resources of the sea or seabed for financial gain or reward;";

(d) by the insertion in subregulation (1) after the definition of "length" of the following definitions:

> "'limited waters', in relation to a fishing vessel, has the same meaning as in regulation 2(1) of the Merchant Shipping (Training and Certification) (Fishing and Marine Motorman) Regulations, 2005;
>
> 'mate' means the deck officer next in rank to the master and upon whom the command of the ship will fall in the event of the incapacity of the master;";

(e) by the insertion in subregulation (1) after the definition of "seagoing ship" of the following definition:

> "'second engineer' means the engineer officer next in rank to the chief engineer and upon whom 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;";

(f) by the substitution in subregulation (1) for the definition of "the Training and Certification Regulations" of the following definition:

> "'the Training and Certification Regulations' means the regulations under the Act relating to the training and certification of masters and seamen;"; and

(g) by the insertion in subregulation (1) after the definition of "unlimited voyage" of the following definitions:

"'unlimited waters', in relation to a fishing vessel, has the same meaning as in regulation 2(1) of the Merchant Shipping (Training and Certification) (Fishing and Marine Motorman) Regulations, 2005;

'watchkeeping officer' means a ship's officer whose duties include—

(a) if serving in the deck department on a ship, taking charge of a navigational watch on the ship; or

(b) if serving in the engine-room department on a ship, taking charge of an engineering watch on the ship;".

3. The following regulation is substituted for regulation 6 of the Regulations:

"Watchkeeping

6. (1) The owner and the master of every ship, other than a fishing vessel, shall ensure that the watchkeeping principles and arrangements set out in Annex 1 are complied with in relation to the ship.

(2) The owner and the master of every fishing vessel shall ensure that the watchkeeping principles set out in Annex 2 are complied with in relation to the vessel.".

4. The following regulation is substituted for regulation 12 of the Regulations:

"Employment of certificated deck officers on fishing vessels

12. The owner and the master of every fishing vessel shall ensure that there is employed on the vessel in their appropriate capacities the number and description of appropriately certificated deck officers specified in the applicable item of the following table:

Item	Type of voyage	Length of vessel (metres)	Capacity of employment	Appropriate minimum certification and number of persons to be employed	
				Certification	Number
1	Limited waters	< 24	Master	Skipper (Fishing < 24 metres)	1
			Mate	Deck Officer (Fishing < 24 metres)(B)	1(A)
2		≥ 24	Master	Skipper (Fishing ≥ 24 metres)	1
			Mate	Deck Officer (Fishing ≥ 24 metres)	1
			Watchkeeping officer	Deck Officer (Fishing ≥ 24 metres)	1

Item	Type of voyage	Length of vessel (metres)	Capacity of employment	Appropriate minimum certification and number of persons to be employed	
				Certification	Number
3	Unlimited waters	< 24	Master	Skipper (Fishing < 24 metres) with Unlimited Waters Command Endorsement	1
			Mate	Deck Officer (Fishing < 24 metres)	1
			Watchkeeping officer	Deck Officer (Fishing < 24 metres)(B)	1
4		≥ 24	Master	Skipper (Fishing ≥ 24 metres) with Unlimited Waters Command Endorsement	1
			Mate	Deck Officer (Fishing ≥ 24 metres)	1
			Watchkeeping officer	Deck Officer (Fishing ≥ 24 metres)	1
Notes: (A) Not required for vessels < 50 GT going to sea for periods not exceeding 12 consecutive hours. (B) Or Coastal Skipper (> 9 metres).					

5. Regulation 13 of the Regulations is repealed.

6. The following regulation is substituted for regulation 15 of the Regulations:

"Employment of certificated engineer officers on fishing vessels

15. The owner and the master of every fishing vessel shall ensure that there is employed on the vessel in their appropriate capacities the number and description of appropriately certificated engineer officers specified in the applicable item of the following table:

Item	Propulsion power of vessel (kW)	Capacity of employment	Appropriate minimum certification and number of persons to be employed	
			Certification	Number
1	< 350	Chief engineer	Marine Motorman Grade 2	1
2	≥ 350 but < 750	Chief engineer	Marine Motorman Grade 1	1
		Second engineer	Marine Motorman Grade 2	1
3	≥ 750 but < 2000	Chief engineer	Marine Motorman Higher Grade	1
		Second engineer	Marine Motorman Grade 1	1
		Watchkeeping officer	Marine Motorman Grade 2	1(A)
4	≥ 2000	Chief engineer	Chief Engineer Officer (Fishing)	1
		Second engineer	Marine Motorman Higher Grade	1
		Watchkeeping officer	Marine Motorman Grade 1	1
Notes: (A) Not required on vessels operating in limited waters.				

7. Regulation 16 of the Regulations is amended by the substitution for the existing table of the following table:

"Item	Voyage	Tonnage / Length of ship	Appropriate certification and number of persons to be employed	
			Certification	Number
Ships other than fishing vessels				
1	Port operations	≥ 25 GT	Restricted Radiotelephone Operator	1
2	Near-coastal	≥ 25 GT but < 300 GT	Restricted Radiotelephone Operator	2
3		≥ 300 GT	GMDSS General Operator	2
4	Unlimited	≥ 25 GT but < 300 GT	Restricted Radiotelephone Operator	2
5		≥ 300 GT	GMDSS General Operator	2
Fishing vessels				
6	Limited waters within 40 nautical miles offshore	≥ 25 GT	Restricted Radiotelephone Operator (VHF only)	1
7	Limited waters beyond 40 nautical miles offshore	≥ 25 GT	Restricted Radiotelephone Operator	2
8	Unlimited waters	< 45 metres	Restricted Radiotelephone Operator	2
9		≥ 45 metres	GMDSS General Operator	2".

8. The following regulation is substituted for regulation 18 of the Regulations:

"Employment of certificated ratings on fishing vessels of 24 metres or more in length

18. The owner and the master of every fishing vessel of 24 metres or more in length shall ensure that there is employed on the vessel in their appropriate capacities the number and description of appropriately certificated ratings specified in the applicable item of the following table:

Item	Number of persons on vessel	Minimum certification and number of persons to be employed		
		Able seaman	Proficient in survival craft	Efficient cook
1	≥ 15 but < 30	1	1	—
2	≥ 30	1	2	1

Notes:
(1) The number of ratings required to be qualified as proficient in survival craft shall be in addition to the number required to be qualified as able seaman.
(2) The certification as able seaman may be the local certification (including the able seaman (fishing) certification) or the certification issued in accordance with the STCW Convention.
(3) The certification as proficient in survival craft may be the local certification or the certification issued in accordance with the STCW Convention.".

9. Regulation 19 of the Regulations is amended—

(a) by the substitution for subparagraph (i) of subregulation (2)(a) of the following subparagraph:

"(i) a valid Ship Captain's Medical Training Certificate issued under the Merchant Shipping (Medical Training) Regulations, 1992; or"; and

(b) by the substitution for subparagraph (i) of subregulation (2)(b) of the following subparagraph:

"(i) a valid First Aid at Sea Certificate issued under the Merchant Shipping (Medical Training) Regulations, 1992; or".

10. Regulation 23 of the Regulations is amended—

(a) by the insertion in the table in subregulation (1)(b) after item 20 of the following item:

"Item	Column 1	Column 2	Column 3
	Title of certificate issued before commencement of repealed regulations	**Equivalent certificate or endorsement under repealed regulations**	**Equivalent certificate or endorsement under Training and Certification Regulations**
20A	—	Fisherman Grade 2 with High Seas Command Endorsement	Skipper (Fishing ≥ 24 metres) with Unlimited Waters Command Endorsement";

(b) by the substitution in the table in subregulation (1)(b) for item 21 of the following item:

"Item	Column 1	Column 2	Column 3
	Title of certificate issued before commencement of repealed regulations	**Equivalent certificate or endorsement under repealed regulations**	**Equivalent certificate or endorsement under Training and Certification Regulations**
21	Skipper of a fishing, sealing or shore-based whaling boat of 100 GT or more	Fisherman Grade 2	Skipper (Fishing ≥ 24 metres)";

(c) by the insertion in the table in subregulation (1)(b) after item 21 of the following item:

"Item	Column 1	Column 2	Column 3
	Title of certificate issued before commencement of repealed regulations	**Equivalent certificate or endorsement under repealed regulations**	**Equivalent certificate or endorsement under Training and Certification Regulations**
21A	—	Fisherman Grade 3 with High Seas Command Endorsement	Deck Officer (Fishing ≥ 24 metres) endorsed: *—Master of a fishing vessel of less than 30 metres in length operating in unlimited waters"*;

(d) by the substitution in the table in subregulation (1)(b) for item 22 of the following item:

"Item	Column 1	Column 2	Column 3
	Title of certificate issued before commencement of repealed regulations	**Equivalent certificate or endorsement under repealed regulations**	**Equivalent certificate or endorsement under Training and Certification Regulations**
22	Mate of a fishing, sealing or shore-based whaling boat of 100 GT or more	Fisherman Grade 3	Deck Officer (Fishing ≥ 24 metres) endorsed: *—Master of a fishing vessel of less than 30 metres in length operating in limited waters"*;

(e) by the insertion in the table in subregulation (1)(b) after item 22 of the following items:

"Item	Column 1 Title of certificate issued before commencement of repealed regulations	Column 2 Equivalent certificate or endorsement under repealed regulations	Column 3 Equivalent certificate or endorsement under Training and Certification Regulations
22A	—	Fisherman Grade 4 (Skipper) with High Seas Command Endorsement	Skipper (Fishing < 24 metres) with Unlimited Waters Command Endorsement
22B	—	Fisherman Grade 4 with High Seas Command Endorsement	Skipper (Fishing < 24 metres) with Unlimited Waters Command Endorsement";

(f) by the substitution in the table in subregulation (1)(b) for items 23 to 26 of the following items, respectively:

"Item	Column 1 Title of certificate issued before commencement of repealed regulations	Column 2 Equivalent certificate or endorsement under repealed regulations	Column 3 Equivalent certificate or endorsement under Training and Certification Regulations
23	Boatswain of a fishing, sealing or shore-based whaling boat of 100 GT or more	Fisherman Grade 4 (Skipper)	Skipper (Fishing < 24 metres)
24	Skipper of a coasting ship or a fishing, sealing or shore-based whaling boat of less than 100 GT	Fisherman Grade 4 (Skipper)	Skipper (Fishing < 24 metres)
25	Mate of a coasting ship or a fishing, sealing or shore-based whaling boat of less than 100 GT	Fisherman Grade 4 (Watchkeeper)	Deck Officer (Fishing < 24 metres)
26	—	Fisherman Grade 4	Skipper (Fishing < 24 metres)";

(g) by the substitution in the table in subregulation (1)(b) for item 29 of the following item:

"Item	Column 1 Title of certificate issued before commencement of repealed regulations	Column 2 Equivalent certificate or endorsement under repealed regulations	Column 3 Equivalent certificate or endorsement under Training and Certification Regulations
29	—	Marine Engineer-Officer Class 3 with Service Endorsement	(a) Second Engineer Officer (< 3 000 kW) endorsed: *—Chief Engineer Officer of a ship of less than 750 kW propulsion power* *—Chief Engineer Officer of a ship of any kilowatt propulsion power operating within a port operations area* (b) Chief Engineer Officer (Fishing)";

(h) by the insertion in the table in subregulation (1)(b) after item 30 of the following item:

"Item	Column 1 Title of certificate issued before commencement of repealed regulations	Column 2 Equivalent certificate or endorsement under repealed regulations	Column 3 Equivalent certificate or endorsement under Training and Certification Regulations
30A	—	Marine Engineer-Officer Class 4 with Service Endorsement	Chief Engineer Officer (Fishing)";

(i) by the substitution in the table in subregulation (1)(b) for item 31 of the following item:

"Item	Column 1	Column 2	Column 3
	Title of certificate issued before commencement of repealed regulations	Equivalent certificate or endorsement under repealed regulations	Equivalent certificate or endorsement under Training and Certification Regulations
31	Second Engineer-Officer of a coasting ship	Marine Engineer-Officer Class 4	(a) Engineer Officer endorsed: *—Chief Engineer Officer of a ship of less than 1 500 kW propulsion power operating within a port operations area* (b) Second Engineer Officer (Port Operations) (c) Chief Engineer Officer (Fishing)"; and

(j) by the substitution in the table in subregulation (1)(b) for item 35 of the following item:

"Item	Column 1	Column 2	Column 3
	Title of certificate issued before commencement of repealed regulations	Equivalent certificate or endorsement under repealed regulations	Equivalent certificate or endorsement under Training and Certification Regulations
35	Assistant Marine Engineman, under 150 brake horsepower	Marine Motorman Grade 3	Marine Motorman Grade 2".

11. The Regulations are amended by the addition of the following Annex:

"ANNEX 2

(Regulation 6(2))

BASIC PRINCIPLES TO BE OBSERVED IN KEEPING A NAVIGATIONAL WATCH ON BOARD FISHING VESSELS

1 The following principles must be observed to ensure that a safe navigational watch is maintained at all times.

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

3 The basic principles, including but not limited to the following, must be taken into account on all fishing vessels.

4 ***En route* to or from fishing grounds**

4.1 *Arrangements of the navigational watch*

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

4.1.2 When deciding the composition of the watch the following factors, *inter alia*, must be taken into account:

.1 at no time is the wheelhouse to be left unattended;

.2 weather conditions, visibility and whether there is daylight or darkness;

.3 proximity of navigational hazards which may make it necessary for the officer in charge of the watch to carry out additional navigational duties;

.4 use and operational condition of navigational aids such as radar or electronic position-indicating devices and of any other equipment affecting the safe navigation of the vessel;

.5 whether the vessel is fitted with automatic steering; and

.6 any unusual demands on the navigational watch that may arise as a result of special operational circumstances.

4.2 *Fitness for duty*

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

4.3 *Navigation*

4.3.1 The intended voyage must, as far as possible, be planned in advance taking into consideration all pertinent information, and any course laid down must be checked before the voyage commences.

4.3.2 During the watch course steered, position and speed must be checked at sufficiently frequent intervals, using any available navigational aids necessary to ensure that the vessel follows the planned course.

4.3.3 The officer in charge of the watch must have full knowledge of the location and operation of all safety and navigational equipment on board the vessel, and must be aware and take account of the operating limitations of such equipment.

4.3.4 The officer in charge of a navigational watch must not be assigned or undertake any duties which would interfere with the safe navigation of the vessel.

4.4 *Navigational equipment*

4.4.1 The officers in charge of the watch must make the most effective use of all navigational equipment at their disposal.

4.4.2 When using radar the officer in charge of the watch must bear in mind the necessity to comply at all times with the provisions on the use of radar contained in the applicable regulations for preventing collisions at sea.

4.4.3 In cases of need the officer of the watch must not hesitate to use the helm, engines, and sound and light signalling apparatus.

4.5 *Navigational duties and responsibilities*

4.5.1 The officer in charge of the watch must—

.1 keep watch in the wheel house;

.2 in no circumstances leave the wheelhouse until properly relieved;

.3 continue to be responsible for the safe navigation of the vessel despite the presence of the skipper in the wheelhouse until informed specifically that the skipper has assumed that responsibility and this is mutually understood;

.4 notify the skipper when in any doubt as to what action to take in the interest of safety; and

.5 not hand over the watch to a relieving officer if there is reason to believe that the latter is not capable of carrying out the watchkeeping duties effectively, in which case the skipper must be notified.

