REPUBLIEK VAN SUID-AFRIKA

REPUBLIC OF SOUTH AFRICA

Staatskoerant
Government Gazette

Verkoopprys • Selling price
(AVB uitgesluit/GST excluded)
Plaaslik **45c** Local
Buitelands **60c** Other countries
Posvry • Post free

Regulasiekoerant
Regulation Gazette
No. 3902

As 'n Nuusblad by die Poskantoor geregistreer
Registered at the Post Office as a Newspaper

Vol. 245 PRETORIA, 29 NOVEMBER 1985 No. 10026

GOEWERMENTSKENNISGEWINGS

DEPARTEMENT VAN VERVOER

No. R. 2652 **29 November 1985**

REGULASIES BETREFFENDE DIE BEMANNING VAN SUID-AFRIKAANSE SKEPE

Dit het die Minister van Vervoerwese behaag om, kragtens die bepalings van artikel 356 (1) van die Handelskeepsvaartwet, 1951 (Wet 57 van 1951), soos gewysig, die volgende regulasies uit te vaardig:

INHOUD

1. Titel van hierdie regulasies.
2. Uitleg.
3. Toepassing.
4. Indiensneming van gesagvoerders en seemanne.
5. Indiensneming van gesagvoerders op skepe van 25 bruto-registerton en groter.
6. Indiensneming van persone in besit van geëndosseerde dokumente.
7. Indiensneming van gediplomeerde dekoffisiere op ander laslynskepe as passasierskepe en op ander vissersbote as dié wat binne die omskrewe visvanggebied gebruik word.
8. Indiesneming van gediplomeerde dekoffisiere op passasierskepe.
9. Indiensneming van gediplomeerde vissermanne op vissersbote wat slegs binne die omskrewe visvanggebied gebruik word.
10. Indiensneming van gediplomeerde ingenieuroffisiere en/of seemasjiniste op skepe van minstens 25 bruto-registerton.
11. Indiensneming van gediplomeerde radiobeamptes.
12. Indiensneming van gediplomeerde radiotelefoniste.
13. Indiensneming van gediplomeerde seemanne op skepe van 100 bruto-registerton en groter.
14. Vrystelling ten opsigte van sekere vaartuie.
15. Gelykwaardigheid van sertifikate wat toegeken is na die inwerkingtreding van hierdie regulasies.
16. Minimumvereistes vir die voortgesette geldigheid van Bekwaamheidsertifikate.

1. TITEL

Hierdie regulasies staan bekend as die Regulasies betreffende die Bemanning van Skepe, 1985.

2. UITLEG

(1) In hierdie regulasies beteken die uitdrukking "die Wet" die Handelskeepvaartwet, 1951 (Wet 57 van 1951), en tensy die samehang anders aandui, het enige uitdrukking waaraan in die Wet 'n betekenis toegeken is, die betekenis wat aldus daaraan toegeken is en beteken—

"gediplomeerde offisier" 'n gesagvoerder of 'n skip se offisier wat die houer is van 'n Bekwaamheidsertifikaat toegeken kragtens artikel 75 (1) van die Wet;

GOVERNMENT NOTICES

DEPARTMENT OF TRANSPORT

No. R. 2652 **29 November 1985**

REGULATIONS GOVERNING THE MANNING OF SOUTH AFRICAN SHIPS

The Minister of Transport has been pleased, under the provisions of section 356 (1) of the Merchant Shipping Act, 1951 (Act 57 of 1951), as amended, to make the following regulations:

CONTENTS

1. Title of these regulations.
2. Interpretation.
3. Application.
4. Employment of masters and seamen.
5. Employment of masters on ships of 25 or more gross register tons.
6. Employment of persons in possession of endorsed certificates.
7. Employment of certificated deck officers on load line ships other than passenger ships and on fishing boats other than those operating within the Defined Fishing Zone.
8. Employment of certificated deck officers on passenger ships.
9. Employment of certificated fishermen on fishing boats whose operations are wholly within the Defined Fishing Zone.
10. Employment of certificated engineer officers and/or marine motormen on ships of twenty five or more gross register tons.
11. Employment of certificated radio officers.
12. Employment of certificated radiotelephone operators.
13. Employment of certificated ratings on ships of one hundred or more gross register tons.
14. Exemption in respect of certain vessels.
15. Equivalence of certificates granted after the coming into force of these regulations.
16. Minimum requirements for the continued validity of Certificates of Competency.

1. TITLE

These regulations shall be called the Manning of Ships Regulations, 1985.

2. INTERPRETATION

(1) In these regulations the expression "the Act" shall mean the Merchant Shipping Act, 1951 (Act 57 of 1951), and, unless the context otherwise indicates:

"certificated officer" shall mean a master or a ship's officer holding a Certificate of Competency granted in terms of section 75 (1) of the Act;

''gevaarlike vrag'' petroleum of produkte daarvan, enige vloeibare chemikalieë gelys in Hoofstuk VI van die Internasionale Maritieme Organisasie (IMO) se publikasie genaamd 'Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk' en enige vloeibare gas gelys in Hoofstuk XIX van die IMO- publikasie;

''omskrewe visvanggebied'' die gebied suidwaarts van 5° suiderbreedte tot 50° suiderbreedte en ooswaarts van die Greenwich-meridiaan tot by die meridiaan van 40° oosterlengte;

''begrens'' beperk binne die seegebied aangrensend aan die Suider-Afrikaanse kus tussen die grense van Kaap Delgado in die ooste en die Kongorivier in die weste en strekkende oor 'n gebied 250 seemyl van die kus af;

''radiobeampte'' 'n persoon wat kragtens artikel 222 van die Wet as sodanig in diens geneem is;

''radiotelegraafskip'' 'n skip wat met 'n radiotelegraafinstallasie toegerus is en nie 'n radiotelefoonskip is nie;

''radiotelefoonskip'' 'n skip wat nie 'n passasierskip is nie en 'n tonnemaat van 300 ton of meer maar minder as 1 600 ton het en waarvan die eienaar die Direkteur-generaal skriftelik kennis gegee het (welke kennisgewing nie teruggetrek is nie) dat die skip ooreenkomstig die Handelskeepvaartradioregulasies met 'n radiotelefooninstallasie toegerus is;

''radiotelefoonoperateur'' 'n persoon wat kragtens artikel 222 van die Wet as sodanig in diens geneem is;

''seeman'' 'n seeman wat nie 'n skeepsoffisier is nie;

''beperk'' beperk tot omskrewe vaarte vanaf 'n genoemde hawe of plek;

''kort seegang'' beperk tot 'n gebied nie langer nie as 500 seemyl en strekkende 250 seemyl ver van die kus tussen die grense Punta Do Oro en die monding van die Kunenerivier;

''opleidingskonvensie'' die Internasionale Konvensie insake Standaarde van Opleiding, Diplomering en Waghou vir Seevaarders, 1978;

''vissersboot'' of ''vissersvaartuig'' enige vaartuig wat kommersieel gebruik word vir die vang van vis, walvisse, robbe of enige ander lewende oeste van die see;

''skip op vreemde vaart'' 'n skip wat tussen 'n hawe in een land en 'n hawe in 'n ander land vaar, en wat nie gebruik word vir beperkte reise of vaarte nie.

Opmerking.—Artikel 2 van die Wet sluit die volgende omskrywings in:

'' 'kusvaarder' 'n skip wat gebruik word op reise tussen hawens in dieselfde land, maar dit omvat nie 'n vissersboot of 'n robbe- of walvisvaarder nie'';

'' 'laslynskip' 'n skip van 14 meter of langer wat nie net vir visvang gebruik word nie en nie 'n plesierjag is nie'';

'' 'gesagvoerder', ten opsigte van 'n skip, iemand (behalwe 'n loods) wat toesig het of gesag voer oor bedoelde skip'';

'' 'eienaar' iemand aan wie 'n skip of 'n aandeel in 'n skip behoort'';

'' 'passasier' 'n persoon wat op 'n skip vervoer word, behalwe—

(a) 'n persoon wat in enige hoedanigheid aan boord van die skip in verband met die besigheid van die skip in diens is of bedrywig is;

''dangerous cargo'' shall mean petroleum or its products, any liquid chemical listed in Chapter VI of the International Maritime Organisation (IMO) publication entitled 'Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk', and any liquefied gas listed in Chapter XIX of the IMO publication entitled 'Code for the Construction and Equipment of Ships carrying Liquefied Gases in Bulk';

''defined fishing zone'' shall mean the area southward from latitude 5° S to latitude 50° S and eastward from the Greenwich meridian to the meridian of longetude 40° E;

''fishing boat'' or ''fishing vessel'' shall mean any vessel used commercially for catching fish, whales, seals or any other living resources from the sea;

''foreign-going ship'' shall mean a ship plying between a port in one country and a port in another country, but shall exclude any such ship engaged in limited voyages or operations;

''limited'' shall mean restricted to within the sea area adjacent to the southern African coast between the limits of Cape Delgado in the east and the Congo River in the west and extending 250 nautical miles from the shore;

''radio officer'' shall mean a person employed in such capacity in terms of Section 222 of the Act.

''radiotelegraph ship'' shall mean a ship which is provided with a radiotelegraph installation and which is not a radiotelephone ship;

''radiotelephone operator'' shall mean a person employed in such capacity in terms of Section 222 of the Act;

''radiotelephone ship'' shall mean a ship, other than a passenger ship, of 300 tons or over but of less than 1 600 tons the owner of which has given written notice to the Director-General (which notice has not been withdrawn) to the effect that such ship is provided with a radiotelephone installation in compliance with the Merchant Shipping Radio Regulations;

''rating'' shall mean a seaman other than a ship's officer;

''restricted'' shall mean restricted to defined operations from a stated port or place;

''short sea'' shall mean restricted to an area of not more than 500 nautical miles in length and extending 250 nautical miles from the shore between the limits of Punta Do Oro and the mouth of the Kunene River;

''training convention'' shall mean the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978;

and any expression to which a meaning has been assigned in the Act shall bear such meaning.

Note.—Section (2) of the Act includes the following definitions:

'' 'coasting ship' means a ship employed in plying between ports in the same country but does not include any fishing, sealing or whaling boat'';

'' 'load line ship' means a ship of 14 metres or more in length which is not engaged in fishing and is not a pleasure yacht'';

'' 'master' means in relation to a ship, any person (other than a pilot) having charge or command of such ship'';

'' 'owner' means any person to whom a ship or share in a ship belongs'';

'' 'passenger' means any person carried in a ship, except—

(a) a person employed or engaged in any capacity on board the ship on the business of the ship;

(b) 'n persoon wat aan boord die skip is òf ingevolge die verpligting wat hierdie Wet die gesagvoerder oplê om skipbreukelinge, mense in nood of ander persone te vervoer, òf vanweë enige omstandigheid wat nòg die gesagvoerder nòg die eienaar nòg die bevragter (as daar een is) kon voorkom het;

(c) 'n kind wat onder een jaar oud is'';

'' 'hawe' 'n plek, ongeag of dit as 'n openbare hawe geproklameer is al dan nie en of dit natuurlik of kunsmatig is, waarheen skepe vir skuiling kan gaan of om goedere of passasiers te laai of af te laai'';

'' 'seeman' 'n persoon (behalwe 'n gesagvoerder, loods of leerling-offisier) wat in diens is of in diens geneem is in enige hoedanigheid as lid van 'n skip se bemanning'';

'' 'skip' enige soort vaartuig wat in navigasie gebruik word en nie deur middel van roeispane voortbeweeg word nie'';

'' 'skeepsoffisier' 'n navigasie-offisier of ingenieuroffisier, gediplomeerd of ongediplomeerd, wat as sodanig aan boord van 'n skip in diens is, maar omvat nie 'n gesagvoerder nie en enige verwysing na 'n skeepsoffisier word by toepassing op 'n skip waarop 'n stuurman of seemasjinis in diens is, uitgelê asof dit 'n verwysing na 'n stuurman of seemasjinis insluit''.

'' 'Suid-Afrikaanse skip' 'n skip kragtens hierdie Wet in die Republiek geregistreer of geag aldus geregistreer te wees'';

'' 'vaartuig' ook enige skip of boot, of enige soort vaartuig wat gebruik word of ontwerp is vir gebruik in navigasie'';

(2) Vir doeleindes van hierdie regulasies het die Minister die volgende beamptes as ''bevoegde beamptes'' in die Republiek aangestel:

Te Kaapsad, Durban, Walvisbaai, Oos-Londen, Mosselbaai, Port Elizabeth, Richardsbaai en Saldanha: die Eerstebeampte van die Marine-afdeling; te Lüderitz: die Kontroleur Van Doeane; te Port Nolloth: die Resident-landdros.

3. TOEPASSING

(1) Hierdie regulasies is van toepassing op elke skip wat in die Republiek geregistreer of gelisensieer is en wat—

(i) nie 'n plesierjag is wat in handel betrokke is nie;

(ii) nie 'n skip is wat net binne die grense van 'n hawe vaar nie;

(iii) nie 'n skip is wat besit word deur die Suid-Afrikaanse Vervoerdienste nie as dit in 'n noodgeval uitvaar, of ander skepe in die omgewing van hawegrense bystaan.

(2) Die bepalings van Regulasie 11 is ook van toepassing op—

(a) elke passasierskip; en

(b) elke skip van 300 bruto-registerton of meer, wat nie 'n passasierskip is wat in 'n ander land as die Republiek geregistreer is nie.

4. INDIENSNEMING VAN GESAGVOERDERS EN SEEMANNE

(1) Die eienaar en Gesagvoerder van elke skip moet, afgesien van die offisiere en ander persone wat kragtens hierdie regulasies in diens geneem moet word, 'n voldoende aantal van die regte persone in diens neem om te verseker dat sodanige skip behoorlik en doeltreffend beman is.

(2) Die eienaar van elke skip van minder as 25 brutoregisterton moet op sodanige skip in diens neem—

(a) 'n persoon in beheer daarvan wat ondervinding ter see opgedoen het en wat bekwaam is om die skip op 'n ware seemanswyse te hanteer;

(b) a person on board the ship either in pursuance of the obligation laid upon the master to carry shipwrecked, distressed or other persons or by reason of any circumstance that neither the master nor the owner nor the charterer (if any) could have prevented;

(c) a child under the age of one year'';

'' 'port' means a place, whether proclaimed a public harbour or not, and whether natural or artificial, to which ships may resort for shelter or to ship or unship goods or passengers'';

'' 'seaman' means any person (except a master, pilot or apprentice-officer) employed or engaged in any capacity as a member of the crew of a ship'';

'' 'ship' means any kind of vessel used in navigation not propelled by oars'';

'' 'ship's officer' means a navigating officer or engineer officer, whether certificated or uncertificated, employed as such on board a ship, but does not include a master, and any reference to a ship's officer shall, in its application to a ship in which a mate or marine motorman is employed, be construed as including a reference to a mate or marine motorman'';

'' 'South African ship' means a ship registered in the Republic in terms of this Act or deemed to be so registered'';

'' 'Vessel' includes any ship or boat or any description of vessel used or designed to be used in navigation''.

(2) For the purpose of these regulations the Minister has designated the following officers to be ''proper officers'' in the Republic:

At Cape Town, Durban, Walvis Bay, East London, Mossel Bay, Port Elizabeth, Richards Bay and Saldanha: the Principal Officer of the Marine Division; at Luderitz: the Controller of Customs; at Port Nolloth: the Resident Magistrate.

3. APPLICATION

(1) These regulations shall apply to every ship registered or licenced in the Republic other than—

(i) a pleasure yacht not engaged in trade;

(ii) any ship operating only within the limits of a port;

(iii) any ship owned by the South African Transport Services if it goes to sea in an emergency, or attends other ships in the proximity of port limits.

(2) The provisions of Regulation 11 shall apply, in addition, to—

(a) every passenger ship; and

(b) every ship of 300 gross register tons or over not being a passenger ship registered in a country other than the Republic.

4. EMPLOYMENT OF MASTERS AND SEAMEN

(1) The owner and master of every ship shall, in addition to the officers and other persons required to be employed in terms of these regulations, employ as crew of such ship an adequate number and description of persons to ensure that it is sufficiently and efficiently manned.

(2) The owner of every ship of less than 25 gross register tons shall employ on such ship—

(a) a person in charge thereof who has had experience at sea and who is capable of handling such ship in a seamanlike manner;

(b) indien dit met 'n masjien toegerus is, 'n persoon wat ervaring het van masjienwerk en in staat is om toesig te hou oor die masjien; en

(c) sodanige bykomende aantal van die regte persone wat nodig is om te verseker dat die skip behoorlik en doeltreffend beman is:

Met dien verstande dat daar afgesien kan word van die vereistes van paragraaf (b) as die persoon in beheer van sodanige skip oor die ondervinding en vermoë beskik soos in bedoelde paragraaf uiteengesit.

(3) Vir die doeleindes van hierdie regulasie word 'n skip as behoorlik en doeltreffend beman beskou as die skip na die mening van die bevoegde beampte 'n bemanning het van toereikend gekwalifiseerde persone om die skip in staat te stel om uit te vaar met die nodige inagneming van die vereistes van die Botsing- en Noodseinregulasies, 1977, die Regulasies betreffende Reddingsuitrusting, 1968, die Handelskeepvaartradioregulasies, 1968, en enige ander veiligheidsbepalings wat op sodanige vaartuig van toepassing mag wees.

(4) Die bevoegde beampte moet, wanneer die toereikendheid van die bemanning van enige skip vir die doel van hierdie regulasie bepaal word, die volgende in aanmerking neem:

(a) Die goedgekeurde bemanning aan boord sodanige skip op onlangse reise;

(b) die voltallige bemanning aan boord soortgelyke skepe wat op reise soortgelyk aan dié wat nou voorgestel word, gebruik word; en

(c) die aard van die diens waarvoor sodanige skip bedoel is.

5. INDIENSNEMING VAN GESAGVOERDERS OP SKEPE VAN 25 BRUTO-REGISTERTON EN MEER

Die eienaar van elke skip wat van watter hawe ook al ter see uitvaar, moet, indien sodanige skip 25 bruto-registerton of meer is, as Gesagvoerder van daardie skip in diens neem 'n persoon wat die houer is van 'n Bekwaamheidsertifikaat nie laer nie as dié van enige ander dekoffisier wat ooreenkomstig hierdie regulasies in diens geneem is.

6. INDIENSNEMING VAN PERSONE WAT HOUERS IS VAN GEËNDOSSEERDE SERTIFIKATE

(1) Die Gesagvoerder, Hoof-ingenieuroffisier, Tweede ingenieuroffisier en Dekoffisier tweede in bevel van 'n skip wat 'n gevaarlike massavrag dra wat ten volle of gedeeltelik as gevaarlike vrag omskryf word, moet in besit wees van 'n geskikte Bekwaamheidsertifikaat en moet voldoen aan sodanige bykomende vereistes as wat die Direkteur-generaal van Vervoer mag spesifiseer, en sodanige voldoening moet gestaaf word deur die toepaslike "Gevaarlike Vrag"-endossement op sodanige sertifikaat.

(2) (a) 'n Dekoffisier wat die houer is van 'n bekwaamheidsertifikaat geëndosseer "nie-handelsdiens" kan in 'n gediplomeerde hoedanigheid in diens geneem word op 'n handelskip waar die voorgeskrewe sertifikaat wat vereis word, twee klasse laer is.

(b) Die houer van 'n Klas 4- bekwaamheidsertifikaat geëndosseer "nie-handelsdiens" kan in 'n gediplomeerde hoedanigheid in diens geneem word op 'n handelskip waar die voorgeskrewe sertifikaat wat vereis word, 'n Klas 5-sertifikaat is.

(c) Die houer van 'n Klas 5-bekwaamheidsertifikaat geëndosseer "nie-handelsdiens" mag nie op 'n handelskip in enige gediplomeerde hoedanigheid in diens geneem word nie.

(b) if it is fitted with an engine, a person experienced in engine-work and capable of taking charge of the engine; and

(c) such additional number and description of persons as may be necessary to ensure that such ship is sufficiently and efficiently manned:

Provided that the requirements of paragraph (b) may be dispensed with if the person in charge of such ship has the experience and ability referred to in the said paragraph.

(3) For the purposes of this regulation, a ship shall be deemed to be sufficiently and efficiently manned if in the opinion of the proper officer it has a crew of suitably qualified persons to enable it to proceed to sea with due regard to the requirements of the Collision and Distress Signals Regulation, 1977, of the Life-Saving Equipment Regulations, 1968, of the Merchant Shipping Radio Regulations, 1968, and of any such other safety provisions as may apply to such vessel.

(4) In judging the adequacy of the crew of any ship for the purposes of this regulation, a proper officer shall take the following into consideration:

(a) The complement carried by such ship on recent voyages;

(b) The complement normally carried by similar ships when employed on voyages similar to that now proposed; and

(c) The nature of the service for which such ship is intended.

5. EMPLOYMENT OF MASTERS ON SHIPS OF 25 OR MORE GROSS REGISTER TONS

The owner of every ship going to sea from any port whatsoever shall, if such ship is of 25 or more gross register tons, employ as Master thereof a person holding a Certificate of Competency not lower than the highest class or grade of certificate required to be held by any other deck officer employed in terms of these regulations.

6. EMPLOYMENT OF PERSONS IN POSSESSION OF ENDORSED CERTIFICATES

(1) The Master, Chief Engineer Officer and Second Engineer Officer and deck officer second in command of any ship which has a bulk cargo defined in whole or in part as being a dangerous cargo shall be in possession of the appropriate Certificate of Competency and shall satisfy such additional requirements as the Director-General: Transport may specify, and such satisfaction shall be evidenced by the appropriate "dangerous cargo" endorsement of such certificate.

(2) (a) A deck officer holding a Certificate of Competency endorsed "non-trading service" may be employed in a certificated capacity on a trading ship where the prescribed certificate required to be held is two classes lower.

(b) The holder of a Class 4 Certificate of Competency endorsed "non-trading service" may be employed in a certificated capacity on a trading ship where the prescribed certificate required to be held is of Class 5.

(c) The holder of a Class 5 Certificate of Competency endorsed "non-trading service" shall not be employed in any certificated capacity on a trading ship.

7. INDIENSNEMING VAN GEDIPLOMEERDE DEKOFFISIERE OP ANDER LASLYNSKEPE AS PASSASIERSKEPE, EN OP ANDER VISSERSBOTE AS DIÉ WAT BINNE DIE OMSKREWE VISVANGGEBIED GEBRUIK WORD, VAN 25 BRUTO-REGISTERTON OF MEER

(1) Die eienaar en Gesagvoerder van elke skip wat—

(a) 'n ander laslynskip as 'n passasierskip is; of

(b) 'n ander vissersboot is as dié wat binne die omskrewe visvanggebied vaar,

en 25 bruto-registerton of meer is, moet, as sodanige skip van die tonnemaat getoon in Kolom 2 van enige item in die tabel hieronder is en as die handels- of vaargebied daarvan is soos getoon in kolom 3 van bedoelde item, verseker dat daar aan boord sodanige skip in hul geskikte werkkringe die aantal dekoffisiere, behoorlik kragtens hierdie Wet gediplomeerde of geag gediplomeerde te wees soos getoon in kolom 4 van bedoelde item aangedui word, werksaam is:

7. EMPLOYMENT OF CERTIFICATED DECK OFFICERS ON LOAD LINE SHIPS BEING OTHER THAN PASSENGER SHIPS, AND ON FISHING BOATS BEING OTHER THAN THOSE OPERATING WITHIN THE DEFINED FISHING ZONE, AND BEING OF 25 OR MORE GROSS REGISTER TONS

(1) The owner and master of every ship being—

(a) a load line ship other than a passenger ship; or

(b) a fishing boat other than a fishing boat operating wholly within the defined fishing zone

and being of 25 or more gross register tons shall, if such ship is of the tonnage shown in column 2 of any item in the table below and if the trading or operational area thereof is as shown in column 3 of the said item, ensure that there are employed on board such ship, in their appropriate capacities, such number of deck officers, duly certificated under the Act or deemed under the Act to be certificated, as is shown in column 4 of the said item:

Kolom 1	Kolom 2	Kolom 3	Kolom 4					
Item No.	Bruto-registertonnemaat van skip	Handels- of vaargebied	Minimum getal gediplomeerde dekoffisiere wat aan boord moet wees					
			Klas 1	Klas 2	Klas 3	Klas 4	Klas 5	Klas 6
1	1 600 en meer	Onbeperk	1	1	1	1	—	—
2	Minder as 1 600	Onbeperk	1	1	1	—	—	—
3	5 000 en meer	Begrens	1	1	1	1	—	—
4	1 600 en meer maar minder as 5 000	Begrens	—	1 (A)	—	1	1	—
5	Minder as 1 600	Begrens	—	—	—	2 (A)	1	—
6	Meer as 10 000	Kort seegang	1	1	1	—	—	—
7	5 000 en meer maar minder as 10 000	Kort seegang	1	—	1	1	—	—
8	1 600 en meer maar minder as 5 000	Kort seegang	—	—	—	2 (B)	1	—
9	800 en meer maar minder as 1 600	Kort seegang	—	—	—	—	3 (B)	—
10	200 en meer maar minder as 800	Kort seegang	—	—	—	—	2 (B)	—
11	Minder as 200	Kort seegang	—	—	—	—	1 (B)	—
12	Enige	Beperk	—	—	—	—	—	1

Opmerking

(1) In kolom 4 van items 4 en 5 beteken die inskrywing "(A)" dat die sertifikaat wat die Gesagvoerder besit, geëndosseer moet wees 'Gesagvoerder (Kort seegang)'.

(2) In kolom 4 van items 8, 9, 10 en 11 beteken die inskrywing "(B)" dat die sertifikaat van die Gesagvoerder geëndosseer moet wees 'Gesagvoerder (Kort seegang)'.

Column 1	Column 2	Column 3	Column 4					
Item No.	Gross register tonnage of ship	Trading or operating area	Minimum number of certificated deck officers to be carried					
			Class 1	Class 2	Class 3	Class 4	Class 5	Class 6
1	1 600 and over	Unlimited	1	1	1	1	—	—
2	Less than 1 600	Unlimited	1	1	1	—	—	—
3	5 000 and over but	Limited	1	1	1	1	—	—
4	1 600 and over but less than 5 000	Limited	—	1(A)	—	1	1	—
5	Less than 1 600	Limited	—	—	—	2(A)	1	—
6	10 000 and over	Short Sea	1	1	1	—	—	—

Column 1	Column 2	Column 3	Column 4					
Item No.	Gross register tonnage of ship	Trading or operating area	Minimum number of certificated deck officers to be carried					
			Class 1	Class 2	Class 3	Class 4	Class 5	Class 6
7	5 000 and over but less than 10 000	Short Sea.....	1	—	1	1	—	—
8	1 600 and over but less than 5 000	Short Sea.....	—	—	—	2(B)	1	—
9	800 and over but less than 1 600	Short Sea.....	—	—	—	—	3(B)	—
10	200 and over but less than 800	Short Sea.....	—	—	—	—	2(B)	—
11	Less than 200.....	Short Sea.....	—	—	—	—	1(B)	—
12	Any.....	Restricted.....	—	—	—	—	—	1

Notes

(1) In column 4 of items 4 and 5, the entry "(A)" means that the certificate held by the Master is required to carry a 'Master (Limited Trade)' endorsement.

(2) In column 4 of items 8, 9, 10 & 11 the entry "(B)" means that the certificate held by the Master is required to carry a 'Master (Short Sea)' endorsement.

(2) Vir die doeleindes van hierdie regulasie is die vereistes van kolom 4 van item 4 in bostaande tabel die vereistes vir 'n vissersboot van enige tonnemaat, wat nie uitsluitlik binne die omskrewe visvanggebied vaar nie.

8. INDIENSNEMING VAN GEDIPLOMEERDE DEKOFFISIERE OP PASSASIERSKEPE

Die eienaar en Gesagvoerder van elke—

(a) Suid-Afrikaanse passasierskip wat wegvaar van enige hawe; of

(b) passasierskip (wat nie 'n Suid-Afrikaanse passasierskip is nie) wat passasiers aan boord laat gaan by of wegvaar van enige hawe in die Republiek;

moet, as sodanige skip van die tonnemaat is soos getoon in kolom 2 van enige item in die Tabel hieronder, as die handels- of vaargebied daarvan is soos getoon in kolom 3 van bedoelde item en as die getal passasiers aan boord is soos getoon in kolom 4 van bedoelde item, sorg dat daar aan boord sodanige skip in hul toepaslike werkkringe die aantal dekoffisiere, behoorlik kragtens hierdie Wet gediplomeerd of geag gediplomeerd te wees soos in kolom 5 van bedoelde item aangedui word, werksaam is:

(2) For the purposes of this regulation, the requirements of column 4 of item 4 in the above table shall be the requirements for a fishing boat of any tonnage operating other than wholly within the defined fishing zone.

8. EMPLOYMENT OF CERTIFICATED DECK OFFICERS ON PASSENGER SHIPS

The owner and Master of every—

(a) South African passenger ship going to sea from any port whatsoever; or

(b) passenger ship (other than a South African passenger ship) embarking passengers at, and going to sea from, any port in the Republic

shall, if such ship is of the tonnage shown in column 2 of any item in the Table below, if the trading or operational area thereof is as shown in column 3 of the said item and if the number of passengers carried is as shown in column 4 of the said item, ensure that there are employed on board such ship, in their appropriate capacities, such number of deck officers, duly certificated under the Act or deemed under the Act to be certificated, as is shown in column 5 of the said item:

Kolom 1	Kolom 2	Kolom 3	Kolom 4	Kolom 5					
Item No.	Bruto-registertonnemaat van passasierskip	Handels- of vaargebied	Totale getal passasiers aan boord	Minimum getal gediplomeerde dekoffisiere wat aan boord moet wees					
				Klas 1	Klas 2	Klas 3	Klas 4	Klas 5	Klas 6
1	Meer as 25.....	Onbegrens of begrens.....	Meer as 12.....	1	1	1	1	—	—
2	2 000 en meer.....	Kort seegang	Meer as 12.....	—	1(*)	—	1	—	—
3	1 000 en meer maar minder as 2 000	Kort seegang	Meer as 12.....	—	—	1(*)	1	—	—
4	200 en meer maar minder as 1 000	Kort seegang	Meer as 12.....	—	—	—	1(*)	1	—
5	25 en meer maar minder as 200	Kort seegang	Meer as 12.....	—	—	—	—	1(*)	1
6	200 en meer	Beperk	Nie meer as 250 nie.....	—	—	—	—	—	2
7	minder as 200	Beperk	Nie meer as 250 nie	—	—	—	—	—	1

Opmerking.—In kolom 5 van item 2 tot en met item 5 beteken die inskrywing "(*)" dat die sertifikaat gehou deur die Gesagvoerder, geëndoseer moet wees 'Gesagvoerder (Kort Seegang)'.

Column 1	Column 2	Column 3	Column 4	Column 5					
Item No.	Gross register tonnage of passenger ship	Trading or operational area	Number of passengers carried	Minimum number of certificated deck officers to be carried					
				Class 1	Class 2	Class 3	Class 4	Class 5	Class 6
1	More than 25.....	Unlimited or limited.....	More than 12	1	1	1	1	—	—
2	2 000 and over.....	Short Sea.....	More than 12	—	1(*)	—	1	—	—
3	1 000 and over but less than 2 000	Short Sea.....	More than 12	—	—	1 (*)	1	—	—
4	200 and over but less than 1 000	Short Sea.....	More than 12	—	—	—	1 (*)	1	—
5	25 and over but less than 200	Short Sea.....	More than 12	—	—	—	—	1 (*)	1
6	200 and over	Restricted	Not more than 250.....	—	—	—	—	—	2
7	Less than 200	Restricted	Not more than 250.....	—	—	—	—	—	1

Note.—In column 5 of items 2 to 5 inclusive, the entry "(*)" means that the certificate held by the Master is required to carry a 'Master (Short Sea)' endorsement.

9. INDIENSNEMING VAN GEDIPLOMEERDE VISSERMANNE OP VISSERSBOTE WAT SLEGS BINNE DIE OMSKREWE VISVANGGEBIED GEBRUIK WORD

Die eienaar en Gesagvoerder van elke vissersboot wat ter see uitvaar van enige hawe binne die grense van die omskrewe visvanggebied en waarvan die vaargebied geheel en al binne bedoelde gebied is, moet, as die vissersboot 25 bruto-registerton of meer is en as sodanige vissersboot van die tonnemaat is getoon in kolom 2 van enige item in die tabel hieronder, en as die vaargebied daarvan getoon word in kolom 3 van daardie item, sorg dat daar aan boord sodanige skip in hul toepaslike werkkringe die aantal vissermanne, kragtens hierdie Wet behoorlik gediplomeerd of geag gediplomeerd te wees soos getoon in kolom 4 van bedoelde item aangedui word, werksaam is:

9. EMPLOYMENT OF CERTIFICATED FISHERMEN ON FISHING BOATS WHOSE OPERATIONS ARE WHOLLY WITHIN THE DEFINED FISHING ZONE

The owner and Master of every fishing boat going to sea from any port within the limits of the Defined Fishing Zone, having its operational area wholly within the said Zone and being of 25 or more gross register tons shall, if such fishing boat is of the tonnage shown in column 2 of any item in the table below and if the operational area thereof is as shown in column 3 of the said item, ensure that there are employed on board such ship, in their appropriate capacities, such number of fishermen, duly certificated under the Act or deemed under the Act to be certificated, as is shown in column 4 of the said item:

Kolom 1	Kolom 2	Kolom 3	Kolom 4			
Item No.	Bruto-registertonnemaat van skip	Vaargebied	Minimum getal gediplomeerde vissermanne wat aan boord moet wees			
			Graad 1	Graad 2	Graad 3	Graad 4
1	25 ton en meer maar minder as 100...	* Binne 50 myl van die kus.....	—	—	—	2
2	25 ton en meer maar minder as 100...	* Binne 200 myl van die kus.....	—	—	1	2
3	100 ton en meer maar minder as 600 ton	* Binne 200 myl van die kus	—	1	1	1
4	600 ton en meer	* Binne 200 myl van die kus	—	1	1	2
5	Enige tonnemaat	Enige gebied binne die omskrewe visvanggebied, verder as 200 myl van die kus	1	1	1	1

* Vir items 1 tot 4 is die noordelike grens van die vaargebiede 27° suiderbreedte in die ooste en 16° suiderbreedte in die weste.

Column 1	Column 2	Column 3	Column 4			
Item No.	Gross registered tonnage of ship	Operational area	Minimum number of certificated fishermen to be carried			
			Grade 1	Grade 2	Grade 3	Grade 4
1	25 tons and over but less than 100	* Within 50 miles of shore.....	—	—	—	2
2	25 tons and over but less than 100	* Within 200 miles of shore	—	—	1	2
3	100 tons and over but less than 600...	* Within 200 miles of shore	—	1	1	1
4	600 tons and over	* Within 200 miles of shore	—	1	1	2
5	Any tonnage	Any area within the defined fishing zone but beyond 200 miles from shore	1	1	1	1

* For items 1 to 4 the northern limit of the operational areas is latitude 27°S in the east and latitude 16°S in the west.

10. INDIENSNEMING VAN GEDIPLOMEERDE INGENIEURSOFFISIERE EN/OF SEEMASJINISTE OP SKEPE VAN 25 BRUTO-REGISTERTON OF MEER

Die eienaar en Gesagvoerder van elke skip wat van watter hawe ook al ter see uitvaar, hetsy dit 'n laslynskip of 'n vissersboot is, en 25 bruto-registerton of meer is, moet, as die handels- of vaargebied van sodanige skip is soos getoon in kolom 2 van enige item in die tabel hieronder, en as die geregistreerde krag daarvan is soos getoon in kolom 3 van bedoelde item, sorg dat daar aan boord sodanige skip in hul toepaslike werkkringe, die aantal ingenieuroffisiere en/of seemasjiniste, na gelang van die geval, behoorlik kragtens hierdie Wet gediplomeerd of geag gediplomeerd te wees soos aangedui in kolomme 4 en 5 van bedoelde item, na gelang van die geval, werksaam is:

10. EMPLOYMENT OF CERTIFICATED ENGINEER OFFICERS AND/OR MARINE MOTORMEN ON SHIPS OF 25 OR MORE GROSS REGISTER TONS

The owner and Master of every ship going to sea from any port whatsoever, being a load line ship or a fishing boat, as the case may be, and being of 25 or more gross register tons, shall, if the trading or operational area of such ship is as shown in column 2 of any item in the table below and if the registered power thereof is as shown in column 3 of the said item, ensure that there are employed on board such ship, in their appropriate capacities, such number of engineer officers and/or marine motormen, as the case may be, duly certificated under the Act or deemed under the Act to be certificated, as is shown in columns 4 and 5 of the said item, as the case may be:

Kolom 1	Kolom 2	Kolom 3	Kolom 4				Kolom 5		
Item No.	Handels- of vaargebied	Geregistreerde krag van skip of vissersboot (kW)	Minimum getal gediplomeerde Ingenieuroffisiere wat aan boord moet wees				Minimum getal gediplomeerde seemasjiniste wat aan boord moet wees		
			Klas 1	Klas 2	Klas 3	Klas 4	Graad 1	Graad 2	Graad 3
1	Onbegrens	3 000 en meer	1	1	—	2	—	—	—
		750 en meer maar minder as 3 000	—	1(A)	1	1	—	—	—
		350 en meer maar minder as 750	—	—	1(B)	1	—	—	—
2	Begrens of kort seegang	6 000 en meer	1	1	—	1	—	—	—
		3 000 en meer maar minder as 6 000	—	1 (A)	1	1	—	—	—
		750 en meer maar minder as 3 000	—	—	1 (B)	1	—	—	—
		350 en meer maar minder as 750	—	—	—	2 (C)	—	—	—
		minder as 350	—	—	—	—	1	—	—
3	Beperk	750 en meer	—	—	—	1 (C)	1	—	—
		350 en meer maar minder as 750	—	—	—	—	1	—	—
		minder as 350	—	—	—	—	—	1	—
4	Visvangbedrywighede	3 000 en meer	—	—	1 (B)	1	—	—	—
		1 000 en meer maar minder as 3 000	—	—	—	1 (C)	1	—	—
		350 en meer maar minder as 1 000	—	—	—	—	1	1	—
		150 en meer maar minder as 350	—	—	—	—	—	1	—
		minder as 150	—	—	—	—	—	—	1

Opmerkings

(1) In kolom 4 van items 1 en 2 beteken die inskrywing "(A)" dat die sertifikaat gehou deur die Hoofingenieuroffisier 'Klas 2-diens' geëndosseer moet wees.
(2) In kolom 4 van items 1, 2 en 4 beteken die inskrywing "(B)" dat die sertifikaat gehou deur die Hoofingenieuroffisier 'Klas 3-diens' geëndosseer moet wees.
(3) In kolom 4 van items 2, 3 en 4 beteken inskrywing "(C)" dat die sertifikaat wat deur die Hoofingenieuroffisier gehou word 'Klas 4-diens' geëndosseer moet wees.

Column 1	Column 2	Column 3	Column 4				Column 5		
Item No.	Trading or operational area	Registered power of ship or fishing boat (KW)	Minimum number of certificated Engineer Officers to be carried				Minimum number of certificated Marine Motormen to be carried		
			Class 1	Class 2	Class 3	Class 4	Grade 1	Grade 2	Grade 3
1	Unlimited	3 000 and over	1	1	—	2	—	—	—
		750 and over but less than 3 000	—	1(A)	1	1	—	—	—
		350 and over but less than 750	—	—	1(B)	1	—	—	—

Column 1	Column 2	Column 3	Column 4				Column 5		
Item No.	Trading or operational area	Registered power of ship or fishing boat (KW)	Minimum number of certificated Engineer Officers to be carried				Minimum number of certificated Marine Motormen to be carried		
			Class 1	Class 2	Class 3	Class 4	Grade 1	Grade 2	Grade 3
2	Limited or Short Sea	6 000 and over	1	1	—	1	—	—	—
		3 000 and over but less than 6 000	—	1(A)	1	1	—	—	—
		750 and over but less than 3 000	—	—	1(B)	1	—	—	—
		350 and over but less than 750	—	—	—	2(C)	—	—	—
		Less than 350	—	—	—	—	1	—	—
3	Restricted	750 and over	—	—	—	1(C)	1	—	—
		350 and over but less than 750	—	—	—	—	1	—	—
		Less than 350	—	—	—	—	—	1	—
4	Fishing operations	3 000 and over	—	—	1(B)	1	—	—	—
		1 000 and over but less than 3 000	—	—	—	1(C)	1	—	—
		350 and over but less than 1 000	—	—	—	—	1	1	—
		150 and over but less than 350	—	—	—	—	—	1	—
		Less than 150	—	—	—	—	—	—	1

Note

(1) In column 4 of items 1 and 2, the entry "(A)" means that the certificate held by the Chief Engineer Officer is required to carry a 'Class 2 Service' endorsement.

(2) In column 4 of items 1, 2 and 4, the entry "(B)" means that the certificate held by the Chief Engineer Officer is required to carry a 'Class 3 Service' endorsement.

(3) In column 4 of items 2, 3 and 4 the entry "(C)" means that the certificate held by the Chief Engineer Officer is required to carry a 'Class 4 Service' endorsement.

11. INDIENSNEMING VAN GEDIPLOMEERDE RADIOBEAMPTES

(1) Die skepe waarop hierdie regulasie van toepassing is, word in die volgende klasse ingedeel:

Klas I

'n Skip wat òf meer as 250 passasiers aan boord het òf ten opsigte waarvan daar van krag is 'n sertifikaat uitgereik deur die Nasionale Owerheid te dien effekte dat dit geskik is om meer as 250 passasiers aan boord te hê, en wat langer as 16 uur ter see is tussen twee opeenvolgende hawens.

Klas II

(a) 'n Passasierskip wat nie 'n Klas 1-skip is nie.

(b) 'n Skip van 1 600 bruto-registerton of meer, wat nie 'n passasierskip of 'n hawevaartuig van die Suid-Afrikaanse Vervoerdienste is nie.

Klas III

(a) 'n Skip van 500 bruto-registerton of meer, maar kleiner as 1 600 ton, wat nie 'n passasierskip of 'n hawevaartuig van die Suid-Afrikaanse Vervoerdienste is nie.

(b) 'n Hawevaartuig van die Suid-Afrikaanse Vervoerdienste, van 500 bruto-registerton of meer.

Klas IV

'n Skip van 300 bruto-registerton of meer, maar minder as 500 ton, wat nie 'n passasierskip is nie.

11. EMPLOYMENT OF CERTIFICATED RADIO OFFICERS

(1) This regulation shall apply to the following classes of ships:

Class I

A ship either carrying more than 250 passengers or declared fit to carry more than 250 passengers in terms of a valid certificate issued by the National Authority, and being at sea for more than 16 hours between two consecutive ports.

Class II

(a) A passenger ship other than a ship of Class I.

(b) A ship of 1 600 gross register tons or over other than a passenger ship or a South African Transport Services harbour craft.

Class III

(a) A ship of 500 gross register tons or over but less than 1 600 tons other than a passenger ship and other than a South African Transport Services harbour craft .

(b) A South African Transport Services harbour craft of 500 gross register tons or over.

Class IV

A ship of 300 gross register tons or over but less than 500 tons other than a passenger ship.

(2) Die eienaar en Gesagvoerder van elke radiotelegraafskip wat ter see uitvaar sonder dat dit voorsien is van radiotelegraaf-outo-alarmuitrusting wat voldoen aan die vereistes gespesifiseer in Aanhangsel 6 van die Radioregulasies, 1968, moet verseker dat radiobeamptes wat behoorlik gediplomeer is of by Wet gediplomeerd geag word, soos volg op sodanige skip in diens geneem is:

Klas skip	*Getal radiobeamptes*
I	Twee
II	Een
III	Een
IV	Een

(3) (a) Behoudens artikel 222 van die Wet is niemand bevoeg om 'n radiobeampte te wees of as sodanig in diens geneem te word op 'n radiotelegraafskip nie tensy hy in besit is van 'n geldige bekwaamheid- of bevoegdheidsertifikaat in radiotelegrafie van die eerste of tweede klas, uitgereik deur die Posmeester-generaal, of die ekwivalent van 'n deur hom uitgereikte sertifikaat waaraan daar geheg moet word 'n geldige magtigingsbrief van die Posmeester-generaal om 'n radiotelegraafstasie te bedien.

(b) Ondanks die bepalings van paragraaf (a) moet bedoelde sertifikaat van die eerste klas wees in die geval van minstens een radiobeampte van elke passasierskip.

(c) Vir die doeleindes van paragraaf (a) word geen bekwaamheid- of bevoegdheidsertifikaat op enige datum as geldig beskou as sodanige sertifikaat meer as twee jaar voor sodanige datum uitgereik is en die houer se tydperke van ondervinding altesaam minstens drie maande in genoemde twee jaar is nie tensy die houer die Posmeester-generaal by hereksamen of andersins daarvan oortuig dat hy nog steeds al die kwalifikasies besit wat in sy sertifikaat genoem word: Met dien verstande dat vir die toepassing van hierdie regulasie die uitdrukking 'ondervinding' ondervinding beteken wat opgedoen is ter see as 'n radiobeampte of as 'n bediener van radiotelegraafapparaat by 'n radiotelegraafstasie wat op land deur die Posmeester-generaal of die Suid-Afrikaanse Vervoerdienste vir kommunikasie met handelskepe onderhou word, of sodanige ander ondervinding wat die Posmeester-generaal bevredigend ag.

(4) In die geval van enige skip van Klas I of Klas II moet minstens een van die radiobeamptes iemand wees wat ter see as radiobeampte ondervinding opgedoen het van altesaam minstens—

(a) 2 jaar in die geval van 'n skip van Klas I;

(b) 1 jaar in die geval van 'n skip van Klas II (a);

(c) 6 maande in die geval van 'n skip van Klas II (b) van 3 000 bruto-registerton of meer; of

(d) 3 maande in die geval van 'n skip van Klas II (b) van 1 600 bruto-registerton of meer, maar minder as 3 000 bruto-registerton.

12. INDIENSNEMING VAN GEDIPLOMEERDE RADIOTELEFOONOPERATEURS

(1) Die eienaar en Gesagvoerder van elke radiotelefoonskip wat ter see uitvaar, moet verseker dat daar aan boord voorsiening gemaak word vir minstens een gekwalifiseerde radiotelefoonoperateur, wat 'n dekoffisier kan wees.

(2) Behoudens artikel 222 van die Wet is niemand bevoeg om 'n radiotelefoonoperateur te wees of om in so 'n hoedanigheid op 'n radiotelegraafskip in diens te wees nie, tensy hy die houer is van 'n geldige bekwaamheid- of bevoegdheidsertifikaat in radiotelefonie of radiotelegrafie uitgereik deur die Posmeester-generaal, of 'n sertifikaat wat deur die Posmeester-generaal erken word as die ekwivalent van sodanige sertifikaat wat deur hom uitgereik word en waaraan daar geheg moet word die Posmeester-generaal se geldige magtigingsbrief om 'n radiotelefoonstasie of radiotelegraafstasie te bedien.

(2) The owner and Master of every radiotelegraph ship which, upon proceeding to sea, is not provided with radiotelegraph auto-alarm equipment complying with the requirements specified in Annex 6 of the Radio Regulations, 1968, shall ensure that there are employed, on such ship, radio officers duly certificated under the Act or deemed under the Act to be certificated, as follows:

Class of ship	*Number of radio officers*
I	Two
II	One
III	One
IV	One

(3) (a) Subject to section 222 of the Act, no person shall be qualified to be a radio officer or to be employed in such capacity on any radiotelegraph ship, unless he holds a valid certificate of proficiency or competency in radiotelegraphy of the first or second class granted by the Postmaster-General or the equivalent of such certificate granted by him, to which certificate or equivalent shall be attached the Postmaster-General's valid letter of authority to operate a radiotelegraph station.

(b) Notwithstanding the provisions of paragraph (a), the said certificate shall be of the first class in the case of at least one radio officer of each passenger ship.

(c) For the purposes of paragraph (a), no certificate of proficiency or competency shall be deemed to be valid at any date if such certificate was granted more than two years before such date and the holder's periods of experience do not total at least three months in the said two years, unless the holder satisfies the Postmaster-General by re-examination or otherwise that he still possesses all of the qualifications described in his certificate: Provided that for the purposes of this regulation the expression 'experience' shall mean experience at sea as a radio officer or experience as an operator of a radiotelegraph apparatus at a radiotelegraph station maintained on land by the Postmaster-General or the South African Transport Services for communication with merchant ships, or such other experience as the Postmaster-General may deem satisfactory.

(4) In the case of any ship of Class I or Class II, at least one of the radio officers shall be a person who has had experience at sea as a radio officer for a total of not less than—

(a) 2 years in the case of a ship of Class I;

(b) 1 year in the case of a ship of Class II (a);

(c) 6 months in the case of a ship of Class II (b) of 3 000 gross register tons or over; or

(d) 3 months in the case of a ship of Class II (b) of 1 600 gross register tons or over but of less than 3 000 gross register tons.

12. EMPLOYMENT OF CERTIFICATED RADIO-TELEPHONE OPERATORS

(1) The owner and Master of every radiotelephone ship proceeding to sea shall ensure that there is provided on board at least one qualified radiotelephone operator, who may be a deck officer.

(2) Subject to section 222 of the Act, no person shall be qualified to be a radiotelephone operator or to be employed in such capacity on any ship being a radiotelephone ship, unless he holds a valid certificate of competency or proficiency in radiotelephony or radiotelegraphy granted by the Postmaster-General, or a certificate recognised by the Postmaster-General as the equivalent of such certificate granted by him, to which certificate or equivalent shall be attached the Postmaster-General's valid letter of authority to operate a radiotelephone or radiotelegraph station.