4.5.2 On taking over the watch the relieving officer must confirm and be satisfied as to the vessel's estimated or true position and confirm its intended track, course and speed, and must note any dangers to navigation expected to be encountered during the watch and any traffic in the immediate vicinity.

4.5.3 Whenever practicable a proper record must be kept of the movements and activities during the watch relating to the navigation of the vessel.

4.6 *Look-out*

4.6.1 A proper look-out must be maintained in compliance with Rule 5 of the International Regulations for Preventing Collisions at Sea, 1972, as set out in the Annex to the Merchant Shipping (Collision, etc) Regulations, 1996. It must serve the purpose of—

.1 maintaining a continuous state of vigilance by sight and hearing as well as by all other available means, with regard to any significant changes in the operating environment;

.2 fully appraising the situation and the risk of collision, stranding and other dangers to navigation; and

.3 detecting ships or aircraft in distress, shipwrecked persons, wrecks and debris.

4.6.2 In determining that the composition of the navigational watch is adequate to ensure that a proper look-out can continuously be maintained, the skipper must take into account all relevant factors, including those described under item 4.1, as well as the following factors:

.1 visibility, state of weather and sea;

.2 traffic density, and other activities occurring in the area in which the vessel is navigating;

.3 the attention necessary when navigating in or near traffic separation schemes and other routeing measures;

.4 the additional workload caused by the nature of the vessel's functions, immediate operating requirements and anticipated manoeuvres;

.5 rudder and propeller control and vessel manoeuvring characteristics;

.6 the fitness for duty of any crew members on call who may be assigned as members of the watch;

.7 knowledge of and confidence in the professional competence of the vessel's officers and crew;

.8 the experience of the officer of the navigational watch and the familiarity of that officer with the vessel's equipment, procedures, and manoeuvring capability;

.9 activities taking place on board the vessel at any particular time, and the availability of assistance to be summoned immediately to the wheelhouse when necessary;

.10 the operational status of instrumentation in the wheelhouse and controls, including alarm systems;

.11 the size of the vessel and the field of vision available from the conning position;

.12 the configuration of the wheelhouse, to the extent such configuration might inhibit a member of the watch from detecting by sight or hearing any external developments; and

.13 any relevant standards, procedures and guidelines relating to watchkeeping arrangements and fitness for duty that have been specified in a marine notice.

4.7 *Protection of the marine environment*

The skipper and the officer in charge of the watch must be aware of the serious effects of operational or accidental pollution of the marine environment, and must take all possible precautions to prevent such pollution, particularly within the framework of relevant international, local and port operations.

4.8 *Weather conditions*

The officer in charge of the watch must take relevant measures and notify the skipper when adverse changes in weather could affect the safety of the vessel, including conditions leading to ice accretion.

5 Navigation with pilot embarked

The presence of a pilot on board does not relieve the skipper or officer in charge of the watch from the duties and obligations for the safety of the vessel. The skipper and the pilot must exchange information regarding navigation procedures, local conditions and the vessel's characteristics. The skipper and the officer in charge of the watch must co-operate closely with the pilot and maintain an accurate check of the vessel's position and movement.

6 Vessels engaged in fishing or searching for fish

6.1 In addition to the principles enumerated in item 4, the following factors must be considered and properly acted upon by the officer in charge of the watch:

.1 other vessels engaged in fishing and their gear, own vessel's manoeuvring characteristics, particularly its stopping distance and the diameter of turning circle at sailing speed and with the fishing gear overboard;

.2 safety of the crew on deck;

.3 adverse effects on the safety of the vessel and its crew through reduction of stability and freeboard caused by exceptional forces resulting from fishing operations, catch handling and stowage, and unusual sea and weather conditions;

.4 the proximity of offshore structures, with special regard to the safety zones; and

.5 wrecks and other underwater obstacles which could be hazardous for fishing gear.

6.2 When stowing the catch, attention must be given to the essential requirements for adequate freeboard, adequate stability and watertight integrity at all times during the voyage to the landing port, taking into consideration consumption of fuel and stores, risk of adverse weather conditions and, especially in winter, risk of ice accretion on or above exposed decks in areas where ice accretion is likely to occur.

7 Anchor watch

The skipper must ensure, with a view to the safety of the vessel and the crew, that a proper watch is maintained at all times from the wheelhouse or deck on fishing vessels at anchor.

8 Radio watchkeeping

The skipper must ensure that an adequate radio watch is maintained while the vessel is at sea, on appropriate frequencies, taking into account the requirements of the Merchant Shipping (Radio Installations) Regulations, 2002.

EXPLANATORY NOTE

(This note is not part of the regulations)

1 Introduction

1.1 These regulations are enabled by section 356 of the Merchant Shipping Act, 1951 (Act No. 57 of 1951). The regulations repeal and replace the Examination Regulations for Certificates of Competency for Fishermen, 1993, and the Examination Regulations for Certificates of Competency as Marine Motormen, 1993.

1.2 These are the regulation's main objects:

.1 to overhaul existing training and certification arrangements for fishing vessel personnel and certain other engineer officer capacities, particularly with a view to improving the quality of training outcomes and the prospects for career progression;

.2 to introduce the training, certification and watchkeeping standards embodied in the International Convention on Standards of Training, Certification and Watchkeeping for Fishing Vessel Personnel, 1995 (STCW-F).

2 STCW-F

2.1 STCW-F was adopted in July 1995 by a diplomatic conference convened under the auspices of the International Maritime Organization (IMO). The convention has not yet entered into force because the international community has been slow to accept it; however, this is changing as a result of IMO's ongoing efforts to promote acceptance of the convention amongst its member governments. As a member of the IMO Council, South Africa is expected to support this initiative.

2.2 SAMSA is convinced of the operational benefits of accepting STCW-F and has made appropriate proposals to Government in this regard. These proposals are still under review. In the meantime, SAMSA is proposing, through the present regulations, to introduce in domestic law the principles and standards embodied in the convention, thereby anticipating its effect and paving the way for South Africa's becoming a party to the convention at the international level.

3 The regulations

3.1 The introduction of STCW-F principles and standards will bring about a significant change in the way fishing vessel personnel are trained and certificated. In the past, extended periods of sea service were seen as the way to acquire experience and appropriate skills. Unfortunately, experience has shown that the fishing industry is not an environment that is conducive to producing quality outcomes from a system of on-the-job training and learning. In contrast, the new system is centred around a combination of reduced experiential training and upgraded and more structured education for enhancing knowledge. The system has been designed in a way that will make it possible for seafarers to progress over time from small vessels to large fishing vessels and, eventually, internationally trading vessels.

3.2 The regulations cover all fishing certification (deck and engine-room departments) and all marine motorman certification (fishing and non-fishing), but do not cover personnel on pleasure vessels of less than 100 gross tonnage or on commercially operated vessels of

less than 25 gross tonnage; these people are covered by the Merchant Shipping (Small Vessel Safety) Regulations, 2002.

3.3 The regulations track STCW-F by using vessel length as a threshold rather than gross tonnage. This applies not only to the various certificated capacities in the deck department but also to all seagoing service requirements. For example, seagoing service is generally required to be gained on vessels of 12 metres or more in length (regardless of gross tonnage).

3.4 The regulations also track STCW-F standards for seagoing service. This results in a significant reduction in the total sea time required for certain certification. For example, the 36 months on vessels of 25 gross tonnage or more currently required for the first deck certificate of competency will be reduced, for the equivalent certificate, to 12 months on vessels of 12 metres or more in length.

3.5 In the deck department STCW-F establishes standards only for masters and deck officers on fishing vessels of 24 metres or more in length, leaving national law to determine the standards for fishing vessels of less than 24 metres in length. For fishing vessels of 24 metres or more in length, the regulations adopt the STCW-F standards for masters and deck officers. For fishing vessels of less than 24 metres in length, the existing standard for Fisherman Grade 4 certification has been expanded and upgraded: for example, under the new system the master of a fishing vessel of less than 24 metres [i.e. Skipper (Fishing < 24 metres)] is required to meet the same educational standard as the officer in charge of a navigational watch on a fishing vessel of 24 metres or more in length [i.e. Deck Officer (Fishing ≥ 24 metres)].

3.6 Similarly, in the engine-room department STCW-F establishes standards only for chief engineer officers and second engineer officers on fishing vessels of 750 kW propulsion power or more, and the regulations adopt these standards. For fishing vessels of less than 750 kW propulsion power, existing standards for Marine Motorman certification have been expanded and upgraded.

3.7 An important principle underlying the new system is the facilitation of career progression. This principle finds expression in the facility to gain experience on a range of vessel sizes, thus making it easier to upgrade certification during the course of a seagoing career.

4 The certificates

4.1 The following paragraphs describe the new kinds of certification. But first here are two definitions that help to explain limitations relating to this certification:

"limited waters" *means—*

(a) the internal and territorial waters of the Republic;

(b) the waters of the exclusive economic zone of the Republic; and

(c) if the Republic has entered into an agreement with another State for the purposes of this paragraph, the waters under the jurisdiction of that other State that are covered by the agreement.

"unlimited waters" *means the waters beyond limited waters.*

4.2 Generally, this is how the waters limitation affects the certification:

.1 Deck Officer certification automatically meets the unlimited waters standard. This means that the holders of this certification may serve in the certificated capacity on fishing vessels operating in limited and unlimited waters.

.2 Skipper certification meets the limited waters standard for command purposes and the unlimited standard for watchkeeping purposes. Holders wishing to command fishing vessels operating in unlimited waters are first required to obtain the Unlimited Waters Command Endorsement.

4.3 *Deck department*

4.3.1 **Skipper Coastal (> 9 metres).** Although this certification is issued under the Merchant Shipping (Small Vessel Safety) Regulations, 2002, it is mentioned here because the holder may serve as mate on fishing vessels of less than 24 metres in length operating in limited waters or as watchkeeping officer on fishing vessels of less the 24 metres in length operating in unlimited waters. This will allow the holder of small vessel certification to obtain sea time on larger vessels for the purpose of upgrading the certification.

4.3.2 **Deck Officer (Fishing < 24 metres).** The holder of this certification may serve in the same positions as those described in paragraph 4.3.1, but may also serve as mate on fishing vessels of less than 24 metres in length operating in unlimited waters.

4.3.3 **Deck Officer (Fishing ≥ 24 metres).** The holder of this certification may serve as mate or watchkeeping officer on fishing vessels of 24 metres or more in length operating in limited or unlimited waters. Once the holder gains 12 months sea time as a watckeeping officer, he or she can qualify for the certificate of competency as Skipper (Fishing < 24 metres) without further training or examination, since the education and assessment standards for these certificates are the same.

4.3.4 **Skipper (Fishing < 24 metres).** The education and assessment standards for this certification are the same as those for the certification mentioned in paragraph 4.3.3. The holder of this certification may therefore serve in the same capacities as the holder of certification mentioned in that paragraph. In addition, the holder may also serve as master of a fishing vessel of less than 24 metres in length operating in limited waters. If the holder obtains the Unlimited Waters Command Endorsement, then he or she may serve in the command capacity also on fishing vessels operating in unlimited waters.

4.3.5 **Skipper (Fishing ≥ 24 metres).** The holder of this certification may serve as master of a fishing vessel of any length operating in limited waters, and in any of the other capacities, except as master of a fishing vessel operating in unlimited waters. If the holder obtains the Unlimited Waters Command Endorsement, then he or she may serve in the command capacity also on fishing vessels operating in unlimited waters.

4.3.6 **Unlimited Waters Command Endorsement.** This certification is an endorsement to the certification mentioned in paragraphs 4.3.4 and 4.3.5. It allows the holder to command a fishing vessel (of the length stated in the certification to which the endorsement relates) operating in unlimited waters.

4.3.7 **Able Seaman (Fishing).** This certification can be obtained by a rating and entitles the holder to form part of a navigational watch on a fishing vessel. The holder can convert the certification to the STCW'78 Able Seaman certification by completing additional seagoing service on trading vessels.

4.3.8 For holders of the certification as Skipper (Fishing < 24 metres), Deck Officer (Fishing ≥ 24 metres) and Skipper (Fishing ≥ 24 metres), it is now also possible to obtain equivalent certification for certain kinds of non-fishing vessels without any requirement for additional training or sea time. However, holders of certification obtained under, or converted from, the old system will still be required to do bridging courses in order to obtain these equivalences. These arrangements provide the path for the holder of fishing certification to obtain the STCW'78 Deck Officer certification, after meeting the educational and other requirements in terms of the Merchant Shipping (Training and Certification) Regulations, 1999.

4.4 *Engine-room department*

4.4.1 **Marine Motorman Grade 2.** The holder of this certification may serve in the following capacities:

.1 chief engineer officer of a fishing vessel of less than 350 kW propulsion power;

.2 second engineer officer of a fishing vessels of less than 750kW propulsion power;

.3 watchkeeping officer on fishing vessels of less than 2 000 kW propulsion power.

4.4.2 **Marine Motorman Grade 1.** The holder of this certification may serve in the following capacities on fishing vessels:

.1 chief engineer officer of a fishing of less than 750 kW propulsion power;

.2 second engineer officer of a fishing vessel of less than 2 000 kW propulsion power;

.3 watchkeeping officer on fishing vessels of any kilowatt propulsion power.

4.4.3 **Marine Motorman Higher Grade.** The holder of this certification may serve as chief engineer officer of a fishing vessel of less than 2 000 kW propulsion power or as second engineer officer of a fishing vessel of any kilowatt propulsion power.

4.4.4 **Chief Engineer Officer (Fishing).** The holder of this certification may serve as chief engineer officer of a fishing vessel of any kilowatt propulsion power.

4.4.5 In addition to the capacities mentioned in paragraphs 4.4.2 and 4.4.3, the holders of certification as Marine Motorman Grade 1 or Marine Motorman Higher Grade may also serve in the other (non-fishing) capacities specified in the Merchant Shipping (Safe Manning) Regulations, 1999.

4.4.6 These arrangements provide a path for persons with the lowest qualification to upgrade the qualifications over time. Holders of the Marine Motorman Higher Grade certification now also have the opportunity to obtain the STCW'78 Engineer Officer certification, after meeting the educational and other requirements of the Merchant Shipping (Training and Certification) Regulations, 1999.

4.5 In summary, the new certification system reduces the number of examinations and reduces significantly the seagoing service requirements for the first deck officer certificate. However, these changes are balanced by a higher standard of education for all certification.

5 Revalidation and conversion

5.1 The regulations introduce revalidation requirements for all new certificates of competency and all equivalent existing certificates. Existing certificates will have to be revalidated and exchanged within five years after the commencement of the regulations (unless SAMSA requires them to be exchanged within a shorter period), and every five years thereafter. New certificates will have to be revalidated at five yearly intervals. Information about revalidation arrangements will be published by marine notice (e.g. Marine Notice No. 5 of 2000 covers revalidation of STCW'78 certification).

5.2 Equivalency, revalidation and conversion arrangements will not result in the downgrading of any certification. For example, Fisherman Grade 3 certification is taken to be equivalent to certification as Deck Officer (Fishing ≥ 24 metres) endorsed "master of a fishing vessel of less than 30 metres in length operating in limited waters".

6 Examinations and syllabuses

6.1 The new examination policy tracks the policy already in place for STCW'78 certification. This means that SAMSA will no longer conduct written examinations for fishing and marine motorman certification; instead, these will be conducted by accredited maritime training providers. SAMSA will retain oversight through the accreditation and approval system to ensure that providers meet the relevant standards in the regulations and the *Code for South African Maritime Qualifications* ("the Code"). Responsibility for level 3 assessment (i.e. oral examination) will remain with SAMSA, as for STCW'78 certification.

6.2 The new syllabuses, which will be added to the Code, require a higher standard of competence than those under the current regulations. A significant change has been made with the introduction of Fishing Technology as a subject. There is also more emphasis and expanded content on ship stability, particularly for certification relating to vessels of 24 metres or more in length. The modules on human relations and business have also been expanded, and Morse Code by light has been scrapped from all certification, except the Unlimited Waters Command Endorsement.

6.3 For ancillary courses (e.g. fire-fighting), standards have been kept common wherever possible. This also facilitates the transportability of these qualifications between fishing and other operations. However, in certain cases, such as proficiency in survival craft, additional sea time on trading vessels may be required to obtain the full STCW'78 qualification.

PART B

DRAFT STUDY MATRICES AND SYLLABUSES

This Part sets out the study matrices and syllabuses that will be incorporated into the *Code for South African Maritime Qualifications*.

Contents

STUDY MATRICES

FISHING CERTIFICATION (DECK DEPARTMENT)

(Subject modules shown under certification columns)

Certification / Subject	Unlimited Waters Command Endorsement	Skipper (Fishing ≥ 24 metres)	Skipper (Fishing < 24 metres) / Deck Officer (Fishing ≥ 24 metres)	Deck Officer (Fishing < 24 metres)	Able Seaman (Fishing)
Chartwork	1-5	1-4	1-3	1	—
Celestial Navigation	1	—	—	—	—
Electronic Navigation Systems	1-2	1-2	1-2	1	—
Naval Architecture	1-5	1-5	1-4	1-2	—
Ship's Power Plant	1	1	1	—	—
Personnel Management and Ship's Business	1-6	1-6	1-2 and 6	1	—
Meteorology	1-2	1	1	—	—
Ship Manoeuvring and Handling	1-2	1-2	1	—	—
Fishing Technology	1-2	1-2	1-2	1	1-2
Emergency Procedures	1-2	1-2	1-2	1	—
Communications	2	1	1	1	—
Proficiency in Survival Craft (Local)	X	X	X	—	X
Proficiency in Liferafts	—	—	—	X	—
First Aid at Sea	—	—	X	X	X
Ship Captain's Medical Training	X	X	—	—	—
Fire-fighting	X	X	X	X	X
Advanced Fire-fighting	X	X	X	X	—
Pre-sea Training	—	—	X	X	X
Radiotelephony	—	X	X	X	—
GMDSS	X		—	—	—
Medical certificate	X	X	X	X	X
Eyesight certificate	X	X	X	X	X

MARINE MOTORMAN / CHIEF ENGINEER OFFICER (FISHING) CERTIFICATION

(Subject modules shown under certification columns)

Certification / Subject	Marine Motorman Grade 2	Marine Motorman Grade 1	Marine Motorman Higher Grade	Chief Engineer Officer (Fishing)
Naval Architecture	—	1-2	1-4	—
Personnel Management and Ship's Business	1	1-3	1-4	—
Engineering Knowledge	1	1-2	3	—
Emergency Procedures	1	1	1-2	1-2
Fishing Technology	—	1-2	—	1-2
Electrotechnology	—	—	—	1
Applied Marine Science	—	—	—	1
Drawings	—	—	—	1
General Engineering Science / Applied Mechanics	—	—	—	1
Heat Engines / Thermodynamics	—	—	—	1-2
Proficiency in Survival Craft (Local)	—	—	X	X
Proficiency in Liferafts	X	X	—	—
First Aid at Sea	X	X	X	X
Fire-fighting	—	X	X	X
Advanced Fire-fighting	—	—	X	X
Pre-sea Training	X	X	—	—

WORKSHOP TRAINING (MARINE MOTORMAN GRADE 1)

Certification / Subject	Marine Motorman Grade 1
Diesel	X
Electrical	X
Fitting	X
Machining	X
Welding, Cutting and Sheet Metal	X
Hydraulics	X
Pneumatics	X
Refrigeration	X

SYLLABUSES

CHARTWORK (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
	MODULE 1		
Plan and conduct a safe coastal passage	1 Ability to determine the ship's position on a chart by the use of: .1 latitude and longitude. .2 simultaneous cross bearings (using compass, true or gyro bearings), transit bearings, by bearing and range, multiple ranges and relative bearings. .3 positional information from aids to navigation, including lighthouse, beacons, buoys and electronic navigation systems or by any use of the above. .4 dead reckoning, taking into account estimated speed. 2 Understands the terms "Deviation" and "Variation". 3 Ability to determine safe courses between two positions on a chart and converting true courses into magnetic and compass courses and vice versa and making due allowance for gyro error. 4 Ability to monitor a passage along a planned route. 5 Determining an ETA taking into account speed. 6 Ability to demonstrate thorough knowledge of the content, application and intent of the International Regulations for Preventing Collisions at Sea, 1972, especially annexes II and IV concerned with safe navigation. 7 Ability to demonstrate knowledge of keeping a navigational watch as prescribed in the STCW-F Convention.	By oral Examination, completion of approved education and training, written theoretical examination and assessment of evidence obtained from one or more of the following: 1 approved in-service experience 2 approved training ship experience 3 approved simulator training, where appropriate 4 approved laboratory equipment training, Using, amongst others, chart catalogues, charts (including lattice and pilot charts), deviation tables, navigational publications, radio navigational warnings, azimuth mirror, electronic navigation equipment, echo sounding equipment, compass, gyro compass, tide tables. *Note:* (i) ECDIS systems are considered to be included under the term "charts" (ii) The charts, notices to mariners and tide tables used at this level are those published by the Hydrographer of the SA Navy. Thorough knowledge of Collision Regulations by oral exams and use of small models displaying proper signals or lights or by the use of a navigation light simulator. Thorough knowledge of keeping a navigational watch as detailed in Chapter IV of the STCW-F Convention.	1 The information obtained from navigational charts and publications is relevant, interpreted correctly and properly applied. All potential navigational hazards are accurately identified. 2 The primary method of fixing the ship's position is the most appropriate to the prevailing circumstances and conditions. 3 The reliability of the information obtained from the primary methods of position fixing is checked at appropriate intervals. 4 The charts selected are the largest scale suitable for the area of navigation and charts and publications are corrected in accordance with the latest information available. 5 The degree of precision required: .1 work to a degree of precision consistent with the data available and the type of problem in question taking into account the limits of acceptable instrument/system errors. .2 information from tables shall be extracted as accurately as possible consistent with the inherent accuracy of the tables, and final answers shall be given to the best degree of precision which is justified. .3 Ship's position shall be given within a maximum of one half of a nautical mile. .4 in the calculation of compass errors, bearings and courses, the answer shall be given to the nearest whole degree. .5 tidal calculations are required to be within 15cm of a precise result.

CHARTWORK (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
MODULE 2			
1 Plan and conduct a safe coastal passage	1 Ability to determine a safe course when: .1 approaching a harbour, bay, river mouth or safe anchorage; and .2 making a land fall in thick and clear weather.	As for module 1, using, in addition to the items described in module 1, the IALA buoyage system.	As for module 1.
2 Thorough knowledge of and ability to use navigational charts and publications, such as sailing directions, tide tables, notices to mariners, radio navigational warnings and ship's routing information	2 Ability to determine compass error, deviation and/or gyro error using transit bearings.		
3 Ability to maintain navigational charts and nautical publications from information contained in notice to mariners	3 Ability to plan a coastal passage and entry into harbour.		
4 Understand the broad principles and use of conventional magnetic and gyro compasses	4 Dead reckoning, taking into account winds, tides, current and estimated speed.		

CHARTWORK (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
MODULE 3			
Plan and conduct a safe coastal passage	1 Ability to determine, the effect of current and leeway on course and speed, the course to steer to make good a certain track (making due allowance for current and leeway), the set and rate of a current and the distance at which the ship will pass off a given point. 2 Ability to determine the compass error and deviation using the bearing of the sun at any time. 3 Ability to determine and use dipping distances of lights and distances of sighting points of land of known height. 4 Ability to determine the time and height of height and low water at Ports using South African Tide Tables. 5 Ability to determine the time the tide reaches a specified height or the height of a tide at a given time using tables and tide curves. 6 Ability to determine and use nautical tables to find courses and distances between two positions by Mercator sailing method or traverse tables.	As for module 1, using, in addition to the items described in module 1, South African Tide Tables and nautical tables (Nories or Burtons).	As for module 1.

CHARTWORK (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
MODULE 4			
Plan and conduct a safe passage	1 Ability to determine: .1 the time and height of high and low water using the South African Tide Tables, .2 the time the tide reaches a specified height or the height of a tide at a given time using tables and tide curves. .3 and thence the approximate correction to be applied to soundings or to chartered heights of shore objects. 2 Ability to determine the ship's position on a chart using: .1 bearings of one or more objects with the run between allowing for a current. .2 position lines obtained by any method, including terrestrial position lines. 3 Understand the siting of the magnetic compass with reference to proximity of magnetic material and electrical appliances and the precautions to be taken with electric wiring in the vicinity of the compass.	As for module 1, using, in addition to the items described in modules 1, 2 and 3, notices to mariners, tide tables and other navigational publications.	1 As for module 1. 2 Organizing the bridge watch into the most effetive team to afford the safest navigation for the ship.

CHARTWORK (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
MODULE 5			
Plan and conduct a safe passage	1 Ability to determine: .1 the time and height of high and low water using the Admiralty tide Tables Volumes I and II , .2 the time the tide reaches a specified height or the height of a tide at a given time using tables and tide curves. .3 and thence the approximate correction to be applied to soundings or to chartered heights of shore objects. 2 Ability to determine the ship's position on a chart using: .1 bearings of one or more objects with the run between allowing for a current. .2 position lines obtained by any method, including terrestrial and celestial position lines. 3 Ability to determine the compass error and deviation using the bearing of celestial objects including the sun, moon, planets and stars as listed in the Nautical Almanac at any time.	As for module 1, using, in addition to the items described in modules 1, 2, 3 and 4, notices to mariners, tide tables and other navigational publications.	1 As for module 1. 2 Organizing the bridge watch into the most effective team to afford the safest navigation for the ship.

CELESTIAL NAVIGATION (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
	MODULE 1		
Determine position	1 Understands the terms poles, equator, meridians, parallels of latitude, difference of latitude, difference of longitude, departure, mean latitude, difference of meridional parts, and their use and the relationship between them. 2 Ability to determine course and distance using the traverse method and/or plane and Mercator sailing. 3 Understands the relationship between GMT, LMT, longitude, zone time and standard time. 4 Ability to alter ship's time with change of longitude and rate a chronometer. 5 Ability to determine: .1 the latitude by meridian altitude of the Sun or Venus .2 from a sextant-observation of a heavenly body near or out of the meridian, the direction of the position line and a position through which it passes .3 the ship's position using position lines obtained from two or more celestial observations, with or without a run 6 Ability to use the sextant, determine its index error and reduce the index error to an acceptable error. 7 Ability to pre-compute the approximate time (to the nearest minute) of the meridian passage of a heavenly body and the rising and setting times of the sun and the moon.	By written theoretical examination, completion of approved education and training and assessment of evidence obtained from one or more of the following: 1 approved in-service experience 2 approved training ship experience 3 approved simulator training, where appropriate 4 approved laboratory equipment training. Using sextant, almanac, sight reduction tables, star identifier, navigational tables (Nories or Burtons), pocket scientific calculator. *Note:* (i) Heavenly body in this unit means the Sun, the Moon and stars listed in the nautical almanac. (ii) Air navigation tables are allowed to be used for star sights.	The degree of precision required: 1 work to a degree of precision consistent with the data available and the type of problem in question taking into account the limits of acceptable instrument/ system errors 2 information from tables shall be extracted as accurately as possible consistent with the inherent accuracy of the tables, and final answers shall be given to the best degree of precision which is justified 3 problems may be solved by any method, provided that such method is correct in principle and affords the required degree of precision 4 calculations used to obtain a position line shall be capable of giving an answer to within or maximum of one half of a nautical mile 5 when making calculations to obtain a ship's position, calculations are to be to 0,5 of a minute of arc and to the nearest second of time.

ELECTRONIC NAVIGATION SYSTEMS (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
MODULE 1			
1 Use of echo sounders	1 Understands the basic principles of ship borne echo sounders. Types in use at sea. The principle components of general purpose echo sounding equipment. Precautions to be observed in use and accuracy to be expected	1 During the training establishment phase. Evidence obtained by attending an approved course on: .1 by written examination of the theoretical knowledge; and .2 by assessment of approved simulator training. 2 Using: .1 live and simulated radar, satellite navigator (GPS and DGPS), and electronic log; .2 Charts, equipment manuals and error diagrams/tables.	1 Information obtained from manuals and error diagrams/ charts is correct, accurate and properly applied. 2 Positions are determined within the limits of acceptable instrument/systems errors. 3 Categorize the usefulness of the systems in terms of the areas - oceanic, landfall, coastal and estuarial. 4 Information obtained from radar is correctly interpreted and analysed taking into account the limitations of the equipment and prevailing circumstance and conditions. 5 Action to avoid a close encounter or col-lision with other vessels is timely and in accordance with the International Regulations for Preventing Collisions at Sea.
2 Use speed logs	2 Understands the basic principles of ship borne logs. Types in use at sea. The principle components of general purpose logs. Precautions to be observed in use and accuracy to be expected		
3 Use of GNSS	3 Understands and describes the basic principles of satellite navigation systems. Typical receivers in use on board ships. Corrections and expected accuracy. Coverage areas. Differential Systems.		
4 Operate basic radar equipment	4 Understands the basic principles of radar. Describes the basic radar installation. Identification of controls. Understand factors affecting performance and accuracy.		
5 Use radar for collision avoidance	5 Understands the principle and construction of a radar plot. Use of plot to obtain information about targets. Assessment of collision risk. Effect of alteration of courses and speed in relation in relation to collision avoidance. Radar reporting procedures. Application of collision regulations in restricted visibility		
6 Use of radar as an aid to navigation	6 Able to detect and recognise fixed targets. Sources of error in positions obtained. Use of radar for navigation in confined and coastal waters using blind pilotage techniques.		

ELECTRONIC NAVIGATION SYSTEMS (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
7 Use of electronic plotters/ECDIS as an aid to navigation	Understands and describes the basic principles of electronic plotters and ECDIS systems.		

ELECTRONIC NAVIGATION SYSTEMS (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
MODULE 2			
Conduct a safe passage using radar	Ability to operate and to interpret and analyse information obtained from radar, including the following: .1 performance, including: .1 factors affecting performance and accuracy; .2 setting up and maintaining displays; .3 detection and misrepresentation of information, false echoes, sea return etc, racons and SARTs; and .2 use, including: .1 range and bearing; course and speed of other ships; time and distance of closest approach of crossing, meeting overtaking ships; .2 identification of critical echoes; detecting course and speed changes of other ships; effect of changes in own ship's course or speed or both; .3 application of the International Regulations for Preventing Collisions at Sea; .4 plotting techniques and relative motion concepts; .5 blind pilotage techniques.	1 During the training establishment phase. Evidence obtained by attending an approved course or: .1 by written examination of the theoretical knowledge; and .2 by assessment of approved simulator training. 2 Using: .1 radar simulation; .2 charts, equipment manuals and error diagrams/tables; .3 the collision regulations, notices to mariners, marine notices, Safety of Navigation Regulations, and radar performance specifications (IMO and marine notice); .4 case studies from courts of marine enquiry and MARS reports. As for module 1.	1 Information obtained from radar is correctly interpreted and analysed taking into account the limitations of the equipment and prevailing circumstance and conditions. 2 Action to avoid a close encounter or collision with other vessels is timely and in accordance with the International Regulations for Preventing Collisions at Sea.