13. INDIENSNEMING VAN GEDIPLOMEERDE SEEMANNE OP SKEPE VAN EENHONDERD BRUTO-REGISTERTON EN MEER

Die eienaar en Gesagvoerder van elke skip wat van watter hawe ook al ter see uitvaar, synde 'n laslynskip met 'n tonnemaat van meer as eenhonderd bruto-registerton, moet, as die beskrywing daarvan, die handels- of vaargebied daarvan en die getal seemanne aan boord is soos getoon in onderskeidelik kolomme 2, 3 en 4 van enige item in onderstaande tabel, sorg dat daar aan boord sodanige skip in hul toepaslike werkkringe die aantal gekwalifiseerde seemanne behoorlik kragtens hierdie Wet gediplomeerd of geag gediplomeerd te wees soos in kolom 5 van sodanige item aangedui word, werksaam is:

13. EMPLOYMENT OF CERTIFICATED RATINGS ON SHIPS OF ONE HUNDRED OR MORE GROSS REGISTER TONS

The owner and Master of every ship going to sea from any port whatsoever, being a load line ship and being over one hundred gross register tons shall, if the description thereof, the trading or operational area thereof and the number of ratings carried are as shown in columns 2, 3 and 4 respectively of any item in the table below, ensure that there are employed on board such ship, in their appropriate capacities, such number of qualified ratings duly certificated under the Act or deemed under the Act to be certificated as is shown in column 5 of such item:

Kolom 1	Kolom 2	Kolom 3	Kolom 4	Kolom 5	Kolom 6	Kolom 7	Kolom 8
Item No.	Beskrywing van skip	Handels- of vaargebied	Totale getal seemanne aan boord	Getal seemanne wat houers is van die gepaste bevoegdheidsertifikate, wat aan boord moet wees			
				Bekwame seemanne op die dek	Bekwame seemanne in die masjienkamer	Reddingsbootbemanning	Kokke
1	Passasier	Onbegrens	Enige	4	3	Een vir elke 50 passasiers aan boord, of deel van sodanige getal	Een vir elke 50 passasiers aan boord, of deel van sodanige getal
2		Begrens	Enige	3	2		
3		Kort seegang	Enige	2	2		
4		Beperk	Enige	Een vir elke 50 passasiers aan boord, of deel van sodanige getal	1	Een vir elke 50 passasiers aan boord, of deel van sodanige getal	
5	Laslynskip wat nie 'n passasierskip is nie	Enige	Meer as 20	4	2	—	1
			16–20	3	1	—	1
			11–15	2	1	—	1
			5–10	1	1	1	—
6	Vissersboot van meer as 300 bruto ton	Enige	Getal persone aan boord	—	—	—	—
			Meer as 30	3	—	2	1
			15–30	2	—	1	—

Opmerking.—Die reddingsbootbemanning wat aan boord moet wees volgens kolom 7 is bykomend by die bekwame dekseemanne wat aan boord moet wees volgens kolom 5.

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8
Item No.	Description of ship	Trading or operational area	Total number of ratings carried		Number of ratings holding the appropriate certificates of qualification to be carried		
				Efficient Deck Ratings	Efficient Engine Room Ratings	Lifeboatmen	Cooks
1	Passenger	Unlimited	Any	4	3	One for every 50 passengers carried, or part of such number	One for every 50 passengers carried, or part of such number
2		Limited	Any	3	2		
3		Short Sea	Any	2	2		
4		Restricted	Any	One for every 50 passengers carried, or part of such number	1	One for every 50 passengers carried, or part of such number	
5	Load line ship other than a passenger ship	Any	More than 20	4	2	—	1
			16–20	3	1	—	1
			11–15	2	1	—	1
			5–10	1	1	1	—
6	Fishing boat over 300 gross tons	Any	Number of persons on board ship		—	—	—
			More than 30	3	—	2	1
			15–30	2	—	1	—

Note.—The lifeboatmen required to be carried under Column 7 are in addition to the Efficient Deck Ratings required to be carried under Column 5.

Vereeniging or Johannesburg direct to building or construction sites situated within an area with a radius of two hundred and forty kilometres from such place of business at Vereeniging or Johannesburg exclusively on behalf of GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd.

6. Goods for use by GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd only (i) within a radius of eighty kilometres from building or construction sites where GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd is engaged under contract within the Republic of South Africa and (ii) also between such building or construction sites, and the nearest railway station or railway siding whichever happens to be nearest to such building or construction sites.

7. Own scaffolding, chain for blasting shields, building plant and tools of trade for own use only and for sale or in pursuance of a sale and which is to be used by the holder or his employees in the course of his business—

(i) from the holder's place of business situated at Johannesburg and Vereeniging, direct to a building or construction site situated within the Republic of South Africa; or

(ii) from one such building or construction site direct to another such site; or

(iii) from such a building or construction site direct to the holders place of business at Vereeniging or Johannesburg.

Subject to the explicit condition that no construction material which is normally required by the holder to execute any work or contract as a supplier of steel items shall be conveyed by the holder in terms of this authority.

8. Camping equipment for use by GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd employees and not for sale between GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd's places of business situated at Vereeniging or Johannesburg and any places situated within the Republic of South Africa.

9. Westaform flexible tubing for use by GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd's only, for direct installation from GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd's places of business at Vereeniging or Johannesburg direct to building or construction sites or to the most convenient place of storage as and when requested by the building contractor within the Republic of South Africa exclusively on behalf of GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd.

10. Not more than three tons of anchors and wire cable strands for use by GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd only and for direct installation from place of business of GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd at Vereeniging or Johannesburg direct to building or construction sites within the Republic of South Africa.

11. Purpose made prefabricated hollowround, hollowsquare of hollow-rectangular reinforcing steel columns manufactured from lengths or reinforcing steel rods not exceeding 50 mm in diameter which are tied together to form such hollowshaped columns from GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd's places of business at Vereeniging and Johannesburg direct to building or construction sites or to the most convenient place of storage as and when requested by the building contractor situated within an area with a radius of two hundred and forty kilometres from such place of business at Vereeniging or Johannesburg exclusively on behalf of GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd.

12. Mixed consignment of reinforcing wire mesh, including rolls thereof supporting steel and bale ties lock-links not exceeding 5 mm in diametres within the Republic of South Africa and subject to the condition that these items do not exceed 5% of the load specified under paragraphs 1 to 10 exclusively on behalf of GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd.

13. Prefabricated buildings consisting of one or more apartments completely manufactured and assembled and being conveyed as a single unit, or which is being conveyed in two or more fully manufactured and assembled sections, from GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd's places of business at Vereeniging or Johannesburg where the prefabricated buildings are being manufactured direct to any site where such prefabricated building will be erected and which is situated within an area with a radius of two hundred and forty kilometres from the mentioned place of business at Vereeniging or Johannesburg exclusively on behalf of GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd.

14. Damaged, defective or unused reinforcing mesh and scaffolding on the return journey from building or construction sites situated within the Republic of South Africa direct to GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd's places of business at Vereeniging or Johannesburg exclusively on behalf of GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd.

(a) Flat steel sheets consisting of the following:

With thickness up to and including 0,6 millimetres not more than one hundred sheets per customer per trip.

With thickness up to and including 1,2 millimetres not more than fifty sheets per customer per trip.

With thickness up to and including two millimetres not more than forty sheets per customer per trip.

With thickness up to and including four millimetres not more than fourteen sheets per customer per trip.

With thickness up to and including eight millimetres not more than two sheets per customer per trip.

With thickness up to over ten millimetres not more than one sheet per customer per trip.

From GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd places of business at Vereeniging or Johannesburg direct to a construction site, or most suitable place of storage therefor situated within an area with a radius of two hundred and forty kilometres from GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd said place of business for immediate installation on arrival and any unused items thereof on the return journey from the construction site to GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd said place of business at Vereeniging or Johannesburg exclusively on behalf of GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd.

(b) Mixed consignments of profiled steel, the total combined mass of which may not exceed three thousand kilograms per trip from GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd places of business at Vereeniging and/or Johannesburg direct to a construction site, or most suitable place of storage therefor, situated within an area with a radius of two hundred and forty kilometres from GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd places of business at Vereeniging or Johannesburg, for immediate installation on arrival and any unused items thereof on the return journey from the construction site to GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd said places of business at Vereeniging and Industria Johannesburg exclusively on behalf of GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd.

(c) Hot rolled oiled steel sheets with thickness of sheets not exceeding 1,2 millimetres and cold rolled oiled steel sheets with thickness of sheets not exceeding 1,2 millimetres from GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd places of business at Vereeniging or Johannesburg to points within the Republic of South Africa, and damaged consignments of hot rolled oiled steel sheets on the return journey from buildings or construction sites within the Republic of South Africa direct to GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd's places of business at Vereeniging or Johannesburg exclusively on behalf of GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd.

OP. 1167 A. 4434—Vereeniging. (2) Liberty Transport (Pty) Ltd, Vereeniging/Additional authority. (3) 11 Existing semi-trailers. (4) Goods. (5) As per Annexure attached.

ANNEXURE

1. Horizontally flat reinforcing mesh exceeding 2 300 mm. in length and 2 300 mm in width, with or without extending wires at the sides and/or ends. (This applies to reinforcing mesh manufactured from steel wire or steel rod varying from 2,8 mm to 32 mm in diametre and which has been spotwelded only from GKN Millsteel (Pty) Ltd's, Cape Gate Holdings (Pty) Ltd, and F. H. Harrington Steel (Pty) Ltd to places of business at Vereeniging or Johannesburg direct to building or construction sites situated within the Republic of South Africa exclusively on behalf of GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd.

2. Reinforcing mesh exceeding 2 300 mm in length and 2 300 mm in width manufactured from steel wire or steel rods varying from 2,8 mm to 32 mm in diametre and special reinforcing steel with—

(a) two or more ends/sides bent once at any angle greater than 20° the bent parts not to be shorter than 75 mm and at no place bent back and welded/secured to the flat base and/or

(b) one or more ends and/or sides bent twice or more at any angle with at least one side/end with two bends or more at any angle. Each bend must not be shorter than 75 mm in length.

From GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd, and F. H. Harrington Steel (Pty) Ltd, places of business at Vereeniging or Johannesburg direct to construction or building sites situated within the Republic of South Africa exclusively on behalf of GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd.

3. Reinforcing mesh exceeding 2 300 mm in length and 2 300 mm in width manufactured from steel wire/rod varying from 2,8 mm to 12 mm in diameter, which has been spotwelded only and which is—

(a) bent in a curve length-wide and/or cross-wise with the highest place being not less than 200 mm (but excluding rolls of such reinforcing mesh) and/or

(b) of which the base is bent at any angle in the length and width at two or more places in such a manner that they cannot be properly nested, but not bent back and welded/secured to the base of the mesh exclusively on behalf of GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd.

From GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd's places of business at Vereeniging or Johannesburg direct to construction or building sites situated within the Republic of South Africa.

4. Reinforcing steel mesh exceeding 3 000 mm in length and 2 300 mm in width with—

(i) the diametre of the main wires/rods varying from 6,30 mm to 12 mm and

(ii) the diametre of the cross wires/rods being from 2,30 mm to 5,6 mm and

(iii) the cross wires spaced 300 mm or more apart and

(iv) which has been spotwelded only,

from GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd's places of business at Vereeniging or Johannesburg direct to construction or building sites situated within the Republic of South Africa exclusively on behalf of GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd.

NB.—Mesh as described in items 1 to 4 above also to be conveyed to the most convenient place of storage as and when request by the building contractors.

5. Wire mesh fabric and reinforcing steel (made from steel varying from 6 mm to 50 mm in diametre) which is purpose made to size and completely bent to the required shape and dimensions and/or reinforcing frames all required for the reinforcing of concrete beams and concrete columns only, for direct installation; from GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd's places of business at Vereeniging or Johannesburg direct to building or construction sites situated within an area with a radius of two hundred and forty kilometres from such place of business at Vereeniging of Johannesburg exclusively on behalf of GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd.

6. Goods for use by GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd only (i) within a radius of eighty kilometres from building or construction sites where GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd is engaged under contract within the Republic of South Africa and (ii) also between such building or construction sites, and the nearest railway station or railway siding whichever happens to be nearest to such building or construction sites.

7. Own scaffolding, chain for blasting shields, building plant and tools of trade for own use only and for sale or in pursuance of a sale and which is to be used by the holder or his employees in the course of his business—

(i) from the holders place of business situated at Johannesburg and Vereeniging, direct to a building or construction site situated within the Republic of South Africa; or

(ii) from one such building or construction site direct to another such site; or

(iii) from such a building or construction site direct to the holders place of business at Vereeniging or Johannesburg.

Subject to the explicit condition that no construction material which is normally required by the holder to execute any work or contract as a supplier of steel items shall be conveyed by the holder in terms of this authority.

8. Camping equipment for use by GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd employees and not for sale between GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd's places of business situated at Vereeniging or Johannesburg and any place situated within the Republic of South Africa.

9. Westaform flexible tubing for use by GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd's only, for direct installation from GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd's places of business at Vereeniging or Johannesburg direct to building or construction sites or to the most convenient place of storage as and when requested by the building contractor within the Republic of South Africa exclusively on behalf of GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd.

10. Not more than three tons of anchors and wire cable strands for use by GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd only and for direct installation from place of business of GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd at Vereeniging or Johannesburg direct to building or construction sites within the Republic of South Africa.

11. Purpose made prefabricated hollowround, hollowsquare or hollowrectangular reinforcing steel columns manufactured from lengths or reinforcing steel rods not exceeding 50 mm in diametre which are tied together to form such hollowshaped columns from GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd's places of business at Vereeniging and Johannesburg direct to building or construction sites or to the most convenient place of storage as and when requested by the building contractor situated within an area with a radius of two hundred and forty kilometres from such place of business at Vereeniging or Johannesburg exclusively on behalf of GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd.

12. Mixed consignment of reinforcing wire mesh, including rolls thereof supporting steel and bale ties lock-links not exceeding 5 mm in diametre within the Republic of South Africa and subject to the condition that these items do not exceed 5% of the load specified under paragraphs 1 to 10 exclusively on behalf of GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd.

13. Prefabricated buildings consisting of one or more apartments completely manufactured and assembled and being conveyed as a single unit, or which is being conveyed in two or more fully manufactured and assembled sections, from GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd's places of business at Vereeniging or Johannesburg where the prefabricated buildings are being manufactured direct to any site where such prefabricated building will be erected and which is situated within an area with a radius of two hundred and forty kilometres from the mentioned place of business at Vereeniging or Johannesburg exclusively on behalf of GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd.

14. Damaged, defective or unused reinforcing mesh and scaffolding on the return journey from building or construction sites situated within the Republic of South Africa direct to GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd's places of business at Vereeniging or Johannesburg exclusively on behalf of GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd.

(a) Flat steel sheets consisting of the following:

With thickness of up to and including 0,6 millimetres not more than one hundred sheets per customer per trip.

With thickness up to and including 1,2 millimetres not more than fifty sheets per customer per trip.

With thickness up to and including two millimetres not more than forty sheets per customer per trip.

With thickness up to and including four millimetres not more than fourteen sheets per customer per trip.

With thickness up to and including eight millimetres not more than two sheets per customer per trip.

With thickness up to over ten millimetres not more than one sheet per customer per trip.

From GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd places of business at Vereeniging or Johannesburg direct to a construction site, or most suitable place of storage therefor situated within an area with a radius of two hundred and forty kilometres from GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd said place of business for immediate installation on arrival and any unused items thereof on the return journey from the construction site to GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd said place of business at Vereeniging or Johannesburg exclusively on behalf of GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd.

(b) Mixed consigments of profiled steel, the total combined mass of which may not exceed three thousand kilograms per trip from GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd places of business at Vereeniging and/or Johannesburg direct to a construction site, or most suitable place of storage therefor, situated within an area with a radius of two hundred and forty kilometres from GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd places of business at Vereeniging or Johannesburg, for immediate installation on arrival and any unused items thereof on the return journey from the construction site to GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd said places of business at Vereeniging and Industria, Johannesburg exclusively on behalf of GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd.

(c) Hot rolled oiled steel sheets with thickness of sheets not exceeding 1,2 millimetres and cold rolled oiled steel sheets with thickness of sheets not exceeding 1,2 millimetres from GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd places of business at Vereeniging or Johannesburg to points within the Republic of South Africa, and damaged consigments of hot rolled oiled steel sheets on the return journey from buildings or construction sites situated within the Republic of South Africa direct to GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd's places of business at Vereeniging or Johannesburg exclusively on behalf of GKN Millsteel (Pty) Ltd, Cape Gate Holdings (Pty) Ltd and F. H. Harrington Steel (Pty) Ltd.

OP 1033—Roodepoort. (2) Stadsraad van Roodepoort, Roodepoort/wysiging van tariewe en wysiging van roete. (Herpublikasie vervang publikasie in *Staatskoerant* van 1985-11-08.) (3) 54 Bestaande busse. (4) (a) Blanke persone en hul persoonlike bagasie. (5) (a) Oor bestaande goedgekeurde roete tydtafel en beperkings met wysiging van tariewe. (Bylae ten opsigte van wysiging van tariewe is ter insae by die kantore van die Plaaslike Padvervoerraad, 14de Vloer, Nedbank East City gebou, Endstraat 120, Doornfontein, Johannesburg.) (4) (b) Blanke persone en hul persoonlike bagasie. (5) (b) Met wysiging van roete na Industria soos volg. *Oggende:* Vanaf Roodepoort met Hoofrigweg links Edison, links Caxton regs Maraisburg, links Newclare links Nobel, regs Blumberg, links Kommando regs Hoofrifweg. *Middag:* Begin in Hoofrifweg by UTC en volg dieselfde roete terug na Roodepoort.

OP 1156—Springs. (2) J. H. van Niekerk, Springs/transfer of Permits OP309910, OP305653, OP305651, OP305652, OP305654, OP305656, OP305655 and OP247880 from S. W. van Niekerk & B. J. van Niekerk t/a B & M Transport A4046. (3) Two goods vehicles, six semi-trailers. (Registered in the name of B & M Transport.) (4) Transfer of permits. (5) From S. W. van Niekerk & B. J. van Niekerk t/a B & M Transport to J. H. van Niekerk to obtain the same authority as held by transferor.

OP 1129/A 4704—Pongola. (2) Cotton Trans (Pty) Ltd, Pongola/amendment. (Replacement of vehicle.) (3) One trailer. (4) Replacement of vehicle. (5) To obtain the same authority as held by vehicle to be replaced.

OP 1178—Chamdor. (2) Greyhound Bus Lines (Pty) Ltd, Chamdor/additional authority. (3) Ten buses. (4) White and Non-White persons and their personal effects. (5) As per Annexure attached.

ANNEXURE

JOHANNESBURG—VEREENIGING—VANDERBIJLPARK—PARYS

Transport of passengers and their personal effects

Route forward: As SATS road service 7002, 7003 and 7005 namely: Johannesburg—Meredale—Tedderfield—Walkerville—De Deur—Vereeniging—Vanderbijlpark—Parys.

Route return: As forward route in reverse.

Alternative route

Forward: Johannesburg—Leyds Street—Fredrick Street—Simmonds Street—Village Road—N2—N3—N13—R26 to Vereeniging Klipriver—Daleside—Henley-on-Klip—Meyerton. P156–2 to Vanderbijlpark—P156–2—P155–1—P11–1 to Sasolburg—P9–5—P10–1—P56–1 to Parys.

Alternative route

Return: As alternative forward route in reverse to M2 then Rissik Street—Wolmarans Street—Loveday Street—Leyds Street, Johannesburg.

(Note routes and stops in towns as directed by the local municipal authority.)

Fares single: To be not more than 10c per passenger kilometre, principal fares shown below.

Km	Johannesburg						
30	2,00	Klipriver/Walkerville					
35	2,50	1,00	Daleside/Grasmere Turn-off				
45	3,00	2,00	1,00	De Deur/Meyerton			
60	3,50	3,00	2,00	1,00	Vereeniging		
70	4,00	3,50	3,00	2,00	1,00	Vanderbijlpark	
90	6,00	5,00	4,00	3,00	2,00	1,00	Sasolburg
120	8,00	7,00	6,00	5,00	4,00	3,00	2,00 Parys

Return fare: To be not more than double the single fare.

Children fare:

(a) Under 3—free provided accompanied by adult fare paying passengers (if more than one child under three accompanying the same adult—half adult fare).

(b) Over three but under twelve years of age—half adult fare. Authority to offer discounts on season/special tickets.

Time-table: Daily as required, or as follows:

Monday to Friday

Principal points:

	1	1	1	2	1	3	4	5	6	2	7	8
Johannesburg	06h45	09h15	14h00	15h00	16h20	16h30	16h40	16h50	17h00	17h10	17h20	17h30
Walkerville	–	09h45	14h30	15h30	16h50	–	17h10	–	17h30	–	17h50	–
Meyerton	07h15	–	–	–	–	17h00	–	17h20	–	17h40	–	18h00
Vereeniging	07h30	10h15	15h00	16h00	17h20	17h15	17h40	17h35	18h00	17h55	18h20	18h15
Vanderbijlpark	–	10h30	–	–	17h35	17h30	17h55	17h50	18h15	18h10	18h35	18h25

	1	2	3	4	5	6	7	1	8	1	1	2
Vanderbijlpark	05h30	05h45	06h00	06h15	06h30	06h45	07h00	–	07h30	10h30	–	–
Vereeniging	05h45	06h00	06h15	06h30	06h45	07h00	07h15	07h30	07h45	10h45	15h00	16h00
Meyerton	–	06h15	–	06h45	–	07h15	–	07h45	08h00	–	15h15	16h15
Walkerville	06h15	–	06h45	–	07h15	–	07h45	–	–	11h15	–	–
Johannesburg	06h45	06h45	07h15	07h15	07h45	07h45	08h15	08h15	08h30	11h45	15h45	16h45

OP 1181/A 4242—Gallo Manor. (2) Putco Ltd, Gallo Manor/new application. (3) 18 buses. (4) Non-White persons and their personal effects. (5) *Ennerdale—Doornfontein via Dixinia.*

Route

Forward (A): From points within Ennerdale via Road P162/1 across Railway Bridge turn left along Road K44 via Lenasia South (Dixinia) along Road R554 across R29 (Marokko Bypass Freeway) along K43 via Klipspruit West along Turf Road through Eldorado Park along Main Road left along Golden Highway (R553) along R29, Booysens Interchange Off-ramp along Booysens Road (M27), (R29), Sauer Street, right into Bree Street via Bree Street Terminus along Bree Street left into End Street right into Rockey Street, Error Street to Terminus in Staib Street.

Return (A): Doornfontein Terminus, Angle Street, Van Beek Street, Charles Street, Mosley Street, End Street, Jeppe Street, Sauer Street, Bree Street Busrank, Simmonds Street, Trump Street, Booysens Road then as per forward route in reverse.

Forward (B): From points within Ennerdale via Road P162/1 across Railway Bridge left via Road K44 until Lenasia South (Dixinia) then right along R558 left along Golden Highway R533 then as per forward Route A.

Return (B): As per Route A to Eldorado Park then as per forward route in reverse.

Fares: As approved.

Annexure of time-table are for perusal at the offices of the Local Road Transportation Board, 14th Floor, Nedbank East City Building, 120 End Street, Doornfontein, Johannesburg.

OT4299—Randfontein. (2) M. D. Morabe, I D 174335, Mohlakeng/New application. (3) Two motorcars, eight persons. (4) Black taxi passengers. (5) (i) From Mohlakeng taxi rank to Randfontein station. (ii) From Mohlakeng location via Main Reef Road, Village Street, Southerland Street, Station Street, and return along same route. (iii) Undertaking casual trips 200 kilometres radius.

OT4300—Randfontein. (2) T. J. Dhludhlu, I D 16911960-9, Mohlakeng/New application. (3) Two motorcars, eight persons. (4) Black taxi passengers. (5) (i) From Mohlakeng taxi rank to Randfontein station. (ii) From Mohlakeng location via Main Reef Road, Village Street, Southerland, Station Street, and return along same route (iii) undertaking casual trips within a radius of 200 kilometres.

OT4301—Randfontein. (2) J. O. Matabage, I D 1-6291129-9, Mohlakeng/New application. (3) Two motorcars, eight persons. (4) Black taxi passengers. (5) (i) From Mohlakeng taxi rank to Randfontein station. (ii) From Mohlakeng location via Main Reef Road, Village Street, Southerland Street, Station Street and return along same route. (iii) Undertaking casual trips within a radius of 200 kilometres.

OT4302—Randfontein. (2) S. T. Marumola, I D 1-6442142-8, Mohlakeng/New application. (3) Two motorcars, eight persons. (4) Black taxi passengers. (5) (i) From Mohlakeng taxi rank to Randfontein Station. (ii) From Mohlakeng location via Main Reef Road, Village Street, Station Street and return along, same route (iii) undertaking casual trips within 150 kilometres radius.

OT4345—Randfontein. (2) B. Nkgwedi, I D, Mohlakeng/New application. (3) One motorcar, eight persons. (4) Black taxi passengers. (5a) (I) between points within the magisterial district of Randfontein and the municipal area of Mohlakeng. (ii) casual trips within a radius of 20 kilometres. (Vehicle to be stationed at corner Ralerata and Nandi Streets taxi rank.)

OT5069—Carletonville. (2) S. J. Sankole, I D, Khutsong/bykomende voertuig met bykomende magtiging. (3) Een motorkar, agt persone. (4) Swart huurmotor passasiers. (5) Tussen punte binne 'n radius van 9 kilometer vanaf Carletonville hoof poskantoor en terug. (Voertuig gestasioneer te word te Joshua Doore (Pty) Ltd hoek van Paul Kruger- en Onyxstraat, Carletonville en vandaar te opereer.)

OT5129—Ogies. (2) G. R. Makhubela, I D 3023714, Ogies/Nuwe aansoek (laat hernuwing). (3) Een motorkar, vier persone. (4) Swart huurmotor passasiers. (5) (i) Tussen punte vanaf Matla Steenkoolmyn geleë op die plaas Haasfontein 85, distrik Bethal na plekke geleë binne 'n straal van 30 kilometer vanaf gemelde Matla Steenkoolmyn. (ii) Vanaf plekke geleë binne 'n straal van 30 kilometer vanaf Matla Steenkoolmyn geleë op die plaas Haasfontein 85, distrik Bethal na gemelde Matla Steenkoolmyn. (Voertuig gestasioneer te word te Matla Steenkoolmyn geleë op die plaas Haasfontein 85, distrik Bethal.)

OT5164—Johannesburg. (2) H. K. Lethiba, I D 1-4920405-5, Orlando West/New application. (3) One motorcar, four persons. (4) Black taxi passengers. (5) Between points within the boundaries of Soweto. (Vehicle to be stationed at 11183 Orlando West extension Phirima, Johannesburg.)

OT5165—Orlando East. (2) E. Ngudle, I D 4603221, Orlando East/New application. (3) One motorcar, eight persons. (4) Black taxi passengers. (5) Between points from Dube taxi rank in Dube Village to points within the boundaries of Soweto. (The vehicle to be stationed at Dube taxi rank.)

T5167—Motolo. (2) E. Tsotetsi, I D 2686243, Motolo/New application. (3) One motorcar, eight persons. (4) Black taxi passengers. (5) Between points from Dube taxi rank in Dube Village to points within the Soweto boundaries only. (The vehicle to be stationed at Dube taxi rank.)

OT5168—Soweto. (2) S. Mabitle, I D 5-1801822-5, Dube Village/New application. (3) One motorcar, eight persons. (4) Black taxi passengers. (5) Between points from Dube Taxi rank in Dube Village to points within the boundaries of Soweto. (Vehicle to be stationed at Dube taxi rank in Dube.)

OT5169—Moroka. (2) R. Manoto, I D 22558191, Moroka/New application. (3) One motorcar, eight persons. (4) Black taxi passengers. (5) Between points from Dube taxi rank in Dube Village to points within the boundaries of Soweto. (The vehicle to be stationed at Dube taxi rank.)

OT 5170—Soweto. (2) L. Gumede, I D 458612, Kwa-Xuma/New application. (3) One motorcar, four persons. (4) Black taxi passengers. (5) Between points within the boundaries of Soweto. (Car to be stationed at 1905 Jabulani, Soweto.)

OT5171—Germiston. (2) T. L. Zwane, I D 5-4085349-0, Katlehong/New application. (3) One motorcar, eight persons. (4) Black taxi passengers. (5) Between points within the boundaries of Katlehong and the municipal area of Germiston. (Car to be stationed at Ramakonopi East black taxi rank.)

OT5172—Germiston. (2) O. N. Maisela, I D 1-735780-2, Katlehong/New application. (3) One motorcar, four persons. (4) Black taxi passengers. (5) Between points within the boundaries of Katlehong. (Car to be stationed at 934 Twala Section, Katlehong.)

OT5173—Germiston. (2) M. B. Moloi, I D 5-1653613-6, Katlehong/New application. (3) One motorcar, four persons. (4) Black taxi passengers. (5) Between points within the boundaries of Katlehong. (Car to be stationed at 342 Twala section, Katlehong.)

OT5174—Germiston. (2) M. A. Molisana, I D 1654755, Katlehong/New application. (3) One motorcar, four persons. (4) Black taxi passengers. (5) Between points within the boundaries of Katlehong and the municipal area of Germiston. (Car to be stationed at 172 Monaheng section, Katlehong.)

OP5176—Germiston. (2) T. A. Masuku, I D 1652748, Katlehong/New application. (3) One motorcar, four persons. (4) Black taxi passengers. (5) Between points within the boundaries of Katlehong. (Car to be stationed at 1534 Shangweni section, Katlehong.)

OT5178—Orlando West. (2) J. H. Mvelase, I D 1-3227884-9, Orlando West/New application. (3) One motorcar, four persons. (4) Black taxi passengers. (5) Between points within the boundaries of Soweto. (Car to be stationed at 11574 Orlando West, Soweto.)

OT5181—Soweto. (2) P. S. Mopeloa, I D 3942474, Kwa-Xuma/Replacement and additional authority. (3) One motorcar, eight persons. (4) Replacement of vehicle. (5) To obtain the same authority as vehicle to be replaced and additional authority to increase the carrying capacity from four persons to eight persons.

OT5203—Benoni. (2) S. S. Sishibe, I D 1039686, Benoni/Additional authority and amendment of route. (3) Two motorcars, eight persons. (4) Black taxi passengers. (5) Between points within the magisterial area of Benoni, subject to the condition that the vehicle be stationed at the black taxi rank situated at Dlomo, Wattville, location, district Benoni.

OT5204—Benoni. (2) J. Tsele, I D 1-0631883-0, Wattville/Vervanging van voertuig met bykomende magtiging. (3) Een motorkar, agt persone. (4) Replacement of vehicle. (5) To obtain the same authority as vehicle to be replaced and additional authority to increase the carrying capacity from six persons to eight persons.

OT5205—Carletonville. (2) O. M. Dlamine, I D 1-5053231-8, Khutsong/Bykomende voertuig met nuwe magtiging. (3) Een motorkar, agt persone. (4) Swart huurmotor passasiers. (5) (i) Tussen punte vanaf Welverdiend spoorwegstasie geleë in Welverdiend op die plaas Welverdiend 97, distrik Oberholzer na plekke geleë binne 'n gebied met 'n straal van 10 kilometer vanaf gemelde Welverdiend spoorwegstasie. (ii) Vanaf plekke geleë binne 'n gebied met 'n straal van 10 kilometer vanaf Welverdiend op die plaas Welverdiend 97, distrik Oberholzer na die gemelde Welverdiend spoorwegstasie. (Voertuig gestasioneer te word te Welverdiend spoorwegstasie geleë in Welverdiend op die plaas Welverdiend 97, distrik Oberholzer.)

OT5208—Ratanda. (2) N. J. Hlophe, I D 1-6584670-1, Ratando/Nuwe aansoek. (3) Een motorkar, vier persone. (4) Swart huurmotor passasiers. (5) Tussen punte binne 'n gebied met 'n straal van 15 kilometer vanaf taxi staanplek te Ratanda, Heidelberg.

OT5209—Benoni. (2) T. J. Mtini, I D 1276382, Daveyton/Transfer from Ntini A, H 1444 (Non-White). (3) One motorcar, eight persons. (4) Transfer of permit. (5) To obtain the same authority as held by transferor on permit no. OP 156507.

OT5210—Eldorado Park. (2) D. Southern, Eldorado Park/Replacement of vehicle and additional authority. (3) One motorcar, eight persons. (4) Replacement of vehicle. (5) To obtain the same authority as vehicle to be replaced and additional authority to increase the carrying capacity from five persons to eight persons.

OT5211—Orlando West. (2) L. Mkhize, I D 1031921, Orlando West/Additional vehicle. (3) One motorcar, eight persons. (4) Black taxi passengers. (5) Between points within the boundaries of Soweto. (Car to be stationed at 8853 B Orlando West and Phomolong Station.)

T5213—Orlando East. (2) B. C. Njikelana, I D 1-4112688-5, Orlando East/New application. (3) One motorcar, eight persons. (4) Black taxi passengers. (5) Between points within the boundaries of Soweto.

OT5214—Brakpan. (2) S. M. Makalla, I D 554564, Brakpan/Transfer from H. du Toit 3553 (white). (3) One motorcar, four persons. (4) Transfer of permit. (5) To obtain the same authority as held by transferor on permit no. OP249307.

OT5215—Mofolo North. (2) A. Zonele, I D 4879343, Mofolo North/New application. (3) One motorcar, eight persons. (4) Black taxi passengers. (5) Between points within the boundaries of Soweto. (Taxi to be stationed at Barawanath taxi rank.)

OT5216—Soweto. (2) M. A. Manana, I D 1-3783304, Dube/new application. (3) One motorcar, eight persons. (4) Black taxi passengers. (5) Between points within the boundaries of Soweto.

OT5217—Soweto. (2) W. Mthembu, I D 1-5825077-3, Kwa-Xuma/New application. (3) One motorcar, eight persons. (4) Black taxi passengers. (5) Between points within the boundaries of Soweto. (Car to be stationed at Baragwanath taxi rank.)

OT5218—Boksburg. (2) D. K. Mokwatlo, I D 1-4837271-3, Vosloorus/New application. (3) One motorcar, eight persons. (4) Black taxi passengers. (5) (i) Between points within the magisterial district of Boksburg. (ii) Vehicle to be stationed at Maobane Street taxi rank.

OT5220—Krugersdorp. (2) C. M. Dube, I D 4411413, Kagiso/New application. (3) One motorcar, four persons. (4) Black taxi passengers. (5) Between points within the municipal area of Krugersdorp.

OT5221—Krugersdorp. (2) B. D. Dube, I D 1-4962026-0, Kagiso/New application. (3) One motorcar, four persons. (4) Black taxi passengers. (5) Between points within the municipal area of Krugersdorp.

OT5222—Johannesburg. (2) I. Westcott, I D 4410145061005, Bezvalley/New application. (3) One motorcar, four persons. (4) White taxi passengers. (5) Between points within the municipal area of Johannesburg.

OT5223—Krugersdorp. (2) C. M. Dube, I D 4411413, Kagiso/New application. (3) One motorcar, eight persons. (4) Black taxi passengers. (5) Between points within the municipal area of Krugersdorp.

OT5225—Randfontein. (2) P. Duma, I D 1-0402968-3, Mohlakeng/New application. (3) One motorcar, four persons. (4) Black taxi passengers. (5) Between points within the municipal area of Randfontein.

OT5226—Orlando West. (2) P. Khumalo, I D 1-0981142-0, Orlando West/New application. (3) One motorcar, eight persons. (4) Black taxi passengers. (5) Between points within the boundaries of Soweto. (Taxi to be stationed at Baragwanath taxi rank.)

OT5227—Dube Village. (2) G. T. Mdhluli, I D 1835565, Dube Village/Replacement of vehicle. (3) One motorcar, eight persons. (4) Replacement of vehicle. (5) To obtain the same authority as vehicle to be replaced and additional authority to increase the carrying capacity from five persons to eight persons.

OT5228—Kempton Park. (2) G. Ndlangamandlo, I D 1-4388941-8, Tembisa/Transfer from J. M. Twala, H2912 (Black). (3) One motorcar, eight persons. (4) Transfer of permit. (5) To obtain the same authority as held by transferor on permit No. OP 285739.

OT5229—Springs. (2) M. E. Masuku, I D 1-0084433-1, Kwa-Thema/New application. (3) One motorcar, eight persons. (4) Black taxi passengers. (5) (i) Between points from the parking garage of the C.B.D. Parking Company (Tvl) (Pty) Ltd, situated at "The Avenues", Springs to within a radius of 10 kilometres therefrom. (ii) From points within a radius of 10 kilometres from the parking garage of C.B.D. Parking Company (Tvl) (Pty) Ltd situated at "The Avenues", Springs, to such parking garage. (Vehicle to be stationed at the parking garage of C.B.D. Parking Company (Tvl) (Pty) Ltd.)

2. AANSOEKVORM EN DOKUMENTE WAT VOORGELÊ MOET WORD WANNEER DAAR OM EKSAMINERING AANSOEK GEDOEN WORD

2.1 'n Eksamenkandidaat vir 'n bekwaamheidsertifikaat moet aansoek doen op die vorm wat die Direkteur-generaal goedgekeur het, en hy moet toesien dat dit die eksaminator bereik in die hawe waar hy die eksamen wil aflê, minstens 14 dae voor die datum waarop hy ooreenkomstig regulasie 4 geëksamineer wil word.

2.2 Die kandidaat moet benewens die vorm in subparagraaf 1 van hierdie regulasie genoem, die bykomende dokumente in die tabel hieronder aangedui vir die onderskeie grade voorlê:

2. FORM OF APPLICATION AND DOCUMENTS TO BE SUBMITTED WHEN APPLYING FOR EXAMINATION

2.1 A candidate for an examination for a certificate of competency shall apply on the form approved by the Director-General, and shall cause it to reach the examiner at the port at which he wishes to be examined at least 14 days before the date on which he wishes to be examined in accordance with regulation 4.

2.2 In addition to the form mentioned in sub-paragraph 1 of this regulation the candidate shall submit additional documents as tabled hereunder for the various grades:

	Dokumente wat voorgelê moet word	Visserman Graad				Seemasjinis Graad		
		4	3	2	1	3	2	1
1	Getuigskrifte	×	×	×	×	×	×	×
2	Identiteitsdokument	×	×			×	×	
3	Gesondheidsertifikaat	×	×	×	×	×	×	×
4	Gesigstoetssertifikaat	×	×	×	×			
5	Bewys van diens ter see	×	×	×	×	×	×	×
6	Sertifikaat in noodhulp ter see	×	×			×	×	
7	Brandbestrydingskursussertifikaat (seemanne)	×				×		
8	Brandbestrydingskursussertifikaat (offisiere)		×				×	
9	Beperkte radiotelefoonoperateursertifikaat (see)	×	×					
10	Sertifikaat van bekwaamheid in oorlewingsvaartuie			×				×
11	Vorige bekwaamheidsertifikaat		×	×	×		×	×
12	Sertifikaat in elektroniese navigasiestelsels (vissermanne)		×					
13	Gesagvoerdersertifikaat in mediese opleiding			×				
14	Sertifikaat in visvangtegnologie			×				

	Documents to be submitted	Fisherman Grades				Motorman Grades		
		4	3	2	1	3	2	1
1	Testimonials	×	×	×	×	×	×	×
2	Identity document	×	×			×	×	
3	Health certificate	×	×	×	×	×	×	×
4	Sight test certificate	×	×	×	×			
5	Proof of service at sea	×	×	×	×	×	×	×
6	First Aid at Sea certificate	×	×			×	×	
7	Fire fighting course certificate (ratings)	×				×		
8	Fire fighting course certificate (officers)		×				×	
9	Restricted Radiotelephone Operators certificate (marine)	×	×					
10	Certificate of Proficiency in Survival Craft			×				×
11	Previous certificate of competency		×	×	×		×	×
12	Electronic Navigations Systems certificate (fisherman)		×					
13	Ship Captain's Medical Training certificate			×				
14	Fishing Technology certificate			×				

Let wel: 'n Kandidaat met 'n bekwaamheidsertifikaat wat uitgereik is voor die inwerkingtreding van hierdie regulasies, wat aansoek doen om geëksamineer te word ter verwerwing van 'n hoër bekwaamheidsertifikaat ooreenkomstig die gelykwaardigheidstabel vervat in regulasie 15 van die Regulasies betreffende die Bemanning van Suid-Afrikaanse Skepe, 1984, moet die bykomende dokumente voorlê wat ooreenkomstig bostaande tabel vir die laer graad van die sertifikaat verlang word.

Note: A candidate who holds a certificate of competency issued before the commencement of these regulations, who presents himself for an examination for a higher certificate of competency in accordance with the equivalence table contained in regulation 15 of the Manning of Ships Regulations, 1984, must submit the additional documents as required by the above table for the lower grade of certificate.

3. WOORDBETEKENIS

In hierdie regulasies beteken die uitdrukking "die Wet" die Handelskeepvaartwet, 1951 (Wet 57 van 1951), soos gewysig, en, tensy uit die samehang anders blyk, het enige uitdrukking waaraan daar in die Wet 'n betekenis toegeken is, wanneer dit in hierdie regulasies gebruik word, die aldus toegekende betekenis, en beteken—

beperkte radiotelefoonbedienersertifikaat (see) 'n sertifikaat met so 'n naam, wat deur die Posmeester-generaal uitgereik word;

brandbestrydingsertifikaat 'n sertifikaat met so 'n naam, wat uitgereik word deur 'n skool of inrigting wat opleiding in brandbestryding bied;

Departement die Departement van Vervoer, Direktoraat Watervervoer;

eksaminator iemand wat as sodanig aangestel is kragtens artikel 77 (4) van die Wet;

gediplomeerde visserman iemand wat oor 'n bekwaamheidsertifikaat beskik wat kragtens artikel 75 (1) van die Wet uitgereik is;

gesigstoetssertifikaat 'n sertifikaat wat uitgereik word sodra die kandidaat ooreenkomstig die bepalings van aanhangsel 3 in die gesigstoets slaag;

gesondheidsertifikaat 'n sertifikaat wat deur 'n mediese praktisyn uitgereik word waarin hy sertifiseer dat die kandidaat in goeie gesondheid verkeer en nie liggaamlik of andersins ongeskik is nie;

getuigskrifte dokumente wat tot tevredenheid van die eksaminator getuig van die kandidaat se inbors (met inbegrip van soberheid), ondervinding, bekwaamheid en algemene goeie gedrag aan boord skip, en sodanige getuigskrifte moet op die laaste 12 maande van die kwalifiseringstydperk onmiddellik voor die aansoekdatum betrekking hê;

goedgekeurde goedgekeur deur die Direkteur-generaal van Vervoer;

identiteitsdokument 'n geboortesertifikaat, doopseel, paspoort, identiteitsdokument of enige ander regsdokument wat die volle naam en geboortedatum van die kandidaat verstrek;

omskrewe visvanggebied die gebied wat begrens word deur die parallelle van 5° en 50° suiderbreedte en die meridiane van Greenwich en 40° oosterlengte;

sertifikaat in elektroniese navigasiestelsels (vissermanne) 'n sertifikaat met so 'n naam, wat deur 'n goedgekeurde inrigting uitgereik word;

sertifikaat in Noodhulp ter See 'n sertifikaat met so 'n naam, wat deur 'n goedgekeurde inrigting uitgereik word;

sertifikaat van bekwaamheid in oorlewingsvaartuie 'n sertifikaat met so 'n naam, wat deur die Departement uitgereik word;

gesagvoerdersertifikaat in mediese opleiding 'n sertifikaat met so 'n naam, wat deur 'n goedgekeurde inrigting uitgereik word;

ton bruto ton;

vissersboot of *visservaartuig* enige skuit of vaartuig wat in die handel gebruik word om vis, walvisse, robbe of ander lewende hulpbronne van die see mee te vang.

4. EKSAMENDATUMS EN PLEKKE WAAR EKSAMENS AFGENEEM WORD

Die eksamendatums en plekke waar eksamens afgeneem word, word elke jaar deur die Direkteur-generaal in "Marinekennisgewings" gepubliseer.

3. INTERPRETATION

In these regulations the expression "the Act" means the Merchant Shipping Act, 1951 (Act 57 of 1951), as amended, and unless the context otherwise indicates, any expression used in these regulations to which a meaning has been assigned in the Act, bears the meaning so assigned, and—

approved means approved by the Director-General: Transport;

certificate of proficiency in survival craft means a certificate of qualification of that name, issued by the Department;

certificated fisherman means a person who holds a certificate of competency granted in terms of section 75 (1) of the Act;

defined fishing zone means the area bounded by the parallels of Latitude of 5°S, and 50°S, and by the Meridians of Greenwich and Longitude 40°E;

Department means Department of Transport, Marine Division;

Electronic Navigation Systems (Fisherman) certificate means a certificate of that name issued by an approved institution;

examiner means a person appointed as such in terms of section 77 (4) of the Act;

fire fighting course certificate means a certificate of that name issued by an approved school or institution which gives instruction in fire fighting;

First Aid at Sea certificate means a certificate of that name issued by an approved institution;

fishing boat or fishing vessel means any boat or vessel used commercially for catching fish, whales, seals, or other living resources of the sea;

health certificate means a certificate issued by a medical practitioner certifying that the candidate is in good health and does not suffer from any physical or other disability;

identity document means a birth certificate, a baptismal certificate, a passport or identity document or any other legal document which shows the full names and date of birth of the candidate;

Ship Captain's Medical Training Certificate means a certificate of that name issued by an approved institution;

Sight Test certificate means a certificate issued upon the passing of the sight test in terms of the requirements set out in Annexure 3;

testimonials means testimonials satisfactory to the examiner as to character, (including sobriety), experience, ability and general good conduct on board ship and such testimonial shall cover the last 12 months of qualifying time immediately preceding the date of application;

tons means gross tons;

Restricted Radiotelephone Operator certificate (marine) means the certificate of that name issued by the Postmaster General.

4. DAYS AND PLACES OF EXAMINATION

The days on which and places where examinations are to be held shall be published annually by the Director-General in Marine Notices.

5. KENNIS VAN AFRIKAANS OF ENGELS

Kandidate kan kies of hulle die eksamen in Afrikaans of Engels wil aflê. Hulle moet ter bevrediging van die eksaminatore bewys lewer dat hulle Afrikaans of Engels goed genoeg kan praat en skryf om hul pligte aan boord van 'n Suid-Afrikaanse skip te verrig.

6. LIGGAAMLIKE OF ANDER ONGESKIKTHEID

Nieteenstaande die voorlegging van 'n gesondheidsertifikaat ooreenkomstig regulasie 2.2 moet die eksaminator, as hy tydens die eksamen agterkom dat 'n kandidaat doof is of 'n spraakgebrek of 'n ander liggaamlike of geestesgebrek het, en na verdere ondersoek oortuig is dat die gebrek van so 'n aard is dat dit die kandidaat onbekwaam sou maak om die gewone pligte ter see van die houer van 'n bekwaamheidsertifikaat na behore te verrig, die eksamen summier staak en die saak aan die Direkteur-generaal rapporteer.

As die kandidaat reeds oor 'n sertifikaat beskik, moet daardie sertifikaat saam met die eksaminator se verslag aangestuur word.

7. ONBEVREDIGENDE GEDRAG AAN BOORD SKIP VOOR EKSAMENS

In die geval van 'n kandidaat wat—

1. na ondertekening van die ooreenkoms met die bemanning versuim het om by sy skip aan te sluit; of
2. van sy skip gedros het nadat hy aangesluit het; of
3. deur 'n geregshof skuldig bevind is aan 'n misdryf waarvoor hy tot gevangenisstraf sonder die keuse van 'n boete veroordeel is, of wat, na die mening van die eksaminator, 'n ernstige misdryf is; of
4. skuldig bevind is aan 'n misdryf ten opsigte waarvan 'n inskrywing in die amptelike skeepsjoernaal gemaak is kragtens paragraaf (b) van artikel eenhonderd drie-en-tagtig van die Wet, en wat, na die mening van die eksaminator, 'n ernstige misdryf is,

dek die getuigskrifte wat ingevolge regulasie 2.2 verlang word die tydperk van twee jaar volgende op sodanige wangedrag: Met dien verstande dat die Direkteur-generaal, nadat hy die saak ondersoek het, die tydperk op versoek van die kandidaat na goeddunke kan verkort.

8. POGING TOT OMKOPERY

Enige kandidaat wat 'n beampte van die Departement geld aanbied, word geag hom aan wangedrag skuldig te gemaak het en word nie tot die betrokke eksamen toegelaat nie. Sodanige kandidaat word nie tot enige eksamen vir enige bekwaamheidsertifikaat toegelaat voordat 'n tydperk van minstens 12 maande verloop het nie.

9. DIE UITREIK VAN SERTIFIKATE

'n Kandidaat wat in die eksamen slaag, ontvang vorm TV 5/106 van die eksaminator, wat hy moet indien wanneer hy sy sertifikaat gaan afhaal by die hawe wat op die aansoekvorm aangedui word. 'n Kandidaat wat net gedeeltelik in die eksamen geslaag het of daarin gedruip het, ontvang vorm TV5/107 van die eksaminator, waarop die eksamenuitslae verstrek word. Die kandidaat moet dié vorm hou en dit by die eksaminator indien wanneer hy weer om eksaminering aansoek doen.

10. AFSKRIFTE VAN VERLORE SERTIFIKATE

'n Aansoeker om 'n gesertifiseerde afskrif van 'n verlore sertifikaat moet by die bevoegde beampte aansoek doen en die heffing wat in regulasie 29 voorgeskryf word terselfdertyd betaal. 'n Verklaring aangaande die omstandighede waarin die sertifikaat verlore geraak het, moet deur die aansoeker voor die bevoegde beampte afgelê word, wat die vorm aan die Direkteur-generaal moet deurstuur.

5. CANDIDATES' KNOWLEDGE OF ENGLISH OR AFRIKAANS

Candidates shall have the option of undertaking the examination in either English or Afrikaans. Candidates must prove to the satisfaction of the examiners that they can speak and write English or Afrikaans sufficiently well to perform the duties required of them on board a South African ship.

6. PHYSICAL OR OTHER DISABILITIES

Notwithstanding the production of a health certificate in accordance with Regulation 2.2, the examiner shall, if he finds in the course of the examination that a candidate is afflicted with deafness, with an impediment in speech or with some other physical or mental infirmity, and upon further investigation is satisfied that the degree of infirmity is such as to render the candidate incapable of discharging adequately the ordinary sea-going duties of the holder of a certificate of competency, terminate the examination forthwith and report the matter to the Director-General.

If a candidate is the holder of an existing certificate that certificate shall be forwarded with the report.

7. UNSATISFACTORY CONDUCT ON BOARD SHIP PRIOR TO EXAMINATIONS

In the case of a candidate who—

1. after having signed the agreement with the crew has neglected to join his ship; or
2. after having joined has deserted his ship; or
3. has been convicted by a tribunal of an offence for which he has been sentenced to imprisonment without the option of a fine or which the examiner considers to be of a serious nature; or
4. has been found guilty of an offence in respect of which an entry has been made in the official logbook in terms of paragraph (b) of section one hundred and eighty-three of the Act and which the examiner considers to be of a serious nature,

the testimonials required in terms of regulation 2.2 shall cover the period of two years subsequent to such misconduct: Provided that upon the application of the candidate the Director-General, after having investigated the matter, may in his discretion reduce the period.

8. ATTEMPTED BRIBERY

Any candidate who offers a gratuity to any officer of the Department shall be regarded as having committed an act of misconduct and shall not be admitted to the examination concerned. Such a candidate shall not be admitted to any examination for any certificate of competency until a period of at least 12 months has elapsed.

9. ISSUE OF CERTIFICATES

A candidate who passes the examination shall receive from the examiner a form TV5/106 which must be produced when collecting the certificate at the port designated on the application form. A candidate who is partially successful or unsuccessful in his examination shall receive from the examiner form TV5/107, giving the results of the examination. The candidate must retain this form and produce it to the examiner when next applying for examination.