NAVAL ARCHITECTURE (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
MODULE 1			
Small vessel construction and stability	1 Able to name the principal parts and fittings of a fishing vessel including: bow, stern, stern, bulwarks, hull, hatch, access, rudder, propeller, superstructure, hull valves, grid cooler, masts etc. 2 Understands: .1 reasons for making the deck and superstructure watertight; .2 purpose of watertight bulkheads and the collision bulkhead; .3 reason for a hull survey, the items surveyed at the hull survey and the period between surveys for the issue of a local general safety certificate; .4 drawing the propeller shaft(s) and the opening of hull fittings and the period between the inspect of these items; .5 relationship between centre of gravity, centre of buoyancy and metacentric heigh; .7 conditions of: .1 stiff ship; .2 tender ship; .3 free surface effect and the dangers associated with them; .8 reasons for having efficient means of drawing water rapidly from the deck and the danger of water trapped on deck; .9 reasons for stowing heavy cargo items below and lighter items on top; .10 purpose of free board and reserve buoyancy; .11 meaning of the terms displacement, deadweight and gross tonnage. 3 Knows the danger of stowing cargo on deck only with nothing below.	By oral examination, completion of approved education and training, written theoretical examination and assessment of evidence obtained from one or more of the following: 1 approved in-service experience; 2 approved training ship experience; 3 approved simulator training, where appropriate; 4 approved laboratory equipment training.	1 The safe operating limits of the ship are not exceeded in normal operations. 2 The ship is always properly stowed ensuring that she is always safe. 3 Able to deliver clear and understandable reports issuing ship construction terminology. 4 The ship is always securely battened down for proceeding to sec and severe weather conditions. 5 Bilge pumping systems are properly operated. 6 Fire mains are properly operated.

NAVAL ARCHITECTURE (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
MODULE 2			
Basics of ship dimensions and form	1 Understands the names and principal parts of a ship. 2 Illustrates the general arrangement of common ship types found in the fishing fleet. 3 Describes by means of a diagram: .1 a bilge pumping system; .2 a fire main; .3 a steering system. 4 Understands the need to maintain the watertight integrity of the vessel and can describe the methods of maintaining the following: .1 hatch covers; .2 watertight doors; .3 sounding pipes and vents; .4 offal chutes; .5 scuppers and freeing ports.	As for module 1.	As for module 1.

NAVAL ARCHITECTURE (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
	MODULE 3		
1 Flotation and displacement	1.1 Understands the relationship between the mass of a ship and the volume of water displaced by the hull form and that volume changes with charged in mass of ship. 1.2 Defines: .1 displacement (light and load displacement); .2 deadweight. 1.3 Able to calculate the displacement of a ship. 1.4 Able to use: .1 displacement/draught curve; .2 deadweight curve/scale.	As for module 1.	As for module 1.
2. Buoyancy and reserve buoyancy	2 Describes: 1 buoyancy; 2 the relationship between force of buoyancy and displacement; 3 reserve buoyancy, its importance and the relationship between it and freeboard.		
3 Fundamental statical stability, assessment of initial stability and the curve of statical stability	3.1 Defines: centre of gravity; centre of buoyancy; metacentre; metacentric height; righting lever; righting moment. 3.2 Describes: .1 stability as the ability of the ship to return to an upright position after being heeled by an external force; .2 how the value of GM is a useful guide to the stability of the ship; .3 with the aid of diagrams, a stable and unstable ship and the position of positive, negative and zero GM; .4 with the aid of diagrams, the relationship between the righting lever, righting moment for small and large angles of heel; .5 a capsizing moment; .6 angle of loll and rolling about an angle of loll; .7 ability to interpret various stability conditions from a stability book or a set of pre-calculated stability conditions.		

NAVAL ARCHITECTURE (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
4 Movement of the centre of gravity	4 Describes, with the aid of diagrams, the movement of G when a mass is: - added (loaded) - removed (discharged) - moved within the ship - suspended (from a derrick hook).		

NAVAL ARCHITECTURE (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
	MODULE 4		
1 Construction of specific parts of hull structure	1.1 Identifies the structural components of a ship's hull on ships' plans and drawings. Includes items such as frames, floors, beams, knees, brackets, shell plating, decks, bulkheads, pillars, hatch girders, coamings, bulwarks, cant beams and breast hooks 1.2 Identifies longitudinal, transverse and combined systems of framing on transverse sections of ships. 1.3 Illustrates: .1 double-bottom structure for longitudinal and transverse framing; .2 bilge structure; .3 different keel structures; .4 connection of superstructures to the hull at the ship's side 1.4 Sketches: .1 different deck edge connections; .2. deck-freeing arrangements,; .3 a plane and corrugated bulkhead, showing connections to deck, sides and double bottom and the arrangement of stiffeners. 1.5 Describes the stress concentration in the deck round hatch openings. 1.6 Understands why transverse bulkheads have vertical corrugations and fore-and-aft bulkheads have horizontal ones. 1.7 Explains compensation for loss of strength at hatch openings. 1.8 Describes and illustrates: .1 the purpose of bilge keels and how they are attached to the ship's side; .2 the provision of additional structural strength to withstand pounding and panting; .3. function of the stern frame and stern; .4 the transom stern, showing the connections to the stern frame. .9 Understands why the shaft tunnel must be of watertight construction and how water is prevented from entering the engine-room if the tunnel becomes flooded.	As for module 1.	As for module 1.

NAVAL ARCHITECTURE (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
2 Structure and attachment of various hull fittings	2.1 Describes and sketches: .1 a fishing vessel's arrangements of modern weather-deck mechanical steel hatches; .2 showing how watertightness is achieved at the coamings and cross joints where applicable. 2.2 Sketches and describes typical forecastle mooring and anchoring arrangements including the leads of moorings, rollers, multi-angle, pedestal and Panama fairleads. 2.3 Describes: .1 winch to deck connection; .2 anchor handling and securing arrangements from hawse pipe to spurling pipe; .3 watertightness of spurling pipe; .4 construction of chain lockers and securing of cables; .5 construction and use of a cable stopper. 2.4 Describes and sketches: .1 the bilge pumping system of a fishing vessel with screw-down non-return suction valves, strum boxes and sounding pipe arrangements; .2 a bilge/ballast system in a fishing vessel and the necessity of fitting air pipes to ballast and fuel tanks; .3 a fire main and states what pumps may be used to pressurize it. 2.5 Describes and sketches: .1 modern rudders: semi balanced, balanced and spade; .2 the connection of the rudder to the ship; .3 how the weight of the rudder is supported; .4 how watertight integrity is maintained about the stock/hull.		

NAVAL ARCHITECTURE (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
	MODULE 5		
1 Movement of centre of gravity	1.1 **Describes:** .1 with the aid of diagrams, the movement of G when a mass is: - added (loaded); - removed (discharged); - moved within the ship; - suspended (from a derrick hook); .2 with the aid of diagrams, a stable and unstable ship and the position of neutral equilibrium (positive, negative and zero GM); .3 a "stiff" and "tender" ship; 1.2 **Describes:** .1 with the aid of diagrams, the relationship between stability, the righting lever and righting moment for small and large angles of heel lever (uses the positions of G, B, M and Z); .2 a capsizing moment. 1.3 **Describes:** .1 the angle of "loll" and the dynamics resulting in a zero moment at the angle of loll; .2 the potentially dangerous situation of a ship rolling about the angle of loll. 1.4 **Able to:** .1 identify and use: - cross curves (KN curves) - hydrostatic curves to determine the metacentre above the keel (KM) - determine the GM given the KG .2 know the formula GZ = KN - KG sin ø; .3 derive and draw a GZ curve for stable and initially unstable ships from KN curves; .4 obtain from a given curve of statical stability: .1 the maximum righting lever and the angle at which it occurs; .2 the angle of vanishing stability; .3 the range of stability; .5 show how lowering the position of G increases all values of the righting lever and vice versa. 1.5 Knows the statutory requirements for a fishing vessel.	As for module 1.	As for module 1.

NAVAL ARCHITECTURE (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
	1.6 Calculates: .1 shift of G (horizontally and vertically) resulting from adding, removing, moving or suspending masses; .2 change in KG during a passage resulting from: .1 consumption of fuel and stores; .2 absorption of water by a deck cargo; .3 accretion of ice on decks and superstructures given the masses and their positions.		
3 Effect of slack tanks	3.1 Shows, with the aid of a diagram, the effect on the centre of gravity (G) when the liquid in a partly filled tank moves during rolling (free surface effect). 3.2 Knows: .1 that the increase in KG is affected mainly by the breadth of the free surface and is not dependent upon the mass of liquid in the tank; .2 what ship construction measures are taken to reduce the effects of free surface; .3 the procedure for ballasting tanks when the ship is at an angle of loll or when she has a small positive GM. 3.3 Calculates the virtual loss in GM due free surface moments.		

SHIP'S POWER PLANT (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	MODULE 1		
Understand the working and operation of on board machinery and ship propulsion systems	1 Marine engineering terms: .1 Use the correct engineering terms when describing and explaining the operation of the machinery and equipment. .2 Explain what is meant by the efficiency of a machine. 2 Understand the construction and operation of the following: .1 MARINE POWER PLANTS *Diesel engines* .1 Describe the 4-stroke diesel engine. .2 Describe the methods of supercharging. .3 Describe the fuel oil system from bunker tank to injection. .4 Describe the lube oil system. .5 Describe the engine cooling-water systems. .6 Describe how a diesel engine is prepared for stand-by and starting. .7 Understand that the number of starts is limited by the capacity of the starting air reservoir. .2 AUXILIARIES .1 Describe a domestic water system. .2 Pumps and pumping systems: .1 Classify pumps as displacement, axial-flow or centrifugal. .2 Explain the need to prime a centrifugal pump. .3 Explain net positive suction head and it's significance in pump operation. .4 State that the engine-room emergency bilge suction is connected to the main circulating pump in the engine-room. .3 Steering gears: .1 Describe an electric steering control system. .2 Explain how the change from remote to local control in the engine room is made.	A Oral examination and assessment of evidence obtained from theoretical instruction. B Oral examination and assessment of evidence obtained from practical experience gained through on board training.	Show sufficient knowledge to discuss intelligently with the Chief Engineer, matters relating to the running and maintenance of power plants and auxiliary machinery, complying with safe operating limits at all times.

SHIP'S POWER PLANT (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING & PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
	MODULE 1		
	.4 Generators, alternators and electrical distribution: .1 Describe the operation of generators. .2 Describe a navigation light circuit with indicators and alarms, showing an alternative power supply. .3 Describe the characteristics of lead-acid batteries and of alkaline batteries. .4 Describe the maintenance of batteries. .5 Describe the safety precautions to be observed for battery compartments. .6 Outline the starting requirements for emergency generating sets. .7 List the services to be supplied from the emergency generator. .5 Oily-water separators and oil filtering equipment: .1 Describe the main purpose and operation of oily-water separators. .2 Describe how an oil-content meter functions. .3 Describe an oil discharge monitoring and control system. .6 Deck machinery: .1 State that the design and performance of anchor windlasses is subject to approval. society. .2 Describe an anchor winch. .3 Describe a cargo winch. .4 Sketch and describe a slewing deck crane, its motors and its controls. .5 Describe the lubrication of deck machinery. .6 Describe a spooling device to distribute the wire evenly on the drum of a mooring winch. .7 Hydraulic systems: .1 State that a hydraulic system for deck machinery consists of an oil tank, pumps, control valves, hydraulic motors and pipework. .2 State that cooling of the hydraulic oil is necessary during an operation to maintain the correct viscosity of the oil. .3 State that the oil may need to be heated before starting from cold. .4 State that cleanliness of the oil is essential for a satisfactory operation and that all systems contain filters. .5 State that air in the system leads to erratic functioning.		

PERSONNEL MANAGEMENT AND SHIP'S BUSINESS (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
	MODULE 1		
1 Take precaution to prevent pollution to the marine environment	1 Knows: .1 what to do in an emergency involving an oil spill on deck or in the engine-room; .2 the necessity of being aware at all times of preventing oils spills; .3 that it is prohibited to throw plastics overboard anywhere in the world; .4 that there are special areas (for the trade in which his ship is engaged) where certain pollutants may or may not be discharged overboard. (Candidates will only be required to know that pollution regulations apply to ships.)	By oral examination and completion of approved education and training and assessment during approved on board training.	1.1 Is able to give a clear and concise oil spill report to a ship's officer. 1.2 Can assemble appropriate equipment to control an oil spill or pollution incident with special reference to quick response. 1.3 Containment of oil spill/pollution is achieved using appropriate procedures, techniques and equipment. 1.4 Organisational procedures designed to safeguard the marine environment are observed at all times.
2 Observe safe working practices	2.1 Has a broad knowledge of the contents of the Code of Safe Working Practices for Fishermen. 2.2 Is aware that the Maritime Occupational Safety Regulations provide rules to assist all seafarers. 2.3 Knows and understands their importance. 2.4 Is aware that there is a safety officer on board the ship. 2.5 Knows that his/her superiors have a duty to ensure that work on board is performed to a high standard of occupational safety. 2.6 Knows the importance of adhering to safe working practices at all times. 2.7 Knows the safety and protective devices available to protect against possible hazards aboard a ship, including overalls, safety helmets, goggles, safety footwear and safety harnesses. 2.8 Knows the precautions to take before entering enclosed spaces, including the permit to work system, duties of standby man and safe to work certificate.		2.1 The requirements of the Code of Safe Working Practises for Fishermen have been observed. 2.2 Shows an understanding of contents thereof and has shown understanding of the basic safety requirements observed by seamen in their ordinary course of duty. 2.3 Safe working practices are observed and appropriate safety and protective equipment is correctly used at all times.
3 Contribute to effective human relationship on board ship	3 Understands: .1 importance of maintaining good human and working relationships on board ship: .2 employment conditions, working hours and rest periods;		3 Expected standards of work and behaviour are observed at all times.

PERSONNEL MANAGEMENT AND SHIP'S BUSINESS (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
	.3 individual rights and obligations in terms of the disciplinary code and grievance procedures; .4 dangers of drug and alcohol abuse in terms of their effects to health and safety of others; .5 drug and alcohol policies as applied by shipping companies; .6 basic conditions and terms of his or her contact of employment.		

PERSONNEL MANAGEMENT AND SHIP'S BUSINESS (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
	MODULE 2		
1 Take effective action in the event of an oil spill or other pollution emergency	1 Knows: .1 the ship board contingency plan for an oil spill; .2 where the Emergency Oil Spill Locker is; .3 the equipment that will be found therein and what each item is for.	As for module 1.	1 Is able to: .1 give a clear and concise oil spill report to a ship's officer; .2 assemble appropriate equipment to control an oil spill or pollution incident with special reference to quick response; .3 Contain an oil spill / pollution using appropriate procedures, techniques and equipment.
2 Protection and Preservation of the Marine Environment	2 Knows the zones regarding the disposal of garbage and other waste at sea.		2 Current pollution regulations are observed
3 The Maritime Occupational Safety Regulations	3.1 Has a working knowledge of the Maritime Occupational Safety Regulations and associated Code of Safe Working Practices for Fishermen and understanding of its importance. 3.2 Able to readily and effectively liaise with the vessel's safety officer. 3.3 Knows that the master and ship's officers have a duty to ensure that all work on board is performed to a high standard of occupational safety.		3..1 The requirements of the Code of Safe Working Practices for Fishermen have been observed. 3.2 Shows an understanding of a contents thereof and shows full understanding of all the various safety requirements required of seamen in the ordinary course of their duty.
4 Personnel management on board ships	4.1 Knows the principles of controlling subordinates and maintaining good relationships. 4.2 Able to lead, motivate and develop personnel. 4..3 Able to exercise authority. 4.4 Knows the conditions of employment and discipline and grievances procedure in which hearings are conducted. 4.5 Has an understanding of general industrial relations.		4.1 Applies the various factors affecting personnel management in ships. 4.2 Maintains good relations on board ship.
5 Organise staff	5 Knows how to organise staff and to allocate duties and tasks.		5 Organises staff tasks and duties.
6 Train subordinates on board	6 Understands the importance of familiarisation and ongoing training at sea.		6 Aptitude to give good practical training to subordinates during the course of normal work on board the vessel.
7 Assume command in an emergency or on the demise of the master	7 Knows what procedure is required when assuming command after the death of the master or when the master is temporarily incapacitated.		7 Command capabilities with respect to maintaining a safe ship and a well managed.

PERSONNEL MANAGEMENT AND SHIP'S BUSINESS (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	MODULE 3		
1 Organisations concerned with shipping	1 Knows the basic legal implications of rules, regulations and codes emanating from such organisations as government agencies.	By oral Examination, completion of approved education and training, written theoretical examination and assessment of evidence obtained from one or more of the following: 1 approved in-service experience; 2 approved training ship experience.	1 International and flag state rules, regulations and codes are properly applied to the ship and cargo.
2 Protection and Preservation of the marine environment	2.1 Knowledge of emergency pollution action and duties. 2.2 Shows full knowledge of the equipment in the Emergency Oil Spill Locker and how each item is used. 2.3 Knows what to do if called upon to rapidly organise an emergency team to tackle an oil spill / pollution hazard. 2.4 Has a working knowledge of the contents of the MARPOL Convention.		2.1 Rapidly assess an oil spill or pollution emergency. 2.2 Implement the shipboard emergency plan required by the current international pollution convention so as to preserve the marine environment.
3 Maritime Occupational Safety Regulations	3 Has a working knowledge of contents and regulations of the Maritime Occupational Safety Regulations.		3.1 Maritime Occupational Safety Regulations and associated Code of Safe Working Practises for Fishermen have been observed. 3.2 The various safety precautions required of seamen in the ordinary course of their duties are correctly observed and applied.

PERSONNEL MANAGEMENT AND SHIP'S BUSINESS (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
	MODULE 4		
1 Manage personnel	1.1 At a skipper and chief engineer level: .1 organize and supervise training programmes; .2 lead, motivate and develop junior staff; .3 exercise authority; .4 allocate duties and tasks; .5 organise safety and emergency duties; .6 organise deck or engine room maintenance tasks; .7 conduct: .1 staff performance evaluation; .2 disciplinary proceedings; .3 grievances hearings. 1.2 Know: .1 manning requirements on board ship; .2 contracts of employment between company/manning agency and crew; .3 crews rights and responsibilities; .4 principles of general industrial relations. 1.3 Have an understanding of the requirements of local labour legislation as they affect ship's crews.	As for module 3.	1 The crew are allocated duties and informed of expected standards of work and behaviour in a manner appropriate to the individuals concerned.
2 Responsibility under the master or chief engineer, for on board training of deck or engine-room staff as applicable	2.1 Knows: .1 Training methods; .2 training planning; .3 that training and assessment on board must be conducted, monitored, evaluated and supported by suitably trained persons. 2.2 Has an understanding of the STCW-F Convention.		2 Effective ability to take charge of on board training.

PERSONNEL MANAGEMENT AND SHIP'S BUSINESS (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
MODULE 5			
1 IMO Conventions and local regulations in respect of oil pollution prevention and safety equipment	1.1 **General knowledge of** the requirements of the Life-saving **Equipment Regulations** and MARPOL Convention and the regulations concerning life-saving, fire-fighting appliances and oil pollution prevention.	As for **module 3.**	1 Determine the safety, and oil prevention equipment required on board ship.
2 Protection and preservation of the marine environment	2.1 **Knowledge** of the chief mate's or second engineer's duties (as **applicable) and ship's** liability regarding pollution at sea and able to **ensure that the** crew are fully trained in emergency oil spill procedures and the oil pollution locker is fully equipped in accordance with requirements. 2.2 **Able to organise a rapid, effective response to an oil spill or other pollution emergency on board and knows the importance of** conducting regular drills.		2 Action required to be taken after a spill of oil or when chemicals or sewage waste are inadvertently dumped at sea so as to best preserve the marine environment.
3 Full knowledge of the **Maritime Occupational** Safety Regulations	3 **Full knowledge** of contents and implications of the **Maritime Occupational Safety Regulations.**		3 Chief mate's **duties or second engineer's** duties (as applicable) of **ensuring that all** crew members are suitably informed/instructed and carry out the requirements of **the Maritime** Occupational Safety Regulations.

PERSONNEL MANAGEMENT AND SHIP'S BUSINESS (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
	MODULE 6		
1 Take command of a vessel on unlimited or limited voyages	1.1 Have a clear understanding of action to be taken on assuming command. 1.2 Knows the certificates and other documents required to be carried on board ships; their use, legal significance how they may be obtained, period of validity. 1.3 Knows the handover of command requirements.	As for module 3.	1 Ability to take over command with the legal implications thereof.
2 Relationship to pilot	2 Understand the relationship between master and pilot.		2 Able to communicate and establish a working relationship with the pilot.
3 Knowledge of statutory legal requirements for the official log book and appropriate sections of the Merchant Shipping Act.	3 Know: .1 official log book and the law relating to entries; .2 offences relating to misconduct, endangering the ship and against persons on board; .3 have a general knowledge of Chapter 4 of the Merchant Shipping Act (engagements, discharges, etc.).		3 Can complete: .1 all entries in the official logbook correctly including entries regarding offences; .2 all sign on / sign off procedures correctly.
4 Manage the ship's personnel	4 Have knowledge of: .1 civil liability for certain offences; .2 Conducts meetings as chair.		4 Able to: .1 fulfill all requirements of company's manning policy, including grievance / disciplinary procedures; .2 manage the ship's crew in a professional and competent manner; .3 organise shipboard meetings; .4 implement operational plans, including their evaluation.
5 Custom House Procedure	5 Knows: .1 procedure for entering and clearing ships; .2 role of ship's agents.		5.1 Correct procedure for Custom House entering and clearing is observed. 5.2 Deal with ship's business between master and agent.
6 Full knowledge of the legalities of "seaworthiness"	6 Understands: .1 definition of the term "seaworthiness" and the term "sub-standard ship"; .2 implications of port State inspections and the responsibility of the master.		6 Deal with the implications of a port State inspection.

PERSONNEL MANAGEMENT AND SHIP'S BUSINESS (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
7 Safety of the ship and assistance to other vessels in distress	7 Knows the duties and obligations of the master in respect of: .1 the safety of the ship, crew and passengers; .2 assistance to vessels in distress; .3 stranding, collision, casualty, towage, salvage, Lloyds Standard Form of Salvage Agreement; understands the legal implications thereof.		7.1 That the safety of the ship, crew and passengers is at all times maintained. 7.2 Deal with the legal and practical implications relating to stranding, collision, casualty towage and salvage.
8 Law relating to navigation, marine casualties, marine enquiries, territorial waters	8.1 Knows: .1 the law relating to navigation including the prevention of collisions; .2 the requirements to report dangers to navigation; .3 the use of Maritime Safety information; .4 the requirements to report maritime casualties. 8.2 Understands these terms used in the Law of the Sea Convention: .1 territorial waters; .2 internal waters; .3 right of innocent passage; .4 international straits; .5 exclusive economic zones; .6 continental shelf; .7 high seas.		8 Deal with dangers to navigation, the legal requirements about a collision and maritime casualties.
9 Organisations connected with shipping	9 Detailed knowledge of: .1 Organisations concerned with shipping, including IMO and SAMSA .2 safety conventions, national legislation.		9.1 The role of various organisations concerned with safe shipping. 9.2 Maritime conventions and their implications on flag states. 9.3 The implications of maritime conventions on the ship.
10 Monitor and control compliance with legislation to ensure protection of the marine environment	10 Knowledge of: .1 the Master's duties and ship's liability regarding pollution at sea. .2 what records are to be maintained on board ship and the emergency action and response to an oil spill / pollution emergency.		10.1 No international spill or dumping at sea of oil, chemicals, sewage or waste materials occur. 10.2 That the crew are aware of their responsibilities regarding pollution prevention.
11 Vessel traffic services	11 Knowledge of vessel traffic services, mandatory and voluntary ship reporting systems.		11 Able to follow and report as per the procedure for a vessel traffic reporting service.
12 Foreign ports *Note:* This is only applicable to candidates for the Unlimited Waters Command Endorsement.	12 Knowledge of clearing vessels inwards and outwards in foreign ports with emphasis on immigration, customs and health regulations.		12 Able to deal with the correct procedures for arrival and departure from a foreign port.

METEOROLOGY (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCY	CRITERIA FOR EVALUATING COMPETENCE
	MODULE 1		
1 Shipboard meteorological instruments	1.1 Understands the: .1 basic principle of an aneroid barometer; .2 function of a hygrometer; .3 basic principles of wind sensors. 1.2 Able to: .1 demonstrate ordinary readings of wind speed; .2 read the atmospheric pressure from an aneroid barometer; .3 read the temperature from a thermometer (wet and dry bulb).	By oral examination, completion of approved education and training, and assessment of evidence obtained from one or more of the following. 1 approved in-service experience; 2 approved training ship; 3 approved simulator training, where appropriate; 4 approved laboratory equipment training.	1 Shipboard meteorological instruments are correctly used and read.
2 Weather forecasting	2.1 Defines wind. 2.2 Describes the: .1 Beaufort scale of wind force; .2 method of estimating the strength of the wind from the appearance of the sea surface; .3 method of estimating the wind direction from the appearance of the sea surface, and demonstrates an ability to use the Beaufort scale to estimate the strength of the wind and its direction from the appearance of the sea. 2.3 Defines precipitation, rain, drizzle, hail, snow and sleet. 2.4 Defines fog, mist and haze and states that visibility is reduced by the presence of particles in the atmosphere, near the earth's surface. 2.5 Describes methods of estimating the visibility at sea by day and by night, and the difficulties involved. 2.6 Names and describes the ten basic cloud types. 2.7 Describes: .1 the stages in the life cycle of a polar front depression in the southern hemisphere and the usual movement of the front; .2 with the aid of a diagram, the weather experienced during the passage of a cold front in the southern hemisphere; .3 a family of depressions.		2.1 Current weather conditions are properly understood. 2.2 The current and latest weather forecasts are obtained by the appropriate mean.

METEOROLOGY (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCY**	**CRITERIA FOR EVALUATING COMPETENCE**
	2.8 Knowledge of: .1 currents and seasonal weather patterns on the South African coast; .2 the formation and occurrence of abnormal waves on the eastern seaboard of South Africa; .3 the local winds and their causes. 2.9 Describes: .1 the sources of weather information available to local shipping; .2 the appropriate local weather bulletins and their contents; .3 services provided for local storm warnings.		

METEOROLOGY (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCY**	**CRITERIA FOR EVALUATING COMPETENCE**
MODULE 2			
Weather forecasting and routing	1 Knowledge of: .1 services provided for shipping by meteorological offices including the types of services provided by facsimile machine; .2 appropriate weather bulletin and the contents of each of its sections; .3 services provided for storm warnings. 2 Lists the areas and seasons in which: .1 strong winds at sea are experienced most often; .2 a high incidence of sea fog can be expected. 3 States: .1 the typical weather signs of the approach of a tropical storm; .2 area and times where tropical storms frequently occur. 4 Describes briefly: .1 the pattern of a tropical revolving storm; .2 the behaviour of tropical revolving storms in individual areas and individual pressure conditions; .3 the practical manoeuvring rules for avoiding the centre of a tropical revolving storm; .4 the aid of a figure the most probable track of a tropical storm in various ocean areas. 5 States the regulations given in SOLAS regarding reporting a tropical revolving storm. 6 Explains the: .1 importance of an early warning of a tropical storm; .2 actions to be taken to avoid the storm centre and its vicinity. 7 Lists the information which should be included in a report of a tropical storm. 8 Able to: .1 identify: .1 a cold front, a warm front and an occlusion on a synoptic chart; .2 the air masses on a weather chart; .3 areas of maximum waves. .2 read the codes on a synoptic chart;	By oral examination , completion of approved education and training, written theoretical examination and assessment of evidence obtained from one or more of the following. 1 approved in-service experience; 2 approved training ship; 3 approved simulator training, where appropriate; 4 approved laboratory equipment training.	Show a practical ability to encode and decode weather information, interpret synoptic information and apply this to properly plan a sea passage.

METEOROLOGY (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCY**	**CRITERIA FOR EVALUATING COMPETENCE**
	.3 estimate: .1 the probable track directions of the various air masses; .2 wind directions from the isobars on the weather chart. .3 of expected area or precipitation or fog. .4 or expected area of icing. .4 calculate the wind force from the isobars on the weather chart. .5 demonstrate an analysis of a synoptic chart as a whole. .6 forecast area weather from a synoptic chart as a whole. .7 interpret a prognostic chart of area weather.		

SHIP MANOEUVRING AND HANDLING (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
MODULE 1			
Manoeuvre the ship	Knowledge of: .1 the effects of a single and twin propeller(s) on the turning circle of a ship; .2 the effects of deadweight, draught, trim, speed and under-keel clearance on turning circles and stopping distances; .3 the effects of wind and current on ship handling; .4 manoeuvres and procedures for the rescue of persons in distress and man overboard; .5 squat, shall-water, interaction between ships, canal effect and similar effects; .6 proper procedures for anchoring and mooring; and .7 basic manoeuvres and duties during berthing and unberthing and the use of the various mooring ropes when alongside. .8 manoeuvring during fishing operations with special regard to factors which could adversely affect the vessel's safety during such operations; .9 towing and being towed; .10 berthing, unberthing, anchoring and manoeuvring alongside other vessels at sea.	Oral examination and assessment of evidence obtained from one or more of the following: 1 approved in-service experience; 2 approved training ship experience; 3 approved simulator training, where appropriate 4 approved training on a manned ship model where appropriate.	1 Safe operating limits of ship propulsion, steering and power systems are not exceeded in normal manoeuvres. 2 Adjustments made to the ship's course and speed maintain safety of navigation.