10. COPIES OF LOST CERTIFICATES

An applicant for a certified copy of a lost certificate shall apply to the proper officer, paying at the same time the fee prescribed in regulation 29. A declaration as to the circumstances in which the certificate was lost shall be made by the applicant before the proper officer who shall transmit the form of application to the Director-General.

HOOFSTUK 2

BEREKENING VAN DIENS TER SEE

11. ALGEMEEN

11.1 Die onus om aanvaarbare bewys te lewer van diens ter see rus in alle gevalle op die kandidaat wat op sodanige diens aanspraak maak.

11.2 Alle diens wat ingevolge 'n ooreenkoms met die bemanning gelewer is, word behoudens die bepalings van regulasie 7 erken. As daar geen ooreenkoms met die bemanning aangegaan is nie, word slegs diens vanaf die aanvang van 'n seereis tot by die beëindiging daarvan bereken.

11.3 Indien 'n kandidaat diens doen op 'n vaartuig wat net daaglikse ritte onderneem of vir kort tydperke in gebruik is, word sy diens bereken vanaf die tydstip waarop hy in diens geneem word as 'n gereelde lid van die bemanning van sodanige vaartuig tot die tydstip waarop sy diens beëindig word.

12. GEMENGDE DIENS

12.1 Indien 'n kandidaat sy diens in meer as een hoedanigheid verrig het, moet elke soort diens na verhouding bereken word, mits sodanige diens in ander opsigte aan die regulasies voldoen.

12.2 Indien 'n kandidaat vir dekdiens aangestel is maar hy sy dienstyd ter see hoofsaaklik in die masjienkamer as assistent van die seemasjinis deurgebring het, kan die hele dienstydperk erken word as kwalifiserende diens vir 'n Bekwaamheidsertifikaat as Seemasjinis Graad 3 of Graad 2, na gelang van die geval.

12.3 Indien 'n kandidaat vir diens in enige hoedanigheid in die masjienkamer aangestel is, in 'n vaartuig van minstens 25 bruto ton, maar hy sy dienstyd ter see hoofsaaklik as 'n visserman deurgebring het, kan die hele dienstydperk erken word as kwalifiserende diens vir 'n Bekwaamheidsertifikaat as Visserman Graad 4.

13. DIENS OP VREEMDE SKEPE

Indien 'n kandidaat aanspraak maak op diens op 'n skip wat nie in die Republiek van Suid-Afrika geregistreer is nie, moet hy bewys van sodanige diens tot tevredenheid van die eksaminator lewer. As die bewys onvoldoende of enigsins twyfelagtig blyk te wees, moet alle dokumente vir 'n beslissing na die Direkteur-generaal verwys word.

14. DIENS OP SKEPE WAT NIE VISSERSBOTE IS NIE

14.1 Diens op handelsvaartuie of vlootskepe word ten volle erken as kwalifiserende seediens vir 'n bekwaamheidsertifikaat as Visserman Graad 4 of 3 en Seemasjinis Graad 3 of 2.

14.2 Diens op vaartuie wat deels op kalm water bedrywig is, soos hawesleepbote, baggerbote en kusvoorraadbarkasse, word erken as kwalifiserende diens vir 'n Bekwaamheidsertifikaat as Visserman Graad 4 of 3 en Seemasjinis Graad 3 of 2, in die verhouding van een maand diens vir elke twee maande werklike diens op sodanige vaartuie.

14.3 Ondanks strydige bepalinge in subregulasies 1 en 2 moet elke kandidaat vir 'n Bekwaamheidsertifikaat as Visserman Graad 4 of 3 bewys lewer van minstens ses maande dekdiens op vissersvaartuie van meer as 25 bruto ton.

15. HOËR AKADEMIESE KWALIFIKASIES

Vrystelling van die verwerwing van 'n Bekwaamheidsertifikaat as Visserman Graad 4 word verleen aan diegene wat beskik oor die skooleindsertifikate wat in die tabel hieronder aangedui word. Sodanige kandidate word regstreeks tot die eksamen vir die Bekwaamheidsertifikaat as Visserman Graad 3 toegelaat nadat hulle die dienstermyn wat in die tabel hieronder gespesifiseer word, as kadette op skepe van 100 ton of meer uitgedien het en 'n goedgekeurde opleidingskursus deurloop het.

CHAPTER 2

CALCULATION OF SERVICE AT SEA

11. GENERAL

11.1 In all cases the onus of producing acceptable proof of service at sea shall rest upon the candidate claiming such service.

11.2 All service rendered in terms of an agreement with the crew shall, subject to the provisions of regulation 7, be acceptable. If no agreement with the crew has been entered into, only service from the commencement of a voyage to its termination shall be reckoned.

11.3 Where a candidate serves on a vessel which operates on daily trips or for short periods only, service shall be reckoned from the time when he is engaged as a regular member of the crew of that vessel to the time when he ceases to be so engaged.

12. MIXED SERVICE

12.1 Where a candidate has performed his service in more than one capacity, proportionate allowances shall be made for each kind of service, provided that in other respects such service complies with the regulations.

12.2 Where a candidate has been engaged for service on deck but the time spent at sea has been predominantly in the engine room as assistant to the Marine Motorman, the whole term may be accepted as qualifying for a certificate of competency—Marine Motorman Grade 3 or Grade 2, as the case may be.

12.3 Where a candidate was engaged for service in any capacity in the engine room, in a vessel of not less than 25 tons gross but the time at sea was predominantly spent on deck as a fisherman, the whole term may be accepted as qualifying time for a certificate of competency—Fisherman Grade 4.

13. SERVICE ON FOREIGN SHIPS

Where a candidate claims service in a ship not registered in the Republic of South Africa, he shall produce proof of such service to the satisfaction of the examiner. If the sufficiency of the proof given appears to be at all doubtful, all papers shall be referred to the Director-General for decision.

14. SERVICE ON NON-FISHING SHIPS

14.1 Service performed in trading vessels or in naval ships shall be accepted in full toward sea service required for a certificate of competency—Fisherman, Grade 4 or 3 and Marine Motorman, Grade 3 or 2.

14.2 Service performed in vessels operating in partially smooth water, such as harbour tugs, dredgers and off-shore supply launches, shall be accepted towards qualifying time for a certificate of competency—Fisherman, Grade 4 or 3, and Marine Motorman, Grade 3 or 2, in the proportion of one month of service for every two months actual service on such vessels.

14.3 Notwithstanding anything contained in subregulations 1 and 2, every candidate for a certificate of competency as Fisherman, Grade 4 or 3 must produce evidence of at least six months service on deck in fishing vessels over 25 tons gross.

15. HIGHER ACADEMIC QUALIFICATIONS

Persons in possession of school-leaving certificates as tabled hereunder shall be granted an exemption from the requirement to obtain a certificate of competency as Fisherman, Grade 4, and shall be admitted directly to the examination for certificate of competency as Fisherman, Grade 3, after having served for the period specified in the table below as a Cadet on ships of 100 tons or more and having followed an approved training course.

Skooleindsertifikaat	Diens ter see
Standerd 10 met Wiskunde of Natuurkunde, of enige sertifikaat wat die Direkteur-generaal as gelykwaardig beskou.	Drie jaar
Standerd 8 met Wiskunde of Natuurkunde, of enige sertifikaat wat die Direkteur-generaal as gelykwaardig beskou.	Drie jaar en ses maande

16. OPLEIDINGSINRIGTINGS

16.1 Die tyd wat bestee word aan 'n goedgekeurde kursus aan 'n goedgekeurde inrigting nadat die kandidaat 16 jaar oud geword het, kom in aanmerking as kwalifiserende diens: Met dien verstande dat die kandidaat 'n sertifikaat van die prinsipaal of ander persoon in beheer van die inrigting voorlê waarin getuig word van sy goeie gedrag en bekwaamheid tot op die datum waarop hy die inrigting verlaat het.

16.2 Die Direkteur-generaal bepaal ten opsigte van elke inrigting watter deel van die tyd wat by die inrigting bestee is, gereken moet word as diens gelykwaardig aan diens ter see.

17. ONVOLDOENDE DIENS

17.1 Indien daar bevind word dat 'n kandidaat wat in 'n eksamen geslaag het, nie oor voldoende diens beskik om hom geregtig te maak op 'n bekwaamheidsertifikaat vir die graad waarvoor hy geëksamineer is nie, word daar nie 'n sertifikaat vir daardie graad aan hom uitgereik nie.

17.2 Indien daar bevind word dat daar 'n fout ingesluip het in die berekening van die kandidaat se diens en dat dit nie te wyte is aan 'n vergissing van of opsetlike wanvoorstelling deur die kandidaat nie, word die sertifikaat uitgereik sodra die kandidaat die ontbrekende dienstyd uitgedien het.

17.3 Indien daar bevind word dat die fout vanweë 'n opsetlike wanvoorstelling van die kandidaat begaan is, word die sertifikaat eers uitgereik nadat die kandidaat die ontbrekende dienstyd uitgedien het tesame met sodanige bykomende dienstyd as wat die eksaminator na goeddunke kan bepaal.

HOOFSTUK 3

EKSAMENPROSEDURE

18. ALGEMEEN

18.1 Die eksamens begin elke dag op 'n tyd wat die eksaminator bepaal. Daar word van kandidate verwag om hulle minstens 15 minute voor die bepaalde tyd aan te meld.

18.2 'n Kandidaat wat versuim om hom op die bepaalde tyd vir enige deel van die eksamen aan te meld, kan druip weens nie-verskyning, tensy hy redelike bewys voorlê dat sy nie-verskyning onvermydelik was. As 'n kandidaat weens nie-verskyning druip, verbeur hy die eksamengeld.

18.3 Niemand word in die eksamenkamer toegelaat nie behalwe diegene wat pligmatig teenwoordig moet wees.

18.4 Algehele stilte moet vir die volle duur van 'n skriftelike eksamen gehandhaaf word.

19. GEBRUIK VAN BOEKE EN INSTRUMENTE

19.1 Alle papier, boeke, tafels en kaarte wat vir die eksamen nodig is, word deur die eksaminator verskaf. Daar word van die kandidaat verwag om sy eie pen en potlood te bring.

19.2 'n Kandidaat wat ander tafels wil gebruik as dié wat die eksaminator verskaf, mag dit doen mits hy die tafels voor die aanvang van die eksamen eers deur die eksaminator laat ondersoek en goedkeur. Daar mag geen geskrewe aantekeninge op die tafels aangebring wees nie.

School-leaving certificate	Service at sea
Standard 10 with mathematics or physical science, or any certificate considered by the Director-General to be equivalent.	3 years
Standard 8 with mathematics or physical science, or any certificate considered by the Director-General to be equivalent.	3 years 6 months

16. TRAINING ESTABLISHMENTS

16.1 Time spent on an approved course at an approved establishment after the attainment of the age of 16 years shall count towards the period of qualifying service provided that the candidate produces a certificate from the principal or other person in charge of the establishment testifying to his good conduct and proficiency up to the time of his leaving the establishment.

16.2 The Director-General shall determine in respect of each establishment what proportion of the time spent at that establishment shall count towards service equivalent to service at sea.

17. INSUFFICIENT SERVICE

17.1 If, after a candidate has passed the examination, it is discovered that his service is insufficient to entitle him to receive a certificate of the grade for which the examination has been passed, a certificate of that grade shall not be granted to him.

17.2 If it is found that an error has occurred in the calculation of the candidate's service and that it did not occur through any fault or wilful misrepresentation on the part of the candidate, the certificate shall be granted when the candidate has made up the deficiency in service.

17.3 If it is found that the error occurred through the wilful misrepresentation of the candidate, the certificate shall be granted only when the candidate has made up the deficiency in service, together with such extra service as the examiner in his discretion, may decide.

CHAPTER 3

EXAMINATION PROCEDURE

18. GENERAL

18.1 Examinations shall begin on each day at a time appointed by the examiner. Candidates are expected to present themselves at least 15 minutes prior to the appointed time.

18.2 A candidate who fails to present himself at the appointed time for any part of the examination may be failed by default, in the absence of reasonable proof that failure to attend was unavoidable. If a candidate is failed by default the examination fee shall be forfeited.

18.3 No persons other than those whose duties require them to be present shall be allowed in the examination room.

18.4 Complete silence must be maintained for the full duration of a written examination.

19. USE OF BOOKS AND INSTRUMENTS

19.1 All papers, books, tables and charts which are necessary for the examination shall be supplied by the examiner. The candidate is expected to provide pen and pencil.

19.2 A candidate who wishes to use tables other than those provided by the examiner may do so provided that he submits them to the examiner for scrutiny and approval before the commencement of the examination. These tables shall not contain any manuscript notes.

19.3 Al die instrumente wat vir die eksamen nodig is, word deur die eksaminator verskaf, maar 'n kandidaat mag sy eie teken- en rekeninstrumente na goeddunke van die eksaminator gebruik.

20. OPLOSSINGS

20.1 'n Kandidaat mag probleme oplos volgens enige metode wat hy gewoond is om te gebruik, mits sodanige metode in beginsel korrek is en akkuraat genoeg is, en mits al die werk op die antwoordstel uiteengesit word.

20.2 'n Kandidaat wat 'n rekeninstrument vir sy berekenings gebruik, moet op sy antwoordstel 'n volledige uiteensetting gee van hoe hy die antwoord verkry het. As so 'n werkuiteensetting nie verstrek word nie, word geen punte toegeken nie.

21. VERLANGDE GRAAD VAN AKKURAATHEID

21.1 Kandidate moet so akkuraat werk as wat die beskikbare gegewens en die betrokke tipe probleem toelaat. Inligting uit tafels moet so noukeurig wees as wat die inherente akkuraatheid van die tafels toelaat, en finale antwoorde hoef nie noukeuriger te wees as wat geregverdig is nie.

21.2 Wanneer hulle berekenings doen om 'n skip se posisie te bepaal, word daar van kandidate verwag om dit tot 0,1 van 'n boogminuut en tot die naaste sekonde in tyd te doen. Enige berekeningsmetode waarvolgens 'n standlyn bepaal word, behoort 'n antwoord korrek tot hoogstens 0,5 van 'n seemyl te gee.

21.3 By die berekening van kompasfoute, liggings en koerse moet die antwoord tot die naaste volle graad bereken word.

21.4 By die berekening van getye moet die antwoord binne 150 mm van die presiese antwoord wees.

22. MONDELINGE EKSAMENS

22.1 Waar 'n eksamen deels mondeling en deels skriftelik is, kan die eksaminator mondelinge vrae na aanleiding van die kandidaat se skriftelike antwoorde aan hom stel.

22.2 Van 'n kandidaat wat vanweë 'n ernstige gebrek aan praktiese kennis in die mondelinge deel van die eksamen druip, kan die eksaminator na goeddunke verwag om verdere diens ter see te verrig voordat hy hereksamineer word. Sodanige diens mag nie langer as ses maande duur nie.

23. STRAWWE

23.1 Die diensdokumente (dit is sertifikate, getuigskrifte, ens) van 'n kandidaat wat enige boek, instrument of ander eiendom van die Departement skend of andersins beskadig, word teruggehou totdat hy die skade herstel of die beskadigde artikel vervang het.

23.2 'n Kandidaat mag behoudens die bepalings van regulasie 19.2 nie tydens enige deel van 'n skriftelike eksamen enige boeke, aantekeninge, memoranda of dokumente by hom hê nie.

23.3 'n Kandidaat mag nie die eksamenkamer tydens 'n skriftelike eksamen sonder toestemming en sonder dat hy die vraestel waarmee hy besig is ingelewer het, verlaat nie.

23.4 'n Kandidaat mag onder geen omstandighede die gebou waarin die eksamen aan die gang is, verlaat met die voorneme om na die eksamenkamer terug te keer nie.

23.5 'n Kandidaat mag nie tydens enige deel van 'n skriftelike eksamen enige ongeoorloofde boek of geskrif raadpleeg of enige werk van iemand anders afskryf of aan iemand anders enige hulp verleen of inligting gee of hulp of inligting van iemand anders aanvaar of op enige manier met iemand anders as die eksaminator kommunikeer of enige deel van die vrae of antwoorde afskryf met die doel om dit uit die eksamenkamer te neem nie.

19.3 All instruments necessary for the examination shall be supplied by the examiner but a candidate may use his own drawing and calculating instruments, at the discretion of the examiner.

20. SOLUTIONS

20.1 A candidate may solve problems by any method he is accustomed to use, provided that such method is correct in principle, affords the required degree of precision and that all work is shown on the answer sheet.

20.2 A candidate who uses a calculating instrument for his calculations shall show on his answer sheet the full working statement necessary to arrive at the results. If the statement is not so shown no marks shall be awarded.

21. DEGREE OF PRECISION REQUIRED

21.1 Candidates should work to a degree of precision consistent with the data available and the type of problem in question. Information from tables should be extracted as accurately as possible consistent with the inherent accuracy of the tables, and final answers should be given to the best degree of precision which is justified, and no more.

21.2 When making calculations to obtain a ship's position, candidates are expected to work to 0,1 of a minute of arc and to the nearest second of time. Any method of calculation used to obtain a position line should be capable of giving an answer within a maximum of one half of a nautical mile.

21.3 In the calculation of compass errors, bearings and courses, the answer should be worked to the nearest whole degree.

21.4 Tidal calculations should be worked to provide an answer within 150 mm of a precise result.

22. ORAL EXAMINATIONS

22.1 In the case of examinations which consist of both written and oral sections, the examiner may ask the candidate oral questions arising from the written work produced by the candidate.

22.2 A candidate who fails the oral part of the examination through serious weakness in practical knowledge, may, at the examiner's discretion be required to perform further service at sea before being re-examined. Such service shall not exceed six months.

23. PENALTIES

23.1 The service papers (i.e. certificates, testimonials, etc.) of a candidate who defaces or otherwise damages any book, instrument or other property of the Department shall be retained until he has rectified the damage or replaced the damaged article.

23.2 Subject to the provisions of regulation 19.2 a candidate may not have in his possession during any part of a written examination any books, notes, memoranda or papers.

23.3 A candidate may not leave the examination room during a written examination without permission and without handing in the paper upon which he is engaged.

23.4 A candidate may not, under any circumstances, leave the building while the examination is in progress with the intention of returning to the examination room.

23.5 A candidate may not, during any part of a written examination refer to any unauthorised book or paper, or copy any work from another person, or afford any assistance or give any information to another person, or accept assistance or information from another person, or communicate in any way with another person other than the examiner, or copy any part of the questions or answers for the purpose of taking it out of the examination room.

23.6 'n Kandidaat wat die bepalings van subregulasies 2, 3, 4 of 5 oortree of wat met die eksaminator parmantig is of hom aan wanordelike of onbehoorlike gedrag in of by die eksamenkamer skuldig maak, word geag die hele eksamen te gedruip het en kom vir 'n tydperk van ses maande nie vir 'n hereksamen in aanmerking nie.

24. TYD WAT TUSSEN DRUIPING EN HEREKSAMINERING MOET VERLOOP

24.1 'n Kandidaat wat in enige deel van die eksamen gedruip het, kom nie voor die volgende aangegewe eksamendatum vir hereksaminering in aanmerking nie. Hierdie reëling mag na die goeddunke van die betrokke eksaminator verander word, maar die kandidaat mag onder geen omstandighede hereksamineer word voordat die week wat volg op die week waarin hy gedruip het, verstryk het nie.

24.2 Indien 'n kandidaat slaag in enige deel van 'n eksamen wat uit meer as een deel bestaan, ontvang hy krediet vir die deel waarin hy geslaag het. Sodanige krediet bly geldig vir ses maande en in dié tydperk moet die kandidaat in die oorblywende dele slaag. As hy in gebreke bly om dit te doen, word hy in die hele eksamen hereksamineer.

24.3 As 'n kandidaat 'n tweede keer in die skriftelike of mondelinge deel van 'n eksamen druip, is sy straf 'n verdere drie maande diens ter see. As hy 'n derde keer druip, is sy straf ses maande diens ter see.

25. OMVANG VAN KENNIS VERLANG

Waar die omvang van die kennis wat van die kandidaat verlang word, nie uit die voorgeskrewe leerplan blyk nie, moet dit bepaal word deur 'n werkkomitee wat uit 'n verteenwoordiger van die Departement, die visserybedryf en elke opleidingsinrigting bestaan.

26. EKSAMENROOSTER EN VOORGESKREWE PUNTETOEKENNING

23.6 A candidate who contravenes the provisions of subregulations 2, 3, 4 or 5 or who is guilty of insolence to the examiner, or of disorderly or improper conduct in or about the examination room shall be regarded as having failed the whole of the examination and shall not be accepted for re-examination for a period of six months.

24. TIME ELAPSE BETWEEN FAILURE AND RE-EXAMINATION

24.1 A candidate who has failed in any part of an examination shall not be eligible for re-examination until the following scheduled date of examination. This arrangement may be varied by the examiner concerned at his discretion, but under no circumstances shall the candidate be re-examined before the expiration of the week following the week in which he failed.

24.2 Where any part of an examination which consists of more than one part is passed the candidate shall receive credit for the part he has passed and such credit shall hold good for six months, during which time the remaining parts must be passed. Failure to comply shall result in the candidate being re-examined in the whole of the examination.

24.3 In the case of a second failure in the written or oral part of any examination the candidate shall be penalised by having to serve a further three months period at sea. In the case of a third failure, the penalty shall be six months.

25. DEPTH OF KNOWLEDGE

Where the depth of knowledge required of the candidate is not evident from the prescribed syllabus, the required depth shall be established by a Working Committee consisting of a representative from the Department, the Fishing Industry and each Training Establishment.

26. EXAMINATION TIME-TABLE AND PRESCRIBED MARKING SCHEDULE

		Tyd	Totale getal punte	Persentasie-slaagsyfer
26.1	**Visserman Graad 3**			
	Eerste dag			
	Praktiese Navigasie en Kaartwerk	3 uur	100	70
26.2	**Visserman Graad 2**			
	Eerste dag			
	Praktiese Navigasie	3 uur	200	140
	Kaartwerk	2 uur	200	140
	Tweede dag			
	Algemene Skeepskennis	3 uur	100	50
26.3	**Visserman Graad 1**			
	Eerste dag			
	Algemene Skeepskennis	3 uur	200	100
	Weerkunde	2 uur	100	50
	Tweede dag			
	Praktiese Navigasie en Kaartwerk	3 uur	200	140

		Time	Total Marks	Percentage Pass Mark
26.1	**Fisherman Grade 3**			
	First Day			
	Practical Navigation & Chartwork	3 hrs	100	70
26.2	**Fisherman Grade 2**			
	First Day			
	Practical Navigation	3 hrs	200	140
	Chartwork	2 hrs	200	140
	Second Day			
	General Ship Knowledge	3 hrs	100	50
26.3	**Fisherman Grade 1**			
	First Day			
	General Ship Knowledge	3 hrs	200	100
	Meteorology	2 hrs	100	50
	Second Day			
	Practical Navigation & Chartwork	3 hrs	200	140

26.4 Mondelinge eksamens en eksamens in seinwerk word na aflegging van die skriftelike gedeelte, as daar is, deur die eksaminator afgeneem op 'n tyd deur die eksaminator bepaal.

HOOFSTUK 4

GELDE

27. WANNEER BETAALBAAR

'n Kandidaat wat 'n eksamen vir 'n bekwaamheidsertifikaat wil aflê, moet die eksamengeld voor die eksamendatum betaal, en geen kandidaat word tot die eksamen toegelaat nie, tensy hy 'n kwitansie vir die eksamengeld aan die eksaminator toon.

28. WAAR BETAALBAAR

Die eksamengeld moet aan die naaste bevoegde beampte betaal word, wat 'n kwitansie moet uitreik met vermelding van—

(a) die naam van die kandidaat;
(b) die bedrag wat betaal is; en
(c) die graad van die eksamen.

29. TERUGBETALING VAN GELDE

As 'n kandidaat weens omstandighede buite sy beheer nie 'n eksamen kan aflê waarvoor hy gelde betaal het nie, kan hy skriftelik by die bevoegde beampte aansoek doen om die terugbetaling van die gelde. As die bevoegde beampte van mening is dat die aansoek op redelike gronde berus, stuur hy dit deur na die Direkteur-generaal wat die terugbetaling kan magtig.

30. HEFFING VIR 'N VERLORE SERTIFIKAAT

'n Heffing van R10 is betaalbaar vir 'n gesertifiseerde afskrif van 'n verlore sertifikaat: Met dien verstande dat geen heffing betaalbaar is as die sertifikaat verlore geraak het weens skipbreuk of 'n brand aan boord nie.

31. GELDETABEL

31.1 Die volgende eksamengelde is betaalbaar:

31.1 A. *Vissermanne:*

(a) Visserman Graad 4: R20.
(b) Visserman Graad 3: R30.
(c) Visserman Graad 2: R40.
(d) Visserman Graad 1: R50.

31.1.1 Bogenoemde gelde sluit dié vir die eksamen in seinwerk in as dit gelyktydig met die res van die eksamen afgelê word. As 'n kandidaat net in die skriftelike of mondelinge deel hereksamineer word, is die helfte van genoemde gelde betaalbaar, wat 'n hereksamen in seinwerk insluit as dit gelyktydig afgelê word.

31.1.2 As die kandidaat in die seinwerkdeel van die eksamen afsonderlik hereksamineer word, is 'n bedrag van R15 vir elke eksaminering betaalbaar.

31.1.3 'n Bedrag van R3 is betaalbaar vir die aflê van die gesigstoets vir kleur en vorm, maar as dié toets gelyktydig met die eksamen vir 'n bekwaamheidsertifikaat afgelê word, is geen gelde betaalbaar nie.

31.2 B. *Seemasjiniste:*

(a) Seemajinis Graad 3: R20.
(b) Seemasjinis Graad 2: R30.
(c) Seemasjinis Graad 1: R50.

HOOFSTUK 5

HERROEPING EN KORT TITEL

32. Die Regulasies in verband met die Eksamens vir Vissermanne, 1960, uitgevaardig by Goewermentskennisgewing R. 120 van die *Buitengewone Staatskoerant* van 22 Januarie 1960, word hierby herroep.

26.4 Oral and signals examinations will be conducted by the examiner, following the written part, if any, at a time to be determined by the examiner.

CHAPTER 4

FEES

27. WHEN TO PAY FEES

A candidate for examination for a certificate of competency shall pay the examination fee prior to the date of the examination and no candidate shall be allowed to sit for the examination unless he produces to the examiner the receipt for the fee paid.

28. WHERE TO PAY FEES

The fee for examination shall be paid to the nearest proper officer who shall issue a receipt stating—

(a) the name of the candidate;
(b) the amount paid; and
(c) the grade of the examination.

29. REFUND OF FEES

If, through circumstances beyond the control of a candidate, he is unable to undergo the examination for which fees have been paid he may apply in writing to the proper officer for a refund of such fees. If the proper officer considers that the application is based upon reasonable grounds he shall transmit it to the Director-General who may authorise the refund.

30. FEE FOR A LOST CERTIFICATE

A fee of R10 shall be paid for a certified copy of a lost certificate of competency, provided that no fee shall be paid if the certificate was lost through shipwreck or fire on board ship.

31. TABLE OF FEES

31.1 The fees payable for examinations are as follows:

31.1 *A. Fishermen:*

(a) Fisherman Grade 4: R20.
(b) Fisherman Grade 3: R30.
(c) Fisherman Grade 2: R40.
(d) Fisherman Grade 1: R50.

31.1.1 The above fees include the fee for the examination in signalling, if it is taken at the same time as the rest of the examination. If a candidate is re-examined in only the written part or the oral part, one half the above fee is payable, which includes a re-examination in signalling, if taken at the same time.

31.1.2 If a candidate is re-examined in the signalling part of the examination separately, a fee of R15 shall be paid for each examination.

31.1.3 A fee of R3 shall be paid to undergo the colour and form vision test, but when such test is taken at the same time as an examination for a certificate of competency, no fee shall be payable.

31.2 B. *Motormen:*

(a) Marine Motorman Grade 3: R20.
(b) Marine Motorman Grade 2: R30.
(c) Marine Motorman Grade 1: R50.

CHAPTER 5

REPEAL AND SHORT TITLE

32. The Examination Regulations for Fishermen, 1960, promulgated by Government Notice R. 120 in the *Extraordinary Government Gazette* of 22 January 1960, are hereby repealed.

33. Hierdie regulasies word die Eksamenregulasies vir Bekwaamheidsertifikate vir Vissermanne en Seemasjiniste, 1985, genoem.

AANHANGSELS

AANHANGSEL 1: Vereistes ten opsigte van ouderdom en seediens en eksamenleerplanne vir bekwaamheidsertifikate—vissermanne.

AANHANGSEL 2: Vereistes ten opsigte van ouderdom en seediens en eksamenleerplanne vir bekwaamheidsertifikate—seemasjiniste.

AANHANGSEL 3: Gesigstoetse: Die afneem van die toetse en die verlangde standaard van gesigskerpte.

AANHANGSEL 1

VEREISTES TEN OPSIGTE VAN OUDERDOM EN SEEDIENS EN LEERPLANNE VIR VISSERMANGRADE

AANHANGSEL 1

VEREISTES TEN OPSIGTE VAN OUDERDOM EN SEEDIENS EN EKSAMINLEERPLAN VIR VISSERMAN GRAAD 4

1. Minimum ouderdom—19 jaar.

2. Seediens—Minstens drie jaar dekdiens op vissersvaartuie van meer as 25 bruto ton.

LEERPLAN

1. MONDELINGE EKSAMEN IN NAVIGASIE

1.1 Die praktiese gebruik en beperkinge van elektroniese navigasiestelsels wat tans op 'n groot aantal vissersvaartuie gebruik word, bv. radar, Decca-navigator, eggopeiler, radiorigtingsoeker, satellietnavigator, elektroniese skeepsjoernale.

1.2 Die beginsel en gebruik van die magnetiese kompas en die oorsake en aanwending van variasie en deviasie, en die vergelyking van die magnetiese kompas met die girokompas.

1.3 Hoe om 'n stuurkoers en die afstand tussen twee punte op 'n kaart te kry.

1.4 Hoe om kompaspeilings om te sit in ware pailings en andersom.

1.5 Posisiebepaling deur middel van—

(i) radar- of visuele kruispeilings;

(ii) peiling en radarafstand of eggopeiler;

(iii) enige kombinasie van bogenoemde metodes.

1.6 Die vertolking van 'n kaart, veral wat betref inligting oor boeie, ligte, radiobakens, navigasiehulpmiddels, diepte- en hoogtekontoere, seestrome, gesteldheid van die seebodem, kaartregstellings en -bywerking en kruisnetkaarte.

1.7 Die gebruik en byhou van 'n dekjoernaal.

2. MONDELINGE EKSAMEN IN SEEMANSKAP

2.1 Die Internasionale Regulasies vir die Voorkoming van Botsings ter See.

2.2 Hoe om 'n skip gereed te maak om 'n hawe te verlaat en binne te vaar, veilige waghou op die brug, ter see of voor anker, en die aflos van die wag.

2.3 Kennis van die regulasies in verband met die voer van reddings- en brandblustoerusting en die versorging en gebruik van sodanige toerusting; soorte brande en soorte brandblussers.

2.4 Hoe om 'n vaartuig aan 'n kaai of hawehoof vas te maak en watter voorsorgmaatreëls teen beskadiging getref moet word.

2.5 Hoe om gereed te maak om 'n skip op sleeptou te neem en self gesleep te word, metodes om boegrigting te hou as 'n skip ontredder is, met spesiale verwysing na die beskikbaarheid van materiaal aan boord.

2.6 Die uitkenning van verskillende soorte tou wat gewoonlik op vissersvaartuie gebruik word en hul voor- en nadele.

2.7 Hoe om die gewone knope, skootsteke en slae te maak en te gebruik.

2.8 Die belangrikheid van waterdigtheidintegriteit.

2.9 Optrede as iemand oorboord geval het.

2.10 Die belangrikheid van sindelikheid op 'n skip.

2.11 'n Basiese kennis van visgerei, en die hantering daarvan.

2.12 Die IALA-boeiestelsel.

2.13 Hoe om die lettervlae vir die Internasionale Seinkode te herken; en ook die betekenis daarvan.

33. These regulations shall be called the Examination regulations for Fishermen and Marine Motormen 1985.

ANNEXURES

ANNEXURE 1: Age and sea service requirements and examination syllabuses for certificates of competency—fishermen.

ANNEXURE 2: Age and sea service requirements and examination syllabuses for certificates of competency—marine motormen.

ANNEXURE 3: Sight tests: Conduct of the tests and standard of vision required.

ANNEXURE 1

AGE AND SEA SERVICE REQUIREMENTS AND SYLLABUSES FOR FISHERMAN GRADES

ANNEXURE 1

AGE, SEA SERVICE REQUIREMENTS AND SYLLABUS FOR EXAMINATION AS FISHERMAN GRADE 4

1. Minimum age—19 years.

2. Sea service—At least three years service on deck of fishing vessels over 25 gross tons.

SYLLABUS

1. ORAL EXAMINATION IN NAVIGATION

1.1 The practical use and limitations of electronic navigation systems currently found on a large proportion of fishing vessels, e.g. radar, Decca navigator, echo sounder, radio direction finder, satellite navigator, electronic logs.

1.2 The principle and use of the magnetic compass and the causes of and application of variation and deviation, and the comparison of a magnetic compass with a gyro compass.

1.3 Finding a course to steer and the distance between two points on a chart.

1.4 Converting compass bearings to true bearings and vice-versa.

1.5 Position fixing by means of—

(i) cross bearings obtained visualy or by radar;

(ii) bearing and radar range or echo sounder;

(iii) Decca Navigator;

(iv) any combination of the above methods.

1.6 The interpretation of a chart, particularly information given about buoys, lights, radio beacons, navigational aids, depth and height contours, ocean currents, nature of the bottom, chart corrections and updating and lattice charts.

1.7 The use and upkeep of a deck logbook.

2. ORAL EXAMINATION IN SEAMANSHIP

2.1 International Regulations for Preventing Collisions at sea.

2.2 The preparation of a ship for leaving and entering port, the keeping of a safe bridge watch, at sea or at anchor, and the handing over of the watch.

2.3 A knowledge of the regulations for the carriage of lifesaving and fire-fighting equipment and the care and use of such equipment; types of fires and of extinguishers.

2.4 Securing a vessel alongside a quay or jetty and precautions to be taken to prevent damage.

2.5 Prepare for towing and being towed, methods whereby a disabled ship can be kept head to sea with particular reference to the availability of materials on board.

2.6 The recognition of different kinds of rope in common use upon fishing vessels, their advantages and disadvantages.

2.7 The ability to make and use common knots, bends and hitches.

2.8 The importance of watertight integrity.

2.9 Action to be taken in the event of man overboard.

2.10 The importance of cleanliness in a vessel.

2.11 Basic knowledge of fishing gear and the handling thereof.

2.12 IALA buoyage system.

2.13 To recognise and know the meaning of the alphabetical flags of International Code of Signals.

2.14 Noodseine wat deur skepe en vliegtuie gebruik word en die strawwe vir die misbruik daarvan.

2.15 'n Elementêre kennis van tipiese weerpatrone en van die vernaamste seestrome langs die kus van Suidelike Afrika.

2.16 Hoe om duidelik bewoorde weerberigte te ontvang en gevolgtrekkings in verband met die verwagte weerstoestande te maak.

2.17 Die gebruik van helikopters in reddingswerk; die voorsorgmaatreëls wat getref moet word wanneer personeel of goedere met die helikopterhyser verplaas word.

2.18 'n Deeglike kennis van die bedrywighede in verband met die tewaterlating en praktiese hantering van alle oorlewingsvaartuie en -toerusting aan boord, en van die beginsel van oorlewing in oorlewingsvaartuie ter see.

VEREISTES TEN OPSIGTE VAN OUDERDOM EN SEEDIENS EN EKSAMENLEERPLAN VIR VISSERMAN GRAAD 3

1. Minimum ouderdom—19 jaar.

2. Seediens:

(i) Een jaar as tweede in bevel op enige vissersvaartuig van 50 ton of meer, of

(ii) een jaar in enige offisierswagpos op 'n vissersvaartuig van 100 ton of meer,

terwyl reeds in besit van 'n Graad 4-sertifikaat, of

(iii) sodanige diens as wat regulasie 15 voorskryf.

LEERPLAN

1. SKRIFTELIKE EKSAMEN IN PRAKTIESE NAVIGASIE EN KAARTWERK (3 UUR)

Benewens die leerplan vir Visserman Graad 4—

1.1 hoe om—

(i) die uitwerking van stroom en drif op koers en spoed te bepaal,

(ii) die koers wat gestuur moet word om 'n bepaalde grondkoers te behou,

(iii) die koers en snelheid van die stroom te bepaal;

1.2 hoe om—

(i) die kompasfout te bepaal deur gebruik te maak van—

(a) oorgangspeilings,

(b) die peiling van die son te eniger tyd,

(ii) die skip se posisie te eniger tyd te bepaal deur gebruik te maak van—

(a) koppelkoerstafels of kaartuitstipping,

(b) oorbringde standlyne,

(c) die rigtingsoeker en 'n reeks dieptepeilings,

(d) standlyne, verkry van sonwaarnemings met behulp van waarnemingsherleidingstabelle as die kandidaat dit wil gebruik, gekombineer met enige metode hierbo genoem;

1.3 'n deeglike kennis van navigasiekaarte en publikasies soos vaaraanwysings, getytafels, kennisgewings aan seevaarders en navigasiewaarskuwings, en die vermoë om dit te gebruik.

2. MONDELINGE EKSAMEN IN SEEMANSKAP

Benewens die leerplan vir Visserman Graad 4—

2.1 elementêre kennis van die bepalings van Hoofstuk V van die Handelskeepvaartwet, 1951 (Veiligheid van Skepe en Menselewens ter See), soos van toepassing op skepe van minder as 100 ton;

2.2 kennis van die afmetings en treksterkte van toue en draad, die versorging daarvan en voorsorgmaatreëls by die gebruik en opberging daarvan. Die identifisering van veilige werkpraktyke ten opsigte van visgerei en visvangbedrywighede. Eenvoudige berekenings ten opsigte van die veilige werklas van toue, en die kragwins wat met behulp van takelstelle verkry word;

2.3 die gebruik, versorging en onderhoud van redding- en brandblustoerusting;

2.4 die hantering van 'n vissersboot binne en buite die hawe, ankergooi, maneuvrering in onstuimige weer, hoe 'n skip op sleeptou te neem en self gesleep te word;

2.5 optrede in noodgevalle of tydens ontreddering of stranding; oorlewings- en reddingsprosedures met inbegrip van helikopterreddingswerk;

2.6 optrede om beskadiging te beperk in geval van brand, botsing of stranding;

2.7 die praktiese gebruik van alle navigasie-instrumente aan boord van 'n skip, soos 'n sekstant, chronometer of chronograaf, barometer en elektroniese navigasiehulpmiddels;

2.8 elementêre kennis van stabiliteit, en stywe en rank vaartuie;

2.9 die belangrikheid van die behoud van waterdigtheid, afsluittoestelle, oorsyse en deurdekopenings, byvoorbeeld afvalstortgeute en fabrieksdek-spuigatkleppe;

2.14 Signals of distress used by ships or aircraft, penalties for misuse.

2.15 An elementary knowledge of typical weather patterns and of the principal ocean currents experienced in the coastal waters of Southern Africa.

2.16 To receive plain language weather reports and to draw conclusions as to expected weather.

2.17 The use of helicopters in rescue work; the precautions to be taken when transferring personnel or goods by the helicopter hoist.

2.18 A thorough knowledge of the operations connected with the launching and the practical handling of all survival craft and equipment on board, and of the principle of survival in such survival craft at sea.

AGE, SEA SERVICE REQUIREMENTS AND SYLLABUS FOR EXAMINATION AS FISHERMAN GRADE 3

1. Minimum age—19 years.

2. Sea service:

(i) One year as second in command on any fishing vessel of 50 tons or more, or

(ii) one year in any officer watchkeeping position on a fishing vessel of 100 tons or more,

whilst holding a Grade 4 certificate, or

(iii) service as required by regulation 15.

SYLLABUS

1. WRITTEN EXAMINATION IN PRACTICAL NAVIGATION AND CHARTWORK (3 HOURS).

In addition to the syllabus for Fisherman Grade 4—

1.1 to find—

(i) the effect of current and leeway on course and speed,

(ii) the course to steer to make good a certain tracking,

(iii) the set and rate of the current.

1.2 to determine—

(i) the compass error using—

(a) transit bearings,

(b) the bearing of the sun at any time,

(ii) the ship's position at any time using—

(a) traverse tables or chart plotting,

(b) transferred position lines,

(c) direction finder and a line of soundings,

(d) position lines obtained from observations of the sun with the aid of sight reduction tables if the candidate opts to use them, combined with any of the above methods.

1.3 a thorough knowledge of and the ability to use navigational charts and publications such as sailing directions, tide tables, notices to mariners and navigational warnings.

2. ORAL EXAMINATION IN SEAMANSHIP

In addition to the syllabus for Fisherman Grade 4—

2.1 elementary knowledge of the requirements of Chapter V of the Merchant Shipping Act, 1951 (Safety of Ships and Life at Sea) as applicable to ships of under 100 tons;

2.2 Knowledge of measurements and tensile strengths of ropes and wires, care and precautions during use and storage. Recognition of safe working practices in respect of fishing gear and fishing operations. Simple calculations in respect of safe working loads of ropes and power gained by purchases;

2.3 the use, care and maintenance of lifesaving and fire-fighting equipment;

2.4 the handling of a fishing boat in and out of harbour, anchoring, heavy weather manoeuvring, towing and being towed;

2.5 the action to be taken when disabled, in distress or stranded, survival and rescue procedures including helicopter rescue;

2.6 action to be taken for damage control in case of fire, collision or stranding;

2.7 practical use of all navigation instruments found on board ships such as sextant, chronometer or time piece, barometer and electronic aids to navigation;

2.8 elementary knowledge of stability, stiff and tender vessels;

2.9 importance of watertight integrity, closing devices, overside and through deck openings for example offal chutes and factory deck scupper valves;

2.10 die oorplaas van 'n beseerde of goedere met 'n boot of vlot ter see;

2.11 die praktiese gebruik van die Internasionale Seinkode vir die stuur en ontvang van boodskappe deur middel van vlae of die Morse-kode.

VEREISTES TEN OPSIGTE VAN OUDERDOM EN SEEDIENS EN EKSAMENLEERPLAN VIR VISSERMAN GRAAD 2

1. Minimum ouderdom–21 jaar.

2. Seediens:

(i) Een jaar as tweede in bevel op vaartuie van meer as 100 ton, of
(ii) een jaar in bevel op vaartuie van minder as 100 ton plus ses maande in enige offisierswagpos op vaartuie van meer as 300 ton,

terwyl in besit van 'n Graad 3-sertifikaat.

LEERPLAN

1. SKRIFTELIKE EKSAMEN IN NAVIGASIE (3 UUR)

Benewens die leerplan vir Visserman Graad 3, hoe om—

1.1 die kompasfout te bepaal deur middel van die peiling van die maan of Venus;

1.2 die skip se breedteligging te bepaal deur middel van die meridiaanshoogte van die maan of Venus;

1.3 die rigting te bepaal van die standlyn waarop die skip geleë is en 'n posisie waardeur dit gaan, deur 'n waarneming van die son of Venus naby of buite die meridiaan;

1.4 die skip se ligging te bepaal deur middel van standlyne wat met behulp van twee of meer waarnemings met of sonder 'n meetvaart verkry is.

2. SKRIFTELIKE EKSAMEN IN KAARTWERK (2 UUR)

Benewens die vereistes vir Visserman Graad 3:

2.1 Maksimum sigafstand van ligte en landmerke volgens hul hoogte bo seevlak en die gebruik van die sekstant om afstand seewaarts te bepaal.

2.2 Kandidate word mondeling getoets in verband met die kies van geskikte punte vir peilings, nadering en ankergooi en die binnevaar van smal waters. Die betroubaarheid van kaarte.

2.3 Die gebruik van getytafels om hoogwater- en laagwatertye te bereken en die tye wanneer die gety 'n bepaalde hoogte bereik.

3. SKRIFTELIKE EKSAMEN IN ALGEMENE SKEEPSKENNIS (3 UUR)

3.1 Algemene kennis van die bou van 'n vissersvaartuig met spesifieke verwysing na huidbeplating, spante, dekbeplating, waterdigte skotte, waterdigte deure, peilkokers, lugpype, lens- en ballasleidings en brandbluspompstelsels.

3.2 Veiligheidsmaatreëls aan boord van vissersvaartuie, wat insluit die optakel van valrepe, veiligheidslyne, die werking van laaibome, verhaaltoue en visgerei, meertoue en -drade, die werking van ankers en die gebruik van beskermingsklere; berekenings in verband met die kragwins met behulp van katrolle en takelstelle verkry, die veilige werklaste van toue en die maksimum laste wat met 'n tou opgehys kan word.

3.3 'n Algemene kennis van stabiliteit, wat insluit swaartepunt, drukkingspunt, metasenter en metasenterhoogte; stabiele, neutrale en onstabiele ewewig; stywe en rank skepe; lolganghoek, die oorsaak en regstelling daarvan; statiese stabiliteit, stabiliteitskrommes en stabiliteitstrek; die uitwerking wat die oplig en laat sak van gewigte en die aan boord neem en los van gewigte op die statiese stabiliteit het; die uitwerking van gewigte wat op 'n sekere hoogte hang; die uitwerking van vryboord op die stabiliteitstrek; die uitwerking van vry oppervlak op die metasenterhoogte; en kennis van die stabiliteitsinligting wat aan 'n vissersvaartuig verstrek word. Eenvoudige berekenings betreffende bogenoemde.

4. MONDELINGE EKSAMEN IN SEEMANSKAP, WEERKUNDE EN GESAGVOERDERSBESIGHEIDSPLIGTE

Benewens die vereistes vir 'n Visserman Graad 3-sertifikaat:

4.1 Skeepshantering, vaslê en losgooi, ankergooi, vasmeer en losmeer van skepe.

4.2 Hoe om in onstuimige weer boegrigting te hou as die skip ontredder is.

4.3 Optrede wanneer 'n skip beskadig of aan die brand is of gestrand het.

4.4 Die optakeling en gebruik van noodstuurgerei, die voorkoming van waterinstroming in geval van 'n botsing, en ander noodmaatreëls.

4.5 Brandbeheer en die gebruik van brandblustoestelle.

4.6 Selfontbranding met spesiale verwysing na vismeelstuwing.

4.7 Noodprosedures en veilige werkpraktyke soos vervat in die toepaslike gedeeltes van die FAO/ILO/IWO Code of Safety for Fishermen and Fishing Vessels, Part A, en in Hoofstuk VIII van die Annex to the Torremolinos International Convention for the Safety of Fishing Vessels, 1977.

2.10 transferring an injured man, or goods, at sea by means of boat or raft;

2.11 practical use of the International Code of Signals for transmitting and receiving messages by means of flags or the Morse Code.

AGE, SEA SERVICE REQUIREMENTS AND SYLLABUS FOR EXAMINATION AS FISHERMAN GRADE 2

1. Minimum age—21 years.

2. Sea service:

(i) One year second in command on vessels over 100 tons, or

(ii) one year in command on vessels under 100 tons plus six months in any officer watchkeeping position on vessels over 300 tons,

whilst holding a Grade 3 certificate.

SYLLABUS

1. WRITTEN EXAMINATION IN NAVIGATION—(3 HOURS)

In addition to the syllabus for Fisherman Grade 3 to determine—

1.1 The compass error using the bearing of the Moon or Venus;

1.2 the ship's latitude by meridian altitude of the Moon or Venus;

1.3 the direction of the position line on which the ship is situated and a position through which it passes, from an observation of the sun or Venus near or out of the meridian;

1.4 the ship's position using position lines obtained from two or more observations, with or without a run.

2. WRITTEN EXAMINATION IN CHARTWORK—(2 HOURS)

In addition to the requirements for Fisherman Grade 3:

2.1 Dipping distances of lights and distances of sighting points of land of known height, and using the sextant to find distance off.

2.2 Candidates will be examined orally on the selection of suitable points for bearings, approaching and anchorage and entering narrow waters. The reliability of charts.

2.3 Using tide tables to calculate times of high water and low water, and times at which the tide will be a given height.

3. WRITTEN EXAMINATION IN GENERAL SHIP KNOWLEDGE—(3 HOURS)

3.1 General knowledge of the construction of a fishing vessel with specific reference to shell plating, framing, deck plating, watertight bulkheads, watertight doors, sounding pipes, air pipes, bilge and ballast lines and fire pumping systems.

3.2 Safety precautions abroad fishing vessels, which shall include the rigging of gangways, safety lines, working of derricks, warps and fishing gear, mooring ropes and wires, working of anchors and the use of protective clothing; calculations involving the power gained by tackles and purchases, safe working loads of ropes and maximum loads to be lifted on a rope.

3.3 A general knowledge of stability which shall include centre of gravity, centre of buoyancy, metacentre and metacentric height; stable, neutral and unstable equilibrium; stiff and tender ships; angle of loll, its cause and correction; statical stability, stability curves and range of stability; the effect on the statical stability of raising and lowering of weights and the taking on board and the discharging of weights; the effect of weights suspended at a height; the effect of freeboard on the range of stability; the effect of free surface on the metacentric height; and a knowledge of the stability information supplied to a fishing vessel. Simple calculations on the above.

4. ORAL EXAMINATION IN SEAMANSHIP, METEOROLOGY AND SHIPMASTER'S BUSINESS.

In addition to the requirements for a Fisherman Grade 3 certificate:

4.1 Ship handling, berthing and unberthing, anchoring, mooring and unmooring.

4.2 How to keep a ship's head to sea when disabled in heavy weather.

4.3 The action to be taken when damaged, stranded or on fire.

4.4 The rigging and use of emergency steering gear, the prevention of ingress of water in the case of collision and other emergency measures.

4.5 Fire control and the use of fire fighting appliances.

4.6 Spontaneous combustion with special reference to fishmeal stowage.

4.7 Emergency procedures and safe working practices as contained in the appropriate sections of the FAO/ILO/IMO Code of Safety for Fishermen and Fishing Vessels Part A, and in chapter VIII of the Annex to the Torremolinos International Convention for the Safety of Fishing Vessels, 1977.

4.8 Gesagvoerdersbesigheidspligte. Algemene kennis van die bepalings van die Handelskeepvaartwet, 1951, en die regulasies betreffende botsings, strandings en ander ongevalle. Sertifikate en dokumente wat aan boord gevoer moet word, hoe om hulle te bekom en die tydperk van hul regsgeldigheid. Die indiensneming, ontslag en beheer van die bemanning; lone en ander besoldiging. Bemanningskale. Die amptelike skeepsjoernaal en inskrywings daarin. Dissipline en misdrywe. Akkommodasie vir bemanning, higiëne en die welsyn van die bemanning. Inspeksies en verslae. Beroking en plaagbestryding.