SHIP MANOEUVRING AND HANDLING (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	MODULE 2		
Manoeuvre and handle a ship in all conditions	Manoeuvring and handling a ship in all conditions, including: .1 manoeuvres when approaching pilot stations and embarking or disembarking pilots, with due regard to weather, tide, headreach and stopping distances; .2 handling ship in rivers, estuaries and restricted waters, having regard to the effect of current, wind and restricted water on helm response; .3 interaction between passing ships and between own ship and nearby banks (canal effect); .4 berthing and unberthing under various conditions of wind, tide and current with and without tugs; .5 ship and tug interaction; .6 use of propulsion and manoeuvring systems; .7 choice of anchorage; anchoring with one or two anchors in limited anchorages and factors involved in determining the length of anchor cable to be used; .8 dragging anchor; clearing fouled anchors; .9 dry-docking, both with and without damage; .10 management and handling of ships in heavy weather, including assisting a ship or aircraft in distress; towing operations; means of keeping an unmanageable ship out of trough of the sea, lessening drift and use of oil; .11 precautions in manoeuvring to launch rescue boats or survival craft in bad weather; .12 methods of taking on board survivors from rescue boats and survival craft; .13 ability to determine the manoeuvring and propulsion characteristics of common types of ships with special reference to stopping distances and turning circles at various draughts and speeds; .14 importance of navigating at reduced speed to avoid damage caused by own ship's bow wave and stern wave; .15 use of, and manoeuvring in and near, traffic separation schemes and in vessel traffic service (VTS) areas; .16 transferring fish at sea to factory ships and other vessels; .17 refuelling at sea.	As for module 1.	1 All decisions concerning berthing and anchoring are based on a proper assessment of the ship's manoeuvring and engine characteristics and the forces to be expected while berthed alongside or lying at anchor. 2 While under way, a full assessment is made of possible effects of shallow and restricted waters, ice, banks, tidal conditions, passing ships and own ship's bow and stern wave so that the ship can be safely manoeuvred under various conditions of loading and weather.

FISHING TECHNOLOGY (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	**KNOWLEDGE, UNDERSTANDING & PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
	MODULE 1		
1 Prepare ship and equipment for the fishing operations	1.1 Knows the accepted practice for repairing, replacing, maintaining and positioning of the relevant fishing gear. 1.2 Can recognise irregularities, damage or defects as appropriate to the relevant fishing gear. 1.3 Knows how to report clearly and in good time, to his supervisor, any irregularities, damage or defects.	A Oral examination and assessment of evidence obtained from theoretical instruction. B Oral examination and assessment of evidence obtained from practical experience gained through on board training.	1 All relevant fishing gear is properly maintained, repaired, replaced and positioned as required for safe operation. 2 Reports timeously any defects, damage or irregularities to supervisor. 3 Instructions from supervisor are carried out. 4 Protective/safety gear is correctly worn during fishing operations.
2 The process of handling fishing gear	2.1 Be aware of safety rules applicable especially with regard to dangers caused by vessel's motion, slippery surfaces, fire prevention and fire hazards, and personal protection equipment. 2.2 Understand the instructions given by his/her supervisor regarding the operation and be familiar with common terms used in the fishing industry. 2.3 Knows that irregularities are likely to occur and understands the action to take to protect life and property.		
3 Stowing of the catch and general safety	3.1 Understands the importance of the current safety rules. 3.2 Understands the importance of his/her supervisor's instructions. 3.3 Knows that proper catch stowage and fishing gear is important for vessel/crew safety. 3.4 Understands the operation of ship's valves and offal chutes and can seal spaces from water ingress. 3.5 Understands the operation of dill/bilge/factory decks pumps for removal of water from areas. 3.6 Knows that loading/discharging operations can affect the stability of the vessel especially with regard to heeling moments from gear and catch.		

FISHING TECHNOLOGY (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING & PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
	MODULE 2		
The process of handling fishing gear/catch stowage	1 Understands the importance that sufficient and fit personnel are available to ensure safe and efficient fishing operations. 2 Knows that equipment checks shall be made prior to the beginning of fishing operations and to ensure that operations are carried out in accordance with safety rules. 3 Understands that reports of any irregularities, damage or defects are evaluated and rectified. 4 Knows that instructions are to be given to ratings involved in stowing of catch (when appropriate) to ensure that the operation is carried on in time and according to safety rules. 5 Familiar with construction, application and purpose of deck equipment which includes but is not limited to trawl gallows, gantries, power blocks, pursing blocks, winches and booms, derricks, net drums and side rollers and line and trap haulers. 6 Be familiar with the dangers associated with fishing operations such as shooting all types of fishing gear into the water, hauling fishing gear and landing the catch on board.	As for module 1.	Plans and implements the process of gear handling in accordance with the relevant safety rules.

EMERGENCY PROCEDURES (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
	MODULE 1		
Respond to emergencies and distress signals at sea, **and emergencies in port**	1 Able to take measures in emergencies for the protection and safety of ship, passengers and crew in that the candidate must be able to:- .1 muster persons and launch life saving appliances; .2 execute a man overboard drill; .3 organize an emergency party; .4 react properly to a distress signal; and .5 take charge of life-saving appliances. 2 Able to take initial action following a collision or grounding; initial damage assessment and control in that the candidate must be able to identify the actions: .1 to be taken following a collision; .2 to be taken following a grounding; .3 the precautions for the protection of and safety of crew passengers in emergency situations; .4 the means of limiting damage and salvaging the ship following a fire or explosion; .5 the procedure for abandoning ship; .6 the precautions for ensuring the security of the ship whilst in port; .7 the actions to be taken when emergencies arise in port; .8 the procedure to bring a ship up short or turn it short round using an anchor on a short scope of chain. 3 Able to use the auxiliary steering and know the rigging and use of jury steering arrangements. 4 Know the area of operation and procedures of the SASAR organization.	Oral examination and assessment of evidence obtained from one or more of the following: 1 approved in-service experience; 2 approved training ship experience; 3 approved simulator training where appropriate; 4 practical training.	1 The type and scale of the emergency is promptly identified. 2 Initial actions and, if appropriate, manoeuvring of the ship are in accordance with contingency plans and are appropriate to the urgency of the situation and nature of the emergency.

EMERGENCY PROCEDURES (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
	MODULE 2		
Respond to emergencies and distress signals at sea, and emergencies in port	1 Thorough knowledge of the actions required to execute the correct response to those emergencies and actions listed in module 1. 2 Knowledge of: .1 precautions when beaching a ship; .2 action to be taken if grounding imminent, or after grounding; .3 refloating a grounded ship with and without assistance; and .4 action to be taken if collision is imminent and following a collision or impairment of the watertight integrity of the hull by any cause. 3 Thorough knowledge of: .1 emergency steering; .2 emergency towing arrangements and towing procedures; and .3 the assessment of damage control. 4 Thorough knowledge of the IMO world SAR plan and the SASAR manual.	Oral examination and assessment of evidence obtained from practical instruction, in-service experience and practical drills in emergency procedures.	1 The type and scale of any problem is promptly identified and decisions and actions minimize the effects of any malfunction of the ship's systems. 2 Communications are effective and comply with established procedures. 3 Decisions and actions maximize safety of persons on board.

COMMUNICATIONS (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
MODULE 1			
Use MSI information	1 Able to use the International Code of signals. 2 Adequate knowledge of the English language to enable the officer to use charts and other nautical publications, to understand meteorological information and messages concerning ship's safety and operation, to communicate with other ships and coast stations. 3 Knowledge of the different types of MSI signals, their means of transmission, Navareas, Metareas, and the responsibility to generate navigational warnings. Make use of the South African list of radio signals in the ability to receive such signals. *Note:* Candidates in the examinations for the Skippers and deck officers certificates will only be required to have a local knowledge regarding the use, receipt and transmission of MSI.	Assessment of evidence obtained from written, practical and oral examination.	1 English language navigational publications and messages relevant to the safety of the ship are correctly interpreted or drafted. 2 Communications are clear and understood. 3 Receive a navigational warning, meteorological forecast, SAR message and make the correct decisions regarding the contents of such a message, Generate a navigational warning in accordance with the requirements of the SOLAS convention.

COMMUNICATIONS (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING AND PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
MODULE 2			
1 Transmit and receive information by visual signalling	1.1 Able to transmit and receive signals by morse light. 1.2 Able to use the International Code of signals.	Assessment of evidence obtained from written, practical and oral examination.	1 Read a flashing morse white light at a rate of three words per minute and that the communications, within the operator's area of responsibility are consistently successful.
2 Use the Standard Marine Navigational Vocabulary as replaced by the IMO Standard Marine Communication Phrases and use English in written and oral form	2 Adequate knowledge of the English language to enable the officer to use charts and other nautical publications, to understand meteorological information and messages concerning ship's safety and operation, to communicate with other ships and coast stations and to perform the officer's duties also with multilingual crew, including the abilitity to use and understand the Standard Marine Navigational Vocabulary as replaced by the IMO Standard Marine Communication Phrases.		2.1 English language navigational publications and messages relevant to the safety of the ship are correctly interpreted or drafted. 2.2 Communications are clear and understood.
3 Use MSI information	3 Knowledge of the different types of MSI signals, their means of transmission, Navareas, Metareas, and the responsibility to generate navigational warnings. Make use of the Admiralty list of radio signals in the ability to receive such signals.		3 Receive a navigational warning, meteorological forecast, SAR message and make the correct decisions regarding the contentsof such a message, Generate a navigational warning in accordance with the requirements of the SOLAS convention.

ENGINEERING KNOWLEDGE (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	MODULE 1		
1 Understand the theoretical principles of marine engineering knowledge 2 Understand the working and operation of onboard auxiliary machinery and ship propulsion system	1 Understand terms used in machinery spaces and names of machinery equipment and an elementary knowledge of the main parts of the propelling machinery. 2 Understand engine room watchkeeping procedures: .1 know how to and why read and record temperatures, pressures and fluid levels. Understand how to take over and hand over a watch; .2 know how to deal with minor defects in the propelling and auxiliary machinery; .3 maintain batteries in proper working order; .4 keep bilges empty and clean, is familiar with bilge pumping systems; .5 know how to take out of service and clean and put on line duplex filters; .6 know how to assist in manual operation of automated machinery; .7 know how a diesel engine is prepared for standby and starting. 3 Understand the basic construction and operation of the following: .1 diesel engines: .1 the 4-stroke diesel engine; .2 the 2-stroke diesel engine; .3 the main engine cooling water system, lubrication oil system, fuel system, scavenge air system and starting systems; .4 mechanism of starting and reversing arrangements; .2 auxiliary machinery and systems: .1 know and understand names and functions of the main parts of refrigeration machinery and has a working knowledge of a basic refrigeration systems; .2 classify pumps as reciprocating pumps, centripetal pumps and mono pumps; .3 describe the type of valves used onboard and their function; .4 be able to Illustrate by means of sketches typical pumping arrangements such as bilge, fire main, and deck wash and fuel oil bunkering systems. Understand the necessity to keep bilges empty; .3 steering gear arrangement: .1 describe basic principles of the steering system; .2 explain how to steer from the emergency position.	1 Written examination and assessment of evidence obtained from theoretical instruction, display diagrams and associated practical knowledge 2 Oral examination and assessment of evidence obtained from practical experience gained through sea going service.	Demonstrates a clear understanding of marine engineering knowledge.

ENGINEERING KNOWLEDGE (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING & PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
	4 Generators, alternators and electrical distribution: .1 require basic knowledge of electricity and distribution systems, including protection devices on board ship; .2 describe precautions to take when working on or near electrical systems; .3 describe the safety precautions to be observed for battery compartments. 5 Safe working practise as related to engine room operations: .1 precautions to take when working in enclosed spaces; .2 precautions to take when working on high pressure or high temperature piping systems. 6 Fuel oil bunkering: .1 know how to prepare for taking bunkers and carry out safe bunkering procedures.		

ENGINEERING KNOWLEDGE (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	**KNOWLEDGE, UNDERSTANDING & PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
	MODULE 2		
1 Understand the theoretical principles of marine engineering knowledge 2 Understand the working and operation of onboard auxiliary machinery and ship propulsion system.	1 Prepare main and auxiliary machinery for sea and testing of steering gear. 2 Understand record of engine room logbook and significance of readings taken. 3 Understand routine pumping operations of fuel oil, fresh and salt water and hilge system and location of common faults. 4 Understand starting, coupling and changing over alternators and/or generators. 5 Know safety precautions to be observed during a watch and the immediate action to be taken in the event of a fire or accident, including electric shock. 6 Know precautions to be observed to prevent environmental pollution, operation and maintenance of emergency equipment. 7 Know the use and constructional details of measuring instruments for temperatures and pressure and the operating principles of the ammeter and voltmeter. 8 Know how various machinery components are manufactured and the effects of various treatments on the physical properties of the materials commonly used. 9 Understand and know the construction, arrangements and operation of steering systems, constructional details and maintenance of pressure vessels, constructional details and principles of action of pumps and general requirements for pumping systems. 10 Understand the safe and efficient operation and maintenance of electrical equipment. 11 Understand the efficient operation and maintenance of auxiliary boilers. 12 Understand the working principles and constructional details of marine diesel engines together with their ancillary equipment such as gearboxes, clutches, thrust bearings and transmission systems. 13 Understand the operation and maintenance of diesel engines,	1 Written examination and assessment of evidence obtained from theoretical instruction, display diagrams and associated practical knowledge. 2 Oral examination and assessment of evidence obtained from practical experience gained through sea going service.	Demonstrates a clear understanding of marine engineering knowledge.

ENGINEERING KNOWLEDGE (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	determination of engine power, starting and reversing systems. 14 Know the properties of fuel and lubricating oils used in diesel engines. 15 Understand fuel systems and lubricating oil systems. 16 Know the constructional details and working principle of air compressors. 17 Understand basic electrical circuits including alternating current and direct current systems. 18 Understand basic hydraulic and pneumatic circuits and their maintenance. 19 Understand the safe operation and maintenance of deck machinery. 20 Know precautions against factory deck flooding.		

ENGINEERING KNOWLEDGE (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	**KNOWLEDGE, UNDERSTANDING & PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
	MODULE 3		
1 Understand the theoretical principles of marine engineering knowledge 2 Understand the working and operation of onboard auxiliary machinery and ship propulsion system	**Watchkeeping practice:** 1 Routine associated with taking over and accepting a watch—understand and know: .1 responsibility of the watchkeeper; .2 procedure for taking over a watch; .3 precise nature of the logbook check; .4 routine of handing over a watch; .5 advice of changes during watch or abnormalities; .6 compilation of machinery space logbook; .7 Understanding of essential operating parameters, the upper and lower bounds; .8 recording of incidents during the watch; .9 changes in recording during stand-by periods; .10 The legal implications of the log book. 2 Duties undertaken during a watch—understand and know: .1 routine inspections of all machinery spaces; .2 use of all senses during rounds; .3 specific watch responsibilities; .4 unusual conditions in machinery spaces; .5 action in case of auxiliary machinery failure or black-out; .6 action in case of fire; .7 observation of leaks, pipe bursts, oil spills etc; .8 sudden main engine failure. 3 Preparing to proceed to sea—understand and be able to: .1 start air, fuel, lubricating oil and circulating water systems; .2 warm through; .3 turn over main and auxiliary engines; .4 test alarms, telegraph and steering gear; .5 prepare main engine, prime, turning gear out, etc 4 Preparing for arrival in port—understand and be able to: .1 test telegraph; .2 start stand-by auxiliaries. **Materials:** 1 Production of iron and steel—understand: .1 properties of iron and steel; .2 strength, ductility and elasticity; .3 tensile test, malleability, compression test, toughness, brittleness.	1 Written examination and assessment of evidence obtained from theoretical instruction, display diagrams and associated practical knowledge. 2 Oral examination and assessment of evidence obtained from practical experience gained through sea going service.	Demonstrates a clear understanding of marine engineering knowledge.