4.9 Kennis van die wet met betrekking tot 'n persoon se posisie as gesagvoerder van 'n skip.

4.10 Hoe om die skip gereed te maak om oorlewendes van 'n ander skip te red.

4.11 Hoe om tussen drie hooftipes wolke te onderskei, en die betekenis van elkeen wat die verwagte weer betref.

4.12 Hoe om die rigting en krag van die wind, en die rigting en hoogte van die deining te bepaal.

4.13 Hoe om die heersende en voorafgaande weer te beskryf.

4.14 Hoe om 'n duidelik bewoorde weerberig op te stel wat geskik is om oorgesend te word en so 'n boodskap in die eerste ses groepe van die weerkode vir skepe te kodeer.

4.15 Begrip vir die weerpatrone en die vernaamste seestrome langs die kus van Suidelike Afrika.

4.16 Kennis van die tipiese weer wat voor, tydens en na 'n kouefront verwag kan word.

4.17 Hoe om afleidings te maak uit 'n eenvoudige weervoorspelling of sinoptiese kaart en om aan die hand van die barometriese neiging 'n beeld te kry van die verwagte weersgesteldheid.

5. SEINE

5.1 Hoe om seine te stuur en te ontvang in (i) die Morse-kode met 'n flitslamp, tot ses woorde per minuut, en (ii) die Internasionale Seinkode.

5.2 *Prakties:* Hoe om draagbare radiotoerusting gereed te maak vir gebruik op 'n reddingsboot of reddingsvlot, die antenne op te rig en al die noodfrekwensiegeriewe van die toerusting te gebruik.

VEREISTES TEN OPSIGTE VAN OUDERDOM EN SEEDIENS EN EKSAMENLEERPLAN VIR VISSERMAN GRAAD 1

1. Minimum ouderdom—23 jaar.

2. Seediens:

(i) Een jaar in bevel op vaartuie van meer as 600 ton, of

(ii) een jaar in bevel op vaartuie van meer as 100 ton

PLUS

ses maande as tweede in bevel op vaartuie van meer as 600 ton, of

(iii) twee jaar as tweede in bevel op vaartuie van meer as 600 ton,

terwyl in die besit van 'n Graad 2-sertifikaat.

1. SKRIFTELIKE EKSAMEN IN ALGEMENE SKEEPSKENNIS—VRAESTEL 1 (3 UUR)

1.1 Algemene idees oor skeepsbou en die gebruik van planne en gegewens wat aan boord beskikbaar is; algemene omskrywings van die hoofafmetings. Die name van die vernaamste dele van 'n skip.

Die kandidaat sal deur middel van sketse moet bewys dat hy prakties met die volgende vertroud is: langsbalke en spante; dwarsbalke en dwarsbalkknieë; waterdigte skotte; luikgate en afsluittoestelle; roere; stuurgerei; huid- en dekbeplating; dubbele bodem en piektenks; kimme; sytenks en vleueltenks; skroeframe; skroewe en skroefasse; skroefaskokers; peilkokers; lugpype; algemene pompinrigting; verstywing en versterking om hyg, stamp en langspanning te weerstaan; die oorsaak en voorkoming van korrosie in 'n skeepstruktuur.

1.2 Algemene idees oor sweis, klink en vlamsnywerk en die voorsorgmaatreëls wat getref moet word as sulke werk aan boord gedoen word.

1.3 (i) Die betekenis van die terme—

blokkoëffisiënt; prismakoëffisiënt; verplasing; midskeepsgrootte-koëffisiënt; ladingsgewig; watervlakgrootte-koëffisiënt; benatte oppervlak.

(ii) Die gebruik van verplasing- en ton-per-sentimeter-indompelskale om die gewig van die vrag of ballas volgens die diepgang of vryboord te bepaal. Digtheid, relatiewe digtheid, die Archimedes-beginsel: flottasie.

Die uitwerking van die digtheid van water op diepgang en vryboord. Die skeepshidrometer en sy gebruike.

Dryfvermoë; reserwedryfvermoë; begrip van fundamentele optrede by gedeeltelike verlies van intakte dryfvermoë.

1.4 (i) Algemene begrip met omskrywings van—

swaartepunt; stabiele, onstabiele en neutrale ewewig; drukkingspunt; metasenterhoogte; regbringhefboom; regbringmoment.

(ii) Die gebruik van stabiliteit- en hidrostatiese gegewens wat aan skepe verstrek word.

Die uitwerking as gewigte bygevoeg of verwyder word.

4.8 Shipmaster's business. General knowledge of the requirements of the Merchant Shipping Act, 1951, and the regulations relating to collisions, strandings, and other casualties. Certificates and documents required to be carried on board ship, how they are obtained and the period of their legal validity. Engagement, discharge and management of the crew, wages and other remuneration. Manning scales. The official Log Book and entries therein. Discipline and offences. Crew accommodation, hygiene and crew welfare. Inspections and reports. Fumigation and pest control.

4.9 Knowledge of the law relating to a person's position as master of a ship.

4.10 Prepare ship to rescue survivors from another ship.

4.11 To distinguish three main types of clouds and what the significance is of each, as to expected weather.

4.12 To determine the direction and force of the wind and the direction and size of the sea and swell.

4.13 To describe present and past weather.

4.14 To form a plain language weather report suitable for transmission and to be able to code this message into the first six groups of the weather code for ships.

4.15 To understand the weather patterns and the principal ocean currents off the coast of Southern Africa.

4.16 To have a knowledge of the typical weather which may be expected prior to, during, and after the passage of a cold front.

4.17 To draw conclusions from simple weather forecast or synoptic chart and ability to form an opinion on expected weather from the barometric tendency.

5. SIGNALS

5.1 To send and receive signals in: (i) Morse-code by flash lamp up to six words per minute. (ii) International Code of Signals.

5.2 *Practical:* To prepare portable radio equipment for operation on a lifeboat or liferaft, erect the aerial and operate all the distress frequency facilities on the equipment provided.

AGE AND SEA SERVICE REQUIREMENTS AND SYLLABUS FOR FISHERMAN—GRADE 1

1. Minimum age—23 years.

2. Sea service:

(i) One year in command on vessels over 600 tons, or

(ii) One year in command on vessels over 100 tons

PLUS

Six months Second-in-command on vessels over 600 tons, or

(iii) Two years as Second-in-command on vessels over 600 tons,

whilst holding a Grade 2 Certificate.

1. WRITTEN EXAMINATION ON GENERAL SHIP KNOWLEDGE—PAPER 1 (3 HOURS)

1.1 General ideas on ship construction and on the use of plans and data available on board ship; general definitions of main dimensions. The names of the principal parts of a ship.

The candidate will be expected to show his practical acquaintance with the following by means of sketches: longitudinal and transverse framing; beams and beam knees; watertight bulkheads; hatchways and closing appliances; rudders; steering gear; shell and deck plating; double bottom and peak tanks; bilges; side and wing tanks; stern frames; propellers and propeller shafts; stern tubes; sounding pipes; air pipes; general pumping arrangements; the stiffening and strengthening to resist panting, pounding and longitudinal stresses; cause and prevention of corrosion in a ship's structure.

1.2 General ideas on welding, riveting and burning and the precautions to be taken when such processes are carried out aboard ship.

1.3 (i) The meaning of the terms—

Block coefficient; Prismatic coefficient; Displacement; Amidships area coefficient; Deadweight; Waterplane area coefficient; Wetted surface.

(ii) Use of displacement and tonnes per centimetre immersion scales to determine weight of cargo or ballast from draughts or freeboard. Density, relative density, principle of Archimedes: flotation.

Effect of density of water on draught and freeboard. The marine hydrometer and its uses.

Buoyancy; Reserve Buoyancy; Understanding of fundamental actions to be taken in the event of partial loss of intact buoyancy.

1.4 (i) General understanding with definitions of—

centre of gravity; stable, unstable and neutral equilibrium; centre of buoyancy; metacentric height; righting lever; righting moment.

(ii) The use of stability and hydrostatic data supplied to ships.

Die gevaar van gedeeltelik gevulde ballastenks, met spesiale verwysing na die onderverdeling daarvan.

1.5 Die optakeling van 'n skip vir die laai en aflaai van vrag en die gebruik van laaibome, wenasse en hyskrane. Die stuwing, skeiding en garnering van vragte. Oorsake van sweet en voorsorgmaatreëls wat voor, tydens en na stuwing getref moet word om beskadiging weens sweet te voorkom, veral ten opsigte van vismeel.

Ventilasiestelsels van ruime en tenks.

Voorsorgmaatreëls wat getref moet word voor vrag- en ballastenks en leë ruimtes binnegegaan word.

1.6 Die versorging en onderhoud van alle redding- en brandblustoestelle, ligte en seinapparaat.

2. SKRIFTELIKE EKSAMEN IN PRAKTIESE NAVIGASIE EN KAARTWERK—VRAESTEL 2 (3 UUR)

Hierdie vraestel sal vrae bevat wat die kandidaat se kennis van die leerplanne vir Visserman Graad 4, 3 en 2 toets en sal vrae oor navigasie en kaartwerk kombineer.

3. SKRIFTELIKE EKSAMEN IN WEERKUNDE—VRAESTEL 3 (1 UUR)

3.1 Die beginsels van drukmeting. Die gebruik van standaardstelmerk. Kennis van die aneroïed- en presisie-aneroïedbarometer en die barograaf.

3.2 Die beginsels van die termometer, maksimum- en -minimumtermometer. See- en lugtemperatuurwaarnemings en voorsorgmaatreëls wat getref moet word. Die beginsels van die higrometer; waarnemings vir die bepaling van relatiewe humiditeit. Hoe om instrumente te versorg en op te pas.

3.3 Die Beaufort-windskaal. Metodes om die rigting en krag van die wind ter see te bepaal.

3.4 Kennis van die gemiddelde verspreiding van druk. Daaglikse en seisoensveranderings in lugdruk. Heersende winde. Die plaaslike en streeksuitwerking van verwarming en afkoeling, land- en seebriese, moesonwinde. Daalwinde.

3.5 Die eienskappe van, en weer wat gepaard gaan met die vernaamste drukstelsels, bv. antisiklone, laagdrukgebiede, permanente en halfpermanente hoog- en laagdrukgebiede. Die verhouding tussen drukverspreiding en wind. Lugmassas en hul eienskappe. Die Wet van Buys Ballot.

3.6 Die gebruik van barometriese waarnemings by 'n enkele stasie saam met weertekens.

3.7 Waterdamp in die atmosfeer, verdamping, kondensasie, neerslag. Die betekenis van versadiging, relatiewe humiditeit en doupunt. 'n Elementêre kennis van atmosferiese stabiliteit en die afnametempo. Die vorming en klassifisering van wolke, mis, newel en dou. Waas.

3.8 Kennis van die tipes weerberigte wat weerkundige organisasie vir skepe versprei het. Die kodering en dekodering van weerberigte deur gebruik te maak van die handboek "Weerkode vir Skepe", wat deur die Weerburo uitgegee is. Kennis van die algemene struktuur van weerberiggewing, bv. geselekteerde skepe, weerskepe, skeepstasies.

4. MONDELINGE EKSAMEN IN SEEMANSKAP

4.1 (i) Hoe om 'n barometer, termometer en higrometer af te lees en te verstaan. Die instrumente wat deur die Weerburo verskaf word, word as die standaard beskou.

(ii) Hoe om 'n sekstant te gebruik om vertikale en horisontale hoeke te meet; hoe om 'n sekstant sowel op as buite die boog af te lees.

(iii) Hoe om 'n sekstant reg te stel waarin daar een of meer loodregtestand-, sy- of indeksfoute aangebring is.

(iv) Hoe om 'n sekstant se indeksfout te bepaal.

4.2 (i) Die optakeling van skepe, metodes om die proefspanning en veilige werklaste van toue, met inbegrip van dié van kunsvesel en staal, te bepaal. Kandidate kan ook uitgevra word ten opsigte van die kwalifiserende eksamenleerplan vir die verwerwing van 'n sertifikaat as Bevoegde Dekseeman.

(ii) Die stuwing en vaswoel van vismeel in sakke of in massa. Regulasies en aanbevelings in verband met die vervoer daarvan.

4.3 (i) Voorbereidings om te begin vaar. Wat gedoen moet word voordat die skip uitvaar, 'n hawe binnevaar, 'n dok binnevaar. Hoe om aan te lê langs kaaie, hawehoofde of ander skepe, en die skip aan boeie vas te maak.

(ii) Roerbevele. Onder stuurbevele seil. Die uitwerking van skroewe op die stuur van 'n skip. Hoe om te stop, agteruit te vaar, in die nabyheid van loodsvaartuie en ander vaartuie te maneuvreer. Hoe om 'n loods op te pik. Hoe om kortom te draai. Noodmaneuvers. Hoe om 'n skip in 'n noodgeval voor 'n enkele anker te bring. Man oorboord.

(iii) 'n Behoorlike kennis van die beginsels van navigasiewaghou ter see en voor anker soos deur die IMO voorgeskryf. Die pligte van die dekoffisier in die hawe.

(iv) Driloefeninge en monstering. Die organiseer van noodspanne.

4.4 (i) Ankers, kabels: hulle gebruik en stuwing.

(ii) Elementêre kennis van skeepsmasjinerie. Kennis van die gebruik van alle dektoestelle, met inbegrip van noodstuur gerei.

(iii) Die gebruik en versorging van noodvuurpyle en lynwerpapparaat.

The result of adding and removing weights. The danger of slack tanks, with special reference to subdivision thereof.

1.5 Rigging a ship for loading and discharging cargo, the usage of derricks, winches and cranes. The stowage, separation and dunnaging of cargoes.

Causes of sweating and precautions to be taken before, during and after stowing to prevent damage by sweat, especially in respect of fishmeal.

Ventilation systems of holds and tanks. Precautions to be taken before entering cargo and ballast tanks and void spaces.

1.6 Care and maintenance of all lifesaving and firefighting appliances, lights and signalling apparatus.

2. WRITTEN EXAMINATION ON PRACTICAL NAVIGATION AND CHARTWORK—PAPER 2 (3 HOURS)

This paper will include questions set to test the candidate's knowledge in the syllabusses for Fishermen Grades 4, 3 and 2 and will combine navigation and chartwork questions.

3. WRITTEN EXAMINATION ON METEOROLOGY—PAPER 3 (1 HOUR)

3.1 The principles of pressure measurement. The use of standard datum. Knowledge of the aneroid and precision aneroid barometer and the barograph.

3.2 The principles of the thermometer, maximum and minimum thermometers. Sea and air temperature observations and precautions to be taken. The principles of the hygrometer; observations to obtain relative humidity. Care and attention given to instruments.

3.3 The Beaufort wind scale. Methods of estimating direction and force of wind at sea.

3.4 A knowledge of the mean pressure distribution. Daily and seasonal changes in atmospheric pressure. Prevailing winds. Local and regional effects of heating and cooling, land and sea breezes, monsoons. Katabatic wind.

3.5 The characteristics of, and weather associated with the principal pressure systems eg. anti-cyclones, depressions, permanent and semi-permanent high and low pressure areas. Relationship between pressure distribution and wind. Air masses and their properties. Buys Ballot's Law.

3.6 Use of barometric observations at a single station in conjunction with weather signs.

3.7 Water vapour in the atmosphere, evaporation, condensation, precipitation. Meaning of saturation, relative humidity, dewpoint. Elementary knowledge of atmospheric stability and lapse rate. Formation and classification of clouds, fog, mist and dew. Haze.

3.8 A knowledge of the types of weather messages promulgated by Meteorological Organisations for Shipping. Coding and de-coding messages by the use of the handbook titled "Weather Code for Ships" as published by the Weather Bureau. A knowledge of the general structure of weather reporting, eg selected ships, weather ships, ship stations.

4. ORAL EXAMINATION IN SEAMANSHIP

4.1 (i) To read and understand a barometer, thermometer and hygrometer. The instruments supplied by the Weather Bureau will be taken as standard.

(ii) To use a sextant for taking vertical and horizontal angles; to read a sextant both on and off the arc.

(iii) To correct a sextant into which has been introduced one or more of perpendicularity, side or index errors.

(iv) To find the index error of a sextant.

4.2 (i) The rigging of ships, methods of ascertaining the proof strain and safe working loads of ropes including synthetic fibre and wire ropes. Candidates may also be questioned on the qualifying examination syllabus for the issue of an Efficient Deck Rating Certificate.

(ii) Stowage and securing of fishmeal in bags or bulk. Regulations and recommendations affecting their carriage.

4.3 (i) Preparations for getting under way. Duties prior to proceeding to sea, making harbour, entering a dock. Berthing alongside quays, jetties or other ships and securing to buoys.

(ii) Helm orders. Conning the ship. Effects of propellers on the steering of a ship. Stopping, going astern, manoeuvring in the vicinity of pilot vessels and other craft. Picking up a pilot. Turning short round. Emergency manoeuvres. Bring a ship to single anchor in an emergency. Man overboard.

(iii) A proper knowledge of the principles of navigational watchkeeping at sea and at anchor as laid down by IMO. Duties of the deck officer in port.

(iv) Drills and musters. Organisation of emergency parties.

4.4 (i) Anchors, cables; their use and stowage.

(ii) Elementary knowledge of ship machinery. Knowledge of the use of all deck appliances including emergency steering gear.

(iii) The use and care of distress rockets and line-throwing apparatus.

(iv) Die gebruik en onderhoud van skeepsjoernale en dieptepeilingsapparaat.

4.5 (i) Die gebruik en versorging van reddingstoestelle. Hoe om reddingsbootseile aan te slaan, te span en te verminder. Hoe om die kompressieontstekingsmasjiene van reddingsbote aan die gang te sit. Hoe om roei-, seil- en kragbote in onstuimige weer te hanteer; en hoe om bote ter see op te haal. Hoe om 'n boot te laat strand of te land. Oorlewingsprosedure in reddingsbote en op reddingsvlotte. SAVD-prosedures.

(ii) Die gebruik en versorging van brandblustoestelle, met inbegrip van rookhelms en selfstandige asemapparaat.

4.6 (i) Deeglike kennis van die inhoud en toepassing van die Regulasies vir die Voorkoming van Botsings op See en van die aanhangsels wat op veilige navigasie betrekking het. (Daar sal nie van 'n kandidaat verwag word om 'n seilboot te hanteer nie, maar wel om die ligte van so 'n vaartuig uit te ken en kennis te dra van sy moontlike maneuvers volgens die windrigting.)

(ii) Nood- en loodsseine; strawwe vir misbruik.

(iii) Kennis van die inhoud en gebruik van die Departement van Vervoer se "Handelskeepvaartkennisgewings" die Britse Admiraliteit se "Notices to Mariners" en die Suid-Afrikaanse Vloot se "Kennisgewings aan seevaarders".

4.7 Die eksaminator kan aan die kandidaat vrae stel oor die skriftelike werk indien hy dit nodig ag op grond van swak antwoorde deur die kandidaat verstrek.

SEINE

1. MORSEKODE

Hoe om seine te stuur en te ontvang in—

(i) Morse-kode met 'n flitslamp, tot ses woorde per minuut;

(ii) die Internasionale Seinkode.

2. PRAKTIES

Hoe om draagbare radiotoerusting gereed te maak vir gebruik in 'n reddingsboot of op 'n reddingsvlot, die antenne op te rig en al die noodfrekwensiegeriewe van die toerusting te gebruik.

AANHANGSEL 2

VEREISTES TEN OPSIGTE VAN

OUDERDOM EN SEEDIENS EN

EKSAMENLEERPLANNE VIR

SEEMASJINISTE

AANHANGSEL 2

Let Wel: Die eksamens vir Seemasjinis Graad 1, 2 en 3 is hoofsaaklik mondeling, maar daar kan van kandidate verwag word om hul antwoorde met diagramme en sketse toe te lig.

VEREISTES TEN OPSIGTE VAN OUDERDOM EN SEEDIENS EN EKSAMENLEERPLAN VIR SEEMASJINIS GRAAD 3

1. Minimum ouderdom—19 jaar.

2. Seediens—Bevredigende diens van minstens 18 maande in die bediening van die aandryfmasjinerie van 'n vissersboot wat die eksaminator as geskik beskou.

EKSAMEN IN MASJIENKUNDE

Daar kan van die kandidaat verwag word om die volgende te bewys:

1. Dat hy oor 'n elementêre kennis van die name en funksies van die hoofdele van die aandryfmasjinerie beskik;
2. dat hy weet hoe om klein defekte in die aandryfmasjinerie te herstel;
3. dat hy weet hoe om batterye in 'n behoorlik werkende toestand te hou;
4. dat hy bewus is van die noodsaaklikheid daarvan om die vullings leeg en skoon te hou en vertroud is met die lenspompstelsel;
5. dat hy weet watter voorsorgmaatreëls getref moet word teen brande en ontploffings weens olie of gas; dat hy weet hoe om op te tree as 'n brand sou uitbreek en dat hy weet hoe om brandblussers te herlaai; en
6. dat hy weet hoe om elektriese beskermingstoestelle en toerusting reg te gebruik.

VEREISTES TEN OPSIGTE VAN OUDERDOM EN SEEDIENS EN EKSAMENLEERPLAN VIR SEEMASJINIS GRAAD 2

1. Minimum ouderdom—19 jaar.

2. Seediens:

(a) Bevredigende diens van minstens 18 maande op vaartuie waarvan die aandryfmasjinerie 225 kW of meer lewer.

(b) Die tydperk van diens moet bestee wees aan toesig oor die aandryfmasjinerie van vaartuie wat deur die eksaminator as geskik geag word.

(iv) Use and upkeep of logs and sounding appliances.

4.5 (i) The use and care of life-saving appliances. Bending, setting and taking in lifeboat sails. Starting lifeboat compression ignition engines. Management of boats under oars, sails, and power and in heavy weather; recovering boats at sea. Beaching or landing. Survival procedure in lifeboats and life-rafts. SATS procedures.

(ii) The use and care of fire appliances including the smoke helmet and self-contained breathing apparatus.

4.6 (i) A full knowledge of the content and application of the Collision Regulations and of those annexes concerned with safe navigation. (Candidates will not be placed in the position of handling a sailing craft, but will be expected to recognise the lights carried by such a craft and to have knowledge of her possible manoeuvers according to the direction of the wind.)

(ii) Distress and pilot signals; penalties for misuse.

(iii) A knowledge of the contents and use of Department of Transport 'Merchant Shipping Notices', Admiralty 'Notices to Mariners' and South African Navy 'Notices to Mariners'.

4.7 The examiner may ask the candidate questions arising out of the written work, if it is deemed necessary on account of weakness shown by the candidate.

SIGNALS

1. MORSE

To send and receive signals in—

(i) Morse-code by flash lamp up to six words per minute;

(ii) International Code of Signals.

2. PRACTICAL

To prepare portable radio equipment for operation in a lifeboat or liferaft, erect the aerial and operate all the distress frequency facilities on the equipment provided.

ANNEXURE 2

AGE AND SEA SERVICE REQUIREMENTS

AND SYLLABUSES FOR

MARINE MOTORMAN

EXAMINATIONS

ANNEXURE 2

Note: The examinations for Motorman Grade 1, 2 and 3 are predominantly oral but candidates may be called upon to illustrate their answers by means of diagrams or sketches.

AGE AND SEA SERVICE REQUIREMENTS AND SYLLABUS FOR MARINE MOTORMAN GRADE 3

1. Minimum age—19 years.

2. Sea Service—At least 18 months satisfactory service on the propelling machinery of a fishing boat, regarded by the examiner to be suitable.

EXAMINATION IN ENGINEERING KNOWLEDGE

The candidate may be required to show:

1. That he has an elementary knowledge of the names and functions of the main parts of the propelling machinery;
2. that he knows how to deal with minor defects in the propelling machinery;
3. that he knows how to maintain batteries in proper working order;
4. that he is aware of the necessity of keeping bilges empty and clean and is familiar with the bilge pumping system;
5. that he understands the precautions to be taken against fire and explosion from oil or gas, how to deal with fire, should it break out, and how to recharge fire extinguishers; and
6. that he understands the correct use of electrical protection devices and electrical equipment.

AGE AND SEA SERVICE REQUIREMENTS AND SYLLABUS FOR MARINE MOTORMAN GRADE 2

1. Minimum age—19 years.

2. Sea Service:

(a) At least 18 months satisfactory service on vessels whose propelling machinery with an output of 225 kW or more.

(b) The periods of service shall have been spent whilst on watch on the propelling machinery of vessels regarded by the examiner as suitable.

(c) Aan 'n kandidaat wat sedert hy 16 jaar oud geword het bevredigende diens as leerling-ingenieur of -werktuigkundige of -ambagsman gelewer het ten opsigte van werk wat geskik is vir die opleiding van 'n seemasjinis, kan kwytskelding van seediens toegestaan word na gelang van die tydperk van sodanige diens behoudens 'n tydperk van hoogstens ses maande.

EKSAMEN IN MASJIENKUNDE

Die kandidaat moet bewys dat hy 'n skeepsjoernaal kan hou en—

1. 'n elementêre kennis het van elektrisiteit en elektriese distribusiestelsels, met inbegrip van die beskermingstoestelle aan boord;
2. die name en funksies van die hoofdele van die aandryf- en hulpmasjinerie ken;
3. die meganisme van die aansit- en omstelinrigtings verstaan en weet hoe om dit in bedryf te hou;
4. weet hoe om klein defekte in die aandryf- en hulpmasjinerie te herstel;
5. die name en funksies van die hoofdele van die verkoelingsmasjinerie ken;
6. 'n elementêre kennis van hidroulika en pneumatika het;
7. weet hoe om die wag af te los en wat sy pligte gedurende die wag is;
8. 'n deeglike kennis het van die werksaamhede in verband met die tewaterlating en praktiese hantering van alle oorlewingsvaartuie en -toerusting aan boord en van die beginsel van oorlewing in sodanige oorlewingsvaartuie ter see.

VEREISTES TEN OPSIGTE VAN OUDEROM EN SEEDIENS EN EKSAMENLEERPLAN VIR SEEMASJINIS GRAAD 1

1. Minimum ouderdom—21 jaar.

2. Seediens:

Minstens 12 maande bevredigende ondervinding van motoraandryfmasjinerie terwyl in besit van 'n geldige Graad 2-bekwaamheid- of -diensertifikaat wat na die Direkteur-generaal se mening beskou word as gelykwaardig met of van 'n hoër graad as Graad 2.

Die dienstydperk wat in hierdie aanhangsel gemeld word, moet bestee wees aan toesig oor die aandryfmasjinerie van 'n vaartuig wat deur die eksaminator as geskik geag word: Met dien verstande dat minstens ses maande van sodanige diens afgelê moet wees ten opsigte van die hoofaandryfmasjinerie van vaartuie met 'n lewering van meer as 350 kW per masjien.

EKSAMEN IN MASJIENKUNDE

Die kandidaat moet bewys dat hy die volgende verstaan:

1. Die lewering van elektromotoriese krag deur chemiese of magnetiese metodes en deur elektriese distribusiestelsels;
2. die beginsels en werking van motoraandryf- en hulpmasjinerie;
3. die aansit, omstel en onderhoud van motoraandryfmasjinerie;
4. die werking van die termometer, pirometer, drukmeter, voltmeter en ammeter;
5. tydelike en permanente herstelwerk in geval van 'n onklaarraking;
6. pompstelsels;
7. stuurgerei, verkoelings-, hidrouliese en druklugmasjinerie;
8. die eienskappe van die onderskeie brandstowwe en olies wat aan boord van 'n vaartuig gebruik word; en
9. die voorsorgmaatreëls wat getref moet word teen brande en ontploffings weens olie of gas en die optrede in geval van 'n brand.

Die kandidaat sal in die vakke in die leerplan vir die Graad 2-sertifikaat geëksamineer word, maar 'n hoër standaard van kennis as vir daardie eksamen word verlang.

AANHANGSEL 3

GESIGSTOETSE

1. EKSAMENDATUMS EN -PLEKKE

Die eksamendatums en -plekke moet volgens afspraak met die eksaminator by die naaste hawe gereël word.

2. DIE AFNEEM VAN DIE TOETSE

Die doel van hierdie toetse is om te verseker dat die kandidaat se gesigsvermoë skerp genoeg is om hom in staat te stel om die ligte van skepe ter see in die verte raak te sien en te identifiseer. Vir hierdie doel moet hy sekere minimum standaarde ten opsigte van sowel vorm as kleur behaal.

'n Gesigstoets bestaan uit 'n letter- en lanterntoets wat in daardie volgorde afgeneem word. Die toetse word onder die streng persoonlike toesig van 'n gesigstoetseksaminator afgeneem, wat aantekening hou van alle foute wat die kandidaat in sowel die letter- as die lanterntoets begaan.

(c) A candidate who has, since reaching the age of 16 years, served satisfactorily as apprentice engineer or mechanic or journeyman on work suitable for the training of a marine motorman, may be granted a remission of sea service depending on the time so served, subject to a maximum of six months.

EXAMINATION IN ENGINEERING KNOWLEDGE

The candidate must show that he is able to keep a logbook and—

1. that he has an elementary knowledge of electricity and of the electrical distribution systems, including protection devices on board ships;
2. that he knows the names and functions of the main parts of the propelling and auxiliary machinery;
3. that he understands the mechanism of the starting and reversing arrangements and how to maintain operation;
4. that he knows how to deal with any minor defects in the propelling and auxiliary machinery;
5. that he knows the names and functions of the main parts of refrigeration machinery;
6. that he has an elementary knowledge of hydraulics and pneumatics;
7. that he knows how to take over the watch and his duties during the watch;
8. that he has a thorough knowledge of the operations connected with the launching and the practical handling of all survival craft and equipment on board and of the principle of survival in such survival craft at sea.

AGE AND SEA SERVICE REQUIREMENTS AND SYLLABUS FOR MARINE MOTORMAN GRADE 1

1. Minimum age—21 years.

2. Sea Service:

At least 12 months satisfactory experience on motor propelling machinery whilst in possession of a valid Grade 2 Certificate of Competency or Service which, in the discretion of the Director-General, is regarded as being of an equal or higher grade than the Grade 2.

The period of service mentioned in this annexure must have been spent whilst in charge of a watch on the propelling machinery of a vessel regarded by the examiner as suitable: Provided that at least six months of such service shall have been spent on the main propelling machinery of vessels of more than 350 kW per engine.

EXAMINATION IN ENGINEERING KNOWLEDGE

The candidate must show that he understands—

1. the production of electromotive force by chemical and magnetic means and electrical distribution systems;
2. the principles and working of motor propelling and auxiliary machinery;
3. the starting, reversing and maintenance of motor propelling machinery;
4. the action of the thermometer, pyrometer, pressure gauge, voltmeter and ammeter;
5. temporary and permanent repairs in the event of a breakdown;
6. pumping systems;
7. steering gears, refrigerating, hydraulic, and pneumatic machinery;
8. properties of the various fuels and oil in use on board a vessel; and
9. precautions against fire and explosion from oil or gas and methods of dealing with an outbreak of fire.

The examination shall cover the subjects in the syllabus for Grade 2 Certificate but a higher standard of knowledge will be required than for that examination.

ANNEXURE 3

SIGHT TESTS

1. EXAMINATION DAYS AND PLACES

Examination days and places shall be by appointment as arranged with the examiner at the nearest port.

2. THE CONDUCT OF THE TESTS

The purpose of these tests shall be to ensure that the candidate's eyesight is sufficiently good to enable him to pick up and identify correctly the lights of distant ships at sea. For this purpose a person shall be required to reach certain minimum standards both of form and colour vision.

A sight test shall comprise a letter and a lantern test taken in that order. The tests shall be conducted under the strict personal supervision of a Sight Test Examiner who shall keep a record of all mistakes made by the candidate both in the letter test and in the lantern test.

Elke kandidaat wat tot 'n eksamen toegelaat wil word vir 'n eerste bekwaamheidsertifikaat as dekoffisier of visserman of 'n bevoegdheidsertifikaat as dekseeman, moet oor 'n gesigstoetssertifikaat beskik waarvolgens hy in sowel die letter- as die lanterntoets geslaag het binne die sesmaandetydperk wat die eksamendatum voorafgaan. Vir bekwaamheidsertifikate wat op die eerste een volg, word 'n gesigstoetssertifikaat verlang wat net aan die voorwaardes ten opsigte van die lettertoets voldoen.

Kandidate word gemaan om hulle nie te haas wanneer hulle die lanterntoets aflê nie. Hulle moet hulle vergewis van die kleure van die ligte voordat hulle die kleure aan die eksaminator noem. Die kandidaat se mededelings bepaal die uitslag van die toets; onoplettendheid kan die kandidaat laat druip en hom dus verhinder om sy gekose loopbaan ter see te volg. Kandidate moet die toets aflê wanneer hulle in goeie gesondheid verkeer, anders kan hul gesigskerpte aangetas wees.

Kandidate kan die gesigstoets nes hulle verkies, met of sonder hulpmiddels aflê (gewone brille of kontaklense), maar kandidate wat verkies om die letter- of lanterntoets of albei met sodanige hulpmiddels af te lê, moet 'n bykomende minimum standaard ten opsigte van elke oog sonder hulpmiddels behaal.

2.1 **Lettertoets.**

2.1.1 (a) Die lettertoets word volgens die Snellen-beginsel afgeneem deur middel van letterblaaie wat op so 'n manier onregstreeks met behulp van 'n gepoleerde spieël besigtig word dat die letters 'n virtuele afstand van ses meter van die oog af is. Elke blad het sewe reëls waarvan die derde, vierde, vyfde, sesde en sewende reël onderskeidelik met die standaarde 6/24, 6/18, 6/12, 6/9 en 6/6 ooreenstem.

(b) Elke oog van die kandidaat word afsonderlik getoets.

2.1.2 *Verlangde standaard van gesigskerpte.*

(a) 'n Kandidaat wat verkies om die toets sonder hulpmiddels af te lê moet al die reëls tot en met die sewende met sy beste oog en al die reëls tot en met die sesde met die ander oog reg aflees.

(b) 'n Kandidaat wat verkies om die toets met hulpmiddels af te lê, moet eers die toets daarsonder aflê en dan moet hy al die reëls tot en met die vyfde met sy beste oog en al die reëls tot en met die derde met die ander oog reg aflees. Daarna word hy met hulpmiddels getoets en dan moet hy al die reëls tot en met die sewende met sy beste oog en al die reëls tot en met die sesde met die ander oog reg aflees.

2.1.3 *Toetsmetode*

Die toetsblaaie en die beligtingseenheid moet voldoen aan BS 4274-1960 en moet so in 'n kabinet geplaas word dat die middel van elke blad, as dit besigtig word, op ooghoogte is van 'n gemiddelde persoon in 'n sittende houding. Wanneer die kandidaat in die regte houding sit, word een van die blaaie belig en word hy gevra om die letters van links na regs van die boonste tot die onderste reël af te lees.

As die kandidaat met hulpmiddels of daarsonder of in albei gevalle nie daarin slaag om die verlangde standaard te behaal nie, moet 'n bykomende blad vir elke oog aan hom getoon word in daardie deel of dele van die toets waarin hy gedruip het.

As daar na afloop van die lettertoets gemeen word dat die kandidaat die verlangde standaard behaal het, moet hy die lanterntoets aflê, tensy hy oor 'n bekwaamheidsertifikaat beskik waarvoor 'n lanterntoets wat deur die Direkteur-generaal erken word 'n voorwaarde vir uitreiking was.

As daar na afloop van die lettertoets gemeen word dat die kandidaat nie die verlangde standaard behaal het nie, moet die volgende alternatiewe aan hom verduidelik word:

(a) Die eksamen kan beëindig en 'n druipsertifikaat uitgereik word, en die eksamen kan na 'n tydperk van minstens een maand by betaling van 'n bykomende bedrag herhaal word.

(b) Die kandidaat kan die lanterntoets ook aflê. In so 'n geval word 'n opgawe van al die foute wat in die lettertoets begaan is en al die foute, as daar is, wat in die lanterntoets begaan is, vir sy beslissing aan die Direkteur-generaal gestuur.

'n Lettertoets word partymaal gedruip vanweë 'n gesigsgebrek wat geneesbaar is. Wanneer 'n kandidaat dus nie in 'n lettertoets slaag nie moet hy aangeraai word om 'n oogarts te spreek sodat dié kan vasstel wat die aard van die gebrek is en of dit genees kan word.

2.2 **Lanterntoets.**

2.2.1 Die toets moet afgeneem word in 'n vertrek wat so verdonker is dat dit geen daglig inlaat nie.

2.2.2 Donkerteaanpassing. 'n Kandidaat wat hom by donkerte moet aanpas, moet minstens tien minute lank in 'n kamer gehou word wat heeltemal of deels verdonker is.

2.2.3 Apparaat. Die lantern vir die toets moet so ontwerp wees dat dit drie kleure naamlik rooi, wit en groen, een-een deur 'n groot opening of twee-twee op 'n keer langs mekaar deur klein openinkies kan vertoon. Wanneer die klein openinkies gebruik word, kan enige kombinasie van twee van die drie kleure of twee van dieselfde kleur vertoon word. Die lantern moet reg voor 'n spieël staan sodat die voorkant daarvan presies 3,05 m van die spieël af is en die ligte wat in die spieël weerkaats word, duidelik waarneembaar is vanwaar die kandidaat naby die lantern sit.

Every candidate seeking admission to an examination for a first certificate of competency as a deck officer or fisherman or a certificate of qualification as efficient deck rating shall hold a sight test certificate showing that he has passed in both letter and lantern tests within the six months period preceding the date of the examination. For certificates of competency subsequent to the first, a sight test certificate fulfilling the conditions in respect of the letter test only shall be required.

Candidates are cautioned that, when taking the lantern test, they should not attempt to hurry. They should satisfy themselves as to the colours of the lights shown before reporting them to the examiner. The result of the test shall be judged by what the candidate reports; carelessness may cause failure and thus prevent the candidate from taking up a chosen career at sea. Candidates are required to take the test in good health otherwise their vision may be impaired.

Candidates may take the sight test with or without aids (conventional spectacles or contact lenses) at their option but candidates who opt to use aids for the letter or lantern test or both shall additionally reach a minimum standard in each eye without aids.

2.1 **Letter test.**

2.1.1. (a) The letter test shall be conducted on Snellen's principle by means of sheets of letters viewed indirectly through a polished mirror so as to place the letters at a virtual distance of 6 meters from the eye. Each sheet contains 7 lines, the 3rd, 4th, 5th, 6th and 7th lines corresponding to standards 6/24, 6/18, 6/12, 6/9 and 6/6 respectively.

(b) Candidates shall be tested in each eye separately.

2.1.2 *Standard of vision required.*

(a) A candidate who opts to take the test without aids shall be required to read correctly down to and including line 7 with the better eye and down to and including line 6 with the other eye.

(b) A candidate who opts to take the test using aids shall first take the test without aids when he shall be required to read correctly down to and including line 5 with the better eye and line 3 with the other eye. The candidate shall then be tested with aids and shall be required to read correctly down to and including line 7 with the better eye and down to and including line 6 with the other eye.

2.1.3 *Method of testing.*

The test sheets and the means of illuminating shall be in accordance with BS 4274-1960 and shall be contained in a cabinet placed so that the centre of each sheet as viewed shall be at the height of eye of the average person in a sitting position. When the candidate is sitting in the correct position one of the sheets shall be exposed and he shall be asked to read the letters from left to right beginning at the top and going downwards.

If with aids or without aids or in both cases the candidate fails to reach the required standard an additional sheet shall be given for each eye in that part or parts of the test in which he has failed.

If, at the conclusion of the letter test, the candidate is considered to have reached the required standard, he shall proceed to the lantern test unless he holds a certificate of competency for which a lantern test recognised by the Director-General would have been a condition for its issue.

If, at the conclusion of the letter test, the candidate is considered not to have reached the required standard, the following alternatives shall be explained:

(a) The examination may be stopped, a certificate of failure issued, and the examination may be repeated on payment of a further fee after a period of not less than one month.

(b) The candidate may proceed to the lantern test. In this case a record of all mistakes made in the letter test and all mistakes, if any, made in the lantern test shall be forwarded to the Director-General for his decision on the test.

Failure to pass the letter test may sometimes be due to a defect in vision which may be curable. Whenever, therefore, a candidate fails to pass this test he shall be advised to consult an ophthalmologist with a view to ascertaining the nature of the defect and whether it is curable.

2.2 **Lantern test.**

2.2.1 The test shall be conducted in a room so darkened as to exclude all daylight.

2.2.2 Darkness adaptation. A candidate who needs darkness adaptation shall be kept in a completely or partially darkened room for at least 10 minutes.

2.2.3 Apparatus. The lantern used for the test shall be designed to show three, colours: red, white and green, singly through a large aperture or two at a time, side by side, through small apertures. When the small apertures are used any combination of two of the three colours may be shown or they may be of the same colour. The lantern shall be positioned directly in front of a mirror so that the front part of the lantern is exactly 3,05 m from the mirror and the lights reflected in the mirror show clearly when viewed by the candidate seated close to the lantern.

2.2.4 Toetsmetode. Die toets begin met 'n reeks ligte wat deur die groot opening vertoon word, gevolg deur vier volledige kringlope en een onderbroke kringloop van ligte wat deur die klein openinkies vertoon word. Die kandidate moet die kleure van die ligte opnoem soos hulle verskyn.

3. TOETSRESULTAAT

3.1 'n Kandidaat wat geen fout in die lanterntoets begaan nie of wat, wanneer hy na die ligte in die klein openinkies kyk, groen-wit of rooi-wit nie meer as ses maal in vier volledige kringlope verwar nie, word geag in die kleurgesigstoets te geslaag het.

3.2 As die kandidaat in enige stadium van die lanterntoets rooi vir groen aansien of andersom, word hy geag nie in die kleurgesigstoets te geslaag het nie.

3.3 'n Kandidaat word op 'n toepaslike vorm verwittig of hy geslaag of gedruip het of dat sy geval vir oorweging verwys is.

3.4 'n Kandidaat wat nie in die lanterntoets by 'n bepaalde gesigstoetssentrum slaag nie, word nie by 'n ander sentrum hertoets nie, behalwe na goeddunke van die Direkteur-generaal by wie regstreeks skriftelik aansoek gedoen moet word.

No. R. 2654 **29 November 1985**

DIE REGULASIES BETREFFENDE BEVOEGDHEIDSERTIFIKATE, 1985

Die Minister van Vervoerwese het kragtens die bepalings van artikel 356 van die Handelskeepvaartwet, 1951 (Wet 57 van 1951)—

(a) die Regulasies betreffende Bevoegdheidsertifikate, 1976, afgekondig by Goewermentskennisgewing R. 80 van 16 Januarie 1976 herroep; en

(b) die regulasies vervat in die Bylae hiervan uitgevaardig.

BYLAE

Indeling van regulasies.

HOOFSTUK I

ALGEMEEN

Regulasie No.

1. Kort titel.
2. Woordomskrywing.
3. Direkteur-generaal moet benoembaarheid van kandidate vasstel.
4. Plek waar eksamen afgelê word.
5. Aansoekvorm.
6. Twyfelagtige gevalle, en navrae.
7. Vereiste getuigskrifte.
8. Berekening van seediens.
9. Onvoldoende diens.
10. Afskrifte van verlore sertifikate.
11. Poging tot omkopery.

HOOFSTUK II

SERTIFIKATE, OUDERDOMSGRENSE, LEERPLANNE EN VEREISTE KWALIFIKASIES

BEKWAAMHEIDSERTIFIKAAT IN OORLEWINGSVAARTUIE

12. Kwalifiserende diens.
13. Eksamenvereistes vir bekwaamheid in oorlewingsvaartuie.
14. Eksamenleerplan vir bekwaamheid in oorlewingsvaartuie.

SERTIFIKAAT AS BEKWAME DEKSEEMAN

15. Stuursertifikaat.
16. Kwalifiserende diens.
17. Eksamenvereistes vir bekwame dekseeman.
18. Leerplan vir die eksamen van bekwame dekseeman.

SERTIFIKAAT AS BEKWAME MASJIENKAMERSEEMAN

19. Kwalifiserende diens.
20. Eksamenvereistes vir bekwame masjienkamerseeman.
21. Leerplan vir die eksamen van bekwame masjienkamerseeman.

ENDOSSEMENT VAN VEREISTE ADDISIONELE KWALIFIKASIE

22. Endossement.
23. Dokumentêre bewys.
24. Addisionele dokumente vereis vir endossement van addisionele kwalifikasie.

2.2.4 Method of testing. The test shall commence with a series of lights shown through the large aperture followed by four complete circuits and one broken circuit of lights shown through the small apertures. The candidate shall be required to name the colours of the lights as they appear.

3. TEST RESULTS

3.1 A candidate who makes no mistakes in the test conducted by means of the lantern or who, when reading the small aperture lights confuses green-white or red-white not more than six times in four complete circuits shall be deemed to have passed the colour vision test.

3.2 If at any stage of the test conducted by means of the lantern the candidate mistakes red for green or vice versa, he shall be deemed to have failed the colour vision test.

3.3 Candidates shall be notified on an appropriate form of their success or failure, or that their case has been referred for consideration.

3.4 A candidate who fails the lantern test at a particular sight testing centre shall not be re-tested at another except at the discretion of the Director-General to whom direct application shall be made in writing.

No. R. 2654 **29 November 1985**

THE CERTIFICATES OF QUALIFICATION REGULATIONS, 1985

The Minister of Transport has, in terms of section 356 of the Merchant Shipping Act, 1951 (Act 57 of 1951)—

(a) repealed the Certificates of Qualification Regulations, 1976, published under Government Notice R. 80 of 16 January 1976; and

(b) made the regulations contained in the Schedule.

SCHEDULE

Arrangement of regulations.

CHAPTER I

GENERAL

Regulation No.

1. Short title.
2. Definitions.
3. Director-General to determine eligibility.
4. Place of examination.
5. Form of application.
6. Doubtful cases and enquiries.
7. Testimonials required.
8. Calculation of service at sea.
9. Service found to be insufficient.
10. Copies of lost certificates.
11. Attempted bribery.

CHAPTER II

CERTIFICATES, AGE LIMITS, SYLLABUSES AND QUALIFICATIONS REQUIRED

CERTIFICATE OF PROFICIENCY IN SURVIVAL CRAFT

12. Qualifying service.
13. Examination requirements for proficiency in survival craft.
14. Syllabus for examination for proficiency in survival craft.

CERTIFICATE AS EFFICIENT DECK RATING

15. Steering certificate.
16. Qualifying service.
17. Examination requirements for efficient deck rating.
18. Syllabus for examination as efficient deck rating.

CERTIFICATE AS EFFICIENT ENGINE ROOM RATING

19. Qualifying service.
20. Examination requirements for efficient engine room rating.
21. Syllabus for examination as efficient engine room rating.

ENDORSEMENT OF ADDITIONAL QUALIFICATION REQUIRED

22. Endorsement.
23. Documentary proof.
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25. Voorwaardes vir die toekenning van 'n sertifikaat as bekwame kok.
26. Toekenning van 'n sertifikaat as bekwame kok.
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HOOFSTUK III

UITSLAG VAN EKSAMEN

28. Druiping in eksamen.
29. Uitreiking van sertifikate.

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DIENS IN SKEPE, UITGESONDERD SUID-AFRIKAANSE SKEPE, EN OPLEIDINGSINRIGTINGS

30. Bewys van diens in skepe, uitgesonderd Suid-Afrikaanse skepe.
31. Opleidingsinrigtings.

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32. Wanneer gelde betaal moet word.
33. Waar gelde betaal moet word.
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HOOFSTUK VI

35. Kansellering of opskorting van sertifikate, en hereksaminering van die houers van die sertifikate.

Aanhangsel A—Stuursertifikaat.

Aanhangsel B—Kennisgewing dat 'n kandidaat in die eksamen gedruip het.

Aanhangsel C—Bekwaamheidsertifikaat in oorlewingsvaartuie.

Aanhangsel D—Sertifikaat as bekwame dekseeman.

Aanhangsel E—Sertifikaat as bekwame masjienkamerseeman.

Aanhangsel F—Sertifikaat as bekwame kok.

HOOFSTUK I

ALGEMEEN

KORT TITEL

1. Hierdie regulasies heet die Regulasies betreffende Bevoegdheidsertifikate, 1985.

WOORDOMSKRYWING

2. In hierdie regulasies, tensy uit die samehang anders blyk, beteken ''die Wet'' die Handelskeepvaartwet, 1951 (Wet 57 van 1951), en het enige ander woord of uitdrukking die betekenis in die Wet daaraan geheg.

Die uitdrukking ''bekwame dekseeman'' het dieselfde betekenis as die uitdrukking ''volle seeman'' in artikel 112 van die Wet;

''sertifikaat'' beteken 'n bevoegdheidsertifikaat, en ook 'n bekwaamheidsertifikaat in oorlewingsvaartuie, 'n bevoegdheidsertifikaat as bekwame dekseeman, 'n bevoegdheidsertifikaat as bekwame masjienkamerseeman en 'n bevoegdheidsertifikaat as bekwame kok;

''bekwaamheidsertifikaat in oorlewingsvaartuie'' beteken 'n bevoegdheidsertifikaat wat aandui dat die houer bekwaam is in die gebruik van oorlewingsvaartuie aan boord van 'n Suid-Afrikaanse skip;

''sertifikaat as bekwame dekseeman'' beteken 'n sertifikaat wat die houer daartoe geregtig maak om as 'n dekmanskap in 'n Suid-Afrikaanse skip diens te doen;

''sertifikaat as bekwame masjienkamerseeman'' beteken 'n bevoegdheidsertifikaat wat die houer daartoe geregtig maak om as 'n masjienkamerseeman in 'n Suid-Afrikaanse skip diens te doen.

''sertifikaat as bekwame kok'' beteken 'n bevoegdheidsertifikaat wat die houer daartoe geregtig maak om as 'n kok in 'n Suid-Afrikaanse skip diens te doen;

''goedgekeur'' beteken goedgekeur deur die Direkteur-generaal;

CERTIFICATE AS EFFICIENT COOK

25. Conditions of granting a certificate as efficient cook.
26. Granting of a certificate as efficient cook.
27. Additional documents required for the granting of a certificate as efficient cook.

CHAPTER III

RESULT OF EXAMINATION

28. Failure in examination.
29. Issue of certificates.

CHAPTER IV

SERVICE IN SHIPS OTHER THAN SOUTH AFRICAN SHIPS AND TRAINING ESTABLISHMENTS

30. Evidence as to service in ships other than South African ships.
31. Training establishments.

CHAPTER V

FEES

32. When to pay fees.
33. Where to pay fees.
34. Table of fees.

CHAPTER VI

35. Cancellation or suspension of certificates and re-examination of holders.

Annexure A—Steering certificate.

Annexure B—Notification of failure in examination.

Annexure C—Certificate of proficiency in survival craft.

Annexure D—Certificate as efficient deck rating.

Annexure E—Certificate as efficient engine room rating.

Annexure F—Certificate as efficient cook.

CHAPTER I

GENERAL

SHORT TITLE

1. These Regulations shall be called the Certificate of Qualification Regulations, 1985.

DEFINITIONS

2. In these Regulations, unless the context otherwise indicates, ''the Act'' means the Merchant Shipping Act, 1951 (Act 57 of 1951), and any other word or expression shall have the meaning assigned thereto in the Act.

The expression ''Efficient Deck Rating'' shall have the same meaning as the expression ''Able Seaman'' as contained in Section 112 of the Act;

''certificate'' means a certificate of qualification and includes a certificate of proficiency in survival craft, a certificate of qualification as efficient deck rating, a certificate of qualification as efficient engine room rating and a certificate of qualification as efficient cook;

''certificate in proficiency in survival craft'' means a certificate of qualification indicating that the holder is proficient in the use of survival craft on board a South African ship.

''certificate as efficient deck rating'' means a certificate of qualification entitling the holder to act as a deck rating in a South African ship;

''certificate as efficient engine-room rating'' means a certificate of qualification entitling the holder to act as an engine-room rating in a South African ship;

''certificate as efficient cook'' means a certificate of qualification entitling the holder to act as a cook in a South African ship;

''approved'' means approved by the Director-General;

"endossement van addisionele kwalifikasie" beteken 'n endossement aangebring op 'n sertifikaat as bekwame dekseeman of as bekwame masjienkamerseeman, wat die houer daartoe geregtig maak om in die hoedanigheid van sy sertifikaat in 'n Suid-Afrikaanse skip te vaar wat 'n tipe vaartuig is wat in regulasie 22 (2) genoem word;

"eksaminator" beteken 'n eksaminator wat kragtens artikel 112 (5) van die Wet as sodanig aangestel word.

DIREKTEUR-GENERAAL MOET BENOEMBAARHEID VAN KANDIDATE VASSTEL

3. As daar twyfel ontstaan omtrent die benoembaarheid van 'n kandidaat vir enige sertifikaat of omtrent sy toelating tot enige eksamen in verband met 'n sertifikaat word die saak, ongeag die bepalings van hierdie regulasies, na die Direkteur-generaal verwys, wie se beslissing finaal is.

PLEK WAAR EKSAMEN AFGELÊ WORD

4. Eksamen word afgelê by enige hawe met 'n eksamensentrum en op tye soos deur die eksaminator by daardie hawe bepaal.

AANSOEKVORM

5.1 'n Kandidaat vir eksaminering, of vir die toekenning aan hom van 'n sertifikaat ooreenkomstig hierdie regulasies moet aansoek doen op die vorm deur die Direkteur-generaal goedgekeur.

5.2 Die ingevulde vorm, tesame met die voorgeskrewe gelde en—

(a) die kandidaat se geboortesertifikaat;

(b) die kandidaat se verslagboek of ander dokumentêre bewys van seediens;

(c) die getuigskrifte soos in regulasie 7 voorgeskryf, moet ingedien word by die kantoor van, of gepos word aan die bevoegde beampte by die hawe waar die kandidaat die eksamen wil aflê, of as die aansoek nie op 'n eksamen betrekking het nie, die bevoegde beampte by die naaste hawe: Met dien verstande dat indien die kandidaat nie sy geboortesertifikaat kan toon nie ander bevredigende bewys van ouderdom aanvaar kan word.

TWYFELAGTIGE GEVALLE, EN NAVRAE

6.1 'n Kandidaat by wie daar twyfel bestaan of hy vir die aflê van 'n eksamen vir 'n sertifikaat in aanmerking kan kom en of hy in aanmerking kan kom vir die toekenning aan hom van 'n sertifikaat of 'n endossement van addisionele kwalifikasie, kan die toepaslike dokumente ooreenkomstig hierdie Regulasies vereis, en behoorlik ingevul, aan die eksaminator of die bevoegde beampte stuur.

6.2 Enige verdere navraag met betrekking tot sodanige eksamen, sertifikaat of endossement moet gerig word aan die eksaminator of die bevoegde beampte en moet vergesel gaan van enige sodanige dokumente as wat op die navraag betrekking het of moet die punt waaroor inligting verlang word, duidelik in die navraag uiteensit.

VEREISTE GETUIGSKRIFTE

7.1 'n Kandidaat vir 'n sertifikaat of endossement van addisionele kwalifikasie moet bevredigende getuigskrifte voorlê aangaande karakter (met inbegrip van soberheid), ondervinding, bekwaamheid en algemene gedrag aan boord van 'n skip en sodanige getuigskrifte moet die laaste 12 maande kwalifiserende diens dek wat die aansoekdatum onmiddellik voorafgaan.

7.2 Getuigskrifte moet onderteken wees deur die eienaar of gesagvoerder van die vaartuig waarin die diens verrig is.

"endorsement of additional qualification" means an endorsement effected to a certificate as efficient deck rating or as efficient engine-room rating entitling the holder to sail in the capacity of his certificate on a South African ship which is a vessel of the type mentioned in regulation 22 (2);

"examiner" means any examiner appointed as such in terms of section 112 (5) of the Act.

DIRECTOR-GENERAL TO DETERMINE ELIGIBILITY

3. If any doubt arises as to the eligibility of any candidate to any certificate or to his admission to any examination in connection with a certificate, the matter shall, notwithstanding the provisions of these Regulations, be referred to the Director-General whose decision shall be final.

PLACE OF EXAMINATION

4. Examinations shall be held at any port with an examination centre and on days to be determined by the examiner at that port.

FORM OF APPLICATION

5.1 A candidate for examination, or for the granting to him of a certificate under these Regulations, shall apply therefor on the form approved by the Director-General.

5.2 The completed form, together with the prescribed fee and accompanied by—

(a) the candidate's birth certificate;

(b) the candidate's record book or other documentary proof of sea service; and

(c) the testimonials prescribed in regulation 7 shall be handed in at the office of, or posted to, the proper officer at the port at which the candidate wishes to be examined or, if the application does not relate to an examination, the proper officer at the nearest port: Provided that if the candidate is unable to produce his birth certificate, other satisfactory proof of age may be accepted.

DOUBTFUL CASES AND ENQUIRIES

6.1 A candidate who has any doubt as to whether he is eligible to undergo the examination for a certificate or whether he is eligible for the granting to him of a certificate or an endorsement of additional qualification, may forward the appropriate documents required under these Regulations, duly completed, to the examiner or the proper officer.

6.2 Any other enquiry pertaining to such examination, certificate or endorsement shall be addressed to the examiner or the proper officer and shall be accompanied by any such documents as may be relevant to the enquiry or shall clearly set forth the point on which information is sought.

TESTIMONIALS REQUIRED

7.1 A candidate for a certificate or endorsement of additional qualification shall produce satisfactory testimonials as to character (including sobriety), experience, ability and general conduct on board ship and such testimonials shall cover the last 12 months of qualifying service immediately preceding the date of application.

7.2 Testimonials shall be signed by the owner or master of the vessel in which the service was performed.

BEREKENING VAN SEEDIENS

8.1 Seediens word bereken vanaf die aanvang tot die beëindiging van 'n reis. In geval van diens wat kragtens 'n ooreenkoms met die bemanning gelewer word, word die volle dienstyd wat deur die ooreenkoms gedek word, aanvaar mits vier vyfdes van sodanige dienstyd ter see deurgebring is.

8.2 Kwalifiserende diens beteken diens ter see as 'n dekseeman of masjienkamerseeman, na gelang van die geval, in skepe van 25 bruto ton of meer, en sluit in diens in skepe van die Suid-Afrikaanse Vloot wat ter see uitvaar: Met dien verstande dat net die helfte van sodanige diens op skepe van minder as 100 bruto ton as diens gereken word.

8.3 Kwalifiserende diens wat ooreenkomstig regulasies 16 en 19 vereis word, is onderworpe aan 'n korting ingevolge regulasie 31 ten opsigte van enige dienstydperk aan 'n goedgekeurde opleidingsinrigting, onderworpe aan 'n maksimum korting van ses maande.

ONVOLDOENDE DIENSTYD

9.1 Indien daar bevind word dat 'n kandidaat, nadat hy in 'n eksamen geslaag het, onvoldoende diens het vir die toekenning aan hom van 'n sertifikaat van die graad waarin die eksamen geslaag is, word 'n sertifikaat van dié graad nie aan hom toegeken nie.

9.2 Indien daar bevind word dat 'n fout in die berekening van die kandidaat se dienstyd ontstaan het en dat sodanige fout nie weens die skuld of opsetlike wanvoorstelling van die kandidaat ontstaan het nie, word die sertifikaat toegeken nadat die kandidaat die dienstekort aangevul het.

9.3 Indien daar bevind word dat die fout weens die opsetlike wanvoorstelling van die kandidaat ontstaan het, word die sertifikaat slegs toegestaan nadat die kandidaat die dienstekort aangevul het, tesame met sodanige bykomende diens as wat die eksaminator na goeddunke bepaal. Sodanige diens mag nooit drie kalendermaande oorskry nie.

AFSKRIFTE VAN VERLORE SERTIFIKATE

10.1 'n Aansoeker om 'n gewaarmerkte afskrif van 'n verlore sertifikaat moet aansoek doen op die vorm deur die Direkteur-generaal goedgekeur en moet die aansoek aan die bevoegde beampte voorlê en terselfdertyd toepaslike gelde betaal soos in regulasie 34 uiteengesit.

10.2 'n Verklaring aangaande die omstandighede waarin die sertifikaat verlore geraak het, moet deur die aansoeker gedoen word voor die bevoegde beampte wat die aansoekvorm aan die Direkteur-generaal moet deurstuur.

10.3 As die aansoeker kan bewys dat die sertifikaat as gevolg van skipbreuk of 'n brand aan boord verlore geraak het, word geen betaling gevorder nie.

POGING TOT OMKOPERY

11. Enige kandidaat wat 'n beampte van die Departement geld aanbied, word geag hom aan wangedrag skuldig te gemaak het en word nie tot die betrokke eksamen toegelaat nie. Sodanige kandidaat word nie tot enige eksamen vir 'n bekwaamheidsertifikaat toegelaat voordat 'n tydperk van minstens ses maande verloop het nie.

HOOFSTUK II

SERTIFIKATE, OUDERDOMSGRENSE, LEERPLANNE EN VEREISTE KWALIFIKASIES

BEKWAAMHEIDSERTIFIKAAT IN OORLEWINGSVAARTUIE

Kwalifiserende diens

12. 'n Kandidaat vir 'n bekwaamheidsertifikaat in oorlewingsvaartuie moet minstens 12 maande diens ter see in enige hoedanigheid verrig het.

CALCULATION OF SERVICE AT SEA

8.1 Service at sea shall be calculated from the commencement of a voyage to its termination. In the case of service under an agreement with the crew the whole period covered by the agreement shall be accepted provided that four fifths of such period shall have been spent at sea.

8.2 Qualifying service means service at sea as a deck rating or engine-room rating, as the case may be, in ships of 25 gross tons or more, and will include service in sea-going ships of the South African Navy with the provision that service on ships of less than 100 gross tons will count at half rate.

8.3 Qualifying service as required in terms of regulations 16 and 19 shall be subject to a remission in terms of regulation 31 in respect of any period served at an approved training establishment, subject to a maximum remission of six months.

SERVICE FOUND TO BE INSUFFICIENT

9.1 If, after a candidate has passed the examination, it is discovered that his service is insufficient to entitle him to receive a certificate of the grade for which the examination has been passed, a certificate of that grade shall not be granted to him.

9.2 If it is found that an error has occurred in the calculation of the candidate's service and that it did not occur through any fault or wilful misrepresentation on the part of the candidate, the certificate shall be granted when the candidate has made up the deficiency in service.

9.3 If it is found that the error occurred through the wilful misrepresentation by the candidate the certificate shall be granted only when the candidate has made up the deficiency in service, together with such extra service as the examiner, in his discretion, may decide. Such service shall never exceed three calendar months.

COPIES OF LOST CERTIFICATES

10.1 An applicant for a certified copy of a lost certificate shall apply on the form approved by the Director-General and submit it to the proper officer together with the appropriate fee as set out in regulation 34.

10.2 A declaration as to the circumstances in which the certificate was lost shall be made by the applicant before the proper officer, who shall transmit the application to the Director-General.

10.3 No fee is chargeable if the applicant shows that the certificate was lost through shipwreck or fire on board ship.

ATTEMPTED BRIBERY

11. Any candidate who offers a gratuity to any officer of the Department shall be regarded as having committed an act of misconduct and shall not be admitted to the examination concerned. Such candidate shall not be admitted to any examination for any certificate of competency until a period of at least six months has elapsed.

CHAPTER II

CERTIFICATES, AGE LIMITS, SYLLABUSES AND QUALIFICATIONS REQUIRED

CERTIFICATE OF PROFICIENCY IN SURVIVAL CRAFT

Qualifying service

12. A candidate for a certificate of proficiency in survival craft shall have served at sea in any capacity for a period of not less than 12 months.

Eksamenvereistes vir bekwaamheid in oorlewingsvaartuie

13. 'n Seeman wat—

(a) die ouderdom van 17½ jaar bereik het;

(b) die kwalifiserende diens bedoel in regulasie 12 verrig het;

(c) in besit is van 'n mediese sertifikaat wat deur 'n mediese praktisyn uitgereik is waarin gemeld word dat hy aan geen liggaams- of ander gebrek ly wat hom ongeskik maak om die pligte van 'n persoon in beheer van 'n oorlewingsvaartuig te vervul nie,

kan geëksamineer word vir 'n bekwaamheidsertifikaat in oorlewingsvaartuie:

Eksamenleerplan vir bekwaamheid in oorlewingsvaartuie

14.1 Die kandidaat moet die eksaminator deur praktiese demonstrasie en teoretiese verduideliking oortuig van sy vermoë om—

(a) (i) 'n reddingsbaadjie reg aan te trek;

(ii) veilig van 'n hoogte af in die water in te spring;

(iii) uit die water aan boord van 'n oorlewingsvaartuig te klim terwyl hy 'n reddingsbaadjie dra; en

(iv) 'n omgekeerde reddingsvlot regop te kry terwyl hy 'n reddingsbaadjie dra;

(b) die merke op die oorlewingsvaartuie te vertolk met betrekking tot die getal persone wat die vaartuie mag dra;

(c) die korrekte opdragte te gee wat vereis word vir—

(i) die tewaterlating van die oorlewingsvaartuig en die aan boord neem van persone;

(ii) die ontruiming van die skip; en

(iii) die landing van die oorlewingsvaartuig en die aan wal sit van persone;

(d) die oorlewingsvaartuig in gereedheid te bring en veilig te water te laat, en dit vinnig weg te kry van die kant van die skip af;

(e) beseerde persone sowel gedurende as na die verlating van die skip te behandel;

(f) (i) te roei en te stuur;

(ii) 'n mas op te rig;

(iii) die seile te span;

(iv) 'n boot onder seil te hanteer en 'n boot volgens kompas te stuur; en

(v) die kompas afgemerk in punt- en driesyfernotasie te lees en te verstaan;

(g) seintoerusting, met inbegrip van pirotegniek, te gebruik;

(h) draagbare radiotoerusting vir oorlewingsvaartuie te gebruik; en

(i) vuurpyllyne te gebruik en af te skiet.

14.2 Die kandidaat moet verder 'n eksamen aflê oor sy kennis van—

(a) die tipes noodsituasies wat kan ontstaan, soos botsing, brand of sinking;

(b) oorlewingsbeginsels, met inbegrip van—

(i) die waarde van opleiding en oefeninge;

(ii) die nodigheid daarvan om gereed te wees vir 'n noodgeval;

(iii) die stappe wat gedoen moet word wanneer na oorlewingsvaartuigstasies geroep word;

(iv) die stappe wat gedoen moet word wanneer vereis word dat die skip verlaat moet word;

Examination requirements for proficiency in survival craft

13. Any seaman who—

(a) has attained the age of 17½ years;

(b) has performed the qualifying service referred to in regulation 12;

(c) is in possession of a medical certificate issued by a medical practitioner which states that he is free from any physical or other defect which would render him unfit to perform the duties of a person in charge of a survival craft,

may be examined for a certificate of proficiency in survival craft.

Syllabus for the examination for proficiency in survival craft

14.1 The candidate shall, by practical demonstration or theoretical explanation, satisfy the examiner as to his ability to—

(a) (i) don a life-jacket correctly;

(ii) safely jump from a height into the water;

(iii) board a survival craft from the water while wearing a life-jacket; and

(iv) right an inverted life-raft while wearing a life-jacket;

(b) interpret the markings on survival craft with respect to the number of persons they are permitted to carry;

(c) give the correct commands required for—

(i) launching and boarding the survival craft;

(ii) clearing the ship; and

(iii) handling and disembarking from the survival craft;

(d) prepare and launch survival craft safely into the water and clear the ship's side quickly;

(e) deal with injured persons both during and after abandonment of ship;

(f) (i) row and steer;

(ii) erect a mast;

(iii) set the sails;

(iv) manage a boat under sail and steer a boat by compass; and

(v) read and understand the compass graduated in point notation and three-figure notation;

(g) use signalling equipment, including pyrotechnics;

(h) use portable radio equipment for survival craft, and

(i) use and firing of rocket lines.

14.2 The candidate shall further be examined in his knowledge of—

(a) types of emergency situations which may occur, such as collision, fire, and foundering;

(b) principles of survival, including—

(i) value of training and drills;

(ii) need to be ready for an emergency;

(iii) actions to be taken when called to survival craft stations;

(iv) actions to be taken when required to abandon ship;

(v) die stappe wat gedoen moet word wanneer in die water;

(vi) die stappe wat gedoen moet word wanneer aan boord van 'n oorlewingsvaartuig; en

(vii) die belangrikste gevare vir oorlewendes;

(c) die spesiale pligte opgedra aan elke bemanningslid soos aangedui in die monsterlys, met inbegrip van die verskil tussen die seine wat die bemanning na die oorlewingsvaartuie of brandstasies roep;

(d) die tipes reddingstoerusting wat skepe gewoonlik aan boord het;

(e) die konstruksie en toerusting van oorlewingsvaartuie en die gebruik van die individuele toerustingitems;

(f) die bepaalde kenmerke en fasiliteite van oorlewingsvaartuie;

(g) die verskillende tipes toestelle wat gebruik word om oorlewingsvaartuie te water te laat;

(h) metodes om oorlewingsvaartuie in ontstuimige see te water te laat;

(i) optrede nadat die skip verlaat is;

(j) hoe om oorlewingsvaartuie in ontstuimige weer te hanteer;

(k) die toedeling van voedsel en water in oorlewingsvaartuie;

(l) helikopterredding metodes;

(m) die gebruik van die noodhulptoerusting, en bybringtegnieke;

(n) radiotoestelle wat oorlewingsvaartuie aan boord het, met inbegrip van nood posisieaanduidende radiobakens;

(o) die uitwerking van hipotermie en die voorkoming daarvan, en die gebruik van beskermende bedekkings en beskermende klere;

(p) metodes om 'n oorlewingsvaartuigenjin en sy toebehores aan die gang te sit en te bedien, met inbegrip van die gebruik van brandblussers wat voorsien word;

(q) die gebruik van noodbote en motorreddingsbote om reddingsvlotte op te stel en oorlewendes en persone in die see te red;

(r) die op die strand stuur van 'n oorlewingsvaartuig;

(s) knope en touverbindings wat by bootwerk vereis word;

(t) enige ander aangeleentheid wat die eksaminator nodig mag ag aangaande hierdie eksamen.

SERTIFIKAAT AS BEKWAME DEKSEEMAN

Stuursertifikaat

15.1 'n Kandidaat wat 'n eksamen vir 'n sertifikaat as bekwame dekseeman wil aflê, moet deur middel van stuursertifikate bewys dat hy, benewens tydperke van onderrig, vir tydperke wat altesaam minstens 10 uur beloop, 'n skip van 100 bruto ton of meer gestuur het waarvan minstens vyf uur gedurende tydperke toe die skip onder loodsing gevaar het, dit is terwyl die skip 'n hawe binnegevaar of verlaat het, of tydens kanaal- of riviertransitovaarte.

15.2 Die gesagvoerder van elke skip waarop 'n seeman beurte aan die stuur waarneem, reik op versoek van die betrokke seeman 'n stuursertifikaat aan hom uit wesenlik in die vorm wat in Aanhangsel A uiteengesit word, met vermelding van die tyd wat die seeman aan hierdie diens bestee het.

(v) actions to be taken when in the water;

(vi) actions to be taken when aboard a survival craft; and

(vii) main dangers to survivors;

(c) special duties assigned to each crew member as indicated in the muster list, including the difference between the signals calling all crew to survival craft or to fire stations;

(d) types of life-saving appliances normally carried on board ships;

(e) construction and outfit of survival craft and the use of all individual items of equipment;

(f) particular characteristics and facilities of survival craft;

(g) various types of devices used for launching survival craft;

(h) methods of launching survival craft into a rough sea;

(i) action to be taken after leaving the ship;

(j) handling survival craft in rough weather;

(k) apportionment of food and water in survival craft;

(l) methods of helicopter rescue;

(m) use of the first aid kit and resuscitation techniques;

(n) radio devices carried in survival craft, including emergency position-indicating radio beacons;

(o) effects of hypothermia and its prevention, and the use of protective covers and protective garments;

(p) methods of starting and operating a survival craft engine and its accessories, together with the use of fire extinguishers provided;

(q) use of emergency boats and motor life-boats for marshalling life-rafts and rescue of survivors and persons in the sea;

(r) beaching a survival craft;

(s) knots, bends and hitches required in boatwork;

(t) any other matter which the examiner may deem necessary relating to this examination.

CERTIFICATE AS EFFICIENT DECK RATING

Steering Certificate

15.1 A candidate who wishes to be examined for a certificate as efficient deck rating shall be required to prove by means of steering certificates that he has, apart from periods of instruction, spent periods amounting to a total of at least 10 hours steering a ship of 100 gross tons or more, of which at least five hours shall have been during periods when the ship was under pilotage namely entering or leaving harbour, or during canal or river transits.

15.2 The master of each ship in which turns at the wheel are taken shall, upon request by the seaman concerned, issue to him a steering certificate substantially in the form set out in Annexure A, indicating the time spent on this duty.

Kwalifiserende diens

16. 'n Kandidaat vir 'n sertifikaat as bekwame dekseeman moet aanvaarbare bewys lewer van 18 maande kwalifiserende diens in enige hoedanigheid in die dekafdeling, verminder ingevolge regulasie 31, indien van toepassing. Minstens die helfte van die diens moet op skepe van meer as 100 bruto ton verrig wees.

Eksamenvereistes vir bekwame dekseeman

17. Enige seeman wat—

(a) die ouderdom van 18 jaar bereik het;

(b) die kwalifiserende diens in regulasie 16 vermeld, verrig het;

(c) stuursertifikate vir 'n minimum tydperk van 10 uur ooreenkomstig die bepalings van regulasie 15 voorlê;

(d) in besit is van 'n bekwaamheidsertifikaat in oorlewingsvaartuie;

(e) in besit is van 'n mediese sertifikaat wat deur 'n mediese praktisyn uitgereik is waarin gemeld word dat hy aan geen liggaams- of ander gebrek, met inbegrip van doofheid, ly nie; en

(f) in besit is van 'n oogtoetssertifikaat wat aandui dat hy die toets geslaag het binne ses maande na die eksamendatum,

kan geëksamineer word vir 'n sertifikaat as bekwame dekseeman.

Leerplan vir die eksamen van bekwame dekseeman

18.1 Daar word nie van 'n kandidaat verlang dat hy skriftelike antwoorde moet gee nie aangesien die eksamen slegs mondeling en prakties is.

18.2 'n Kandidaat word geëksamineer in—

(a) skeepvaartkennis, met inbegrip van—

(i) die betekenis van algemene skeepvaartterme;

(ii) die name en funksies van die verskillende dele van die skip;

(iii) kennis van die magnetiese en girokompas en die vermoë om by benadering die peiling van 'n voorwerp volgens boegpunte deur sowel sig as gehoor te kan aangee;

(iv) (aa) begrip van die bevele van die roerganger;

(bb) die oorhandiging van die wag; en

(cc) vertroudheid met die oorskakeling van stuuroutomaat na handstuur en omgekeerd;

(v) (aa) merke op 'n handloodlyn; en

(bb) hoe om die handlood te gooi en korrek verslag te doen van die loding aldus verkry;

(vi) (aa) die gebruik, versorging en instandhouding van reddings- en brandbestrydingstoerusting;

(bb) basiese beginsels van die oorsake, voorkoming en blus van brande aan boord, en skadebeheer (selfontbranding);

(vii) die skoonhou van die skip en persoonlike higiëne;

(viii) (aa) die voorbereiding van oppervlakke vir verf, grondlae, onderlae en eindlae; en

(bb) die versorging van toerusting;

(ix) (aa) die skoonmaak en voorbereiding van ruime en tenks vir die inskeep van vrag; en

(bb) die vasmaak, vaswoel en keiling van vrag;

(x) algemene veiligheidsmaatreëls wat ter see en in die hawe nagekom moet word;

(xi) basiese noodhulp;

(xii) die gebruik van die toepaslike internekommunikasie- en alarmstelsels;

Qualifying service

16. A candidate for a certificate as efficient deck rating shall produce acceptable proof of 18 months qualifying service in any capacity in the deck department, reduced in terms of regulation 31 if applicable. At least half of the period shall have been served on ships of over 100 gross tons.

Examination requirements for efficient deck rating

17. Any seaman who—

(a) has attained the age of 18 years;

(b) has performed the qualifying service referred to in regulation 16;

(c) produces steering certificates for a minimum period of 10 hours in accordance with the provisions of regulation 15;

(d) is in possession of a certificate of proficiency in survival craft;

(e) is in possession of a medical certificate issued by a medical practitioner which states that he does not suffer from any physical or other defect inclucing deafness; and

(f) is in possession of a sight test certificate showing that he has passed the test within six months of the date of examination,

may be examined for a certificate as efficient deck rating.

Syllabus for examination as efficient deck rating

18.1 A candidate shall not be required to give written answers, as the examination is oral and practical only.

18.2 A candidate shall be examined in—

(a) nautical knowledge including—

(i) the meaning of common nautical terms;

(ii) the names and functions of various parts of the ship;

(iii) knowledge of the magnetic and gyro compass and ability to report the approximate bearing of an object in terms of points in the bow by sight as well as by hearing;

(iv) (aa) understanding helm orders;

(bb) handing over the watch; and

(cc) familiarity with the change-over from automatic pilot to hand steering and vice versa;

(v) (aa) markings on a hand lead line; and

(bb) taking a cast of the hand lead and correctly reporting the soundings obtained;

(vi) (aa) the use, care and maintenance of life-saving and fire-fighting equipment;

(bb) basic principles of the causes, prevention and extinguishing of shipboard fires and damage control (spontaneous combustion);

(vii) ship cleanliness and personal hygiene;

(viii) (aa) preparation of surfaces for painting, priming coats, undercoats and final coats of paint; and

(bb) care of equipment;

(ix) (aa) cleaning and preparation of holds and tanks for receipt of cargo; and

(bb) securing, lashing and tomming down of cargo.

(x) general safety precautions to be observed at sea and in harbour;

(xi) basic first aid;

(xii) the use of the appropriate internal communication and alarm systems;

(xiii) die gebruik van pirotegnieknoodseine;

(xiv) noodpligte;

(xv) die voorsorgmaatreëls wat getref moet word om besoedeling van die see-omgewing te voorkom;

(xvi) die voorsorgmaatreëls wat getref moet word wanneer draagbare masjiengereedskap gebruik word; en

(xvii) die pligte van 'n uitkykwag;

(xviii) stuwing, versorging en die optekening van voorrade, en

(xix) enige ander aangeleentheid wat die eksaminator nodig mag ag aangaande hierdie eksamen.

(b) die volgende praktiese werk—

(i) (aa) knope en ander touverbindings wat algemeen gebruik word;

(bb) die besetting van 'n tou se ent;

(cc) die afwerking van die punt van 'n werplyn deur middel van 'n sjouermans- en kruisknoop of ander eenvoudige metode;

(dd) die aansit van ketting- of toustoppers;

(ee) die aansit van 'n seising, en

(ff) die konstruksie van 'n loodsleer;

(ii) (aa) die splitsing van gevlegte en meerdraadmanilla- en sintetiese veseltou deur middel van oogsplitsing, kort splitsing en agtersplitsing;

(bb) die splitsing van draadtou deur middel van oogsplitsing deur gebruik te maak van sluitsteek; en

(cc) versorging en hantering van tou en draad;

(iii) hoe om 'n boot se loper en loeftakel te reef;

(iv) (aa) hoe om 'n stellasie met stroppe op te hys;

(bb) hoe om 'n bootsmanstoel en loodsleer op te takel;

(cc) die optakeling van 'n skip aan die walloopbrug; en

(dd) veiligheidsmaatreëls ten opsigte van die aangeleenthede wat in hierdie subparagraaf genoem word;

(v) (aa) die optakeling van 'n laaiboom;

(bb) die hantering van 'n wenas en die inkoppel en ontkoppel van ratte en hulle gebruik; en

(cc) algemene voorsorgmaatreëls wat voor en gedurende die werking van 'n wenas getref moet word, hetsy dit vir laaiwerk of verhaalwerk gebruik word;

(vi) (aa) die gebruik en werking van 'n ankerspil by ankerwerk en verhaalwerk;

(bb) die veilige hantering van meertoue met besondere verwysing na sintetieseveseltoue en selfspanningswenasse; en

(cc) die opberging van 'n ankerketting in die kettingbak en die vasmaak van die anker vir uitvaring;

(vii) (aa) kennis van die skeepstuig wat gebruik word vir laaiwerk en 'n begrip van die gebruik daarvan;

(bb) die gebruik van kettingblokke; en

(cc) algemene instandhoudingswerk met spesiale klem op die herstel van rammelblokke en geiblokke en die optakel van eenvoudige takelstelle;

(viii) (aa) die veilige hantering van luikdeksels; en

(bb) die toeklamp en vasmaak van luikopenings en tenkdeksels;

(ix) die vermoë om bevele te begryp en om hom by die offisier van die wag verstaanbaar te maak oor aangeleenthede wat op sy pligte betrekking het;

(x) enige ander aangeleentheid wat die eksaminator nodig mag ag aangaande hierdie eksamen.

(xiii) the use of pyrotechnic distress signals;

(xiv) emergency duties;

(xv) the precautions to be taken to prevent pollution of the marine environment;

(xvi) the precautions to be taken when using portable power tools; and

(xvii) the duties of a look-out;

(xviii) stowage, care and stock records of stores; and

(xix) any other matter which the examiner may deem necessary relating to this examination.

(b) the following practical work—

(i) (aa) knots and other hitches and bonds in common use;

(bb) whipping a rope's end;

(cc) finishing off the end of a heaving line by a wall and crown knot or other simple method;

(dd) the putting on of chain or rope stoppers;

(ee) putting on a seizing; and

(ff) construction of a pilot ladder;

(ii) (aa) splicing plaited and multi-strand manilla and synthetic fibre rope by means of eye splice, short splice and back splice;

(bb) splicing wire rope by means of eye splicing using a locking tuck; and

(cc) care in handling rope and wire;

(iii) reeving a boat's fall and luff tackle;

(iv) (aa) slinging a stage;

(bb) rigging a boatswain's chair and pilot ladder;

(cc) rigging of ship to shore gangway; and

(dd) safety practices in respect of the matters referred to in this subparagraph;

(v) (aa) rigging a derrick;

(bb) driving a winch and the engaging and disengaging of gears and their use; and

(cc) general precautions to be taken before and during operation of a winch, whether used for the working of cargo or for warping;

(vi) (aa) the use and operation of a windlass in anchor work and in warping;

(bb) safe handling of moorings with particular reference to synthetic fibre ropes and self-tensioning winches; and

(cc) stowage of chain cables in the chain locker and securing the anchor for sea;

(vii) (aa) a knowledge of the gear used in cargo work and an understanding of its uses;

(bb) the use of chain blocks; and

(cc) general maintenance, with special reference to the overhauling of gin blocks and guy blocks and to the rigging of simple purchases;

(viii) (aa) the safe handling of hatch covers; and

(bb) battening down and securing of hatchway and tank lids; and

(ix) ability to understand orders and make himself understood by the officer of the watch in matters relevant to his duties.

(x) any other matter which the examiner may deem necessary relating to this examination;

SERTIFIKAAT AS BEKWAME MASJIENKAMER-SEEMAN

Kwalifiserende diens

19. 'n Kandidaat vir 'n sertifikaat as bekwame masjienkamerseeman moet aanvaarbare bewys aan die eksaminator lewer van 18 maande kwalifiserende diens in enige hoedanigheid in die masjienkamerafdeling, verminder ingevolge regulasie 31, indien van toepassing. Minstens die helfte van die diens moet op vaartuie van meer as 100 bruto ton verrig wees.

Eksamenvereistes vir bekwame masjienkamerseeman

20. Enige seeman wat—

(a) die ouderdom van 18 jaar bereik het;

(b) die kwalifiserende diens in regulasie 19 vermeld, verrig het;

(c) in besit is van 'n mediese sertifikaat wat deur 'n mediese praktisyn uitgereik is wat meld dat hy nie aan enige liggaams- of ander gebrek, met inbegrip van doofheid, ly nie,

kan geëksamineer word vir 'n sertifikaat as masjienkamerseeman.

Leerplan vir die eksamen van bekwame masjienkamerseeman

21.1 Daar word nie van 'n kandidaat verlang dat hy skriftelike antwoorde moet gee nie aangesien die eksamen slegs mondelings en prakties is.

21.2 'n Kandidaat word geëksamineer in—

(a) skeepvaartkennis, met inbegrip van—

(i) die betekenis van algemene skeepvaartterme soos van toepassing op die masjienkamer en dek;

(ii) die name en funksies van die verskillende dele van die skip;

(iii) die gebruik, versorging en instandhouding van reddings- en brandbestrydingtoerusting soos van toepassing op die masjienkamer;

(iv) algemene veiligheidsmaatreëls wat ter see en in die hawe nagekom moet word;

(v) (aa) die prosedures en gebruik van al die pompinstallasies in 'n konvensionele tipe masjienkamer, en

(bb) die verskillende tipes kleppe;

(vi) basiese noodhulp;

(vii) die voorsorgmaatreëls wat getref moet word om besoedeling van die see-omgewing te voorkom;

(viii) die verskillende noodroetes uit die masjienkamer;

(ix) die gebruik van die toepaslike interne kommunikasie- en alarmstelsels;

(x) noodpligte;

(xi) (aa) die voorbereiding van oppervlakke vir verf, grondlae, onderlae en eindlae, en

(bb) die versorging van toerusting;

(xii) die skoonhou van die skip en higiëne;

(xiii) die basiese beginsels van oorsake, voorkoming en blus van brande aan boord, en skadebeheer (self-ontbranding)

(xiv) stuwing, versorging en die optekening van voorrade;

(xv) bunkering—voorbereiding, voorsorgmaatreëls, gebruik van uitsitruimtemeetbande, tenkinhoude, versorging en instandhouding van peilkokers, luggate en drupbakke;

(xvi) die vaswoel, vasmaak en veilige stuwing van masjienkameronderdele;

CERTIFICATE AS EFFICIENT ENGINE-ROOM RATING

Qualifying service

19. A candidate for a certificate as efficient engine-room rating shall produce proof acceptable to the examiner, of 18 months qualifying service in any capacity in the engine room department, reduced in terms of regulation 31, if applicable. At least half of the period shall have been served on vessels of over 100 gross tons.

Examination requirements for efficient engine-room rating

20. Any seaman who—

(a) has attained the age of 18 years;

(b) has performed the qualifying service referred to in regulation 19;

(c) is in possession of a medical certificate issued by a medical practitioner which states that he does not suffer from any physical or other defect including deafness;

may by examined for a certificate as engine-room rating.

Syllabus for examination as efficient engine-room rating

21.1 A candidate shall not be required to give written answers as the examination is oral and practical only.

21.2 A candidate shall be examined in—

(a) nautical knowledge including—

(i) the meaning of common nautical terms as applicable to the engine-room and deck;

(ii) the names and functions of various parts of the ship;

(iii) the use, care and maintenance of lifesaving and fire-fighting equipment as applicable to the engine-room;

(iv) general safety precautions to be observed at sea and in harbour;

(v) (aa) the procedures and use of all the pumping arrangements found in a conventional type engine-room; and

(bb) different types of valves;

(vi) basic first aid;

(vii) the precautions to be taken to prevent pollution of the marine environment;

(viii) the various escape routes from an engine-room;

(ix) the use of the appropriate internal communication and alarm systems;

(x) emergency duties;

(xi) (aa) preparation of surfaces for painting, priming coats, undercoats and final coats of paint; and

(bb) care of equipment;

(xii) ship cleanliness and hygiene;

(xiii) basic principles of causes, prevention and extinguishing of shipboard fires and damage control (spontaneous combustion);

(xiv) stowage, care and stock records of stores;

(xv) bunkering—preparation, precautions, use of ullage tapes, tank capacities, care and maintenance of sounding pipes, vents and drip trays;

(xvi) lashing, securing and safe stowing of engine-room spares;

(xvii) die voorsorgmaatreëls wat getref moet word wanneer draagbare masjiengereedskap gebruik word; en

(b) die volgende werk—

(i) (aa) hoe om 'n stellasie met stroppe op te hys;

(bb) hoe om 'n bootsmanstoel op te takel;

(cc) veiligheidsmaatreëls ten opsigte van die aangeleenthede wat in hierdie subparagraaf genoem word;

(ii) (aa) die maak van knope en ander touverbindings wat algemeen gebruik word;

(bb) die optakel van eenvoudige takelstelle;

(iii) die gebruik van kettingblokke en bobaanlaaibrûe;

(iv) die vermoë om bevele te begryp en om hom by die ingenieur van die wag verstaanbaar te maak oor aangeleenthede wat op sy pligte betrekking het; en

(v) enige ander aangeleentheid wat die eksaminator nodig mag ag aangaande hierdie eksamen.

ENDOSSEMENT VAN VEREISTE ADDISIONELE KWALIFIKASIE

Endossement

22.1 Indien 'n houer van 'n sertifikaat as bekwame dekseeman of as bekwame masjienkamerseeman in 'n tipe vaartuig in subregulasie 2 genoem, wil vaar in die hoedanigheid van die sertifikaat waarvan hy die houer is, word 'n endossement van addisionele kwalifikasie op sy sertifikaat vereis.

22.2 'n Endossement van addisionele kwalifikasie word vereis van 'n bekwame dekseeman of bekwame masjienkamerseeman wat vaar in—

(a) 'n olietenkskip;

(b) 'n chemikalieëtenkskip;

(c) 'n vloeigastenkskip.

22.3 'n Endossement van addisionele kwalifikasie word nie by regulasie 29 (5) toegeken nie, tensy dokumentêre bewys voorgelê is dat die houer van 'n sertifikaat as bekwame dekseeman of as bekwame masjienkamerseeman sodanige kursus suksesvol voltooi het by sodanige opleidingsinrigting as wat deur die Direkteur-generaal goedgekeur word.

22.4 Die kursus wat in subregulasie 3 beoog word, dek die volgende vakke met betrekking tot elke besondere klas vaartuig wat in subregulasie 2 genoem word:

(a) gesondheidsgevare, en voorsorgmaatreëls wat getref moet word met betrekking tot die tipe vrag wat vervoer word;

(b) 'n kennis van die skip se reëls en regulasies met betrekking tot veiligheid;

(c) brandbestryding en brandvoorkoming;

(d) voorkoming van besoedeling en stappe wat in die geval van storting gedoen moet word;

(e) die regte gebruik van veiligheidstoerusting, reddingstoerusting en ontsnappingstoerusting;

(f) noodprosedures; en

(g) algemene bedryfsprosedures.

Dokumentêre bewys

23. Die onderhawige opleidingsinrigting moet, na die kandidaat se suksesvolle voltooiing van die kursus in regulasie 2.3 beoog, 'n slaagsertifikaat aan hom toeken.

Addisionele dokumente vereis vir endossement van addisionele kwalifikasie

24. Benewens die dokumente in paragrawe (a), (b) en (c) van regulasie 5.2 genoem, moet 'n kandidaat die volgende dokumente voorlê:

(a) Sy sertifikaat as bekwame dekseeman of as bekwame masjienkamerseeman; en

(b) sy slaagsertifikaat in regulasie 23 genoem.

(xvii) the precautions to be taken when using portable power tools; and

(b) the following work—

(i) (aa) slinging a stage;

(bb) rigging a boatswain's chair;

(cc) safety practices in respect of the matters referred to in this subparagraph;

(ii) (aa) knots and other hitches and bends in common use; and

(bb) the rigging of simple purchases;

(iii) the use of chain blocks and overhead gantries; and

(iv) the ability to understand orders and make himself understood by the officer of the watch in matters relevant to his duties;

(v) any other matter which the examiner may deem necessary relating to this examination.

ENDORSEMENT OF ADDITIONAL QUALIFICATION REQUIRED

Endorsement

22.1 If a holder of a certificate as efficient deck rating or an efficient engine-room rating wishes to sail on a type of vessel mentioned in subregulation 2 in the capacity of the certificate he holds, then an endorsement of additional qualification to his certificate shall be required.

22.2 An endorsement of additional qualification shall be required for an efficient deck rating or efficient engine-room rating sailing in—

(a) an oil tanker;

(b) a chemical tanker; or

(c) a liquefied gas tanker.

22.3 An endorsement of additional qualification shall not be granted under regulation 29 (5) unless documentary proof has been submitted that the holder of a certificate as efficient deck rating or as efficient engine-room rating has successfully completed such course at such training establishment as may be approved by the Director-General.

22.4 The course contemplated in subregulation 3 shall cover the following subjects in respect of each particular class of vessel mentioned in subregulation 2:

(a) health hazards and precautions to be taken in conjunction with the type of cargo carried;

(b) a knowledge of the ship's rules and regulations governing safety;

(c) fire-fighting and fire prevention;

(d) pollution prevention and steps to be taken in the event of spillage;

(e) the proper use of safety equipment, rescue equipment and escape equipment;

(f) emergency procedures; and

(g) general operational procedures.

Documentary proof

23. The training establishment in question shall, on the candidate's successful completion of the course contemplated in regulation 22.3, grant him a certificate of pass.

Additional documents required for endorsement of additional qualification

24. In addition to the documents mentioned in paragraphs (a), (b) and (c) of regulation 5.2, a candidate shall submit the following documents:

(a) His certificate as efficient deck rating or as efficient engine-room rating; and

(b) his certificate of pass mentioned in regulation 23.

SERTIFIKAAT AS BEKWAME KOK

Voorwaardes vir die toekenning van 'n sertifikaat as bekwame kok

25. 'n Sertifikaat as bekwame kok word aan 'n spysenieringseeman toegeken wat—

(a) die ouderdom van 18 jaar bereik het;

(b) 18 maande kwalifiserende diens as 'n spysenieringseeman of assistent-kok in skepe van 100 bruto ton of meer verrig het;

(c) ses maande van die 18 maande kwalifiserende diens in paragraaf (b) genoem verrig het as 'n assistent-kok terwyl hy die houer was van 'n sertifikaat van bywoning van 'n opleidingskool, of 'n sertifikaat as kok uitgereik deur 'n opleidingskool of -inrigting wat deur die Direkteur-generaal goedgekeur is; en

(d) in besit is van 'n mediese sertifikaat wat deur 'n mediese praktisyn uitgereik is wat meld dat hy nie aan enige liggaams- of ander gebrek, met inbegrip van doofheid, ly nie.

Toekenning van 'n sertifikaat as bekwame kok

26. 'n Sertifikaat as bekwame kok word by regulasie 29.4 en 29.5 toegeken.

Addisionele dokumente vereis vir die toekenning van 'n sertifikaat as bekwame kok

27. Benewens die dokumente in paragrawe (a), (b), en (c) van regulasie 5.2 genoem, moet 'n kandidaat die bywoningsertifikaat of sertifikaat as kok in regulasie 25 (c) genoem, voorlê.

HOOFSTUK III

UITSLAG VAN EKSAMEN

Druiping in eksamen

28. Aan 'n kandidaat wat druip in 'n eksamen ooreenkomstig hierdie regulasies word 'n kennisgewing uitgereik wesenlik in die vorm soos in Aanhangsel B uiteengesit.

Uitreiking van sertifikate

29.1 Aan 'n kandidaat wat slaag in die eksamen vir 'n bekwaamheidsertifikaat in oorlewingsvaartuie word genoemde sertifikaat uitgereik wesenlik in die vorm soos in Aanhangsel C uiteengesit.

29.2 Aan 'n kandidaat wat slaag in die eksamen vir 'n sertifikaat as bekwame dekseeman word genoemde sertifikaat uitgereik wesenlik in die vorm soos in Aanhangsel D uiteengesit.

29.3 Aan 'n kandidaat wat slaag in die eksamen vir 'n sertifikaat as bekwame masjienkamerseeman word genoemde sertifikaat uitgereik wesenlik in die vorm soos in Aanhangsel E uiteengesit.

29.4 Aan 'n kandidaat wat aan die vereistes vir 'n sertifikaat as bekwame kok voldoen, word genoemde sertifikaat uitgereik wesenlik in die vorm soos in Aanhangsel F uiteengesit.

29.5 (a) 'n Bekwaamheidsertifikaat in oorlewingsvaartuie, 'n sertifikaat as bekwame dekseeman en 'n sertifikaat as bekwame masjienkamerseeman word toegeken deur die eksaminators wat die eksamen afgeneem het.

(b) 'n Sertifikaat as bekwame kok en 'n endossement van addisionele kwalifikasie word toegeken deur enige eksaminator wat tevrede is dat die spysenieringseeman voldoen het aan die voorwaardes in regulasie 25 uiteengesit.

(c) Afskrifte van die sertifikate en endossemente in paragrawe (a) en (b) vermeld, word deur die betrokke eksaminator aan die Direkteur-generaal deurgestuur.

CERTIFICATE AS EFFICIENT COOK

Conditions of granting a certificate as efficient cook

25. A certificate as efficient cook shall be granted to a catering rating who—

(a) has attained the age of 18 years;

(b) has performed 18 months of qualifying service as a catering rating or assistant cook in ships of 100 gross tons or more;

(c) has performed six months of the 18 months qualifying service mentioned in paragraph (b) as an assistant cook whilst holding a certificate of attendance at a training school or a certificate as cook, such certificate having been issued by a training school or establishment which has been approved by the Director-General; and

(d) is in possession of a medical certificate issued by a medical practitioner which states that he does not suffer from any physical or other defect, including deafness.

Granting of a certificate as efficient cook

26. A certificate as efficient cook shall be granted under regulation 29.4 and 29.5.

Additional documents required for the granting of a certificate as efficient cook

27. In addition to the documents mentioned in paragraphs (a), (b) and (c) of regulation 5.2, a candidate shall submit the certificate of attendance or certificate as cook mentioned in regulation 25 (c).

CHAPTER III

RESULT OF EXAMINATION

Failure in examination

28. A candidate who fails in an examination under these regulations shall be issued with a notification substantially in the form as set out in Annexure B.

Issue of certificates

29.1 A candidate who passes the examination for a certificate of proficiency in survival craft shall be issued with the said certificate substantially in the form as set out in Annexure C.

29.2 A candidate who passes the examination for a certificate as efficient deck rating shall be issued with the said certificate substantially in the form as set out in Annexure D.

29.3 A candidate who passes the examination for a certificate as efficient engine-room rating shall be issued with the said certificate substantially in the form as set out in Annexure E.

29.4 A candidate who satisfied the requirements for a certificate as efficient cook shall be issued with the said certificate substantially in the form as set out in Annexure F.

29.5 (a) A certificate of proficiency in survival craft, efficient deck rating and efficient engine-room rating shall be granted by the examiners who conducted the examination.

(b) A certificate as efficient cook and an endorsement of additional qualification shall be granted by any examiner who is satisfied that the catering rating has complied with the conditions set out in regulation 25.

(c) Copies of the certificates and endorsements referred to in paragraphs (a) and (b) shall be forwarded by the examiner concerned to the Director-General.

HOOFSTUK IV

DIENS IN SKEPE, UITGESONDERD SUID-AFRIKAANSE SKEPE, EN OPLEIDINGSINRIGTINGS

Bewys van diens in skepe, uitgesonderd Suid-Afrikaanse skepe

30.1 As 'n kandidaat aanspraak maak op seediens in skepe wat nie in die Republiek geregistreer is nie en sodanige diens nie deur die Direkteur-generaal bevestig kan word nie, word die diens bevestig deur 'n bevoegde gesag van die land waarin die skip geregistreer is.

30.2 Indien die afdoendheid van die bewys wat gelewer word enigsins twyfelagtig voorkom, word alle dokumente na die Direkteur-generaal verwys vir sy beslissing.

Opleidingsinrigtings

31. 'n Tydperk van diens, ná die bereiking van 14 jaar, aan 'n opleidingsinrigting, hetsy op land of nie, wat deur die Direkteur-generaal goedgekeur word, word soos in regulasie 17.2 en regulasie 20.2 beoog, in aanmerking geneem by die berekening van die tydperk van kwalifiserende diens wat onderskeidelik vir 'n sertifikaat as bekwame dekseeman en 'n sertifikaat as bekwame masjienkamerseeman vereis word: Met dien verstande dat—

(a) die kandidaat 'n bevredigende sertifikaat van die prinsipaal of ander persoon in beheer van die inrigting voorlê waarin gemeld word dat die kandidaat die opleidingskursus wat deur die inrigting aangebied word, voltooi het en waarin getuig word van sy goeie gedrag en bekwaamheid tot op die datum waarop hy die inrigting verlaat het;

(b) die Direkteur-generaal ten opsigte van elke inrigting wat deur hom goedgekeur is, moet vasstel watter gedeelte van die tyd wat by daardie inrigting bestee is, as kwalifiserende diens moet tel.

HOOFSTUK V

GELDE

Wanneer gelde betaal moet word

32. 'n Kandidaat vir 'n eksamen moet die gelde betaal voordat die eksamen afgelê word.

Waar gelde betaal moet word

33. Die eksamengelde moet betaal word aan die naaste bevoegde beampte wat 'n kwitansie moet uitreik met vermelding van—

(a) die naam van die kandidaat;

(b) die bedrag wat betaal is; en

(c) die sertifikaat waarvoor die kandidaat die eksamen aflê.

Tabel van gelde

34.1 Die eksamengelde wat betaal moet word, is soos volg:

(a) Vir 'n eksamen vir 'n bekwaamheidsertifkaat in oorlewingsvaartuie: R15;

(b) vir 'n eksamen vir 'n sertifikaat as bekwame dekseeman: R15;

(c) vir 'n eksamen vir 'n sertifikaat as bekwame masjienkamerseeman: R15;

(d) vir die toekenning van 'n sertifikaat as bekwame kok: R10;

(e) vir 'n endossement van addisionele kwalifikasie: R5.

(2) Geen gelde word gevorder vir 'n hereksamen ooreenkomstig regulasie 35 nie.