ENGINEERING KNOWLEDGE (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING & PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
	2 **Manufacturing processes** and treatments—have **knowledge of:** .1 **casting, forging, rolling, spinning, drawing, extrusion;** .2 machining and **welding;** .3 heat treatment; .4 hardening, tempering, toughening, **annealing,** normalising, stress relieving; .5 surface hardening. 3 Alloying and effect on properties—have **knowledge of:** .1 alloying elements; .2 nickel, chromium, tungsten, molybdenum, vanadium, silicon, copper, lead, cobalt, boron, titanium; .3 **effect of these elements on the properties of the metal.** 4 Non-ferrous metals—have knowledge of: .1 aluminium, copper, lead, platinum, tin, zinc; .2 common brasses and bronzes; .3 cupro-nickel and aluminium-nickel bronzes; .4 white metal and other bearing metals; .5 suitability of above metals to withstand corrosion, fatigue, heat, erosion, creep and cavitation; .6 castability and repairability of these metals. **Instrumentation and control:** Understand basic operating principles and constructional details: 1 **pressure measurement;** 2 barometers; 3 manometers: U-tube; 4 Bourdon tubes: C, spiral and helical tubes; 5 temperature measurement; 6 liquid-in-glass, liquid-in-steel, vapour and gas filled systems; 7 bimetal thermometers; 8 flow measurement; 9 level measurement; 10 direct reading methods: sight glass, floats; 11 viscosity measurement; 12 electrical: tacho generators; 13 liquid density: hydrometers. **Internal Combustion Engines:** 1 Understand and know principles of operation: .1 two stroke, four stroke; .2 lubrication, cooling, fuel, scavenge and air starting systems;		

ENGINEERING KNOWLEDGE (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	.3 automatic control for above systems. 2 Construction—understand and have know ledge of: .1 engine framework; .2 bedplates, A-frames, cylinder blocks and tie bolts; .3 holding down bolts; .4 collision chocks; .5 crankshafts, connecting rods, crossheads; .6 cylinder liners, pistons, piston rings; .7 wear and lubrication; .8 cylinder covers, exhaust valves, cams and rocker arms; .9 fuel injectors and pumps; .10 starting and reversing arrangements. 3 Engine-room operations—be able to: .1 prepare engine for departure to sea; .2 prepare for arrival at next port; .3 take action in abnormal conditions such as failure in lube oil, fuel and cooling water systems; failure of engine component; scavenge fire; crankcase or air start system explosion. **Fuel oil and lubricants:** 1 Have an understanding and knowledge of: .1 properties of fuel oil: density, viscosity, flash point, etc; .2 methods of storing; .3 tank fittings; .4 wire gauze; .5 danger of oil spilling, leakage and contamination; .6 precautions to be taken during routine pumping operations; .7 precautions when working in oil tanks; .8 purification, clarification, filters. 2 Have an understanding and knowledge of: .1 animal, vegetable, mineral and compound oils; .2 methods of storing; .3 filters and strainers; .4 lubrication fundamentals; .5 boundary and hydrodynamic lubrication; .6 lubricating oil additives; .7 lubricating oil tests; .8 grease.		

ENGINEERING KNOWLEDGE (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	Steam plant and auxiliary systems: 1 Understand the construction and operation of: .1 auxiliary boilers, steam-steam generators and exhaust gas economisers; .2 soot blowers and soot collectors; .3 boiler mountings; .4 setting safety valves and water gauges; .5 combustion equipment; .6 boxing up, filling a boiler and raising steam; .7 precautions when opening steam valves; .8 cause and danger of water hammer; .9 correct method of blowing gauge glasses; .10 routine operating observations and log; .11 shutting down a boiler for a short period; .12 shutting down, blowing down and opening up for repairs; .13 inspection of water and gas sides for defects; .14 action to be taken in abnormal conditions, high or low water level, leaking tubes or shell, soot fires in uptakes, oil leakage and furnace front fire. 2 Understand and be able to describe: .1 a closed feed system, condenser, a hot well and feed pump; .2 producing distilled water, evaporators, corrosion and scale formation; .3 boiler water treatment and routine tests; .4 caustic embrittlement; .5 sources of contamination, precautions and action. **Power transmission systems:** Understand the construction and operation of: 1 a thrust bearing; 2 shaft bearings; 3 stern tube; 4 water and oil lubricated types; 5 stern tube seals; 6 propellers, fixed blade, built up and controllable pitch; 7 steering gear, types of steering gear, pre-sea checks, routine checks and emergency operation of steering gears. **Pumps and pumping systems:** 1 Understand the construction and operation of: .1 reciprocating, single and double acting pumps;		

ENGINEERING KNOWLEDGE (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	.2 gear, screw, vane, lobe pumps; .3 discharge pressure control; .4 centrifugal pumps and air pumps for suction; .5 types of valves and ship-side fittings. 2 Be able to describe by means of sketches: .1 bilge pumping systems, oily water separators; .2 emergency bilge pumping arrangements; .3 precautions against flooding; .4 domestic cold water system; .5 fresh water generators; .6 domestic hot water system. **Refrigeration systems:** 1 Constructional arrangement, details and working of refrigerating machinery and auxiliary machinery on board fishing vessels: compressors, condensers, evaporators, expansion valves, liquid receivers, liquid stop valves, refrigerants, danger of refrigerants, lubricants, oil separators, danger of entering cool spaces, CO_2 gas. 2 Describe refrigeration cycle by means of sketch. **Fire and safety:** 1 Safety measures and precautions: .1 methods of extinguishing, fire detection methods, patrols, alarm circuits, fixed installation systems; .2 dangers of leakage from oil tanks, pipes, gas products and vaporizers, particularly in bilges and other unventilated spaces; .3 precautions against fire or explosions due to oil or gas; .4 flash point; .5 explosive properties of gas or vapour given off by fuel or lubricating oils when mixed with air; .6 action of wire gauze diaphragms and the places in which such devices should be fitted. 2 Operation of fire-fighting equipment: .1 CO_2 gas flooding systems, and fixed fire smothering installations; .2 Fire detection methods, patrols, alarm circuits.		

ENGINEERING KNOWLEDGE (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING & PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
	Marine electrical equipment and systems: 1 Preparing, starting and running of diesel and steam turbines. 2 Sequences of paralleling alternators and generators. 3 Operation of shaft generators. **Ship maintenance & management:** 1 Machinery and hull surveys: .1 reasons for survey, compare statutory and Class surveys, preparing for surveys; .2 inspection techniques: inspection before dismantling, recording relevant facts, ususal measurement; .3 condition and performance monitoring: interpreting changes in instrument readings on machines, vibration monitoring techniques. 2 Statutory responsibility of the chief engineer, second engineer and engineer officer: .1 temporary or permanent repairs in the event of breakdown; .2 methods of dealing with wear and tear of machinery and boilers.		

ELECTROTECHNOLOGY (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	**KNOWLEDGE, UNDERSTANDING & PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
	MODULE 1		
Understand and apply the principles of electricity			
1 Electron Theory	1.1 Understands and describes the following: atoms, molecules, ions, a compound, an element ionization. 1.2 Describes: .1 current flow in a conductor and circuit; .2 potential difference; .3 conductors and insulators with examples. 1.3 Explains the following electrical terms with relevant symbols: current, volt, direct and alternating current, static electricity, resistance, volt drop.	Examination and assessment of evident obtained from theoretical instruction as associated laboratory or workshop practical training.	Demonstrate a clear theoretical and practical application of electricity.
2 Diagrams and symbols	2.1 Draws simple circuit diagrams using the correct symbols for electrical components. 2.2 Describes parallel and series circuits.		
3 Electrical theory	3.1 Defines the following: Ohm's Law; Kirchoff's Law. 3.2 Describes the uses of the Wheatstone Bridge. 3.3 Calculates the voltage, current or resistance in parallel or series circuits.		
4 Electrical instruments and test applications	4.1 Sketches and describes the units and their application: Voltmeter and an ammeter. 4.2 Describes: .1 the use of shunts and series resistors; .2 the following testing equipment: insulation tester and continuity tester, multi tester.		

ELECTROTECHNOLOGY (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING & PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
	MODULE 1		
5 **Work, energy and power**	5.1 Explains, with the relevant symbols, the difference between work, energy and power. 5.2 Calculates the energy and work. 5.3 Applies the equations related to voltage, current, power and work. 5.4 Describes the transfer of heat energy to electrical energy.		
6 **Electrical safety**	6 Describes electrical shock, safe voltage range and safety precautions.		
7 **Conductors**	7.1 Describes factors governing conductor resistance. 7.2 Determines resistivity values of conductors. 7.3 Explains and calculates temperature coefficient with respect to resistance of pure metals, carbon, germanium silicon, constantan. 7.4 Compares resistance variation with temperature increase of a conductor or semiconductor. 7.5 Explains the use of thermistors.		
8 **Insulation**	8.1 Defines the term insulator and its usage. 8.2 Describes: .1 leakage and factors affecting insulation resistance; .2 the general physical characteristics of insulation materials		
9 **Batteries**	9 Describes: .1 the voltaic cell, primary cells and secondary cells; .2 the lead-acid and alkaline battery; .3 the charging process, maintenance and dangers associated with batteries.		

ELECTROTECHNOLOGY (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING & PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
MODULE 1			
10 **Magnetism and electromagnetism**	10.1 Describes natural and artificial magnetics, magnetism, magnetic materials, magnetic field, magnetic flux and magnetic flub density. 10.2 Defines the force on a conductor in a magnetic field. 10.3 Calculates field strength, conductor current and effective length of conductor.		
11 Electromagnetic induction	11.1 Describes electromagnetic induction and its application. 11.2 Explains: .1 the affect on induced voltage from flux density, number of turns in the coil and conductor/flux cutting rate; .2 flux linkages, Faraday's and Lenz's Laws, static, mutual and self induction, dynamic induction.		
12 **Generators and motors**	12.1 Knows and uses Fleming's hand Rules. 12.2 Explains, with sketches the functions of : the armature, the commutator, sliprings, brush mechanism, field coils and poles, inter-poles. 12.3 Describes: .1 variation in a simple loop generator; .2 the circuits of Shunt, and applications series and compound AC Motors; .3 the purposes of a DC motor starter; .4 the DC generator circuits for excitation and draws load characteristics; .5 two types of windings for DC generators.		

ELECTROTECHNOLOGY (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING & PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
	MODULE 1		
13 AC alternators and motors	13.1 Describes: .1 AC voltage with respect to root means square, peak values; .2 3 phase generations and the 3 phase star connected alternator; .3 the salient pole generator; .4 excitation, automatic voltage regulation, synchronizing sequence, parallel running, cooling; .5 the emergency power generation system; .6 single and 3 phase induction motor components and basic operation; .7 the graphs of the relationships: speed and load and current and load; .8 direct-on-line starter, star-delta starter, star connected running and auto-transformer starter; .9 protection and the reasons for it; for fuses, over current relays, over current trip, thermal relay, thermistor, phase open circuit, under voltage trip; .10 the term single phasing; .11 ways of varying speeds; .12 Ward-Leonard drive and variable-frequency motor principles. 13.2 Explains that frequency is proportional to rotation speed.		
14 Alternating current	14.1 Describes AC generation in a simple loop rotating in a magnetic flux and relates the loop position to voltage wave form. 14.2 Explains: .1 the relationship between instantaneous voltage, conductor velocity and the sine of the displayed angle e; .2 root mean square (rms) values. 14.3 Defines frequency and appropriate units and symbols. 14.4 Describes: .1 a 3 phase supply circuit; .2 phase difference between voltage and current.		
15 Transformers	15 Describes: .1 the construction principles and operation of transformers; .2 the transformer connections; Star-Star, Delta-Delta, Star-Delta or Delta-Star; .3 transformer checks and maintenance requirements		

ELECTROTECHNOLOGY (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING & PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
	MODULE 1		
16 Distribution	16.1 Describes: .1 the purpose of switches, circuit breakers and fuses; .2 the sources of emergency electrical power supply and systems supplied; .3 insulated systems and earthed-neutral systems. 16.2 Explains: .1 an open circuit, earth and short circuit; .2 how earth faults occur and are detected.		
17 Protection	17.1 Describes: .1 protection and the reasons for its installation; .2 3 types of overcurrent protection relay. 17.2 Explains: .1 the high rupturing-capacity fuses; .2 preferential tripping, undervoltage and reverse power protection; .3 the dangers for replacing a blown fuse, entering spaces near busbars and opening switchboard cubicles; .4 switchboard instruments transformers and any potential dangers.		
18 Cables	18 Describes: .1 materials and the reasons for the following in cables: conductors, insulation and sheathing; .2 resistance and why terminals are to be secured and locked.		
19 Maintenance	19 Describes: .1 system isolation, carbon brush replacement and insulation resistance; .2 circuit breaker maintenance noting handling, tripping and interlocks.		

APPLIED MARINE SCIENCE (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	**KNOWLEDGE, UNDERSTANDING & PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
	MODULE 1		
Obtain the mathematical skills required for an understanding of the theoretical knowledge in the certificate courses			
1 "Algebra"	1.1 Knows: .1 the standard algebraic manipulations leading to the transportation of equations and their solution. .2 how to produce a graph of given or observed data and extract information from the graph. .3 how to convert between polar and rectangular co-ordinates. .4 how to interpolate quickly and accurately. .5 the properties of the ellipse. 1.2 Defines: "error" as the observed or calculated value minus the true value. 1.3 Explains the meaning of "absolute error" and "relative error"	Written examination and assessment of evidence obtained from theoretical instruction.	1.1 Transposes equations to isolate a given variable. 1.2 Solves: .1 equations, giving answers rounded to a specified number of decimal places or significant figures. .2 problems leading to linear equations. .3 problems leading to simulations linear equations in two unknowns. 1.3 Plot points, given their Cartesian co-ordinates. 1.4 Draws: .1 a smooth graph through plotted points. .2 a graph of given functions. 1.5 Given the abscissa, reads the value of the ordinate and vice versa. 1.6 Extracts values from graphs on ship's data. 1.7 Uses: .1 linear interpolation to find intermediate values in table such as ullage tables, deadweight scales, deviation table. .2 a calculator to convert between polar and rectangular co-ordinates. 1.8 Interpolates in tables with two arguments. 1.9 Performs linear extrapolation. 1.10 Constructs by plotting an ellipse.

APPLIED MARINE SCIENCE (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	**KNOWLEDGE, UNDERSTANDING & PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
	MODULE 1		
2 "Trigonometry"	2.1 Proficient in the use of trigonometrical function of angles. 2.2 Knows: .1 the range of values of trigonometrical functions. .2 the range of values of the inverse functions. .3 the value of radian.		2.1 Solves: .1 problems reducible to right-angle triangles of trigonometrical functions. .2 problems on oblique plane triangles using the cosine and sine formulae. 2.2 Converts: .1 polar co-ordinates to Cartesian and vice versa. .2 angles into radians and vice versa.
3 "Mensuration and Geometry"	3 Knows: .1 perimeters and areas. .2 the areas of sectors and segments of a circle. .3 surface areas and volumes. .4 Simpson's 1st, 2nd and 3rd Rule. .5 the construction of a circle through two known points when angle between two points is known (Snellius Problem). .6 the properties of figures, parallel lines and constructions.		3.1 Calculates: .1 the perimeters and areas of: .1 a square .2 a rectangle .3 a parallelogram .4 a trapezium .5 a triangle .6 a circle .2 the areas of sectors and segment of a circle. .3 the surface areas and volume of: .1 a cube .2 a rectangular and .3 a triangle prism .4 a cylinder .5 a sphere .4 areas and centroids of irregular figures. .5 volumes and centre of gravity of volumes of irregular figures. .6 the distance from an object when the height and subtended vertical angle is known. 3.2 Constructs: .1 a circle through two known points when angle subtended between the two points is known. .2 a triangle from given data. 3.3 Determines .1 by plotting three given points and the theangles subtended by pairs of those points at a position. .2 are length given radius and angle of sector. 3.4 Users Phythagoras' theorem to calculate one side of a right-angled triangle, given the other two.