(3) Geen gelde word gevorder vir die uitreiking van 'n stuursertifikaat ooreenkomstig regulasie 15 nie.

CHAPTER IV

SERVICE IN SHIPS OTHER THAN SOUTH AFRICAN SHIPS AND TRAINING ESTABLISHMENTS

Evidence as to service in ships other than South African ships

30.1 Where a candidate claims sea service in ships not registered in the Republic and such service cannot be verified by the Director-General, the service shall be confirmed by a competent authority of the country in which the ship is registered.

30.2 If the sufficiency of the proof given appears to be doubtful, all papers shall be referred to the Director-General for his decision.

Training establishments

31. Time served after the attainment of the age of 14 years at a training establishment approved by the Director-General, whether ashore or not, shall, as contemplated in regulation 17.2 and regulation 20.2 count towards the period of qualifying service required for a certificate as efficient deck rating and as efficient engine-room rating, respectively: Provided that—

(a) the candidate produces a satisfactory certificate from the principal or other person in charge of the establishment to the effect that the candidate has completed the course of training provided by the establishment and testifying to his good conduct and proficiency up to the time of his leaving the establishment;

(b) the Director-General shall determine in respect of each establishment approved by him what proportion of the time spent at that establishment shall count as qualifying service.

CHAPTER V

FEES

When to pay fees

32. A candidate for an examination shall pay the fees before the examination takes place.

Where to pay fees

33. The fee for an examination shall be paid to the nearest proper officer, who shall issue a receipt, stating—

(a) the name of the candidate;

(b) the amount paid; and

(c) the certificate for which the candidate is being examined.

Table of fees

34.1 The fees payable shall be as follows:

(a) For an examination for a certificate of proficiency in survival craft: R15;

(b) For an examination for a certificate as efficient deck rating: R15;

(c) For an examination for a certificate as efficient engine-room rating: R15;

(d) For the granting of a certificate as efficient cook: R10; and

(e) For an endorsement of additional qualification: R5.

(2) No fee shall be charged for a re-examination under regulation 35 (2).

(3) No fee shall be charged for the issue of a steering certificate under regulation 15.

HOOFSTUK VI

KANSELLERING OF OPSKORTING VAN SERTIFIKATE EN HEREKSAMINERING VAN HOUERS VAN DIE SERTIFIKATE

35.1 Nieteenstande enigiets in hierdie regulasies vervat, kan die Direkteur-generaal 'n sertifikaat wat ooreenkomstig hierdie regulasies uitgereik of toegeken is, kanselleer of opskort indien die houer daarvan die sertifikaat op grond van onjuiste inligting verkry het.

35.2 (a) Indien dit onder die aandag van die Direkteur-generaal kom dat die houer van 'n sertifikaat wat ooreenkomstig hierdie regulasies uitgereik is, nie meer die nodige kwalifikasies besit nie, kan hy vereis dat die houer van die sertifikaat hom vir hereksaminering aanmeld.

(b) Indien die uitslag van die hereksamen nie tot tevredenheid van die Direkteur-generaal is nie, kan hy die sertifikaat wat voorheen aan die houer uitgereik is, kanselleer.

(c) As 'n persoon hom verontreg voel deur die beslissing van die Direkteur-generaal ooreenkomstig subregulasie (2), kan hy na die Minister appelleer, wie se beslissing in die saak finaal is.

AANHANGSEL A

REPUBLIEK VAN SUID-AFRIKA

DEPARTEMENT VAN VERVOER

MARINE-AFDELING

[Handelskeepvaartwet, 1951 (Wet 57 van 1951), soos gewysig]

STUURSERTIFIKAAT

Let Wel.—Hierdie sertifikaat moet uitgereik word slegs ten opsigte van diens in skepe van 100 of meer bruto registerton.

A. Besonderhede van seeman:

Van (in blokletters)	Voorname (in blokletters)	Geboorteplek

Geboortedatum	Nasionaliteit	Ras	Gradering	Verslagboeknommer

B. Besonderhede van skip:

Naam van skip	Amptelike No.	Registrasiehawe	Bruto tonnemaat	Spesifiseer of kraggedrewe, seil of ander

Hierby word gesertifiseer dat bogenoemde seeman diens gedoen het as ..... vanaf ..... tot ..... op bogenoemde skip en dat hy beurte waargeneem het aan die stuur van die skip vir 'n totale tydperk van ..... uur waarvan ..... uur terwyl die skip onder loodsing gevaar het.

Datum .....

.....
Gesagvoerder

CHAPTER VI

CANCELLATION OR SUSPENSION OF CERTIFICATES AND RE-EXAMINATION OF HOLDERS

35.1 Notwithstanding anything contained in these Regulations, the Director-General may cancel or suspend a certificate issued or granted in terms of these Regulations if the holder obtained the certificate on erroneous information.

35.2 (a) If it comes to the notice of the Director-General that the holder of a certificate issued under these Regulations no longer possesses the necessary qualifications, he may require the holder to present himself for re-examination.

(b) If the results of any such re-examination are not to the satisfaction of the Director-General, he may cancel the certificate as previously issued to the holder.

(c) If any person is aggrieved by the decision of the Director-General in terms of subregulation (2), he may appeal to the Minister whose decision in the matter shall be final.

ANNEXURE A

REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF TRANSPORT

MARINE DIVISION

[Merchant Shipping Act, 1951 (Act 57 of 1951)]

STEERING CERTIFICATE

Note.—This certificate must be issued only in respect of service in ships of 100 or more gross register tons.

A. Particulars of seaman:

Surname (in block letters)	First names (in block letters)	Place of birth

Date of Birth	Nationality	Race	Rating	No. of record book

B. Particulars of ship:

Name of ship	Official No.	Port of registry	Gross tonnage	Specify whether power driven, sail or other

This is to certify that the above-mentioned seaman served as ..... from ..... to ..... on the above-mentioned ship and that he took turns at the wheel in steering the ship for a total of ..... hours of which ..... hours were whilst under pilotage.

Date .....

.....
Master

AANHANGSEL B

REPUBLIEK VAN SUID-AFRIKA

DEPARTEMENT VAN VERVOER (MARINE-AFDELING)

[Handelskeepvaartwet, 1951 (Wet 57 van 1951)]

KENNISGEWING DAT 'N KANDIDAAT GEDRUIP HET IN 'N EKSAMEN OOREENKOMSTIG DIE REGULASIES BETREFFENDE BEVOEGDHEIDSERTIFIKATE

Van (in blokletters) .....

Voorname .....

Geboorteplek ..... Geboortedatum .....

Verslagboeknommer ..... Huidige gradering .....

Ek wens u te verwittig dat u gedruip het in die eksamen wat op die ..... dag van .....

19..... te..... gehou is.

(a) vir 'n bekwaamheidsertifikaat in oorlewingsvaartuie.

(b) vir 'n bevoegdheidsertifikaat as bekwame dekseeman.

(c) vir 'n bevoegdheidsertifikaat as bekwame masjienkamerseeman.

Die volgende dokumente word hierby ingesluit .....

.....

Hawe.....

Datum ....

Handtekening van eksaminator

---

* *Let wel.*—Die eksaminator moet (a), (b) of (c), watter ook al nie van toepassing is nie, skrap.

AANHANGSEL C

REPUBLIEK VAN SUID-AFRIKA

DEPARTEMENT VAN VERVOER—MARINE-AFDELING

[Handelskeepvaartwet, 1951 (Wet 57 van 1951), soos gewysig]

BEKWAAMHEIDSERTIFIKAAT IN OORLEWINGSVAARTUIE

Besonderhede van seeman

Van (in blokletters)	Voorname (in blokletters)	Geboorteplek	Geboorte-datum

Nasionaliteit	Lengte	Kleur van oë	Ras	Gradering	Verslagboek-nommer

Hierby word gesertifiseer dat bogenoemde seeman geëksamineer is te ..... op (datum)..... en my daarvan oortuig het dat hy die verrigtinge verbonde aan die tewaterlating van oorlewingsvaartuie begryp; dat hy vertroud is met die praktiese hantering van die oorlewingsvaartuie onder roeispane, krag en seil; dat hy die bevele betreffende die hantering van oorlewingsvaartuie kan verstaan en uitvoer en dat hy die beginsels van oorlewing in 'n oorlewingsvaartuig ter see verstaan.

Gedateer te..... op hede die ..... dag van ..... 19.....

.....

Eksaminator

(Amptelike stempel)

.....

Handtekening van seeman

AANHANGSEL D

REPUBLIEK VAN SUID-AFRIKA

DEPARTEMENT VAN VERVOER—MARINE-AFDELING

[Handelskeepvaartwet, 1951 (Wet 57 van 1951), soos gewysig]

BEVOEGDHEIDSERTIFIKAAT AS BEKWAME DEKSEEMAN

Besonderhede van seeman

Van (in blokletters)	Voorname (in blokletters)	Geboorteplek	Geboorte-datum

ANNEXURE B

REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF TRANSPORT (MARINE DIVISION)

[Merchant Shipping Act, 1951 (Act 57 of 1951)]

NOTIFICATION OF FAILURE IN EXAMINATION UNDER THE CERTIFICATES OF QUALIFICATION REGULATIONS

Surname (in block letters).....

First names.....

Place of birth..... Date of birth.....

No. of record book..... Present rating.....

I have to inform you that you failed the examination held at.....

on the .....day .....19.....

(a) for a certificate of proficiency in survival craft.

(b) for a certificate of qualification as efficient deck rating.

(c) for a certificate of qualification as efficient engine-room rating.

The following documents are enclosed .....

.....

Port.....

Date..... .....

Signature of examiner

---

* *Note.*—The examiner must strike out (a), (b) or (c) whichever is not applicable.

ANNEXURE C

REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF TRANSPORT—MARINE DIVISION

[Merchant Shipping Act, 1951 (Act 57 of 1951) as amended]

CERTIFICATE OF PROFICIENCY IN SURVIVAL CRAFT

Particulars of seaman

Surname (in blockletters)	First names (in blockletters)	Place of birth	Date of birth

Nationality	Height	Colour of eyes	Race	Rating	No. of record book

This is to certify that the above-mentioned seaman was examined at.....

..... on (date) ..... and has satisfied me that he understands the operations connected with the launching of survival craft; that he is acquainted with the practical handling of the survival craft under oars, power and sail; that he is capable of understanding and answering the orders relative to the handling of the survival craft and that he understands the principles of survival in a survival craft at sea.

Dated at..... this .....day of.....19.....

.....

Examiner

(Official stamp)

.....

Signature of Seaman

ANNEXURE D

REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF TRANSPORT—MARINE DIVISION

[Merchant Shipping Act, 1951 (Act 57 of 1951) as amended]

CERTIFICATE OF QUALIFICATION AS EFFICIENT DECK RATING

Particulars of seaman

Surname (in blockletters)	First names (in blockletters)	Place of birth	Date of birth

Nasionaliteit	Lengte	Kleur van oë	Ras	Gradering	Verslagboeknommer

Hierby word gesertifiseer dat bogenoemde seeman geëksamineer is te ..... op (datum)..... en my daarvan oortuig het dat hy behoorlik gekwalifiseer is om die pligte van 'n bekwame dekseeman in skepe van die Handelsdiens te vervul.

Gedateer te ..... op hede die ..... dag van ..... 19.....

.....
Eksaminator

(Amptelike stempel)

.....
Handtekening van seeman

AANHANGSEL E

REPUBLIEK VAN SUID-AFRIKA

DEPARTEMENT VAN VERVOER—MARINE-AFDELING

[Handelskeepvaartwet, 1951 (Wet 57 van 1951), soos gewysig]

BEVOEGDHEIDSERTIFIKAAT AS BEKWAME MASJIENKAMER-SEEMAN

Besonderhede van seeman

Van (in blokletters)	Voorname (in blokletters)	Geboorteplek	Geboortedatum

Nasionaliteit	Lengte	Kleur van oë	Ras	Gradering	Verslagboeknommer

Hierby word gesertifiseer dat bogenoemde seeman geëksamineer is te ..... op (datum)..... en my daarvan oortuig het dat hy behoorlik gekwalifiseer is om die pligte van 'n bekwame masjienkamerseeman in skepe van die Handelsdiens te vervul.

Gedateer te ..... op hede die ..... dag van ..... 19.....

.....
Eksaminator

(Amptelike stempel)

.....
Handtekening van seeman

AANHANGSEL F

REPUBLIEK VAN SUID-AFRIKA

DEPARTEMENT VAN VERVOER—MARINE-AFDELING

[Handelskeepvaartwet, 1951 (Wet 57 van 1951), soos gewysig]

BEVOEGDHEIDSERTIFIKAAT AS BEKWAME KOK

Besonderhede van seeman

Van (in blokletters)	Voorname (in blokletters)	Geboorteplek	Geboortedatum

Nasionaliteit	Lengte	Kleur van oë	Ras	Gradering	Verslagboeknommer

Hierby word gesertifiseer dat bogenoemde seeman my oortuig het dat hy aan al die vereistes voldoen vir die toekenning van 'n sertifikaat as bekwame kok in skepe van die Handelsdiens.

Gedateer te ..... op hede die ..... dag van ..... 19.....

.....
Eksaminator

(Amptelike stempel)

.....
Handtekening van seeman

Nationality	Height	Colour of eyes	Race	Rating	No. of record book

This is to certify that the above-mentioned seaman was examined at ..... on (date) ..... and has satisfied me that he is fully qualified to fulfil the duties of an Efficient Deck Rating in ships of the Merchant Service.

Dated at..... this.....day of.....19.....

.....
Examiner

(Official stamp)

.....
Signature of Seaman

ANNEXURE E

REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF TRANSPORT—MARINE DIVISION

[Merchant Shipping Act, 1951 (Act 57 of 1951) as amended]

CERTIFICATE OF QUALIFICATION AS EFFICIENT ENGINEROOM RATING

Particulars of seaman

Surname (in blockletters)	First names (in blockletters)	Place of birth	Date of birth

Nationality	Height	Colour of eyes	Race	Rating	No. of record book

This is to certify that the above-mentioned seaman was examined at ..... on (date) ..... and has satisfied me that he is duly qualified to fulfil the duties of an Efficient Engineroom Rating in ships of the Merchant Service.

Dated at..... this.....day of.....19.....

.....
Examiner

(Official stamp)

.....
Signature of Seaman

ANNEXURE F

REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF TRANSPORT—MARINE DIVISION

[Merchant Shipping Act, 1951 (Act 57 of 1951) as amended]

CERTIFICATE OF QUALIFICATION AS EFFICIENT COOK

Particulars of seaman

Surname (in blockletters)	First names (in blockletters)	Place of birth	Date of birth

Nationality	Height	Colour of eyes	Race	Rating	No. of record book

This is to certify that the above-mentioned seaman has satisfied me that he has met all the requirements for the granting of a certificate as efficient cook in ships of the merchant service.

Dated at..... this.....day of.....19.....

.....
Examiner

(Official stamp)

.....
Signature of Seaman

No. R. 2655 **29 November 1985**

EKSAMENREGULASIES VIR INGENIEUROFFISIERE, 1985

Die Minister van Vervoerwese het, kragtens artikel 356 (1) van die Handelskeepvaartwet, 1951 (Wet 57 van 1951), die regulasies in die Bylae hiervan uitgevaardig.

BYLAE

Ordening van regulasies.

HOOFSTUK 1

ALGEMEEN

Regulasie No.

1. Titel van hierdie regulasies.
2. Woordomskrywings.
3. Oorweging van twyfelagtige gevalle.
4. Plekke waar eksamens afgeneem word.
5. Aansoekvorm.
6. Ander dokumente wat ingedien moet word.
7. Getuigskrifte.
8. Doofheid en ander liggaams- of geestesongeskiktheid.
9. Onvoldoende dienstyd.
10. Afskrifte van verlore sertifikate.
11. Veiligheidsaangeleenthede.

HOOFSTUK II

KWALIFIKASIES VEREIS VAN 'N KANDIDAAT VIR 'N BEKWAAMHEIDSERTIFIKAAT AS MARINE-INGENIEUROFFISIER KLAS 4 EN ENDOSSEMENT, OF MARINE-INGENIEUROFFISIER KLAS 3 EN ENDOSSEMENT

A. KANDIDAAT VIR 'N BEKWAAMHEIDSERTIFIKAAT AS MARINE-INGENIEUROFFISIER KLAS 4 EN ENDOSSEMENT

12. Ouderdom van kandidaat.
13. Diens as leerlingingenieur of ambagsgesel.
14. Studente- of tegniese vakleerlingskappe.
15. Voltydse of stapelkursusse aan 'n tegniese kollege, technikon of universiteit.
16. Kadetkursus vir Marine-ingenieuroffisier Klas 4–3.
17. Vergoedende diens.
18. Tydperk seediens vereis van 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 4.
19. Tydperk seediens vereis vir die endossering van bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 4 en vir 'n diensendossement.
20. Tipe seediens vereis van 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier en endossement.
21. Kwytskelding van seediens vir 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 4.

B. KANDIDAAT VIR 'N BEKWAAMHEIDSERTIFIKAAT AS MARINE-INGENIEUROFFISIER KLAS 3 EN ENDOSSEMENT

22. Tydperk seediens vereis van kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 3.
23. Tydperk seediens vereis vir die endossering van 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 3.
24. Tipe seediens vereis van 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 3, en endossement.
25. Kwytskelding van seediens vir 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 3.
26. Druiping in die eksamen vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 3 kan die toekenning van 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 4 regverdig.

HOOFSTUK III

KWALIFIKASIE VEREIS VAN 'N KANDIDAAT VIR 'N BEKWAAMHEIDSERTIFIKAAT AS MARINE-INGENIEUR KLAS 2 EN ENDOSSEMENT, OF MARINE-INGENIEUROFFISIER KLAS 1 EN ENDOSSEMENT

A. KANDIDAAT VIR 'N BEKWAAMHEIDSERTIFIKAAT AS MARINE-INGENIEUROFFISIER KLAS 2 EN ENDOSSEMENT

27. Ouderdom van kandidaat.

Werkwinkeldiens

28. Diens as vakleerling of ambagsgesel in ingenieursambagte.
29. Studente- of tegniese vakleerlingskap.
30. Voltydse of stapelkursusse aan 'n technikon, tegniese kollege of universiteit.
31. Kadetopleidingskursus vir Marine-ingenieuroffisiere.
32. Vergoedende diens.

No. R. 2655 **29 November 1985**

THE EXAMINATION REGULATIONS FOR ENGINEER-OFFICERS, 1985

The Minister of Transport Affairs has, in terms of section 356 (1) of the Merchant Shipping Act, 1951 (Act 57 of 1951), made the regulations contained in the Schedule.

SCHEDULE

Arrangement of regulations.

CHAPTER 1

GENERAL

Regulation No.

1. Title of these regulations.
2. Interpretation and definitions.
3. Consideration of doubtful cases.
4. Places of examination.
5. Form of application.
6. Other documents to be submitted.
7. Testimonials.
8. Deafness and other physical or mental disabilities.
9. Service found to be insufficient.
10. Copies of lost certificates.
11. Matters relating to security.

CHAPTER II

QUALIFICATIONS REQUIRED OF A CANDIDATE FOR A CERTIFICATE OF COMPETENCY AS MARINE ENGINEER-OFFICER CLASS 4 AND ENDORSEMENT OR MARINE ENGINEER-OFFICER CLASS 3 AND ENDORSEMENT

A. CANDIDATE FOR A CERTIFICATE OF COMPETENCY AS MARINE ENGINEER-OFFICER CLASS 4 AND ENDORSEMENT

12. Age of candidate.
13. Service as apprentice or journeyman in engineering works.
14. Full-time or sandwich courses at technical college, technikon or university.
15. Student or technical apprenticeships.
16. Cadet course for Marine Engineer-Officer Class 4–3.
17. Compensatory service.
18. Period of sea service required of a candidate for a certificate of competency as Marine Engineer-Officer Class 4.
19. Period of sea service required for the endorsement of a certificate of competency as Marine Engineer-Officer Class 4.
20. Type of sea service required of a candidate for a certificate of competency as Marine Engineer-Officer Class 4 and endorsement.
21. Remission of sea service for a candidate for a certificate of competency as Marine Engineer-Officer Class 4.

B. CANDIDATE FOR A CERTIFICATE OF COMPETENCY AS MARINE ENGINEER-OFFICER CLASS 3 AND ENDORSEMENT

22. Period of sea service required of a candidate for a certificate of competency as Marine Engineer-Officer Class 3.
23. Period of sea service required for the endorsement of a certificate of competency as Marine Engineer-Officer Class 3.
24. Type of sea service required of a candidate for a certificate of competency as Marine Engineer-Officer Class 3 and endorsement.
25. Remission of sea service for a candidate for a certificate of competency as Marine Engineer-Officer Class 3.
26. Failure in the examination for a certificate of competency as Marine Engineer-Officer Class 3 may justify the award of a certificate of competency as Marine Engineer Class 4.

CHAPTER III

QUALIFICATION REQUIRED OF A CANDIDATE FOR A CERTIFICATE OF COMPETENCY AS MARINE ENGINEER-OFFICER CLASS 2 AND ENDORSEMENT OR MARINE ENGINEER-OFFICER CLASS 1 AND ENDORSEMENT

A. CANDIDATE FOR A CERTIFICATE OF COMPETENCY AS MARINE ENGINEER-OFFICER CLASS 2 AND ENDORSEMENT

27. Age of candidate.

Workshop service

28. Service as apprentice engineer or journeyman.
29. Student or technical apprenticeship.
30. Full-time or sandwich courses at a technikon, technical college or university.
31. Marine Engineer Officer Cadet Training Course.
32. Compensatory service.

Seediens

33. Tydperk seediens vereis van 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2.
34. Tydperk seediens vereis vir die endossering van 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2.
35. Tipe seediens vereis van 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2 en endossement.
36. Kwytskelding van seediens vir 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2.

B. KANDIDAAT VIR 'N BEKWAAMHEIDSERTIFIKAAT AS MARINE-INGENIEUROFFISIER KLAS 1 EN ENDOSSEMENT

37. Tydperk seediens vereis van 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 1.
38. Tydperk seediens vereis vir die endossering van 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 1.
39. Tipe seediens vereis van 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 1 en endossement.
40. Kwytskelding van seediens vir 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 1.
41. Eksamen vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 1 sonder dat 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2 voorgelê word.

HOOFSTUK IV

KWALIFIKASIES VEREIS VAN 'N KANDIDAAT VIR 'N BEKWAAMHEIDSERTIFIKAAT AS HOOF-INGENIEUROFFISIER—SPESIALE GRAAD

42. Algemeen.

HOOFSTUK V

ALGEMENE BEPALINGS BETREFFENDE AANVAARBAARHEID [NIE OP 'N KANDIDAAT VIR 'N BEKWAAMHEIDSERTIFIKAAT AS HOOF-INGENIEUROFFISIER (SPESIALE GRAAD) VAN TOEPASSING NIE]

43. Algemeen.
44. Hoe seediens bereken word.
45. Diens by hulpmasjiene.

HOOFSTUK VI

EKSAMENGELDE (ALLE KANDIDATE)

46. Wanneer gelde betaal moet word.
47. Waar gelde betaal moet word.
48. Tabel van eksamengelde.
49. Terugbetaling van eksamengelde.

HOOFSTUK VII

EKSAMENS: BEKWAAMHEIDSERTIFIKAAT AS MARINE-INGENIEUROFFISIER KLAS 4 EN ENDOSSEMENT, OF MARINE-INGENIEUROFFISIER KLAS 3 EN ENDOSSEMENT

50. Eksamen vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 4 of Marine-ingenieuroffisier Klas 3.
51. Eksamen vir endossering van 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 4 of Marine-ingenieuroffisier Klas 3.
52. Slaagpunt vereis.

HOOFSTUK VIII

EKSAMENS: BEKWAAMHEIDSERTIFIKAAT AS MARINE-INGENIEUROFFISIER KLAS 2 EN ENDOSSEMENT, OF MARINE-INGENIEUROFFISIER KLAS 1 EN ENDOSSEMENT

53. Eksamen vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2.
54. Eksamen vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 1.
55. Eksamen vir endossering van 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2 of Marine-ingenieuroffisier Klas 1.
56. Slaagpunt vereis.

HOOFSTUK IX

EKSAMENS: BEKWAAMHEIDSERTIFIKAAT AS HOOF-INGENIEUROFFISIER (SPESIALE GRAAD)

57. Algemeen.

HOOFSTUK X

DRUIPING IN EKSAMEN VIR 'N ANDER BEKWAAMHEIDSERTIFIKAAT AS DIÉ VAN HOOF-INGENIEUROFFISIER (SPESIALE GRAAD)

58. Algemeen.

Sea Service

33. Period of sea service required of a candidate for certificates of competency as Marine Engineer-Officer Class 2.
34. Period of sea service required for the endorsement of a certificate of competency as Marine Engineer-Officer Class 2.
35. Type of sea service required of a candidate for a certificate of competency as Marine Engineer-Officer Class 2 and endorsement.
36. Remission of sea service for a candidate for a certificate of competency as Marine Engineer-Officer Class 2.

B. CANDIDATE FOR A CERTIFICATE OF COMPETENCY AS MARINE ENGINEER-OFFICER CLASS 1 AND ENDORSEMENT

37. Period of sea service required of a candidate for a certificate of competency as Marine Engineer-Officer Class 1.
38. Period of sea service required for the endorsement of a certificate of competency as Marine Engineer-Officer Class 1.
39. Type of sea service required of a candidate for a certificate of competency as Marine Engineer-Officer Class 1 and endorsement.
40. Remission of sea service for a candidate for a certificate of competency as Marine Engineer-Officer Class 1.
41. Examination for a certificate of competency as Marine Engineer-Officer Class 1 without producing a certificate of competency as Marine Engineer-Officer Class 2.

CHAPTER IV

QUALIFICATIONS REQUIRED OF A CANDIDATE FOR A CERTIFICATE OF COMPETENCY AS CHIEF ENGINEER-OFFICER—SPECIAL GRADE

42. General.

CHAPTER V

GENERAL PROVISIONS AS TO ELIGIBILITY (NOT APPLICABLE TO A CANDIDATE FOR A CERTIFICATE OF COMPETENCY AS CHIEF ENGINEER-OFFICER-SPECIAL GRADE)

43. General.
44. How sea service is calculated.
45. Service on auxiliary machinery.

CHAPTER VI

EXAMINATION FEES (ALL CANDIDATES)

46. When to pay fees.
47. Where to pay fees.
48. Table of examination fees.
49. Refund of examination fees.

CHAPTER VII

EXAMINATIONS: CERTIFICATE OF COMPETENCY AS MARINE ENGINEER-OFFICER CLASS 4 AND ENDORSEMENT, OR MARINE ENGINEER OFFICER CLASS 3 AND ENDORSEMENT

50. Examination for a certificate of compentency as Marine Engineer-Officer Class 4 or Marine Engineer-Officer Class 3.
51. Examination for endorsement of a certificate of competency as Marine Engineer-Officer Class 4 or Marine Engineer-Officer Class 3.
52. Marks required for pass.

CHAPTER VIII

EXAMINATIONS: CERTIFICATE OF COMPETENCY AS MARINE ENGINEER-OFFICER CLASS 2 AND ENDORSEMENT, OR MARINE ENGINEER-OFFICER CLASS 1 AND ENDORSEMENT

53. Examination for a certificate of competency as Marine Engineer-Officer Class 2.
54. Examination for a certificate of competency as Marine Engineer-Officer Class 1.
55. Examination for endorsement of a certificate of competency as Marine Engineer-Officer Class 2 or Marine Engineer-Officer Class 1.
56. Marks required to pass.

CHAPTER IX

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HOOFSTUK I

ALGEMEEN

Titel van hierdie regulasies

1. Hierdie regulasies heet die Eksamenregulasies vir Ingenieuroffisiere, 1985.

Woordomskrywings

2. In hierdie regulasies beteken die uitdrukking "die Wet" die Handelskeepsvaartwet, 1951 (Wet 57 van 1951), soos gewysig, en tensy die samehang anders aandui, het enige uitdrukking wat in hierdie regulasies gebruik word en waaraan in die Wet 'n betekenis geheg is, die betekenis aldus daaraan geheg en beteken—

"goedgekeur" deur die Direkteur-generaal goedgekeur;

"dagwerk" ingenieurswerk, uitgesonderd ingenieurswerk op gereelde waghoudiens, op 'n skip gedoen deur 'n Marine-ingenieuroffisier wat as lid van die bemanning in diens is;

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CHAPTER 1

GENERAL

Title of these regulations

1. These regulations shall be called the Examination Regulations for Engineer-Officers, 1985.

Interpretation and definitions

2. In these regulations the expression "the Act" means the Merchant Shipping Act, 1951 (Act 57 of 1951), as amended, and unless the context otherwise indicates, any expression used in these regulations to which a meaning has been assigned in the Act, bears the meaning so assigned, and—

"approved" means approved by the Director-General;

"day work" means engineering work, other than on regular watch, performed in a ship by a marine engineer officer employed as a member of the crew;

"eksaminator" die persoon wat kragtens artikel 77 (4) van die Wet as sodanig aangestel is;

"kW" kilowatt;

"lang seereis" 'n seereis waarin die uiterste hawens wat die skip in die loop van die seereis besoek, minstens 500 myl uitmekaar is;

"myl" 1 852 meter;

"drywing" onder meer—

(a) waar motorenjins gebruik word, remdrywing;

(b) waar stoom- en gasturbines gebruik word, asdrywing;

(c) waar suierstoommasjiene gebruik word, indikateurdrywing;

"seediens" ook diens op modderskuite, baggerskepe, vissersbote, loodsbote of sleepbote wat in 'n hawe gebruik word;

"Diensendossement" 'n endossement wat op 'n bekwaamheidsertifikaat van Klas 2, 3 of 4 aangebring word wat die houer geregtig maak om as hoof-ingenieuroffisier diens te verrig in sekere klasse skepe soos in die Regulasies betreffende die Bemanning van Suid-Afrikaanse Skepe uiteengesit;

"kort seereis" 'n reis waarin die uiterste hawens wat die skip in die loop van die seereis besoek, minder as 500 myl uitmekaar is.

Oorweging van twyfelagtige gevalle

3. In die geval van onsekerheid oor die aanvaarbaarheid van 'n kandidaat se diens- of ander kwalifikasies vir 'n bekwaamheidsertifikaat of oor sy toelating tot 'n eksamen vir sodanige sertifikaat moet die saak na die Direkteur-generaal vir sy beslissing verwys word.

Plekke waar eksamens afgeneem word

4. Die dae waarop en die plekke waar eksamens afgeneem word, word jaarliks deur die Direkteur-generaal in Marinekennisgewings gepubliseer.

Aansoekvorm

5. 'n Eksamenkandidaat vir 'n bekwaamheidsertifikaat of diensendossement of gevaarlikevragendossement moet op die goedgekeurde vorm aansoek doen.

6. (1) 'n Kandidaat vir 'n ander bekwaamheidsertifikaat as dié van Hoof-ingenieuroffisier (Spesiale Graad) moet die vorm in duplo invul en dit indien by of pos na die eksaminator by die hawe waar die kandidaat geëksamineer wil word minstens 14 dae voor die datum waarop hy geëksamineer wil word.

Die vorm kan ook by die bevoegde beampte by enige ander Suid-Afrikaanse hawe ingedien word minstens 21 dae voor die datum van die eksamen.

In elke geval moet die vorm vergesel gaan van die kandidaat se—

(a) geboortesertifikaat of ander aanneemlike bewys van ouderdom;

(b) vakleerlingsertifikaat of bewys van suksesvolle voltooiing van 'n gepaste kursus soos voorgeskryf by regulasies 14, 15, 16, 29, 30 of 31, na gelang van die geval;

(c) ontslagsertifikate, indien hy sulke sertifikate het;

(d) getuigskrifte;

(e) 'n sertifikaat van bywoning van 'n goedgekeurde kursus in brandbestryding op skepe, met 'n geldigheidsduur van hoogstens vyf jaar;

"examiner" means the person appointed as such in terms of section 77 (4) of the Act;

"kW" means kilowatts;

"long voyage" means a voyage in which the distance between the extreme ports visited by the ship in the course of a voyage is not less than 500 miles;

"mile" means 1 852 metres;

"power" includes—

(a) where motor engines are employed, brake power;

(b) where steam and gas turbines are employed, shaft-power;

(c) where reciprocating steam engines are employed, indicated power;

"sea service" includes service in hoppers, dredgers, fishing vessels, pilot vessels or tugs operating in port;

"Service Endorsement" is an endorsement appended to a certificate of competency of Class 2, 3 or 4 which entitles the holder to serve as chief engineer-officer in certain classes of ships as set out in the Regulations Governing the Manning of South African Ships;

"short voyage" means a voyage in which the distance between the extreme ports visited by the ship in the course of a voyage is less than 500 miles.

Consideration of doubtful cases

3. If any doubt arises as to the acceptance of the service or other qualification of any candidate for a certificate of competency or as to his admission to an examination for such a certificate, the matter shall be referred to the Director-General for decision.

Places of examination

4. The days on which, and places where examinations are to be held shall be published annually by the Director-General in Marine Notices.

Form of application

5. A candidate for examination for a certificate of competency or service endorsement or dangerous cargo endorsement shall apply on the form approved.

6. (1) A candidate for a certificate of competency other than as Chief Engineer-Officer—Special Grade, shall complete the application form in duplicate and hand it in or post it to the examiner at the preferred examination port at least 14 days before the date on which he wishes to be examined.

The form may alternatively be handed in to the proper officer at any other South African port at least 21 days before the date of the examination.

In each case the form must be accompanied by the candidate's—

(a) birth certificate or other acceptable proof of age;

(b) certificate of apprenticeship or proof of the successful completion of an appropriate course as prescribed by regulations 14, 15, 16, 29, 30 or 31 as the case may be;

(c) certificates of discharge, if any;

(d) testimonials;

(e) a certificate of attendance at an approved course of fire fighting in ships of no more than five years validity;

(f) 'n sertifikaat van bywoning van 'n goedgekeurde noodhulpsertifikaatkursus, met 'n geldigheidsduur van hoogstens drie jaar;

(g) 'n bekwaamheidsertifikaat as reddingsbootman;

(h) 'n matrikulasiesertifikaat (slegs vir Klas 2);

(i) enige bekwaamheidsertifikaat wat voorheen verwerf is;

(j) enige sertifikaat van gedeeltelike slaging of vrystelling in verband met die eksamen wat nou vereis word;

(k) die toepaslike gelde.

(2) Die eksaminator kan 'n kandidaat na goeddunke toelaat om die eksamen af te lê indien die aansoek later gedoen is as wat by hierdie regulasie voorgeskryf word.

Getuigskrifte

7. (1) Behoudens die bepalings van Regulasie 11 moet 'n kandidaat vir 'n ander bekwaamheidsertifikaat as dié van Hoof-ingenieuroffisier (Spesiale Graad) getuigskrifte in die vorm in Aanhangsel 1 getoon, voorlê wat sy werkwinkeldiens en sy seediens dek.

(2) Die getuigskrifte oor die kandidaat se werkwinkeldiens moet van sy gedrag en bekwaamheid melding maak en moet meld watter soort werk hy gedoen het en die tydperk wat hy aan elke vertakking, bv. paswerk, oprigtingswerk, draaiwerk, masjienwerk, ens., bestee het. Hierdie getuigskrifte moet deur die werkgewer of sy verteenwoordiger geteken wees en moet die stempel van die firma dra.

(3) Kandidate wat meer as twee jaar te min aanvaarbare werkwinkeldiens gedoen het, moet by voltooiing van vergoedende seediens in 'n basiese werkwinkelvaktoets slaag.

(4) Die getuigskrifte oor die kandidaat se kwalifiserende seediens moet van sy soberheid, ervaring, bekwaamheid en algemene goeie gedrag melding maak en moet meld wat sy werklike rang op waghoudiens is, hoeveel Ingenieuroffisiere gelyktydig by die ketels en/of die hoofaandrywingsmasjinerie waghoudiens verrig en wat die aard is van die werk wat hy gedoen het. Hierdie getuigskrifte moet geteken word deur die Hoof-ingenieuroffisier onder wie die diens verrig is, en, indien moontlik, moet hulle ook geëndosseer word deur die Ingenieursuperintendent of, waar daar nie so 'n superintendent is nie, deur die gesagvoerder of die verteenwoordiger van die eienaar. Indien die kandidaat 'n Hoof-ingenieuroffisier is, moet die getuigskrifte deur die Ingenieursuperintendent of besturende eienaar of die sekretaris van die maatskappy onderteken word.

(5) Indien 'n kandidaat so hardhorend is dat normale gesprekvoering moeilik is, of as hy aan 'n ander liggaamsgebrek ly wat van so 'n aard is dat dit die behoorlike vervulling van sy pligte as Ingenieur-offisier op waghoudiens kan belemmer, moet in sy getuigskrifte vermeld word of die gebrek inderdaad die behoorlike vervulling van die kandidaat se pligte in enige opsig belemmer het.

Doofheid en ander liggaams- of geestesongeskiktheid

8. (1) Indien die eksaminator in die loop van 'n eksamen vind dat 'n kandidaat doof is of 'n spraakgebrek het of aan die een of ander liggaamlike of geestelike swakheid ly en dat die mate van doofheid of gebrek of ander swakheid sodanig is dat dit die kandidaat onbekwaam maak vir die vervulling van die gewone pligte van die skeepsrang wat die sertifikaat waarvoor hy geëksamineer word, hom die reg sou gee om te beklee, moet hy die kandidaat, indien dié dit verlang, toelaat om die eksamen te voltooi en moet hy die saak aan die Direkteur-generaal rapporteer met die oog op sodanige stappe as wat laasgenoemde nodig ag.

(f) a certificate of attendance at an approved first aid certificate course of no more than three years validity;

(g) a certificate of qualification as lifeboatman;

(h) certificate of matriculation (for Class 2 only);

(i) any previously obtained certificate of competency;

(j) any previously obtained certificate of partial pass or exemption relating to the examination now required;

(k) the appropriate fee.

(2) The examiner may in his discretion allow a candidate to sit the examination if the application is made later than is required by this regulation.

Testimonials

7. (1) Subject to the provisions of regulation 11, a candidate for a certificate of competency, other than Chief Engineer-Officer—Special Grade, shall produce testimonials covering his Workshop Service and Sea Service in a form shown in Annex 1.

(2) The testimonials covering his workshop service shall testify to the candidates conduct and ability, and state the kind of work on which he was engaged and the period of time spent in each branch, e.g. fitting, erecting, turning, machine work, etc. These testimonials shall be signed by the employer or his representative and bear the stamp of the firm.

(3) Candidates who are deficient in acceptable workshop service time in excess of two years will be required on completion of compensatory sea service to pass a basic Workshop Trade test.

(4) The testimonials covering his qualifying sea service shall testify to the candidate's sobriety, experience, ability and general good conduct and state his actual rank on watch, the number of engineer-officers simultaneously on watch on the boilers and/or the main propelling machinery and the nature of the duties performed by him. These testimonials shall be signed by the Chief Engineer-Officer under whom the service has been performed and, if possible, they shall also be endorsed by the Engineer Superintendent or where there is no such Superintendent by the master or representative of the owner. Where the candidate is a Chief Engineer-Officer, the testimonials shall be signed by the Engineer Superintendent or managing owner or the secretary of the company.

(5) If a candidate is hard of hearing to the extent that normal conversation is difficult or suffers from any other physical defect of such a nature that it might interfere with the proper performance of his duties as an Engineer-Officer on watch, it shall be stated in his testimonials whether the defect did in fact interfere in any way with the proper performance of the candidate's duties.

Deafness and other physical or mental disabilities

8. (1) If during the progress of an examination the examiner finds that a candidate is deaf, or has an impediment in his speech, or suffers from some other physical or mental infirmity to the extent that the degree of deafness or the impediment or other infirmity is such as to render the candidate incompetent to discharge the ordinary duties of the station on the ship which the certificate for which the candidate is being examined would entitle him to hold, he shall if the candidate so desires, allow him to complete the examination and shall report the matter to the Director-General for such action as he may deem necessary.

(2) Ondanks die bepalings van hierdie regulasies mag nòg 'n bekwaamheidsertifikaat, nòg 'n dokument wat die uitreiking van so 'n sertifikaat magtig aan 'n kandidaat wat in subregulasie (1) vermeld word en in die eksamen geslaag het, uitgereik word: Met dien verstande dat 'n bekwaamheidsertifikaat uitgereik kan word aan 'n kandidaat wat, nadat hy in die eksamen geslaag het, aan die Direkteur-generaal bevredigende bewys lewer dat sy gehoor, spraak of liggaamlike of geestelike toestand verbeter het of normaal is.

Onvoldoende dienstyd

9. (1) Indien daar bevind word dat 'n kandidaat wat in die eksamen geslaag het, nie oor voldoende diens beskik om hom geregtig te maak op 'n bekwaamheidsertifikaat vir die graad waarin hy geslaag het nie, word die sertifikaat behoudens die bepalings van hierdie regulasie nie aan hom toegeken nie.

(2) Indien die Direkteur-generaal daarvan oortuig is dat die fout in die berekening van die kandidaat se diens nie deur die fout van of deur opsetlike wanvoorstelling deur die kandidaat veroorsaak is nie, moet die sertifikaat teruggehou word tot tyd en wyl bevredigende bewys gelewer is dat al die nodige diens voltooi is, en daarna moet die sertifikaat behoudens die bepalings van hierdie regulasies aan die kandidaat uitgereik word.

(3) Indien die Direkteur-generaal daarvan oortuig is dat die fout opsetlik begaan is, moet die sertifikaat teruggehou word tot tyd en wyl die kandidaat al die nodige kwalifiserende diens en ook sodanige verdere diens as wat die Direkteur-generaal bepaal, voltooi, die toepaslike bedrag betaal en weer in die eksamen geslaag het.

(4) Addisionele diens wat ingevolge subregulasie (3) deur 'n kandidaat gelewer is, kom nie as kwalifiserende diens vir enige ande sertifikaat in aanmerking nie.

Afskrifte van verlore sertifikate

10. 'n Aansoeker om 'n gewaarmerkte afskrif van 'n verlore sertifikaat, hetsy van bekwaamheid of diens, moet op die goedgekeurde vorm aansoek doen, en sodanige aansoek aan die bevoegde beampte oorhandig en terselfdertyd die bedrag van R10 betaal. 'n Verklaring aangaande die omstandighede waarin die sertifikaat verlore geraak het, moet deur die aansoeker voor die bevoegde beampte afgelê word, wat die aansoekvorm aan die Direkteur-generaal moet deurstuur.

Geen betaling word gevorder as die aansoeker bewys lewer dat die sertifikaat as gevolg van skipbreuk of 'n brand aan boord verlore geraak het nie.

Veiligheidsaangeleenthede

11. (1) In die geval van 'n kandidaat wat—

(a) na ondertekening van die ooreenkoms met die bemanning versuim het om hom by sy skip aan te sluit;

(b) van sy skip gedros het nadat hy aangesluit het;

(c) deur 'n wetlike geregshof skuldig bevind is aan 'n misdryf waarvoor hy tot gevangenisstraf sonder die keuse van 'n boete veroordeel is;

(d) skuldig bevind is aan 'n misdryf ten opsigte waarvan 'n inskrywing kragtens artikel 183 (b) van die Wet in die amptelike skeepsjoernaal gemaak is,

dek die getuigskrifte wat ingevolge regulasie 7 (4) vereis word die tydperk van twee jaar volgende op sodanige wangedrag: Met dien verstande dat op aansoek van die aansoeker die Direkteur-generaal, nadat hy die saak ondersoek het, die tydperk na goeddunke kan verminder.

(2) Notwithstanding the provisions of these regulations, neither a certificate of competency nor a document authorising the delivery of such a certificate shall be issued to a candidate referred to in subregulation (1) who has passed the examination: Provided that a certificate of competency may be issued to a candidate who, after having passed the examination, produces satisfactory evidence to the Director-General to the effect that his hearing, speech or physical or mental condition has improved or is normal.

Service found to be insufficient

9. (1) If, after a candidate has passed the examination, it is discovered that his service is insufficient to entitle him to receive a certificate of competency of the grade for which he has passed, the certificate shall not, subject to the provisions of this regulation, be granted to him.

(2) If the Director-General is satisfied that the error in the calculation of the candidate's service did not occur through the fault of or through wilful misrepresentation by the candidate, the certificate shall be withheld pending the production of satisfactory proof that the necessary service has been completed in full, upon which the certificate shall, subject to the provisions of these regulations, be issued to him.

(3) If the Director-General is satisfied that the error was deliberately made, the certificate shall be withheld until the candidate has completed the necessary qualifying service in full and has performed such further period of service as may be decided by the Director-General, has paid the appropriate fee and has again passed the examination.

(4) Any additional service performed by the candidate in terms of subregulation (3) shall not count as qualifying service for any other certificate.

Copies of lost certificates

10. An applicant for a certified copy of a lost certificate, whether of competency or service, shall apply on the form approved, and shall hand it to the proper officer, paying at the same time the fee of R10. A declaration as to the circumstances in which the certificate was lost shall be made by the applicant before the proper officer, who shall transmit the form of application to the Director-General.

No fee is chargeable if the applicant shows that the certificate was lost through shipwreck or fire on board ship.

Matters relating to security

11. (1) In the case of a candidate who—

(a) after having signed the agreement with the crew, has neglected to join his ship;

(b) after having joined, has deserted his ship;

(c) has been convicted by a legal tribunal of an offence for which he has been sentenced to imprisonment without the option of a fine;

(d) has been found guilty of an offence in respect of which an entry has been made in the official logbook in terms of section 183 (b) of the Act,

the testimonials required in terms of regulation 7 (4) shall cover the period of two years subsequent to such misconduct: Provided that upon application by the candidate the Director-General, after having investigated the matter, may in his discretion reduce the period.

(2) Indien daar te eniger tyd aan die Direkteur-generaal gerapporteer word dat 'n kandidaat aan 'n eksaminator of enige ander persoon wat ingevolge hierdie Wet in diens is, geld of iets anders aangebied het met die doel om hom op enige wyse met betrekking tot 'n eksamen te beïnvloed, doen die Direkteur-generaal ondersoek, en indien hy daarvan oortuig is dat die kandidaat met dié doel so 'n aanbod gedoen het, kan hy weier dat die kandidaat geëksamineer word, of as daar reeds met die eksamen 'n aanvang gemaak is, kan hy die eksaminator gelas om die eksamen te staak, of as die eksamen reeds voltooi is, kan hy die uitslag daarvan nietig verklaar en gelas dat die gelde wat deur die kandidaat betaal is, verbeurd verklaar word en weier dat sodanige kandidaat weer binne 'n tydperk van hoogstens 12 maande, gereken vanaf die datum waarop sodanige aanbod gedoen is, tot 'n eksamen in die Republiek toegelaat word.

(3) 'n Vreemdeling mag nie geëksamineer word vir die uitreiking van 'n bekwaamheidsertifikaat as Hoofingenieuroffisier (Spesiale Graad) of Marine-ingenieuroffisier Klas 1 of vir 'n diensendossement vir enige klas of sertifikaat nie, behalwe in uitsonderlike omstandighede waarvan die besonderhede op aanvraag by die Direkteur-generaal verkry kan word.

HOOFSTUK II

KWALIFIKASIES VEREIS VAN 'N KANDIDAAT VIR 'N BEKWAAMHEIDSERTIFIKAAT AS MARINE-INGENIEUROFFISIER KLAS 4 EN ENDOSSEMENT, OF MARINE-INGENIEUROFFISIER KLAS 3 EN ENDOSSEMENT

A. KANDIDAAT VIR 'N BEKWAAMHEIDSERTIFIKAAT AS MARINE-INGENIEUROFFISIER KLAS 4 EN ENDOSSEMENT

12. 'n Kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 4 of Klas 3 moet minstens 21 jaar oud wees.

Werkwinkeldiens

Diens as leerlingingenieur of ambagsgesel

13. (1) 'n Kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 4 of Klas 3 moet bewys dat hy sedert bereiking van die ouderdom van 16 jaar minstens vier jaar lank as 'n vakleerling of ambagsgesel bevredigende diens gelewer het. Slaging in vaktoetse om hierdie tydperk, van vier jaar te verkort, word nie erken nie.

(2) Die tydperk van vier jaar werkwinkeldiens wat by subregulasie (1) vereis word, moet bestee gewees het—

(a) aan die montering, oprigting of herstel van masjinerie (bv. werk aan skeepsmasjiene en taamlik groot hulpmasjiene van 'n tipe wat in skepe geïnstalleer word, of aan aandrywingsmasjiene van dergelike waarde in die opleiding van skeepsingenieurs), hetsy in of buite die werkwinkel; of

(b) gedeeltelik aan die tipe werk genoem in paragraaf (a) en gedeeltelik of uitsluitlik aan ander gespesialiseerde werk onderworpe daaraan dat tydsbesteding op die volgende grondslag geskied:

Herstel en onderhoud van swaardiensdiesel masjiene	Voltyds tot hoogstens drie jaar.
Herstel en onderhoud van petrolmasjiene	Voltyds tot hoogstens twee jaar.
Metaaldraaiwerk	Voltyds tot hoogstens twee jaar.
Geelkoperafwerking	Voltyds tot hoogstens een jaar.
Maak of herstel van ketels	Voltyds tot hoogstens twee jaar.
Modelmakery	Voltyds tot hoogstens een jaar.
Skaafwerk, gleufwerk, sterkarmskaafwerk en freeswerk	Voltyds tot hoogstens 18 maande.

(2) If at any time it is reported to the Director-General that a candidate has offered any sum of money or other thing whatsoever to any examiner or any other person employed under the Act for the purpose of influencing him in any manner in relation to an examination, the Director-General shall enquire into the matter, and if he is satisfied that the candidate has made such an offer for the said purpose, he may refuse to permit the candidate to be examined or, if the examination has already commenced, may direct the examiner not to proceed with the examination, or, if the examination has already been completed, may cancel the result thereof, and may order the forfeiture of any fee paid by the candidate, and may refuse to allow him to present himself at any examination in the Republic for a period not exceeding 12 months from the date of making such offer.

(3) No alien may be examined for the issue of a certificate of competency as Chief Engineer-Officer (Special Grade) or Marine Engineer Officer Class 1 or for a Service Endorsement to any Class of certificate, save in exceptional circumstances the particulars of which may be found on application to the Director-General.

CHAPTER II

QUALIFICATIONS REQUIRED OF A CANDIDATE FOR A CERTIFICATE OF COMPETENCY AS MARINE ENGINEER-OFFICER CLASS 4 AND ENDORSEMENT, OR MARINE ENGINEER OFFICER CLASS 3 AND ENDORSEMENT

A. CANDIDATE FOR A CERTIFICATE OF COMPETENCY AS MARINE ENGINEER-OFFICER CLASS 4 AND ENDORSEMENT

12. A candidate for a certificate of competency as Marine Engineer-Officer Class 4 or Class 3 shall be not less than 21 years of age.

Workshop service

Service as apprentice or journeyman in engineering works

13. (1) A candidate for a certificate of competency as Marine Engineer-Officer Class 4 or Class 3 shall prove that since reaching the age of 16 years he has served satisfactorily for not less than 4 years as an apprentice or journeyman. The passing of trade tests to reduce this period of four years will not be credited to the candidate.

(2) The period of four years' workshop service required in terms of subregulation (1) shall have been spent—

(a) on the fitting, erecting or repairing of machinery (e.g. work on marine engines and substantial auxiliary machinery of a type fitted in ships, or on motive power machinery which has a similar value in the training of marine engineers), either in the works or outside; or

(b) partly on the type of work specified in paragraph (a), and partly or entirely on other specialised work subject to a time allowance on the following basis:

Repair and maintenance of heavy duty diesel engines	Full time up to a maximum of three years.
Repair and maintenance of petrol engines	Full time up to a maximum of two years.
Metal turning	Full time up to a maximum of two years.
Brass finishing	Full time up to a maximum of one year.
Boiler making or repairing of boiliers	Full time up to a maximum of two years.
Pattern making	Full time up to a maximum of one year.
Planning, slotting, shaping and milling	Full time up to a maximum of 18 months.

Gereedskapmaker	Voltyds tot hoogstens 18 maande.
Goedgekeurde skemas vir opleiding in die gebruik van handgereedskap en klein masjiengereedskap	Voltyds tot hoogstens een jaar.
Smidswerk	Voltyds tot hoogstens ses maande.
Kopersmidswerk	Voltyds tot hoogstens ses maande.
Sweiswerk	Voltyds tot hoogstens ses maande.
Werk in tekenkantoor as tekenaar of ingenieur werksaam in verband met samestelling, detail of ontwerp	Voltyds tot een jaar. Indien meer as een jaar in die tekenkantoor deurgebring is, tel net die helfte van die addisionele tyd. Die totaal is onderworpe aan 'n maksimum van 18 maande.
Elektriese werkwinkel- of herstelwerk nie reeds hierbo gedek nie, uitgesonderd werk van minder belangrike aard	Voltyds tot een jaar, en daarbo tel net die helfte. Die totaal is onderworpe aan 'n maksimum van 18 maande.
Werk aan instrumente en kontroleuitrusting van 'n tipe wat in skepe gebruik word	Voltyds tot een jaar, en daarbo tel net die helfte. Die totaal is onderworpe aan 'n maksimum van 18 maande.

Studente- of tegniese vakleerlingskappe

14. As alternatief vir die bepalings van regulasie 13 kan die Direkteur-generaal na eie oordeel iemand as kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 4 toelaat wat minstens vier jaar bevredigende diens in 'n georganiseerde studente- of tegniese vakleerlingskap deur die Direkteur-generaal goedgekeur, gelewer het: Met dien verstande dat die kandidaat ten minste T2-standaard in twee tegniese vakke verwerf het en minstens een jaar aan die tipe werkwinkeldiens bedoel in regulasie 13 (2) bestee het.

Voltydse of stapelkursusse aan tegniese skole, tegniese kolleges of universiteite

15. (1) As verdere alternatief vir die bepalings van regulasie 13 kan die Direkteur-generaal na eie oordeel iemand as kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier toelaat wat 'n goedgekeurde voltydse of stapelkursus van minstens drie jaar in meganiese ingenieurswese aan 'n goedgekeurde tegniese kollege, technikon of universiteit op bevredigende wyse voltooi het en minstens 24 maande lank in werkwinkels opgelei is as 'n meganiese tegnikus of ingenieur: Met dien verstande dat daar van die 24 maande wat by hierdie regulasie vereis word, minstens ses agtereenvolgende maande bestee is aan die tipe werkwinkeldiens waarvan in regulasie 13 (2) melding gemaak word.

(2) Werkwinkelopleiding gedurende vakansies van tegniese kolleges, technikons of universiteite en tydperke van altesaam hoogstens ses maande bestee aan die werkwinkel se vakleerlingopleidingskemas vir passers en draaiers of aan dergelike opleiding in die werkwinkels van 'n tegniese kollege, technikon of universiteit maak deel uit van die 24 maande diens wat by hierdie regulasie vereis word, maar is onderworpe aan 'n gesamentlike maksimum van nege maande. Afsonderlike tydperke van opleiding mag nie korter as een maand wees nie.

KADETKURSUS VIR MARINE-INGENIEUROFFISIER KLAS 4–3

16. (1) As verdere alternatief vir die bepalings van regulasie 13 kan die Direkteur-generaal na eie oordeel 'n kandidaat toelaat wat 'n goedgekeurde Marine-ingenieuroffisier Klas 4- of Klas 3-kadetopleidingskursus van vier jaar op bevredigende wyse voltooi het vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 4 of Klas 3, afhangende van vermoë. Hierdie kursus bestaan uit 'n aanvanklike

Tool room	Full time up to a maximum of 18 months.
Approved schemes of training in the use of hand and small machine tools	Full time up to a maximum of one year.
Smith work	Full time up to a maximum of six months.
Coppersmith work	Full time up to a maximum of six months.
Welding	Full time up to a maximum of six months.
Work in drawing office as draughtsman or engineer engaged on arrangement, detail or design	Full time up to one year. When more than one year has been spent in the drawing office, only half the additional time will count. Maximum total 18 months.
Electrical shop or repair work not already covered above, excluding work of a minor nature	Full time up to one year; additional at half rate. Maximum total 18 months.
Work on instruments and control gear of a type to be used on ships	Full time up to one year; additional time at half rate. Maximum total 18 months.

Student or technical apprenticeships

14. As an alternative to the requirements of regulation 13, the Director-General may in his discretion admit a candidate for a certificate of competency as Marine Engineer-Officer Class 4 who has performed satisfactory service for not less than four years in an organised student or technical apprenticeship approved by the Director-General: Provided that the candidate has obtained at least T2 standard in two technical subjects and has spent not less than one year on the type of workshop service referred to in regulation 13 (2).

Full-time or sandwich courses at technical schools, technical colleges or universities

15. (1) As a further alternative to the requirements of regulation 13, the Director-General may at his discretion admit a candidate for a certificate of competency as Marine Engineer-Officer Class 4 who has satisfactorily completed at an approved technical college, technikon or university an approved full-time or sandwich course of study of at least three years in mechanical engineering, and has trained for not less than 24 months in workshops as a mechanical technician, or engineer: Provided that of the 24 months required by this regulation at least six consecutive months shall have been spent on the type of workshop service referred to in regulation 13 (2).

(2) Workshop training carried out during technical college, technikon or university vacations and periods totalling not more than six months spent in works apprentice training schemes for fitters and turners or on similar training in technical school, technical college, technikon or university workshops shall count towards the 24 months service required by this regulation up to an overall maximum of nine months. Separate periods of training shall be of not less than one month's duration.

MARINE ENGINEER OFFICER CLASS 4–3 CADET COURSE

16. (1) As a further alternative to the requirements of regulation 13, the Director-General may in his discretion admit a candidate who has satisfactorily completed an approved Marine-Engineer Officer Class 4 or Class 3 cadet training course of four years duration for a certificate of competency as Marine Engineer-Officer Class 4 or Class 3 depending on ability. This course shall consist of an initial

tydperk ter see vir gekeurde kandidate gevolg deur 'n tydperk van voltydse studie aan 'n kollege vir tegniese onderrig, 'n tydperk van 12 maande praktiese werkwinkelopleiding, 'n tweede tydperk van voltydse studie, 'n verdere 12 maande ter see en ten slotte verdere voltydse studie ter voltooiing van die vierjaarkursus. Die fases van die kursus kan na goeddunke van die opvoedkundige instelling herrangskik word indien aaneenlopende studie as voordelig vir die kadette beskou word.

(2) Kadette wat die opleidingskursus op bevredigende wyse voltooi, kan die eksamen vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 3 in die vakke Algemene Ingenieurswetenskap en Hittewerktuie aflê voordat hulle met hul kwalifiserende seediens begin. Kwytskelding van drie maande kwalifiserende seediens sal toegelaat word vir die Marine-ingenieuroffisier Klas 4- asook vir die Marine-ingenieuroffisier Klas 3-bekwaamheidsertifikaat vir kandidate wat in albei vakke slaag.

Vergoedende diens

17. (1) Waar 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 4 die typerke werkwinkeldiens voorgeskryf by regulasie 13, 14 of 15 voltooi het, maar te kort skiet in die tipe werk voorgeskryf, moet vergoedende diens verrig word—

(a) òf by wyse van dagwerk ter see as Ingenieuroffisier op 'n skip wat kort of lang seereise onderneem;

(b) òf by wyse van dagwerk as ingenieuroffisier op 'n modderskuit, baggerskip of sleepboot wat in 'n hawe gebruik word of die see kort afstande invaar;

(c) òf by wyse van dagwerk as Seemasjinis of Assistent-seemasjinis op 'n vissersboot van minstens 350 kW;

(d) òf by wyse van gereelde waghoudiens op sodanige skip.

Al die tyd aldus deurgebring op 'n skip wat lang seereise onderneem en twee derdes van die tyd aldus deurgebring op 'n skip wat kort seereise onderneem of op 'n modderskuit, baggerskip of sleepboot wat in die hawe gebruik word of die see kort afstande invaar, word as kwalifiserende werkwinkeldiens gereken: Met dien verstande dat sodanige werk wat voor die ouderdom van 20 jaar verrig is, nie aldus gereken mag word nie.

(2) Waar 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 4 oor geen of onvoldoende kwalifiserende werkwinkel- of vergoedende diens soos voorgeskryf by regulasies 13, 14, 15, 16 (1) en (2) beskik, maar diens op 'n skip verrig het as stoker, olieman, hulpmasjinis, magasynman, ongediplomeerde Ingenieuroffisier, of op vissersbote as Assistent-seemasjinis of Seemasjinis, twee derdes van die tyd aldus bestee aan diens op 'n skip wat lang seereise onderneem en een helfte van die tyd aldus bestee aan diens op 'n skip wat kort seereise onderneem of op 'n modderskuit, baggerskip of sleepboot wat in 'n hawe gebruik word of die see kort afstande invaar, of op vissersbote, word geag geskikte diens te wees om in aanmerking geneem te word vir die voorgeskrewe kwalifiserende tydperk van werkwinkel- of vergoedende diens: Met dien verstande dat sodanige diens wat voor die ouderdom van 20 jaar verrig is, nie aldus gereken mag word nie.

Seediens

Tydperk seediens vereis van 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 4.

18. 'n Kandidaat vir 'n bekwaamheidsertifikaat (stoom, motor of stoom en motor) as Marine-ingenieuroffisier Klas 4 moet na voltooiing van die werkwinkeldiens vereis by regulasies 14, 15 en 16, en na voltooiing van die vergoedende diens (as daar is) wat kragtens regulasie 16 in plaas

period at sea for selected candidates, followed by a period of full-time study at an approved college for technical education, practical workshop training for a period of 12 months, a second period of full-time study, a further 12 months at sea and finally further full-time study to complete the four year course. The phases of the courses may be rearranged at the discretion of the educational establishment if continuous study is considered advantageous to the cadets.

(2) Cadets who satisfactorily complete the training course may write the examination for a certificate of competency as Marine Engineer-Officer Class 3 in the subjects General Engineering Science and Heat Engines before commencing their qualifying sea service. A remission of three months' qualifying sea service will be allowed for both Marine Engineer-Officer Class 4 and Marine Engineer-Officer Class 3 certificates of competency, to candidates who are successful in both subjects.

Compensatory service

17. (1) Where a candidate for a certificate of competency as Marine Engineer Officer Class 4 has completed the periods of workshop service prescribed in regulations 13, 14 or 15 but is deficient in the type of work prescribed, compensatory service shall be performed either—

(a) on day-work at sea as Engineer-Officer in a ship making short or long voyages;

(b) on day-work as Engineer-Officer in a hopper, dredger or tug operating in port or proceeding to sea for short distances; or

(c) on day-work as Marine Motorman or Assistant Marine Motorman in a fishing vessel having a power of not less than 350 kW; and

(d) on regular watch in such a ship.

All of the time so spent in a ship making long voyages and two thirds of the time so spent in a ship making short voyages or in a hopper, dredger or tug operating in port or proceeding to sea for short distances, shall be counted towards the period of qualifying workshop service provided that no such work performed before the age of 20 years shall be so counted.

(2) Where a candidate for a certificate of competency as Marine Engineer-Officer Class 4 has had no or insufficient qualifying workshop or compensatory service as prescribed in regulations 13, 14, 15 and 16 (1) and (2) but has been employed in a ship in such capacities as fireman, oiler, donkeyman, store keeper, uncertificated Engineer-Officer, or in fishing vessels as Assistant Marine Motorman or Marine Motorman, two thirds of the time so spent served in a ship making long voyages and one half of the time so spent served in a ship making short voyages or in a hopper, dredger or tug operating in a port or proceeding to sea for short distances, or in fishing vessels, shall be considered appropriate service to be taken into consideration for the qualifying period of workshop or compensatory service prescribed: Provided that no such service performed before the age of 20 years shall be taken into consideration.

Sea Service

Period of sea service required of a candidate for a certificate of competency as Marine Engineer Officer Class 4

18. A candidate for a certificate of competency (steam, motor or combined steam and motor) as Marine Engineer-Officer Class 4, shall after completing the workshop service required in terms of regulations 14, 15 and 16 and after completing the compensatory service (if any) accepted in

van werkwinkeldiens aanvaar word, bewys lewer dat hy die volgende tydperk seediens verrig het in skepe van minstens 350 kW:

(a) Indien 'n bekwaamheidsertifikaat (stoom) vereis word, ses maande, waarvan minstens vier maande aan die ketels en hoofaandrywingmasjinerie van 'n stoomskip bestee is. Hierdie tydperk van minstens vier maande moet minstens twee maande diens in verband met die ketels en minstens twee maande diens in verband met die hoofaandrywingsmasjinerie insluit: Met dien verstande dat die diens in verband met die ketels en die diens in verband met die hoofaandrywingsmasjinerie gelyktydig kan wees. Die oorblywende twee maande of deel van twee maande kon bestee gewees het aan die ketels van 'n stoomskip of aan die hoofaandrywingsmasjinerie van 'n stoomskip of motorskip, of aan geskikte hulpmasjiene van 'n stoomskip of motorskip, of aan dagwerk;

(b) indien 'n bekwaamheidsertifikaat (motor) vereis word, ses maande, waarvan minstens vier maande aan die hoofaandrywingsmasjinerie van 'n motorskip bestee is. Die oorblywende twee maande of deel van twee maande kon bestee gewees het aan die hoofaandrywingsmasjinerie van 'n stoomskip of motorskip of aan die hulpmasjiene van 'n stoomskip of motorskip, of hoogstens twee maande daarvan kon aan die ketels van 'n stoomskip, of aan dagwerk bestee gewees het;

(c) indien 'n gekombineerde bekwaamheidsertifikaat (stoom en motor) vereis word, agt maande, waarvan minstens—

(i) vier maande aan die ketels en hoofaandrywingsmasjinerie van 'n stoomskip bestee is. Hierdie tydperk van minstens vier maande moet minstens twee maande diens in verband met die ketels en twee maande diens in verband met die hoofaandrywingsmasjinerie insluit: Met dien verstande dat die diens in verband met die ketels en die diens in verband met die hoofaandrywingsmasjinerie gelyktydig kon wees; en

(ii) vier maande aan die hoofaandrywingsmasjinerie van 'n motorskip bestee is.

Tydperk seediens vereis vir die endossering van 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 4 en vir 'n diensendossement

19. 'n Kandidaat vir die endossering van 'n bekwaamheidsertifikaat (stoom of motor) as Marine-ingenieuroffisier Klas 4 moet bewys lewer dat hy die volgende tydperk seediens verrig het:

(a) Indien die motorendossement van 'n bekwaamheidsertifikaat (stoom) vereis word, twee maande benewens die seediens wat by regulasie 18 (a) vereis word: Met dien verstande dat altesaam minstens vier maande diens in verband met die hoofaandrywingsmasjinerie van 'n motorskip verrig moet wees;

(b) indien die stoomendossement van 'n bekwaamheidsertifikaat (motor) vereis word, twee maande benewens die seediens wat by regulasie 18 (b) vereis word: Met dien verstande dat altesaam minstens vier maande diens in verband met die ketels en hoofaandrywingsmasjinerie van 'n stoomskip verrig moet wees;

(c) vir 'n diensendossement, ses maande terwyl hy die houer is van 'n sertifikaat waarvoor die endossement vereis word.

Tipe seediens vereis van 'n kandidaat vir 'n bekwaamheidsertifikaat as ingenieuroffisier en endossement

20. (1) Die seediens wat ooreenkomstig regulasies 18 en 19 van 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier en endossement vereis word, moet

lieu of workshop service under regulation 16, produce proof of having performed the following period of sea service in ships of not less than 350 kW registered power:

(a) If a certificate of competency (steam) is required, six months, of which at least four months shall have been spent on the boilers and main propelling machinery of a steamship. This period of at least four months shall include at least two months service on the boilers and two months service on the main propelling machinery: Provided that the service on the boilers and the service on the main propelling machinery may have been simultaneous. The remaining two months, or balance of two months, may have been spent on the boilers of a steamship or on the main propelling machinery of a steamship or motorship, or on suitable auxiliaries of a steamship or motorship, or on day-work;

(b) If a certificate of competency (motor) is required, six months, of which at least four months shall have been spent on the propelling machinery of a motorship. The remaining two months, or balance of two months, may have been spent on the main propelling machinery of a steamship or motorship, or on the auxiliaries of a steamship or motorship, or to the extent of not more than two months on the boilers of a steamship, or on day-work;

(c) if a combined certificate of competency (steam and motor) is required, eight months, of which at least—

(i) four months shall have been spent on the boilers and main propelling machinery of a steamship. This period of at least four months shall include at least two months service on the boilers and two months service on the main propelling machinery: Provided that the service on the boilers and the service on the main propelling machinery may have been simultaneous; and

(ii) four months shall have been spent on the main propelling machinery of a motorship.

Period of sea service required for the endorsement of a certificate of competency as Marine Engineer-Officer Class 4 or for a Service Endorsement

19. A candidate for the endorsement of a certificate of competency (steam or motor) as Marine Engineer-Officer Class 4 shall produce proof of having performed the following period of sea service:

(a) If a motor endorsement of a certificate of competency (steam) is required, two months in addition to the sea service required in terms of regulation 18 (a): Provided that not less than four months service in all shall have been served on the main propelling machinery of a motorship;

(b) if a steam endorsement of a certificate of competency (motor) is required, two months in addition to the sea service required in terms of regulation 18 (b): Provided that not less than four months service in all shall have been served on the boilers and main propelling machinery of a steamship;

(c) for a service endorsement, six months whilst in possession of a certificate for which the endorsement is required.

Type of sea service required of a candidate for a certificate of competency as Marine Engineer-Officer Class 4 and endorsement

20. (1) The sea service required in terms of regulations 18 and 19 of a candidate for a certificate of competency as Marine Engineer-Officer Class 4 and endorsement, shall

verrig gewees het op gereelde waghoudiens van altesaam minstens agt uur uit elke 24 uur diens waarop aanspraak gemaak word as—

(a) Ingenieuroffisier ter see op 'n skip wat kort of lang seereise onderneem; of

(b) Ingenieuroffisier in 'n modderskuit, baggerskip of sleepboot wat in die hawe gebruik word of die see kort afstande invaar; of

(c) Seemasjinis Graad 1 of Seemasjinis Graad 2 op 'n vissersboot van minstens 350 kW maar minder as 1 000 kW; of

(d) Seemasjinis Graad 1 of Seemasjinis Graad 2 op 'n vissersboot van 1 000 kW of meer.

(2) Diens op 'n skip vermeld in subregulasie (1) (a) en (d) word alles as diens gereken, terwyl twee derdes van die diens op 'n skip vermeld in subregulasies 1 (b) en (c) as diens gereken word.

(3) Dagwerk ter see binne die masjien- of ketelruimte van 'n skip vermeld in paragrawe (a) en (c) en dagwerk binne die masjien- of ketelruimte van 'n skip vermeld in subregulasie (1) (b) kan ingereken word as deel van die kwalifiserende diens op gereelde waghoudiens waarvan in daardie subregulasie melding gemaak word, dog hoogstens die helfte van sodanige dagwerk, behoudens 'n maksimum van twee maande, kan aldus ingereken word.

Kwytskelding van seediens vir 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 4

21. 'n Kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 4, wat alvorens hy met sy kwalifiserende seediens begin het, in al die vakke van die eksamen vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 4 geslaag het, of wat vir volle vrystelling van hierdie eksamen kwalifiseer, kan hoogstens twee maande van die volle vereiste ses maande kwalifiserende seediens kwytgeskel word.

B. KANDIDAAT VIR 'N BEKWAAMHEIDSERTIFIKAAT AS MARINE-INGENIEUROFFISIER KLAS 3 EN ENDOSSEMENT

Tydperk seediens vereis van 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 3

22. (1) 'n Kandidaat vir 'n bekwaamheidsertifikaat (stoom of motor of stoom en motor) as Marine-ingenieuroffisier Klas 3 moet benewens die aanvanklike opleidingsvereistes uiteengesit in regulasies 13,14,15 of 16, die kwalifiserende seediens voltooi wat by regulasie 32 vir Klas 2-kandidate vasgestel is.

(2) 'n Kandidaat vir 'n diensendossement moet 12 maande diens in stoom- of motorskepe voltooi het terwyl hy die houer is van 'n Klas 3-sertifikaat.

Tydperk seediens vereis vir die endossering van 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 3

23. 'n Kandidaat vir die endossering van 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 3 moet die tydperk seediens voltooi het wat by regulasie 34 vir die endossering van 'n bekwaamheidsertifikaat (stoom of motor, na gelang van die geval) as Marine-ingenieuroffisier Klas 2 vereis word.

have been performed by the candidate on regular watch totalling at least eight hours out of every 24 hours service claimed, as—

(a) Engineer-Officer at sea in a ship making short or long voyages; or

(b) Engineer-Officer in a hopper, dredger or tug operating in port or proceeding to sea for short distances, or

(c) Marine Motorman Grade 1 or Marine Motorman Grade 2 in a fishing vessel having a power of not less than 350 kW but under 1 000 kW.

(d) Marine Motorman Grade 1 or Marine Motorman Grade 2 in a fishing vessel having a power of 1 000 kW or more.

(2) Service in a ship mentioned in subregulation (1) (a) and (d) shall be counted at full rate, whereas service in a ship mentioned in subregulation (1) (b) and (c) shall be counted at two-thirds rate.

(3) Day-work at sea carried out within the engine or boiler spaces of a ship mentioned in paragraphs (a) and (c) and day-work carried out within the engine or boiler spaces of a ship mentioned in subregulation (1) (b), may be accepted towards the qualifying service on regular watch referred to in that subregulation, and shall be counted at half rate subject to a maximum allowance of two months.

Remission of sea service for a candidate for a certificate of competency as Marine Engineer-Officer Class 4

21. A candidate for a certificate of competency as Marine Engineer-Officer Class 4 who, before commencing his qualifying sea service, has passed all subjects of the examination for a certificate of competency as Marine Engineer-Officer Class 4, or who qualifies for full exemption from this examination may be granted a remission of sea service not exceeding two months of the full requisite six months of qualifying sea service.

B. CANDIDATE FOR A CERTIFICATE OF COMPETENCY AS MARINE ENGINEER-OFFICER CLASS 3 AND ENDORSEMENT

Period of sea service required of a candidate for a certificate of competency as Marine Engineer-Officer Class 3

22. (1) A candidate for a certificate of competency (steam, motor or combined steam and motor) as Marine Engineer-Officer Class 3 shall in addition to meeting the initial training requirements set out in Regulations 13, 14, 15 or 16 have completed the qualifying sea service required in terms of Regulation 32 as laid down for Class 2 candidates.

(2) For a Service Endorsement shall have completed 12 months in steam or motor ships whilst in possession of a Class 3 Certificate.

Period of sea service required for the endorsement of a certificate of competency as Marine Engineer-Officer Class 3

23. A candidate for the endorsement of a certificate of competency as Marine Engineer-Officer Class 3 shall have completed the period of sea service required in terms of regulation 34 for the endorsement of a certificate of competency (steam or motor, as the case may be) as Marine Engineer-Officer Class 2.

Tipe seediens vereis van 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 3 en endossement

24. (1) Die seediens wat by regulasies 22 en 23 van 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 3 en endossement vereis word, moet verrig gewees het deur die kandidaat terwyl hy in die hoedanigheid van—

(a) Ingenieuroffisier ter see op 'n skip wat kort of lang seereise onderneem; of

(b) Ingenieuroffisier op 'n modderskuit, baggerskip of sleepboot wat in 'n hawe gebruik word of die see kort afstande invaar; of

(c) Seemasjinis Graad 1 op 'n vissersboot van minstens 350 kW, maar minder as 1 000 kW; of

(d) Seemasjinis Graad 1 of Graad 2 op 'n vissersboot van 1 000 kW of meer,

minstens agt uit die 24 uur diens waarop aanspraak gemaak word, volle beheer oor 'n gereelde waghoudiens gehad het.

(2) Diens op 'n skip vermeld in subregulasie (1) (a) en (d) word alles as diens gereken, terwyl twee derdes van die diens op 'n skip vermeld in subregulasie (1) (b) en (c) as diens gereken word.

(3) Dagwerk word nie aanvaar nie.

Kwytskelding van seediens vir 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 3

25. 'n Kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 3, wat alvorens hy met sy kwalifiserende seediens begin het, in al die vakke van die eksamen vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 3 geslaag het, of wat vir volle vrystelling van hierdie eksamen kwalifiseer, kan hoogstens drie maande van die vereiste 21 maande kwalifiserende seediens kwytgeskel word.

26. (1) Indien 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 3 nie in die eksamen vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 3 slaag nie, maar toon dat hy die standaard bereik het wat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 4 vereis word, kan die Direkteur-generaal so 'n sertifikaat aan hom toeken: Met dien verstande dat geen deel van die eksamengeld aan hom terugbetaal word nie.

(2) Daar moet op gelet word dat 'n kandidaat wat die aanvanklike opleiding voorgeskryf in paragraaf 13, 14, 15 of 16 voltooi het, onmiddellik met die Klas 3-eksamen kan voortgaan al is hy nie die houer van 'n Klas 4-sertifikaat nie, en dat 'n kandidaat wat die aanvanklike opleiding voorgeskryf in paragraaf 28, 29, 30 of 31 voltooi het, onmiddellik met die Klas 2-eksamen kan voortgaan al is hy nie die houer van 'n Klas 4- of 'n Klas 3-sertifikaat nie. 'n Kandidaat moet egter die houer wees van 'n Klas 2-sertifikaat voordat hy in aanmerking kom vir die Klas 1-eksamen.

(3) Elke Ingenieuroffisier in bevel van 'n ingenieurswaghoudiens op skepe van 750 kW of meer waarop hierdie regulasies van toepassing is, moet die houer wees van 'n toepaslike Klas 4-stoom- of -motorbekwaamheidsertifikaat of dienssertifikaat as 'n minimum kwalifikasie.

Type of sea service required for the endorsement of a certificate of competency as Marine Engineer-Officer Class 3 and endorsement

24. (1) The sea service required in terms of regulations 22 and 23 of a candidate for a certificate of competency as Marine Engineer-Officer Class 3 and endorsement, shall have been performed by the candidate in full charge of a regular watch totalling at least eight hours out of every 24 hours service claimed, as—

(a) Engineer-Officer at sea in a ship making short or long voyages; or

(b) Engineer-Officer in a hopper, dredger or tug operating in port or proceeding to sea for short distances; or

(c) Marine Motorman Grade 1 in a fishing vessel having a power of not less than 350 kW but under 1 000 kW;

(d) Marine Motorman Grade 1 or Grade 2 in a fishing vessel having a power of 1 000 kW or more.

(2) Service in a ship mentioned in subregulation (1) (a) and (d) shall be counted at full rate, whereas service in a ship mentioned in subregulation (1) (b) and (c) shall be counted at two-thirds rate.

(3) Day-work shall not be accepted.

Remission of sea service for a candidate for a certificate of competency as Marine Engineer-Officer Class 3

25. A candidate for a certificate of competency as Marine Engineer-Officer Class 3 who, before commencing his qualifying sea service, has passed all subjects of the examination for a certificate of competency as Marine Engineer-Officer Class 3 or who qualifies for full exemption from this examination may be granted a remission of sea service not exceeding three months of the requisite 21 months of qualifying sea service.

26. (1) If a candidate for a certificate of competency as Marine Engineer-Officer Class 3 fails to pass the examination for a certificate of competency as Marine Engineer-Officer Class 3 but shows that he has reached the standard required for a certificate of competency as Marine Engineer-Officer Class 4 the Director-General may grant him such certificate: Provided that no part of the examination fee shall be refunded to him.

(2) It should be noted that a candidate who has completed the initial training prescribed in paragraphs 13, 14, 15 or 16 may proceed directly to the Class 3 examination without holding a Class 4 certificate and a candidate who has completed the initial training prescribed in paragraphs 28, 29, 30 or 31 may proceed directly to the Class 2 examination without holding a Class 4 or a Class 3 certificate. However a candidate must hold a Class 2 certificate before being eligible for the Class 1 examination.

(3) Every Engineer-Officer in charge of an engineering watch in ships of 750 kW registered power or more to which these regulations apply shall hold an appropriate Class 4 steam or motor certificate of competency or certificate of service as a minimum qualification.

HOOFSTUK III

KWALIFIKASIES VEREIS VAN 'N KANDIDAAT VIR 'N BEKWAAMHEIDSERTIFIKAAT AS MARINE-INGENIEUROFFISIER KLAS 2 EN ENDOSSEMENT, OF MARINE-INGENIEUROFFISIER KLAS 1 EN ENDOSSEMENT

A. 'N KANDIDAAT VIR 'N BEKWAAMHEIDSERTIFIKAAT AS MARINE-INGENIEUROFFISIER KLAS 2 EN ENDOSSEMENT.

Ouderdom van kandidaat

27. 'n Kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2 moet gematrikuleerd wees en minstens 22 jaar oud wees.

Werkwinkeldiens

Diens as vakleerling of ambagsgesel in ingenieursambagte

28. (1) 'n Kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieur Klas 2 moet bewys lewer dat hy sedert hy 16 jaar oud geword het, minstens vier jaar lank as leerling-ingenieur of ambagsgesel bevredigende diens gelewer het. Slaging in vaktoetse sal nie die vereiste vier jaar verminder nie.

(2) Minstens nege maande uit die vier jaar werkwinkeldiens wat by subregulasie (1) vereis word, moet bestee gewees het aan die montering, oprigting of herstel van swaar masjinerie (bv. werk aan skeepsmasjiene en taamlik groot hulpmasjiene van 'n tipe wat in skepe geïnstalleer word, of aan aandrywingsmasjiene van dergelike waarde in die opleiding van skeepsingenieurs) hetsy in of buite die werkwinkel.

(3) Die oorblywende drie jaar en drie maande kon bestee gewees het aan werk van die aard voorgeskryf in subregulasie (2) of aan ander gespesialiseerde werk, onderworpe daaraan dat tydsbesteding op die volgende grondslag geskied:

Metaaldraaiwerk	Voltyds tot hoogstens twee jaar.
Geelkoperafwerking	Voltyds tot hoogstens een jaar.
Maak of herstel van ketels	Voltyds tot hoogstens een jaar.
Modelmakery	Voltyds tot hoogstens een jaar.
Skaafwerk, gleufwerk, sterkarmskaafwerk en freeswerk	Voltyds tot hoogstens een jaar.
Gereedskapkamer	Voltyds tot hoogstens een jaar.
Goedgekeurde skemas vir opleiding in die gebruik van handgereedskap	Voltyds tot hoogstens een jaar.
Smidswerk	Voltyds tot hoogstens ses maande.
Kopersmidswerk	Voltyds tot hoogstens ses maande.
Sweiswerk	Voltyds tot hoogstens ses maande.
Werk in tekenkantoor as tekenaar of ingenieur werksaam in verband met samestelling, detail of ontwerp	Voltyds tot een jaar. Indien meer as een jaar in die tekenkantoor deurgebring is, tel net die helfte van die addisionele tyd. Die totaal is onderworpe aan 'n maksimum van 18 maande.
Elektriese werkwinkel- of herstelwerk nie reeds hierbo gedek nie, uitgesonderd werk van minder belangrike aard	Voltyds tot een jaar en daarbo tel net die helfte. Die totaal is onderworpe aan 'n maksimum van 18 maande.
Instrument- en afstandsbeheertoerustingmontering	Voltyds tot hoogstens ses maande.

Studente- of tegniese vakleerlingskap

29. As alternatief vir die bepalings van regulasie 28 kan die Direkteur-generaal na eie oordeel iemand as kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2 toelaat wat minstens vier jaar lank bevredigende diens gelewer het in 'n georganiseerde studente- of tegniese vakleerlingskap goedgekeur deur die Direkteur-generaal: Met dien verstande dat die kandidaat minstens T2-standaard in drie tegniese vakke behaal het en minstens nege maande bestee het aan die montering, oprigting of herstel van die tipe masjinerie waarvan in regulasie 28 (2) melding gemaak word.

CHAPTER III

QUALIFICATION REQUIRED OF A CANDIDATE FOR A CERTIFICATE OF COMPETENCY AS MARINE ENGINEER-OFFICER CLASS 2 AND ENDORSEMENT, OR MARINE ENGINEER OFFICER CLASS 1 AND ENDORSEMENT

A. CANDIDATE FOR A CERTIFICATE OF COMPETENCY AS MARINE ENGINEEER-OFFICER CLASS 2 AND ENDORSEMENT.

Age of candidate

27. A candidate for a certificate of competency as Marine Engineer-Officer Class 2 shall be matriculated and not be less than 22 years of age.

Workshop service

Service as apprentice or journeyman in engineering trades

28. (1) A candidate for a certificate of competency as Marine Engineer-Officer Class 2 shall prove that since reaching the age of 16 years he has served satisfactorily for not less than four years as an apprentice or journeyman. The passing of trade tests will not reduce the requisite 4 years.

(2) Not less than nine months of the four years workshop service required in terms of subregulation (1) shall have been devoted to fitting, erecting or repairing heavy machinery (e.g. work on marine engines and substantial auxiliary machinery of a type fitted in ships, or on motive power auxiliary which has a similar value in the training of marine engineers) either in the works or outside.

(3) The remaining three years and three months may have been spent on work of the nature prescribed in sub-regulation (2) or on other specialised work, subject to a time allowance on the following basis:

Metal turning	Full time up to a maximum of two years.
Brass finishing	Full time up to a maximum of one year.
Boiler making or repairing of boilers	Full time up to a maximum of one year.
Pattern making	Full time up to a maximum of one year.
Planing, slotting, shaping and milling	Full time up to a maximum of one year.
Tool room	Full time up to a maximum of one year.
Approved schemes of training in the use of hand and small machine tools	Full time up to a maximum of one year.
Smith work	Full time up to a maximum of six months.
Coppersmith work	Full time up to a maximum of six months.
Welding	Full time up to a maximum of six months.
Work in drawing office as draughtsman or engineer engaged on arrangement detail or design	Full time up to one year. When more than one year has been spent in the drawing office only half the additional time will count. Maximum total 18 months.
Electrical shop or repair work not already covered above, excluding work of a minor nature	Full time up to one year additional at half-rate. Maximum total 18 months.
Instrument and distant control gear fitting	Full time up to a maximum of six months.

Student or technical apprenticeship

29. As an alternative to the requirements of regulation 28, the Director-General may in his discretion admit a candidate for a certificate of competency as marine Engineer-Officer Class 2 who has performed satisfactory service for not less than four years in an organised student or technical apprenticeship approved by the Director-General: Provided that the candidate has obtained at least T2 standard in three technical subjects and has devoted not less than nine months to fitting, erecting or repairing the type of machinery referred to in regulation 28 (2).

Voltydse of stapelkursusse aan technikons, tegniese kolleges of universiteite

30. (1) As verdere alternatief vir die bepalings van regulasie 28 kan die Direkteur-generaal na eie oordeel iemand as kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2 toelaat wat 'n goedgekeurde voltydse of stapelkursus van minstens drie jaar in meganiese ingenieurswese aan 'n goedgekeurde technikon, tegniese kollege of universiteit op bevredigende wyse voltooi het en minstens 24 maande lank in werkwinkels opgelei is as 'n meganiese tegnikus of ingenieur: Met dien verstande dat van die 24 maande wat by hierdie regulasie vereis word, minstens ses agtereenvolgende maande bestee is aan die montering, oprigting of herstel van die tipe masjinerie waarvan in regulasie 28 (2) melding gemaak word.

(2) Werkwinkelopleiding gedurende vakansies van tegniese skole, tegniese kolleges of universiteite en tydperke van altesaam hoogstens ses maande bestee aan die werkwinkel se vakleerlingopleidingskemas vir passers en draaiers of aan dergelike opleiding in die werkwinkels van 'n technikon, tegniese kollege of universiteit maak deel uit van die 24 maande diens wat by hierdie regulasie vereis word, maar is onderworpe aan 'n gesamentlike maksimum van nege maande. Afsonderlike tydperke van opleiding mag nie korter as een maand wees nie.

Kadetopleidingskursus vir ingenieuroffisiere

31. (1) As verdere alternatief vir die bepalings van regulasie 28 kan die Direkteur-generaal na eie oordeel iemand as kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2, wat 'n goedgekeurde kadetopleidingskursus voltooi het, toelaat. Hierdie kadetopleidingskursusse kan van tyd tot tyd met die goedkeuring van die Direkteur-generaal gewysig word.

(2) Aan kadette wat die opleidingskursus op bevredigende wyse voltooi en die Nasionale Diploma in Skeepsingenieurswese ontvang, kan vrystelling van alle vakke behalwe Ingenieurswese en Skeepsboukunde in die Klas 1-eksamen, en van alle vakke behalwe Ingenieurswese in die Klas 2-eksamen verleen word. Hierdie kadette sal ook van drie maande kwalifiserende seetyd slegs vir die Klas 1-sertifikaat kwytgeskeld word.

(3) Aan kadette wat nie die Nasionale Diploma in Skeepsingenieurswese kon behaal nie, maar kan toon dat 'n minimum van 40 % in alle vakke behaal is, kan vrystelling verleen word van alle vakke behalwe Ingenieurswese slegs in die Klas 2-eksamen.

(4) Kadette wat die opleidingskursus op bevredigende wyse voltooi en in aanmerking kom vir die toekenning van die Hoër Nasionale Tegniese Sertifikaat, kwalifiseer vir vrystelling van sekere vakke van die eksamens vir Klas 2 en Klas 1. Kwytskelding van drie maande kwalifiserende seediens sal verleen word slegs ten opsigte van die Klas 1-sertifikaat.

(5) Kadette wat die opleidingskursus voltooi sonder om die vereiste akademiese standaard te bereik, sal toegelaat word om die volle eksamen van die Departement te skryf.

(6) Die vrystelling verleen ingevolge subregulasies (2), (3) en (4) hierbo kan met uitsondering van die vak Ingenieurswese na eie goeddunke deur die eksaminator toegestaan word op 'n vak-vir-vakgrondslag oor die geheel van die eksamen.

Vergoedende diens

32. Waar 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2 werkwinkeldiens verrig het oor die tydperk voorgeskryf in regulasies 28, 29, 30 of 31, maar te kort skiet in die tipe werk voorgeskryf, moet vergoedende seediens verrig word—

(a) òf by wyse van dagwerk as Ingenieuroffisier op 'n skip van minstens 750 kW, wat kort of lang seereise onderneem;

Full-time or sandwich courses at technikons, technical colleges or universities

30. (1) As a further alternative to the requirements of regulation 28, the Director-General may in his discretion admit a candidate for a certificate of competency as Marine Engineer-Officer Class 2 who has satisfactorily completed at an approved technikon, technical college or university an approved full-time or sandwich course of study of at least three years in mechanical engineering, and has trained for not less than 24 months in workshops as a mechanical technician or engineer: Provided that of the 24 months required by this regulation at least six consecutive months shall have been devoted to fitting, erecting or repairing the type of machinery referred to in regulation 28 (2).

(2) Workshop training carried out during technical school, technical college or university vacations and periods totalling not more than six months spent in works apprentice training schemes for fitters and turners or on similar training in technikon, technical college or university workshops shall count towards the 24 months service required by this regulation up to an overall maximum of nine months. Separate periods of training shall be of not less than one month duration.

Engineer-Officer cadet training courses

31. (1) As a further alternative to the requirements of regulation 28, the Director-General may in his discretion admit a candidate for a certificate of competency as Marine Engineer-Officer Class 2 who has satisfactorily completed an approved Engineer-Officer cadet training course. These cadet training courses may be amended from time to time with the approval of the Director-General.

(2) Cadets who satisfactorily complete the training course and are awarded the National Diploma in Marine Engineering may be granted exemption from all subjects except Engineering Knowledge and Naval Architecture in the Class 1 examination, and from all subjects except Engineering Knowledge in the Class 2 examination. These cadets will also be allowed a remission of three months qualifying sea time for the Class 1 certificate only.

(3) Cadets who are not successful in obtaining the National Diploma in Marine Engineering but can show that a minimum of 40 % was obtained in all subjects may be granted exemption from all subjects except Engineering Knowledge in the Class 2 examination only.

(4) Cadets who satisfactorily complete the training course and qualify for the award of the Higher National Certificate for Technicians will qualify for exemption from certain subjects of the Class 2 and Class 1 examinations. A remission of three months of qualifying sea service will be allowed only in respect of the Class 1 certificate.

(5) Cadets who complete the training course without reaching the required academic standard will be allowed to take the Department's examinations in full.

(6) The exemptions granted under subregulations (2), (3) and (4) above may at the discretion of the examiner be granted on a subject for subject basis over the whole of the examinations with the exception of the subject Engineering Knowledge.

Compensatory service

32. Where a candidate for a certificate of competency as Marine Engineering-Officer Class 2 has completed the periods of workshop service prescribed in regulations 28, 29, 30 or 31 but is deficient in the type of work prescribed, compensatory service shall be performed either—

(a) on day-work as Engineer-Officer in a ship having a power of not less than 750 kW making short or long voyages; or

(b) òf by wyse van gereelde waghoudiens op so 'n skip.

Twee derdes van die tyd aldus deurgebring op 'n skip wat lang seereise onderneem en vier negendes van die tyd aldus deurgebring op 'n skip wat kort seereise onderneem, kan as kwalifiserende werkwinkeldiens gereken word: Met dien verstande dat sodanige werk wat voor die ouderdom van 20 jaar verrig is, nie aldus gereken mag word nie.

Seediens

Tydperk seediens vereis van 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2

33. 'n Kandidaat vir 'n bekwaamheidsertifikaat (stoom of motor of stoom en motor) as Marine-ingenieuroffisier Klas 2 moet na voltooiing van die werkwinkeldiens vereis by regulasie 28, gelees met regulasies 29, 30, 31 en 32, en na voltooiing van die seediens (as daar is) wat kragtens regulasie 32 in plaas van werkwinkeldiens aanvaar word, bewys lewer dat hy die volgende tydperk seediens verrig het:

(a) Indien 'n bekwaamheidsertifikaat (stoom) vereis word, 21 maande, waarvan minstens nege maande aan die ketels en hoofaandrywingsmasjinerie van 'n stoomskip bestee is. Hierdie tydperk van minstens nege maande moet minstens ses maande diens in verband met die ketels en ses maande diens in verband met die hoofaandrywingsmasjinerie insluit: Met dien verstande dat die diens in verband met die ketels en die diens in verband met die hoofaandrywingsmasjinerie gelyktydig kon wees. Die oorblywende 12 maande of deel van 12 maande kon bestee gewees het aan die ketels van 'n stoomskip of aan die hoofaandrywingsmasjinerie van 'n stoomskip of motorskip of aan die hulpmasjiene van 'n stoomskip of motorskip, of aan dagwerk;

(b) indien 'n bekwaamheidsertifikaat (motor) vereis word, 21 maande, waarvan minstens nege maande aan die hoofaandrywingsmasjinerie van 'n motorskip bestee is. Die oorblywende 12 maande of deel van 12 maande kon bestee gewees het aan die hoofaandrywingsmasjinerie van 'n stoomskip of motorskip, of aan die hulpmasjiene van 'n stoomskip of motorskip, of hoogstens ses maande daarvan kon aan die ketels van 'n stoomskip, of aan dagwerk bestee gewees het;

(c) indien 'n gekombineerde bekwaamheidsertifikaat (stoom en motor) vereis word, 21 maande, waarvan minstens—

(i) nege maande aan die ketels en hoofaandrywingsmasjinerie van 'n stoomskip bestee is. Hierdie tydperk van minstens nege maande moet minstens drie maande diens in verband met die ketels en ses maande diens in verband met die hoofaandrywingsmasjinerie insluit: Met dien verstande dat die diens in verband met die ketels en die diens in verband met die hoofaandrywingsmasjinerie gelyktydig kon wees; en

(ii) nege maande aan die hoofaandrywingsmajinerie van 'n motorskip bestee is. Die oorblywende drie maande of deel van drie maande kon aan die ketels van 'n stoomskip of aan die hoofaandrywingsmasjinerie van 'n stoomskip of motorskip, of aan geskikte hulpmasjiene van 'n stoomskip of motorskip, of aan dagwerk bestee gewees het.

Tydperk seediens vereis vir die endossering van 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2

34. 'n Kandidaat vir die endossering van 'n bekwaamheidsertifikaat (stoom of motor) as Marine-ingenieuroffisier Klas 2 moet bewys lewer dat hy die volgende tydperk seediens verrig het:

(a) Indien die motorendossement van 'n bekwaamheidsertifikaat (stoom) vereis word, minstens nege maande as senior ten volle in beheer van waghoudiens by die hoofaandrywingsmasjinerie van 'n motorskip.

(b) on regular watch in such a ship.

Two-thirds of the time so spent in a ship making long voyages and four-ninths of the time so spent in a ship making short voyages, shall be counted towards the period of qualifying workshop service: Provided that no such work performed before the age of 20 years shall be counted.

Sea Service

Period of sea service required of a candidate for a certificate of competency as Marine Engineer-Officer Class 2

33. A candidate for a certificate of competency (steam, motor or combined steam and motor) as Marine Engineer-Officer Class 2 shall, after completing the workshop service required in terms of regulation 28 read with regulations 29, 30, 31 and 32, and after completing the sea service (if any) accepted in lieu of workshop service under regulation 32, produce proof of having performed the following period of sea service:

(a) If a certificate of competency (steam) is required, 21 months, of which at least nine months shall have been spent on the boilers and main propelling machinery of a steamship. This period of at least nine months shall include at least six months service on the boilers and six months service on the main propelling machinery: Provided that the service on the boilers and the service on the main propelling machinery may have been simultaneous. The remaining 12 months, or balance of 12 months, may have been spent on the boilers of a steamship or on the main propelling machinery of a steamship or motorship, or on the auxiliaries of a steamship or motorship, or on day-work;

(b) if a certificate of competency (motor) is required, 21 months, of which at least nine months shall have been spent on the main propelling machinery of a motorship. The remaining 12 months, or balance of 12 months, may have been spent on the main propelling machinery of a steamship or motorship, or on the auxiliaries of a steamship or motorship, or to the extent of not more than six months on the boilers of a steamship, or on day-work;

(c) if a combined certificate of competency (steam and motor) is required, 21 months, of which at least—

(i) nine months shall have been spent on the boilers and main propelling machinery of a steamship. This period of at least nine months shall include at least three months service on the boilers and six months service on the main propelling machinery: Provided that the service on the boilers and the service on the main propelling machinery may have been simultaneous; and

(ii) nine months have been spent on the main propelling machinery of a motorship. The remaining three months, or balance of three months, may have been spent on the boilers of a steamship or on the main propelling machinery of a steamship or motorhsip, or on suitable auxiliaries of a steamship or motorship, or on daywork.

Period of sea service required for the endorsement of a certificate of competency as Marine Engineer-Officer Class 2

34. A candidate for the endorsement of a certificate of competency (steam or motor) as Marine Engineer-Officer Class 2 shall produce proof of having performed the following period of sea service:

(a) If the motor endorsement of a certificate of competency (steam) is required, a minimum of nine months as senior in full charge of a watch on the main propelling machinery of a motorship.

(b) Indien die stoomendossement van 'n bekwaamheidsertifikaat (motor) vereis word, minstens nege maande as senior in volle beheer van waghoudiens by die hoofaandrywingsmasjinerie van 'n moderne turbine-aangedrewe vaartuig met hoëdrukwaterpypketels.

Tipe seediens vereis van 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2 en endossement

35. (1) Die seediens wat by regulasies 33 en 34 vereis word van 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2 en endossement moet deur die kandidaat in die hoedanigheid van Ingenieuroffisier ter see op 'n skip van minstens 750 kW wat kort of lang seereise onderneem, verrig gewees het op gereelde waghoudiens van altesaam minstens agt uur uit elke 24 uur diens waarop aanspraak gemaak word. Diens op so 'n skip wat lang seereise onderneem, tel alles, maar van diens op so 'n skip wat kort seereise onderneem, tel net twee derdes.

(2) Dagwerk ter see binne die masjien- of ketelruimte van 'n skip vermeld in subregulasie (1) kan ingereken word as deel van die kwalifiserende diens op gereelde waghoudiens waarvan in daardie subregulasie melding gemaak word, en tel alles tot 'n maksimum van agt maande, dog hoogstens die helfte van enige verdere dagwerk, onderworpe aan 'n maksimum van 12 maande kan aldus ingereken word.

(3) Van diens op sleepbote, modderskuite, baggerskepe, loodsbote en vissersbote van minstens 750 kW tel 'n kwart, onderworpe aan 'n maksimum van ses maande: Met dien verstande dat sodanige diens nie as kwalifiserende diens soos vereis by regulasie 34 mag tel nie.

(4) Diens wat deur ingenieuroffisiere verrig word op skepe wat volgens 'n ander waghouroetine optree as die "4 uur op wag en 8 uur vry van wag"—roetine kan ten volle aanvaar word indien sodanige werk verrig, voorsiening maak vir 'n redelik gebalanseerde stelsel van diens.

Kwytskelding van seediens vir 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2

36. 'n Nie-kadetkandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2 kan hoogstens drie maande kwalifiserende seediens kwytgeskeld word as hy, alvorens hy met sy kwalifiserende seediens begin het, Deel A van die eksamen vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2 geslaag het of as hy 'n sertifikaat, diploma of graad verwerf het wat deur die Direkteur-generaal as kwalifikasie vir algehele of gedeeltelike vrystelling van enige deel van die eksamen vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2 erken word. 'n Lys sertifikate, diplomas, grade of gedeeltelike grade, soos deur die Direkteur-generaal erken, word in tabelvorm in Aanhangsel 7 van die Regulasies uiteengesit, met die voorbehoudsbepaling dat die lys van tyd tot tyd gewysig kan word ooreenkomstig veranderings in die sertifikaat- en diplomastruktuur deur die Departement van Nasionale Opvoeding aangebring.