APPLIED MARINE SCIENCE (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	**KNOWLEDGE, UNDERSTANDING & PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
MODULE 1			
4 "Vectors"	4 Knows: .1 that vector quantities have direction as well as magnitude. .2 the graphical solution of sums and differences of vector quantities		4.1 Calculates: .1 the vector sum of two or more vectors by graphical methods. .2 the difference between two vectors by graphical methods. .3 sums an difference of vectors by resolution into perpendicular directions. 4.2 Resolves: .1 a given vector into components in two specific directions by drawing. .2 a given vector into components in two specific perpendicular directions by calculation.
5 "Statistics"	5 Knows: .1 graphical representation of data. .2 measures of central tendency. .3 standard deviation.		5.1 Draws bar and pie charts, histograms and frequency polygons from given data. 5.2 Calculates: .1 mode, meridian and mean. .2 standard deviation.
6 "Ellipse and Hyperbola"	6 Knows the properties of the ellipse and hyperbola.		6 Constructs: .1 an ellipse by plotting. .2 a family of hyperbola.

DRAWINGS (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	MODULE 1		
Understand and apply the principles of mechanical drawing			
1 Types of drawings	1.1 Explains the following: general arrangement assemble, component, pictorial drawings.	Examination and assessment of evident obtained from completing mechanical drawings.	Demonstrate by completing and extracting information from mechanical drawings.
	1.2 Storage of drawings: cabinet, computer and microfilm.		
2 Linework	2.1 Draws examples of lines, tangents.		
	2.2 Demonstrates first angle and third angle projections including hidden detail.		
	2.3 Completes orthographic projections with sectional views.		
3 Pictorial projections	3 Draws isometric and oblique projections.		
4 Development	4 Draws developments of circular tranking intersections, cone, square pyramid, square-to-round transition pad.		
5 Screw threads and fasteners	5.1 Identifies and describes left- and right-hand threads, thread terminology, thread types, multiple threads, hexagonal nut.		
	5.2 Draws threads, nut, studs, bolt, washer assemblies.		
	5.3 Identifies and describes the socket-head screw and machine screw ranges		
6 Locking and retaining devices	6 Describes: .1 locking plate; Simmonds lock-nut; lock, spring and tab washer and peering and wire locking; .2 taper pins; bifurcated taper pins; parallel and split pins; wire rings and air clips.		
7 Riveted-type fastenings	7 Describes: .1 the different rivet heads; blind rivet nuts and blind screw anchors; .2 the 4 riveted types of joints; .3 the "huckbolt" fastener.		
8 Welded connections	8 Describes various welded connections and the symbols.		

DRAWINGS (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	**KNOWLEDGE, UNDERSTANDING & PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
9 Dimensioning	9 Describes datum dimensioning and dimensions a simple component with the correct standards.		
10 Limits and fits	10 Describes limit and fit; tolerance, basic, actual nominal size; fits and selective assembly.		
11 Geometrical tolerancing	11 Describes geometrical tolerancing giving the symbols.		
12 Cams	12 Constructs cam profiles to give uniform velocities and dwell period to the follower		
13 Bearings, seals and lubrication	13 Describes: .1 direct lined bearings; solid or lined inserts and the walled type bearings; .2 lubrication properties and the different types of bearing metals; .3 Ball and roller bearings, the radial and axial load carrying capabilities; the tapered-bore bearing and location; .4 the following seals: felt seal, rubbing seal, non-rubbing seal, lip seals and V-rig seals; .5 the lubrication of bearings, bushes, ball and roller bearings, the properties of the different lubricants.		
14 Engineering drawing practice	14.1 Makes an engineering drawing employing: sections in 2 parallel planes; revolved, thin, part, half sections; hidden detail; symbols; surface finish; angular and auxiliary dimensions; arrowheads; centre & leader lines; pitch-circle diameters; threads, hatching; enlarged views. 14.2 Uses applications as appropriate for units 1 to 13.		

GENERAL ENGINEERING SCIENCE/APPLIED MECHANICS (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING & PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE.**
	MODULE 1		
Understands the principles of mechanics with respect to Statics, dynamics, Kinematics and Hydrostatics.			
1 Statics	1.1 Defines the following terms with the relevant formulated symbols: .1 area, volume of figures and shapes; .2 mass, weight; .3 density, relative density and centre of gravity. 1.2 Defines: .1 a moment, couple and equilibrium; .2 vectors and vector diagrams applicable to the Triangle and Polygon of forces. 1.3 Understands the action of concentrated loads on beams and cantilevers. 1.4 Describes and defines, with the relevant symbols: .1 Stress—tensile, compressive, sheer; .2 Strain—Hooke's Law, elasticity, factor of safety, elastic limits, yield point, ultimate and breaking strength.	Examination and assessment of evidence obtained from theoretical instruction and associated laboratory equipment training.	Demonstrates a clear theoretical basis of mechanics.
2 Kinematics	2.1 Defines with the relevant symbols: distance, speed, acceleration, velocity, average velocity and relative velocity. 2.2 Applies the formulae: $V = u \pm at$ $V^2 \pm as$ $S = ut + at^2/2$		
3 Dynamics	3.1 Defines: .1 with the relevant symbols: work, power, energy, force, force of gravity, inertia friction and coefficient of friction; .2 kinetic and potential energy; .3 Newton's 3 laws of motion. 3.2 Applies the formula: force = mass x acceleration.		

GENERAL ENGINEERING SCIENCE/APPLIED MECHANICS (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING & PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE.
	MODULE 1		
4 Hydrostatics	4.1 Defines: .1 a fluid; .2 with the relevant symbols, pressure; atmospheric pressure; absolute pressure gauge pressure; liquid lead and vacuum; .3 the principles of flotation. 4.2 Describes: .1 the operation and use of the following instruments: piezometer, manometer, barometer, Bourdon pressure gauge .2 the principles of hydraulic lifting machines; .3 the energies stored in liquids in motion pressure, kinetic and potential. 4.3 States: .1 the volumetric flow is velocity x cross-sectional area; .2 the mass of flow is velocity x cross-sectional area x density.		
5 Simple machines	5 Describes: .1 the operations of simple lifting machines, screw jack, hydraulic jack, rope pulley blocks, work drivers and chain blocks; .2 the terms velocity ratio, mechanical advantage, efficiency.		

HEAT ENGINES/THERMODYNAMICS (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	**KNOWLEDGE, UNDERSTANDING & PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
	MODULE 1		
Understand the theoretical principles of Thermodynamics and Heat Engines in respect of the following principles			
1 Thermodynamic properties	1.1 Defines the terms and relevant symbols: Heat, temperature and scales, calorific value, specific heat, pressure, volume, enginery, absolute quantities, solids, liquids and gases, vapours expansion.	Examination and assessment of evidence from theoretical instruction and associated laboratory equipment training.	Demonstrate a clear theoretical basis of Thermodynamics and Heat Engines.
	1.2 Describes: .1 linear and volumetric expansion; .2 enthalpy of fusion and enthalpy of evaporation.		
	1.3 Determines the amount of expansion due to heat action.		
2 Thermodynamic energy	2.1 Describes "internal" or "intrinsic" energy.		
	2.2 Defines: .1 kinetic and potential energy as molecular energy; .2 heat flow and work; .3 the first law of thermodynamics.		
3 Heat transfer	3.1 Defines heat transfer by conduction, convection and radiation.		
	3.2 Describes laboratory equipment to determine specific heat capacity and final temperature.		
	3.3 States Fourier's Law for conduction.		
	3.4 Explains coefficient of thermal conductivity.		
4 Vapour	4.1 Defines saturated, dry, wet, superheated vapours and dryness fraction.		
	4.2 Describes the relationship between pressure and temperature for saturated liquids or vapours.		
	4.3 Uses tables of thermodynamic properties (Steam tables) to determine values of enthalpy, internal energy, volume at given pressures and/or temperatures.		

HEAT ENGINES/THERMODYNAMICS (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	**KNOWLEDGE, UNDERSTANDING & PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
5 Ideal gases and gas cycles	5.1 Defines critical temperature, ideal gas and perfect gas, ideal-gas cycle. 5.2 States Boyle's and Charles's Law. 5.3 Sketches P-V and V-T curves or graphs. 5.4 Explains the following cycles with pressure-vol sketches: Otto, diesel, dual and Joule Cycles. 5.5 Describes: .1 the practical engines modelled on the cycles of 4 above; .2 single- and double-acting reciprocating engine applications; .3 the Rankie Cycle and state the effic ratio; .4 sketches the components of a steam plant: boiler, steam turbine, condenser and feed pump.		
6 Thermodynamic process	6.1 Defines a thermodynamic process in the forms of heat transfer and/or work transfer. 6.2 Explains .1 the Second Law of Thermodynamics; .2 P-V diagrams of the following standard processes: pressure remains constant, volume remains constant, temperature remains constant, zero heat transfer and polytropic expansion and compression. 6.3 Describes the following processes: isothermal as constant temperature adiabatic as a no heat transfer.		
7 Work transfer	7.1 Defines work with relevant symbols. 7.2 Describes P-V diagrams relating to work done and work transfer for a vapour in terms of pressure and volume.		

HEAT ENGINES/THERMODYNAMICS (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING & PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
8 Heat engine cycles and internal combustion engines	8.1 Describes: .1 the 2 and 4 stroke internal combustion engines operation cycle with crank angles, port timing or valve timing; .2 heat balance 8.2 Determines: .1 the engine efficiency from energy input and energy output and energy losses and mechanical efficiency from brake and indicated power; .2 indicated power. 8.3 Defines stroke, swept volume, compression ratio, mean effective pressure, indicated power, friction power, brake power. 8.4 Sketches and describes indicator diagrams and the purpose of taking these diagrams.		
9 Air compressors	9.1 Describes the operation of an air compressor. 9.2 States the Pn^x = constant and $\frac{PV}{T}$ = constant apply.		
10 Combustion of fuels	10.1 Describes the following terms: combustion, calorific value, flash point. 10.2 Determines the minimum air required for complete combustion.		

HEAT ENGINES/THERMODYNAMICS (FISHING)			
COLUMN 1	**COLUMN 2**	**COLUMN 3**	**COLUMN 4**
COMPETENCE	**KNOWLEDGE, UNDERSTANDING & PROFICIENCY**	**METHODS FOR DEMONSTRATING COMPETENCE**	**CRITERIA FOR EVALUATING COMPETENCE**
MODULE 2			
Understands the theoretical principles of Thermodynamics and Heat Engines in respect of the following principles:			
1 Refrigeration cycle	1.1 Describes: .1 the refrigeration cycle with comparison to the heat engine cycle. .2 refrigerants and their properties; .3 and sketches the components of a refrigeration plant: evaporator, compressor, condenser and expansion valve; .4 the vapour-compression cycle. 1.2 States that the plant performance is related to the quantity of energy extracted per unit of energy supplied.	As for module 1.	As for module 1.
2 Boilers and evaporator feed water	2.1 Defines *ppm*, dissolved solids contamination. 2.2 Determines the change in density due to contamination.		

WORKSHOP TRAINING (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	1 Diesel: .1 Safety in the Workshop .2 Correct use of tools and equipment .3 Vernier and Micrometer .4 Bolts and Nuts .5 Fire Triangle inside the engine .6 Diesel engine parts .7 Operation of the 4-stroke cycle diesel engine .8 Stripping and assembling of C I engines .9 Valve timing diagrams .10 Spill timing of Compression Ignition engines without timing marks .11 Fuel systems .12 Lift pumps .13 Injectors .14 Lubricating systems .15 Tune-ups .16 Pre-start checks 2 Electrical: .1 Soldering techniques and practice .2 Joints and splices - techniques and practice .3 Circuit wiring and colour codes .4 Circuit diagram interpretation .5 Planning and construction of basic electronic circuits .6 Printed circuit design and processing .7 Basic testing of circuit performance 3 Fitting: .1 Electric drill press and drills .2 Files .3 Grinders .4 Hacksaw .5 Measuring equipment .6 Micrometers .7 Punches (Heat treatment and sharpening) .8 Scriber .9 Square .10 Taps .11 Vernier callipers .12 Vernier height gauge	Assessment of evidence obtained from specialist workshop training including practical demonstration, exercises and simulation. Practical exercises and instruction conducted under approved and truly realistic training conditions (eg simulation) using approved equipment.	

WORKSHOP TRAINING (FISHING)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	4 Machining: .1 Boring .2 Drilling .3 Three jaw chuck work .4 Gear cutting .5 Grinding and wheel dressing .6 Indexing .7 Knurling .8 Measuring Equipment .9 Milling .10 Parallel turning .11 Screw cutting .12 Taper turning .13 Tool sharpening and grinding .14 "V" Thread - male 5 Welding and Sheet metal .1 WELDING Safety: WORKSHOP: Gas cylinders Machines Plate Cutting Plate handling Welding Workshop PERSONAL: Clothing Lighting Up Closing down Rings and Watches Ventilation Practical: Arc welding Gas welding Brazing Oxy-Acetylene soldering Theory: Apparatus knowledge Design Factors Gas cylinders Strength and weakness Technique		

WORKSHOP TRAINING (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	.2 SHEETMETAL Safety: WORKSHOP: Hand tools Machines Plate cutting Plate handling Workshop Soldering and gas PERSONAL Clothing Correct gear Lighting up Closing down Practical: Gas equipment Flame setting Technique Drawings: Marking off Reading of technical drawings Setting out Wastage Construction: Bending up Edging Rolling Seaming Soft soldering soft welding 6 Hydraulics: .1 Theory and principles of hydraulic transmission of power .2 Hydraulic symbols and the reading of schematic diagrams .3 Layout and explanation of a basic hydraulic system .4 Construction, principles and application of: Hydraulic pump and motors Pressure control valves Flow control valves Directional control valves Hydraulic actuators Fluids, filters and filtration Reservoirs and coolers Accumulators .5 Basic maintenance and faultfinding procedures		

WORKSHOP TRAINING (FISHING)			
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	METHODS FOR DEMONSTRATING COMPETENCE	CRITERIA FOR EVALUATING COMPETENCE
	7. Pneumatics: .1 Air service units .2 Analysis and fault finding procedures .3 Exercises in circuit design and operation .4 Operation, Construction and application components .5 Pneumatic symbols .6 Theory and physical principles related to pneumatics 8. Refrigeration .1 WORKSHOP SAFETY Workshop Refrigerants .2 THEORY Evacuating Principles of refrigeration Recovery and recycling Specialist tools and equipment System components Types of systems .3 PRACTICAL Evacuation Pressure testing and leak detecting Refrigerant charging Replacement of components Servicing and maintenance Trouble shooting		