B. KANDIDAAT VIR 'N BEKWAAMHEIDSERTIFIKAAT AS MARINE-INGENIEUROFFISIER KLAS 1 EN ENDOSSEMENT

Tydperk seediens vereis van 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 1

37. 'n Kandidaat vir 'n bekwaamheidsertifikaat (stoom of motor of stoom en motor) as Marine-ingenieuroffisier Klas 1 moet, behoudens die bepalings van regulasie 41, die houer wees van 'n geldige bekwaamheidsertifikaat (stoom of motor of stoom en motor) as Marine-ingenieuroffisier Klas 2, en moet terwyl hy die houer van so 'n sertifikaat was, die tydperk toepaslike seediens voltooi het wat by regulasie 33 vereis word.

(b) If the steam endorsement of a certificate of competency (motor) is required a minimum of nine months as senior in full charge of a watch on the main propelling machinery of a modern turbine driven vessel with high pressure watertube boilers.

Type of sea service required of a candidate for a certificate of competency as Marine Engineer-Officer Class 2 and endorsement

35. (1) The sea service required in terms of regulations 33 and 34 of a candidate for a certificate of competency as Marine Engineer-Officer Class 2 and endorsement shall have been performed in a ship having a power of not less than 750 kW making short or long voyages, as an Engineer-Officer at sea on regular watch totalling at least eight hours out of every 24 hours service claimed. Service in such a ship making long voyages shall be counted at full rate whereas service in such a ship making short voyages shall be counted at two-thirds rate.

(2) Day-work at sea carried out within the engine or boiler spaces of any ship mentioned in subregulation (1) may be accepted towards the qualifying service on regular watch referred to in that subregulation, and shall be counted at full rate up to eight months and any further periods at half rate subject to a maximum allowance of 12 months.

(3) Service in tugs, hoppers, dredgers, pilot vessels and fishing vessels having a power of not less than 750 kW may be accepted at quarter rate subject to a maximum of six months: Provided that such service shall not be counted towards the qualifying service required in regulation 34.

(4) Service performed by engineer-officers employed in work practices in ships operated other than on the four and eight off watch routine may be accepted at full rate if such work practices provide a reasonably balanced system of service.

Remission of sea service for a candidate for a certificate of competency as Marine Engineer-Officer Class 2

36. A non-cadet candidate for a certificate of competency as Marine Engineer-Officer Class 2 who, before commencing his qualifying sea service, has passed Part A of the examination for a certificate of competency as Marine Engineer-Officer Class 2 or who has obtained a certificate, diploma, degree or partial degree recognised by the Director-General as conferring full or partial exemption from any part of the examination for a certificate of competency as Marine Engineer Officer Class 2 may be granted a remission of qualifying sea service not exceeding three months. A list of certificates, diplomas, degrees or partial degrees recognised by the Director-General is tabulated in Annex 7 to the Regulations, with the proviso that the list may be amended from time to time as changes are made in the certificate and diploma structure by the Department of National Education.

B. CANDIDATE FOR A CERTIFICATE OF COMPETENCY AS MARINE ENGINEER-OFFICER CLASS 1 AND ENDORSEMENT

Period of sea service required of a candidate for a certificate of competency as Marine Engineer-Officer Class 1

37. A candidate for a certificate of competency (steam, motor or combined steam and motor) as Marine Engineer-Officer Class 1 shall, subject to the provisions of regulation 41, hold a valid certificate of competency (steam, motor or combined steam and motor) as Marine Engineer-Officer Class 2, and whilst holding such a certificate, shall have completed the period of appropriate sea service required in terms of regulation 33.

Tydperk seediens vereis vir die endossering van 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 1

38. 'n Kandidaat vir die endossering van 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 1 moet die tydperk seediens voltooi het wat by regulasie 34 vir die endossering van 'n bekwaamheidsertifikaat (stoom of motor, na gelang van die geval) as Marine-ingenieuroffisier Klas 2 vereis word.

Tipe seediens vereis van 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 1 en endossement

39. (1) Die seediens wat ingevolge regulasies 37 en 38 van 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 1 en endossement vereis word, moet deur die kandidaat in die hoedanigheid van ingenieuroffisier ter see op 'n skip van minstens 3 000 kW wat lang en kort seereise onderneem, verrig gewees het op gereelde waghoudiens van minstens agt uur uit elke 24 uur diens waarop aanspraak gemaak word.

(2) Behoudens die bepalings van subregulasie (3) moet die diens waarvan in subregulasie (1) melding gemaak word, deur die kandidaat verrig gewees het as senior ingenieur met bevel oor die hele waghoudiens, of as tweede in die senioriteitsvolgorde op 'n skip aangedryf deur twee of meer stelle masjiene of op 'n groot eenskroefskip waar daar terselfdertyd drie of meer ingenieuroffisiere op gereelde waghoudiens is. Waar sodanige diens aldus verrig word op 'n skip wat lang seereise onderneem, tel alles, maar van sodanige diens op 'n skip wat kort seereise onderneem, tel net twee derdes.

(3) Die diens waarvan in subregulasie (1) melding gemaak word, kon ook in die geval van 'n skip aangedryf deur twee of meer stelle masjiene of op 'n groot eenskroefskip verrig gewees het in range laer as dié wat in subregulasie (2) vermeld word. As hierdie diens aldus verrig is op 'n skip wat lang seereise onderneem, tel net die helfte daarvan, en as dit aldus verrig is op 'n skip wat kort seereise onderneem, tel net 'n kwart daarvan.

(4) Van diens op sleepbote, modderskuite, baggerskepe, loodsbote en vissersbote van minstens 3 000 kW tel 'n kwart, onderworpe aan 'n maksimum van ses maande: Met dien verstande dat sodanige diens nie as kwalifiserende diens soos vereis by regulasie 38, gelees met regulasie 34, mag tel nie.

(5) Deeltydse diens wat deur ingenieuroffisiere by werkverrigting van masjinerie sonder toesig verrig word, kan aanvaar word indien die eksaminator daarvan oortuig is dat sodanige diens voorsiening maak vir 'n redelik gebalanseerde stelsel van diens. Diens wat deur hierdie subregulasie omvat word, sal op dieselfde wyse bereken word as bepaal ingevolge regulasie 35 (4).

Kwytskelding van seediens vir 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 1

40. 'n Kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 1 kan hoogstens drie maande seediens kwytgeskeld word as hy, alvorens hy met sy kwalifiserende seediens begin het, Deel A van die eksamen vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 1 geslaag het of as hy 'n sertifikaat, diploma, graad of gedeeltelike graad verwerf het wat deur die Direkteur-generaal as kwalifikasie vir algehele of gedeeltelike vrystelling van enige deel van die eksamen vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas I erken word. 'n Lys sertifikate, diplomas, grade of gedeeltelike grade, soos deur die Direkteur-generaal erken, word in tabelvorm in Aanhangsel 7 van die Regulasies uiteengesit, met die voorbehoudsbepaling dat die lys van tyd tot tyd gewysig kan word ooreenkomstig veranderings in die sertifikaat- en diplomastruktuur deur die Departement van Nasionale Opvoeding aangebring.

Period of sea service required for the endorsement of a certificate of competency as Marine Engineer-Officer Class 1

38. A candidate for the endorsement of a certificate of competency as Marine Engineer-Officer Class 1 shall have completed the period of sea service required in terms of regulation 34 for the endorsement of a certificate of competency (steam or motor, as the case may be) as Marine Engineer-Officer Class 2.

Type of sea service required of a candidate for a certificate of competency as Marine Engineer-Officer Class 1 and endorsement

39. (1) The sea service required in terms of regulations 37 and 38 of a candidate for a certificate of competency as Marine Engineer-Officer Class 1 and endorsement shall have been performed in a ship having a power of not less than 3 000 kW making long or short voyages, as an engineer-officer at sea on regular watch for not less than eight hours out of every 24 hours service claimed.

(2) Subject to the provisions of subregulation (3), the service referred to in subregulation (1), shall have been performed as senior engineer in charge of the entire watch, or as second in seniority in a ship propelled by two or more sets of engines or in a large single screw ship where there are three or more engineer-officers on regular watch at the same time. Such service so performed in a ship making long voyages shall be counted at full rate, whereas such service so performed in a ship making short voyages shall be counted at two-thirds rate.

(3) The service referred to in subregulation (1) may also have been performed in ranks below those mentioned in subregulation (2) in a ship propelled by two or more sets of engines or in a large single screw ship. This service so performed in a ship making long voyages shall be counted at half rate, whereas such service so performed in a ship making short voyages shall be counted at quarter rate.

(4) Service in tugs, hoppers, dredgers, pilot vessels and fishing vessels of not less than 3 000 kW may be accepted at quarter rate subject to a maximum of six months: Provided that such service shall not be counted towards the qualifying service required in regulation 38 read with regulation 34.

(5) Part-time service performed by engineer-officers in unattended machinery space operation may be accepted if the examiner is satisfied that such service provides a reasonably balanced system of service. Service falling within the scope of this subregulation will be assessed in similar manner to that laid down in regulation 35 (4).

Remission of sea service for a candidate for a certificate of competency as Marine Engineer-Officer Class 1

40. A candidate for a certificate of competency as Marine Engineer-Officer Class 1 who, before commencing his qualifying sea service, has passed Part A of the examination for a certificate of competency as Marine Engineer-Officer Class 1 or who has obtained a certificate, diploma, degree or partial degree recognised by the Director-General as conferring full or partial exemption from any part of the examination for a certificate of competency as Marine Engineer-Officer Class 1 may be granted a remission of sea service not exceeding three months. A list of certificates, diplomas, degrees or partial degrees recognised by the Director-General is tabulated in Annex 7 to the Regulations, with the proviso that the list may be amended from time to time as changes are made in the certificate and diploma structure by the Department of National Education.

Eksamen vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 1 sonder dat 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2 voorgelê word

41. (1) 'n Kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 1 wat weens diens in die buiteland geen geleentheid gehad het om 'n geldige bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2 te verwerf nie, kan behoudens die bepalings van subregulasie (2) tot die eksamen vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 1 toegelaat word: Met dien verstande dat die Direkteur-generaal daarvan oortuig is dat die kandidaat se diens, vakleerlingskap of tegniese studies, met inbegrip van werkwinkeldiens, nie van 'n laer gehalte is as wat vir die toekenning van 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 1 kragtens hierdie regulasies vereis word nie.

(2) 'n Kandidaat vermeld in subregulasie (1) moet bewys lewer dat hy minstens vier jaar op 'n stoomskip of motorskip van minstens 3 000 kW wat lang seereise onderneem, diens gedoen het, van welke tydperk hy minstens 18 maande lank beheer oor die hele waghoudiens by die ketels en hoofaandrywingsmasjinerie van 'n stoomskip of by die hoofaandrywingsmasjinerie van 'n motorskip moet gehad het, en hy moet slaag in die eksamen in Wiskunde en Tekene wat by regulasie 53 (2) (c) en (d) voorgeskryf word.

(3) Indien 'n kandidaat wat in subregulasie (1) vermeld word, nie in die eksamen vir die bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 1 slaag nie, maar toon dat hy die standaard bereik het wat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2 vereis word, kan die Minister so 'n sertifikaat aan hom toeken: Met dien verstande dat geen deel van die eksamengeld aan hom terugbetaal word nie.

HOOFSTUK IV

KWALIFIKASIES VEREIS VAN 'N KANDIDAAT VIR 'N BEKWAAMHEIDSERTIFIKAAT AS HOOF-INGENIEUROFFISIER—SPESIALE GRAAD

Algemeen

42. (1) 'n Kandidaat vir 'n bekwaamheidsertifikaat as Hoof-ingenieuroffisier (Spesiale Graad) moet die houer wees van òf 'n geldige gekombineerde bekwaamheidsertifikaat (stoom en motor) as Marine-ingenieuroffisier Klas 1 òf 'n geldige bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 1 vir die een of die ander vorm van aandryfkrag.

(2) Geen seediens word van 'n kandidaat vereis benewens die diens wat hy vir sy bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 1 of Endossement verrig het nie.

(3) Kandidate wat benewens 'n geldige bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 1 vir stoom- of motorskepe, ook houers is van sertifikate, diplomas, professionele kwalifikasies of volle grade in skeeps-, meganiese of elektriese ingenieurswese gelys in die afdeling van Aanhangsel 7 van die regulasies wat oor bekwaamheidsertifikate as Hoof-ingenieuroffisier (Spesiale Graad) handel, kom ook in aanmerking vir vrystelling op 'n vak-vir-vakgrondslag van alle eksamens vir bekwaamheidsertifikate as Ingenieuroffisier, insluitende dié vir Hoof-ingenieuroffisier (Spesiale Graad).

HOOFSTUK V

ALGEMENE BEPALINGS BETREFFENDE AANVAARBAARHEID [NIE OP 'N KANDIDAAT VIR 'N BEKWAAMHEIDSERTIFIKAAT AS HOOF-INGENIEUR (SPESIALE GRAAD) VAN TOEPASSING NIE]

Algemeen

43. (1) Die las om aanvaarbare bewys van seediens te lewer, rus in alle gevalle op die kandidaat wat op sodanige diens aanspraak maak.

Examination for a certificate of competency as Marine Engineer-Officer Class 1 without production of a certificate of competency as Marine Engineer-Officer Class 2

41. (1) A candidate for a certificate of competency as Marine Engineer-Officer Class 1 who, in consequence of service abroad, has had no opportunity to obtain a valid certificate of competency as Marine Engineer-Officer Class 2 may, subject to the provisions of subregulation (2), be admitted to the examination for a certificate of competency as Marine Engineer-Officer Class 1: Provided the Director-General is satisfied that the character of the candidate's service, apprenticeship or technical studies, including workshop service, is of a standard not lower than that required for the grant under these regulations of a certificate of competency as Marine Engineer-Officer Class 1.

(2) A candidate referred to in subregulation (1) shall produce proof of having served for at least four years in a steamship or motorship having a power of not less than 3 000 kW making long voyages, of which at least 18 months shall have been spent in charge of the entire watch on the boilers and main propelling machinery of a steamship or on the main propelling machinery of motorship and shall pass the examination in Mathematics and Drawing prescribed in regulation 53 (2) (c) and (d).

(3) If a candidate referred to in subregulation (1) fails to pass the examination for a certificate of competency as Marine-Engineer Officer Class 1 but shows that he has reached the standard required for a certificate of competency as Marine Engineer-Officer Class 2 the Minister may grant him such a certificate: Provided that no part of the examination fee shall be refunded to him.

CHAPTER IV

QUALIFICATIONS REQUIRED OF A CANDIDATE FOR A CERTIFICATE OF COMPETENCY AS CHIEF ENGINEER-OFFICER—SPECIAL GRADE

General

42. (1) A candidate for a certificate of competency as Chief Engineer-Officer—(Special Grade) shall hold either a valid combined certificate of competency (steam and motor) as Marine Engineer-Officer Class 1 or a valid certficate of competency as Marine Engineer-Officer Class 1 for either motive power.

(2) Sea service additional to the service which he performed for his certificate of competency as Marine Engineer Officer Class 1 or endorsement, shall not be required of the candidate.

(3) Those candidates who, in addition to holding a valid certificate of competency as Marine Engineer-Officer Class 1 for steamships or motorships, also hold any of the certificates, diplomas, professional qualifications or full degrees in marine, mechanical or electrical engineering listed in that section of Annex 7 to the Regulations dealing with certificates of competency as Chief Engineer Officer (Special Grade) also qualify for exemption on a subject for subject basis from all the examinations for certificates of competency as Engineer-Officer including that for Chief Engineer-Officer (Special Grade).

CHAPTER V

GENERAL PROVISIONS AS TO ELIGIBILITY (NOT APPLICABLE TO A CANDIDATE FOR A CERTIFICATE OF COMPETENCY AS CHIEF ENGINEER-OFFICER—SPECIAL GRADE)

General

43. (1) In all cases the onus of producing acceptable proof of sea service shall rest upon the candidate claiming such service.

(2) As 'n kandidaat op seediens op 'n skip wat nie in die Republiek geregistreer is nie aanspraak maak en sodanige diens nie deur die Direkteur-generaal geverifieer kan word nie, moet die diens bevestig word deur 'n amptelike owerheid van die land waarin die skip waarop die kandidaat diens gedoen het, geregisteer is. As daar enigsins getwyfel word aan die afdoendheid van die gelewerde bewyse, moet alle dokumente met die oog op beslissing na die Direkteur-generaal verwys word.

(3) Slegs seediens—

(a) ingevolge 'n ooreenkoms met die bemanning verrig; of

(b) ingeskryf in 'n ontslagboek of die ekwivalent daarvan, wanneer die gesagvoerder of sy verteenwoordiger die datums van indiensneming en ontslag kontroleer is aanvaarbaar.

(4) Indien 'n deel van of al die kwalifiserende diens deur 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2 of Marine-ingenieuroffisier Klas 1 verrig is op 'n skip wat nie gereeld ter see is nie, moet die kandidaat 'n sertifikaat van die eienaar van die skip voorlê waarin gemeld word watter deel van die tyd werklik ter see deurgebring is. As hierdie tyd minstens twee derdes bedra van die seediens wat nodig is om vir die eksamen te kwalifiseer, kan al die diens aanvaar word, maar as die werklike diens ter see minder as sodanige deel is, moet die kandidaat die tekort aanvul deur addisionele seediens te verrig.

(5) Diens op 'n skip waar 'n waghoudende Ingenieuroffisier as deel van sy gereelde pligte stook- of ander werk moet verrig wat nie gewoonlik deur 'n Ingenieuroffisier gedoen word nie, word nie as kwalifiserende diens aanvaar nie.

(6) In die geval van diens waarvoor nie in hierdie regulasies voorsiening gemaak word nie, moet die Direkteur-generaal beslis of sodanige diens as kwalifiserende diens aanvaar kan word.

Hoe seediens bereken word

44. Die kandidaat se seediens word bereken volgens kalendermaande, d.w.s. die tyd tussen enige bepaalde dag in 'n maand en die voorafgaande dag van die volgende maand, albei inbegrepe. Die getal volle maande vanaf die begin van die tydperk wat aldus vasgestel is, word bereken en daarna word die getal los dae getel. Die dag waarop die ooreenkoms in werking tree en die dag waarop dit eindig, word albei ingesluit en al die los dae word bymekaargetel en teen 30 dae per maand bereken.

Diens by hulpmasjiene

45. (1) Behoudens die bepalings van regulasies 18 en 33 betreffende die minimum diens by ketels en hoofmasjiene tel diens by hulpmasjinerie wat saam met die hoofaandrywingsmasjinerie gebruik word (d.w.s. by hulpmasjiene wat vir die werking van die hoofaandrywingsmasjinerie of ketels noodsaaklik is) alles in mindering van die kwalifiserende tydperk seediens.

(2) Van diens by hulpmasjiene wat onafhanklik van die hoofaandrywingsmasjinerie gebruik word, tel net die helfte.

HOOFSTUK VI

EKSAMENGELDE (ALLE KANDIDATE)

Wanneer gelde betaal moet word

46. (1) 'n Kandidaat wat 'n eksamen vir 'n bekwaamheidsertifikaat wil aflê, moet minstens twee weke voor die datum van die eksamen 'n aansoekvorm in tweevoud invul. Geen kandidaat mag toegelaat word om eksamen af te lê nie, tensy hy die kwitansie vir die betaalde eksamengeld aan die eksaminator toon.

(2) Where a candidate claims sea service performed in a ship not registered in the Republic and such service cannot be verified by the Director-General, the service shall be confirmed by an official authority of the country in which the ship in which the candidate served was registered. If the sufficiency of the proof given appears to be at all doubtful, all papers shall be referred to the Director-General for decision.

(3) Only sea service—

(a) performed in terms of an agreement with the crew; or

(b) entered in a Discharge Book or its equivalent, when the dates of engagement and discharge are supervised by the Master or his representative is acceptable.

(4) When part or whole of the qualifying service has been performed by a candidate for a certificate of competency as Marine Engineer-Officer Class 2 or Marine Engineer-Officer Class 1 in a ship which is not regularly at sea, the candidate shall produce a certificate from the owner of the ship stating the proportion of time actually spent at sea. If this time amounts to not less than two-thirds of the sea service required to qualify for the examination, the service may be accepted in full, but where the actual service at sea falls below this proportion, the candidate shall be required to make up the deficiency by performing additional sea service.

(5) Service in a ship where a watchkeeping Engineer-Officer is, as part of his regular duties, required to do stoking or other work not usually performed by an Engineer-Officer, shall not be accepted as qualifying service.

(6) The acceptance as qualifying service, of service which is not provided for in these regulations, shall be decided by the Director-General.

How sea service is calculated

44. The candidate's sea service shall be reckoned by the calendar month, i.e. the time between any given day in any month and the preceding day of the following month, both inclusive. The number of complete months from the commencement of the period, ascertained in this way, shall be computed, after which the number of odd days shall be counted. The day on which the agreement commences, as well as that on which it terminates, shall both be included, and all odd days added together and reckoned at 30 days to the month.

Service on auxiliary machinery

45. (1) Time served on auxiliary machinery run in conjunction with the main propelling machinery (i.e. on auxiliaries which are essential to the running of the main propelling machinery or boilers) shall, subject to the provisions regarding the minimum service on boilers and main engines set out in regulations 18 and 33, count in full towards the qualifying period of sea service.

(2) Time served on auxiliaries run independently of the main propelling machinery shall count at half rate.

CHAPTER VI

EXAMINATION FEES (ALL CANDIDATES)

When to pay fees

46. (1) A candidate for the examination for a certificate of competency shall complete an application form in duplicate at least two weeks prior to the date of examination. No candidate shall be allowed to sit for the examination unless he produces to the examiner the receipt for the fee paid.

(2) 'n Kandidaat wat aansoek doen om vrystelling van 'n deel van die eksamen vir enige graad van 'n bekwaamheidsertifikaat, moet 'n aansoekvorm in tweevoud invul, die voorgeskrewe gelde vir dié deel van die eksamen waarvoor hy vrystelling verlang, betaal en twee afskrifte van sy vrystellingskwalifikasies voorlê. Hierdie aansoek kan te eniger tyd na voltooiing van 'n kadet- of vakleerlingskap gedoen word.

Waar gelde betaal moet word

47. Die eksamengeld moet aan die naaste bevoegde beampte betaal word en dié moet 'n kwitansie uitreik waarop vermeld word—

(a) die naam van die kandidaat;

(b) die betaalde bedrag;

(c) die graad van die eksamen.

Tabel van eksamengelde

48. Die betaalbare eksamengelde is soos volg:

(a) Eksamen vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 4 of endossement:

(i) Die volle eksamen vir 'n sertifikaat (stoom, motor of stoom en motor): R40.

(ii) Deel van die eksamen: R20.

(iii) Eksamen vir endossement (stoom of motor): R20.

(b) Eksamen vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 3 of endossement:

(i) Die volle eksamen vir 'n sertifikaat (stoom, motor of stoom en motor): R60.

(ii) Deel van die eksamen: R30.

(iii) Eksamen vir endossement (stoom of motor): R30.

(c) Eksamen vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2 of endossement:

(i) Die volle eksamen vir 'n sertifikaat (stoom, motor of stoom en motor): R80.

(ii) Deel A of Deel B of 'n gedeelte van een van hierdie dele: R40.

(iii) Eksamen vir endossement (stoom of motor): R40.

(d) Eksamen vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 1 of endossement:

(i) Die volle eksamen vir 'n sertifikaat (stoom, motor of stoom en motor): R120.

(ii) Deel A of Deel B of 'n gedeelte van een van hierdie dele: R60.

(iii) Eksamen vir endossement (stoom of motor): R60.

(e) 'n Kandidaat wat die houer is van 'n vrystellende kwalifikasie vir Deel A van die eksamen vir Marine-ingenieuroffisier Klas 2 of die eksamen vir Marine-ingenieuroffisier Klas 1 moet die volle bedrag betaal by die eerste poging vir Deel B van sodanige eksamen en, indien hy onsuksesvol is, moet hy by hereksaminering die bedrag vir Deel B alleen betaal.

(f) Eksamen vir 'n bekwaamheidsertifikaat as Hoof-ingenieuroffisier (Spesiale Graad):

(i) Die volle eksamen vir 'n sertifikaat: R160.

(ii) Deel A of Deel B: R80.

(g) 'n Bedrag van R20 is betaalbaar vir die uitreiking van 'n dienssertifikaat.

(2) A candidate who applies for exemption from part of the examination for any grade of certificate of competency shall complete an application form in duplicate, pay the fee prescribed for that part of the examination from which he seeks exemption and submit two copies of his exempting qualifications. This application may be made at any time after completion of a cadetship or an apprenticeship.

Where to pay fees

47. The fee for examination shall be paid to the nearest proper officer who shall issue a receipt stating—

(a) the name of the candidate;

(b) the amount paid;

(c) the grade of the examination.

Table of examination fees

48. The fees payable shall be as follows:

(a) Examination for a certificate of competency as Marine Engineer-Officer Class 4 or endorsement:

(i) The full examination for a certificate (steam, motor or combined steam and motor): R40.

(ii) Part of the examination: R20.

(iii) The endorsement (steam or motor) examination: R20.

(b) Examination for a certificate of competency as Marine Engineer-Officer Class 3 or endorsement:

(i) The full examination for a certificate (steam, motor or combined steam and motor): R60.

(ii) Part of the examination: R30.

(iii) The endorsement (steam or motor) examination: R30.

(c) Examination for a certificate of competency as Marine Engineer-Officer Class 2 or endorsement:

(i) The full examination for a certificate (steam, motor or combined steam and motor): R80.

(ii) Part A or Part B or portion of either Part: R40.

(iii) The endorsement (steam or motor): R40.

(d) Examination for a certificate of competency as Marine Engineer-Officer Class 1 or endorsement:

(i) The full examination for a certificate (steam or motor or combined steam and motor): R120.

(ii) Part A or Part B or a portion of either Part: R60.

(iii) The endorsement (steam or motor) examination: R60.

(e) A candidate holding an exempting qualification for Part A of either the examination for Marine Engineer Officer Class 2 or that for Marine Engineer-Officer Class 1 shall pay the full fee at the first attempt for Part B of such examination and, if unsuccessful, on re-examination shall be required to pay the fee for Part B only.

(f) Examination for a certificate of competency as Chief Engineer-Officer-Special Grade:

(i) The full examination for a certificate: R160.

(ii) Part A or Part B: R80.

(g) A fee of R20 shall be paid for the issue of a certificate of service.

(h) 'n Bedrag van R10 is betaalbaar vir 'n gewaarmerkte afskrif van 'n verlore bekwaamheid- of dienssertifikaat: Met dien verstande dat geen bedrag betaalbaar is indien die sertifikaat as gevolg van skipbreuk of brand aan boord van die skip verlore gegaan het nie.

(i) Die gelde vir die mondelinge eksamen vir 'n diensendossement van Klas 2-, 3- en 4-sertifikate: R20.

(j) Gelde vir 'n gevaarlikevragendossement: R10.

Terugbetaling van eksamengelde

49. (1) Indien 'n kandidaat weens omstandighede buite sy beheer nie in staat is om die eksamen af te lê waarvoor hy eksamengelde betaal het nie, kan hy skriftelik by die bevoegde beampte om terugbetaling van sodanige eksamengeld aansoek doen. Indien die bevoegde beampte van mening is dat die aansoek op redelike gronde berus, moet hy die aansoek deurstuur aan die Direkteur-generaal, wat die terugbetaling kan magtig.

(2) Indien 'n kandidaat nie 'n eksamen ooreenkomstig regulasie 8 voltooi nie, kan hy skriftelik by die bevoegde beampte aansoek doen om terugbetaling van die eksamengeld wat deur hom betaal is, en sodanige geld moet aan hom terugbetaal word.

(3) Indien 'n kandidaat in enige deel van die eksamen druip, word behoudens die bepalings van subregulasie (2) geen deel van die eksamengeld aan hom terugbetaal nie.

(4) Indien die aansoek om 'n dienssertifikaat misluk, word die bedrag wat deur die applikant betaal is, aan hom terugbetaal.

HOOFSTUK VII

EKSAMENS: BEKWAAMHEIDSERTIFIKAAT AS MARINE-INGENIEUROFFISIER KLAS 4 EN ENDOSSEMENT, OF MARINE-INGENIEUROFFISIER KLAS 3 EN ENDOSSEMENT

Eksamen vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 4 of Marine-ingenieuroffisier Klas 3

50. (1) Die leerplanne vir die eksamen vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 4 of Marine-ingenieuroffisier Klas 3 word in Aanhangsel 2 uiteengesit.

(2) Die eksamen moet die volgende dek:

(a) Algemene Ingenieurswetenskap (een vraestel van drie uur).

(b) Hittewerktuie (een vraestel van drie uur).

(c) (i) Ingenieurswese (twee vraestelle van drie uur elk).

(ii) Mondelinge eksamen.

(3) 'n Kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 4 kan hom te eniger tyd tussen voltooiing van sy werkwinkeldiens en voltooiing van sy kwalifiserende seediens aanmeld om in die vakke Algemene Ingenieurswetenskap en Hittewerktuie geëksamineer te word.

(4) 'n Kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 3 kan hom te eniger tyd na die voltooiing van enige van die aanvanklike opleidingskemas aanmeld om in die vakke Algemene Ingenieurswetenskap en Hittewerktuie geëksamineer te word. 'n Klas 4-sertifikaat is nie 'n vereiste nie.

(5) 'n Kandidaat wat in een of twee vakke slaag, hoef nie daardie vakke weer te neem nie en kan hom behoudens die bepalings van regulasie 58 aanmeld om in die oorblywende vak of vakke hereksamineer te word.

(h) A fee of R10 shall be paid for a certified copy of a lost certificate of competency or service: Provided that no fee shall be paid if the certificate was lost through ship-wreck or fire on board ship.

(i) The fee for the oral examination for a Service Endorsement of Class 2, 3 and 4 certificates: R20.

(j) Fee for Dangerous Cargo Endorsement: R10.

Refund of examination fees

49. (1) If through circumstances beyond the control of a candidate he is unable to undergo the examination for which a fee has been paid, he may apply in writing to the proper officer for a refund of such fee. If the proper officer considers that the application is based upon reasonable grounds, he shall transmit it to the Director-General, who may authorise the refund.

(2) If a candidate does not, in terms of regulation 8 complete an examination, he may apply in writing to the proper officer for a refund of the fee paid by him, and such fee shall be refunded to him.

(3) Subject to the provisions of subregulation (2), if a candidate fails to pass any part of the examination, no part of the fee shall be refunded to him.

(4) If the application for a certificate of service is unsuccessful, the fee paid by the applicant shall be refunded to him.

CHAPTER VII

EXAMINATIONS: CERTIFICATE OF COMPETENCY AS MARINE ENGINEER-OFFICER CLASS 4 AND ENDORSEMENT, OR MARINE ENGINEER-OFFICER CLASS 3 AND ENDORSEMENT

Examination for a certificate of competency as Marine Engineer-Officer Class 4 or Marine Engineer-Officer Class 3.

50. (1) The syllabuses for the examination for a certificate of competency as Marine Engineer-Officer Class 4 or Marine Engineer-Officer Class 3 are set out in Annex 2.

(2) The examination shall cover—

(a) General Engineering Science (one paper of three hours).

(b) Heat Engines (one paper of three hours).

(c) (i) Engineering Knowledge (two papers, each of three hours).

(ii) Oral.

(3) A candidate for a certificate of competency as Marine Engineer-Officer Class 4 may present himself for examination in the subjects "General Engineering Science" and "Heat Engines" at any time between the completion of his workshop service and the completion of his qualifying sea service.

(4) A candidate for a certificate of competency as Marine Engineer-Officer Class 3 may present himself for examination in the subjects "General Engineering Science" and "Heat Engines" at any time after he has completed any one of the initial training schemes. A Class 4 certificate is not required.

(5) A candidate who passes in one or two subjects shall not be required to take those subjects again and, subject to the provisions of regulation 58, may present himself for re-examination in the remaining subject or subjects.

Eksamen vir die endossering van 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 4 of Marine-ingenieuroffisier Klas 3

51. Die eksamen vir die endossering van 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 4 of Marine-ingenieuroffisier Klas 3 moet uit die volgende bestaan:

(a) Een skriftelike vraestel van 3 uur in Ingenieurswese;

(b) mondelinge eksamen.

Die leerplanne vir hierdie eksamens word in Aanhangsel 2 uiteengesit.

Slaagpunt vereis

52. (1) Ten einde in die skriftelike deel van die eksamen vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 4 en endossement en Marine-ingenieuroffisier Klas 3 en endossement te slaag, moet 'n kandidaat 'n gemiddelde van 50 % van die totale puntetal in die eksamen behaal met die voorbehoudsbepaling dat die eksaminator die kandidaat na eie goeddunke kan toelaat om te slaag indien sy swakste vak tussen 40 % en 50 % van die totale puntetal slegs vir daardie vak uitmaak. Die slaagpunt in die mondelinge eksamen is 70 %.

(2) Die uitslag van die eksamen sal deur die eksaminator aan die kandidaat meegedeel word.

HOOFSTUK VIII

EKSAMENS: BEKWAAMHEIDSERTIFIKAAT AS MARINE-INGENIEUROFFISIER KLAS 2 EN ENDOSSEMENT, OF MARINE-INGENIEUROFFISIER KLAS 1 EN ENDOSSEMENT

Eksamen vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2

53. (1) Die leerplanne vir die eksamen vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2 word in Aanhangsel 3 uiteengesit.

(2) Die eksamen word in twee dele verdeel, soos volg:

DEEL A

(a) Toegepaste Meganika (een vraestel van drie uur).

(b) Hittewerktuie (een vraestel van drie uur).

(c) Wiskunde (een vraestel van drie uur).

(d) Tekene (een vraestel van ses uur).

DEEL B

(a) Elektrotegnologie (een vraestel van drie uur).

(b) Skeepsboukunde (een vraestel van drie uur).

(c) Ingenieurswese (twee vraestelle van drie uur elk en 'n mondelinge eksamen).

(3) 'n Kandidaat kan, behoudens 'n minimum van twee vakke, vrygestel word van die hele of 'n gedeelte van Deel A en kan die eksamen in afsonderlike dele aflê, soos volg:

(a) As 'n kandidaat 'n goedgekeurde onderrigkursus wat minstens twee uit die vier vakke inbegrepe in Deel A dek, gevolg en 'n sertifikaat verwerf het of 'n verklaring wat meld hoe ver hy in die kursus gevorder het, word hy vrygestel van die vakke in Deel A indien aan die vereiste standaard soos uiteengesit in Aanhangsel 7 van hierdie regulasies voldoen is.

Ondergenoemde kwalifikasies wat onder die ou tegniese opleidingskema verwerf is, word steeds erken:

(i) Die Nasionale Tegniese Sertifikaat Deel V (voorheen bekend as G.T.S. II).

(ii) Die Nasionale Tegniese Diploma (voorheen bekend as die Nasionale Diploma in Ingenieurswese).

Examination for endorsement of a certificate of competency as Marine Engineer-Officer Class 4 or Marine Engineer-Officer Class 3

51. The examination for the endorsement of a certificate of competency as Marine Engineer-Officer Class 4 or Marine Engineer-Officer Class 3 shall consist of—

(a) one written paper of three hours in Engineering Knowledge;

(b) oral.

The syllabuses for these examinations are set out in Annex 2.

Marks required for pass

52. (1) To secure a pass in the written portion of the examination for a certificate of competency as Marine Engineer-Officer Class 4 and endorsement and Marine Engineer-Officer Class 3 and endorsement, a candidate shall be required to obtain an aggregate of 50 % of the total marks in the examination with the proviso that at the discretion of the examiner he may be allowed to pass if his weakest subject carries between 40 % and 50 % of the full marks for that subject only. In the oral examination the pass mark is 70 %.

(2) The result of the examination will be communicated to the candidate by the examiner.

CHAPTER VIII

EXAMINATIONS: CERTIFICATE OF COMPETENCY AS MARINE ENGINEER-OFFICER CLASS 2 AND ENDORSEMENT OR MARINE ENGINEER-OFFICER CLASS 1 AND ENDORSEMENT

Examination for a certificate of competency as Marine Engineer-Officer Class 2

53. (1) The syllabuses for the examination for a certificate of competency as Marine Engineer-Officer Class 2 are set out in Annex 3.

(2) The examination is divided into two parts, as follows:

PART A

(a) Applied Mechanics (one paper of three hours).

(b) Heat Engines (one paper of three hours).

(c) Mathematics (one paper of three hours).

(d) Drawing (one paper of six hours).

PART B

(a) Electrotechnology (one paper of three hours).

(b) Naval Architecture (one paper of three hours).

(c) Engineering Knowledge (two papers, each of three hours and an oral examination).

(3) A candidate may be exempted from Part A or a portion of it, subject to a minimum of two subjects, and may take the examination in seperate parts, as follows:

(a) A candidate who has attended an approved course of instruction which covers not less than two of the four subjects included in Part A and who has obtained a certificate or statement indicating what level of the course he has reached shall be granted exemption from the subject in Part A if the requisite level as tabulated in Annex 7 to the Regulations has been reached.

The undermentioned qualifications gained under the old technical training scheme will continue to be recognised:

(i) The National Technical Certificate Part V (previously known as A.T.C. II).

(ii) The National Technical Diploma (previously known as the National Engineering Diploma).

(b) 'n Kandidaat kan hom te eniger tyd na voltooiing van die nodige werkwinkeldiens òf vir die hele Deel A van die eksamen òf, indien daar kragtens paragraaf (a) gedeeltelike vrystelling aan hom verleen is, vir die oorblywende vak of vakke aanmeld.

(c) 'n Kandidaat wat nie geheel en al of gedeeltelik kragtens paragraaf (a) vrygestel is nie en wat net een vak slaag wanneer hy Deel A van die eksamen aandurf, moet by hereksaminering weer die hele Deel A aflê. As hy in twee of drie vakke slaag, hoef hy nie daardie vakke te herhaal nie en kan hy hom behoudens die bepalings van regulasie 58 vir hereksamen in die oorblywende vak of vakke aanmeld.

(d) 'n Kandidaat kan Deel B te eniger tyd na voltooiing van die nodige tydperke kwalifiserende werkwinkel- en seediens aflê: Met dien verstande dat hy ook terselfdertyd die hele Deel A van die eksamen aflê of eksamen doen in die vakke (as daar is) van daardie deel waarin hy nie reeds geslaag het of waarvan hy nie kragtens paragraaf (a) vrygestel is nie.

(e) 'n Kandidaat mag nie 'n slaagpunt in Deel B of in enige afdeling van Deel B gegee word nie tensy hy Deel A terselfdertyd as Deel B voltooi of reeds tevore voltooi het of daarvan vrygestel is.

(f) 'n Kandidaat wat Deel A voltooi en wanneer hy Deel B aflê, in afdelings (a), (b) of (c) druip, kan 'n slaagpunt vir een of twee van drie vakke gegee word en kan behoudens die bepalings van regulasie 58 'n hereksamen in die oorblywende vakke aflê.

EKSAMEN VIR 'N BEKWAAMHEIDSERTIFIKAAT AS MARINE-INGENIEUROFFISIER KLAS 1

54. (1) Die leerplanne vir die eksamen vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 1 word in Aanhangsel 3 uiteengesit.

(2) Die eksamen word in 2 dele verdeel, soos volg:

DEEL A

(a) Toegepaste Meganika (een vraestel van drie uur).

(b) Hittewerktuie (een vraestel van drie uur).

DEEL B

(a) Elektrotegnologie (een vraestel van drie uur).

(b) Skeepsboukunde (een vraestel van drie uur).

(c) Ingenieurswese (twee vraestelle van drie uur): Met dien verstande dat daar vir kandidate wat die eksamen vir 'n gekombineerde sertifikaat (stoom en motor) aflê 'n derde vraestel van drie uur gestel word. Die skriftelike werk sal deur 'n mondelinge eksamen later in die week gevolg word.

(3) 'n Kandidaat kan van die hele of 'n gedeelte van Deel A vrygestel word en kan die eksamen in afsonderlike dele aflê, soos volg:

(a) 'n Kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 1 kan op 'n vak-vir-vak-grondslag vrystelling van enige deel van die eksamen verleen word indien hy enige van die kwalifikasies gelys in Aanhangsel 7 van die regulasies met betrekking tot Marine-ingenieuroffisier Klas 1 verwerf het.

Ondergenoemde kwalifikasies word steeds erken:

(i) Die Nasionale Tegniese Sertifikaat Deel V, (voorheen bekend as G.T.S. II).

(ii) Die Nasionale Tegniese Diploma (voorheen bekend as die Nasionale Diploma in Ingenieurswese).

(4) (a) 'n Kandidaat kan hom te eniger tyd na slaging in die eksamen vir die bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2 òf vir die hele Deel A van die eksamen òf, indien kragtens subregulasie 3 (a) gedeeltelike vrystelling aan hom verleen is, vir die oorblywende vak aanmeld.

(b) A candidate may present himself either for the whole of Part A or the examination, or, if he has been granted partial exemption under paragraph (e), for the remaining subject or subjects at any time after he has completed the necessary workshop service.

(c) A candidate who has not been exempted wholly or partially under paragraph (a) and who, when attempting Part A of the examination, passes in one subject only, must take the whole of Part A again on re-examination. If he passes in two or three subjects, he shall not be required to take those subjects again and subject to the provisions of regulation 58, may present himself for re-examination in the remaining subject or subjects.

(d) A candidate may take Part B at any time after he has completed the necessary periods of qualifying workshop and sea service: Provided he also takes at the same time the whole of Part A of the examination or such subjects, if any, in that part in which he has not already passed or from which he has not been exempted under paragraph (a).

(e) A candidate shall not be given a pass in Part B or in either section of Part B unless he completes Part A at the same time as Part B or unless he has previously completed it, or has been exempted from it.

(f) A candidate who completes Part A and when taking Part B, fails in Sections (a), (b) or (c) may be given a pass in one or two of the three subjects and subject to the provisions of regulation 58 may sit for re-examination in the remaining subjects.

EXAMINATION FOR A CERTIFICATE OF COMPETENCY AS MARINE ENGINEER-OFFICER CLASS 1

54. (1) The syllabuses for the examination for a certificate of competency as Marine Engineer-Officer Class 1 are set out in Annex 3.

(2) The examination is divided into 2 parts, as follows:

PART A

(a) Applied Mechanics (one paper of three hours).

(b) Heat Engines (one paper of three hours).

PART B

(a) Electrotechnology (one paper of three hours).

(b) Naval Architecture (one paper of three hours).

(c) Engineering Knowledge (two papers each of three hours). Provided that a third paper will be set for candidates taking the examination for a combined certificate. The written work will be followed by an oral examination later in the week.

(3) A candidate may be exempted from Part A or from a Part of it and may take the examination in separate parts as follows:

(a) A candidate for a certificate of competency as Marine Engineer-Officer Class 1 may be granted exemption on a subject for subject basis from any part of the examination if he has obtained any of the qualifications listed in Annex 7 to the Regulations relating to Marine Engineer-Officer Class 1. The undermentioned qualifications will continue to be recognised:

(i) The National Technical Certificate Part V, (previously known as A.T.C. II).

(ii) The National Technical Diploma (previously known as the National Engineering Diploma).

(4) (a) A candidate may present himself either for the whole of Part A of the examination, or, if he has been granted partial exemption under subregulation 3 (a), for the remaining subject at any time after he has passed the examination for a certificate of competency as Marine Engineer-Officer Class 2.

(b) 'n Kandidaat wat nie geheel en al of gedeeltelik kragtens subregulasie 3 (a) vrygestel is nie en wat net een vak slaag wanneer hy Deel A van die eksamen aandurf, hoef nie weer die eksamen in daardie vak af te lê nie en kan hom behoudens die bepalings van regulasie 58 vir hereksamen in die oorblywende vak aanmeld.

(c) 'n Kandidaat kan Deel B te eniger tyd aflê mits hy die houer is van 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2 en die nodige tydperk kwalifiserende seediens voltooi het en mits hy ook terselfdertyd die hele Deel A van die eksamen aflê of eksamen doen in die vak (as daar is) van daardie deel waarin hy nie reeds geslaag het of waarvan hy nie kragtens subregulasie 3 (a) vrygestel is nie.

(d) 'n Kandidaat mag nie 'n slaagpunt in Deel B of in enige afdeling van Deel B gegee word nie tensy hy Deel A terselfdertyd as Deel B voltooi of reeds tevore voltooi het, of van Deel A vrygestel is.

(e) 'n Kandidaat wat Deel A voltooi en wanneer hy Deel B van die eksamen aflê, in afdelings (a), (b) of (c) druip, kan 'n slaagpunt in een of twee van die drie vakke gegee word en kan behoudens die bepalings van regulasie 58 'n hereksamen in die uitstaande vakke aflê.

EKSAMEN VIR ENDOSSERING VAN 'N BEKWAAMHEIDSERTIFIKAAT AS MARINE-INGENIEUROFFISIER KLAS 2 OF MARINE-INGENIEUROFFISIER KLAS 1

55. Die eksamen vir die endossering van 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2 en Marine-ingenieuroffisier Klas 1 bestaan uit—

(a) een skriftelike vraestel van 3 uur in Ingenieurswese;

(b) 'n mondelinge eksamen.

Die leerplanne vir hierdie eksamens word in Aanhangsel 3 uiteengesit.

Slaagpunt vereis

56. (1) Ten einde in die skriftelike deel van die eksamen vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 2 en endossement en Marine-ingenieuroffisier Klas 1 en endossement te slaag, moet 'n kandidaat 'n gemiddelde van 50 % van die totale puntetal in elke Deel van die eksamen behaal met die voorbehoudsbepaling dat die eksaminator die kandidaat na eie goeddunke kan toelaat om te slaag indien sy swakste vak tussen 40 % en 50 % van die totale puntetal slegs vir daardie vak uitmaak. Die slaagpunt in die mondelinge eksamen is 70 %.

(2) Die uitslag van die eksamen sal deur die eksaminator aan die kandidaat meegedeel word.

HOOFSTUK IX

EKSAMEN: BEKWAAMHEIDSERTIFIKAAT AS HOOF/INGENIEUROFFISIER (SPESIALE GRAAD)

Algemeen

57. Die eksamen vir 'n bekwaamheidsertifikaat as Hoofingenieuroffisier (Spesiale Graad) dek die leerplanne vir die eksamens vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 1 en Marine-ingenieuroffisier Klas 2 uiteengesit in Aanhangsel 3, asook die leerplanne uiteengesit in Aanhangsel 4. Drie maande kennisgewing van voorneme om geëksamineer te word, word vereis. Die eksamen word in 2 dele verdeel, soos volg:

DEEL A

(1) (a) Toegepaste Termodinamika 1 (een vraestel van drie uur).

(b) Toegepaste Termodinamika 2 (een vraestel van drie uur).

(b) A candidate who has not been exempted wholly or partially under subregulation 3 (a) and who, when attempting Part A of the examination, passes in one subject only, shall not be required to take that subject again and, subject to the provisions of regulation 58, may present himself for re-examination in the remaining subject.

(c) A candidate may take Part B at any time provided he holds a certificate of competency as Marine Engineer-Officer Class 2 and has completed the necessary period of qualifying sea service, and provided also that he takes at the same time either the whole of Part A of the examination or such subject, if any, in that Part in which he has not already passed or from which he has not been exempted under subregulation 3 (a).

(d) A candidate shall not be given a pass in Part B or in either section of Part B unless he completes Part A at the same time as Part B or unless he has previously completed it, or has been exempted from it.

(e) A candidate who completes Part A and when taking Part B, fails in sections (a), (b) or (c) may be given a pass in one or two of the three subjects and subject to the provisions of regulation 58 may sit for re-examination in outstanding subjects.

EXAMINATION FOR ENDORSEMENT OF A CERTIFICATE OF COMPETENCY AS MARINE ENGINEER-OFFICER CLASS 2 OR MARINE ENGINEER-OFFICER CLASS 1

55. The examination for the endorsement of a certificate of competency as Marine Engineer-Officer Class 2, Marine Engineer-Officer Class 1 shall consist of—

(a) one written paper of 3 hours in Engineering Knowledge;

(b) Oral.

The syllabuses for these examinations are set out in Annex 3.

Marks required for pass

56. (1) To secure a pass in the written portion of the examination for a certificate of competency as Marine Engineer-Officer Class 2 and endorsement or Marine Engineer-Officer Class 1 and endorsement, a candidate shall be required to obtain an aggregate of 50 % of the total marks in each Part of the examination with the proviso that at the discretion of the examiner he may be allowed to pass if his weakest subject carries between 40 % and 50 % of the full marks for that subject only. In the oral examination the pass mark is 70 %.

(2) The result of the examination will be communicated to the candidate by the examiner.

CHAPTER IX

EXAMINATIONS: CERTIFICATE OF COMPETENCY AS CHIEF ENGINEER-OFFICER SPECIAL GRADE

General

57. The examination for a certificate of competency as Chief Engineer-Officer-Special Grade covers the syllabuses for the examinations for a certificate of competency as Marine Engineer-Officer Class 1 and Marine Engineer-Officer Class 2 set out in Annex 3, as well as the syllabuses set out in Annex 4. Three months notice of intention to be examined is required. The examination is divided into 2 parts, as follows:

PART A

(1) (a) Applied Thermodynamics 1 (one paper of three hours).

(b) Applied Thermodynamics 2 (one paper of three hours).

(c) Sterkteleer en eienskappe van materiale (een vraestel van drie uur).

(d) Masjienleer en Hidromeganika (een vraestel van drie uur).

DEEL B

(2) (a) Elektrotegnologie (een vraestel van drie uur).

(b) Skeepsboukunde (een vraestel van drie uur).

(c) Ingenieurswese (een vraestel van drie uur).

(d) Opstel (tyd toegelaat drie uur).

(e) Masjienontwerp (Tekene) (Tyd toegelaat ses uur).

(3) Vrystellingkwalifikasies wat aanvaar word vir die verlening van vrystelling van enige van die vakke gedek deur hierdie eksamen word uiteengesit in regulasie 42 (3) en ook in Aanhangsel 7 van hierdie regulasies.

(4) Indien 'n kandidaat verkies om die hele eksamen meteens af te lê en net in Deel B slaag, kan hy by 'n verdere eksamen net Deel A aflê en word hy van verdere eksamen in Deel B vrygestel.

(5) Ten einde in Deel A of Deel B te slaag, moet 'n kandidaat minstens 60 % van die totale puntetal vir elke vak toegewys, behaal.

(6) Gedeeltelike slagings word op 'n kandidaat se bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 1 geëndosseer en gedeeltelike slagings bly voortdurend geldig.

HOOFSTUK X

DRUIPING IN EKSAMEN VIR 'N ANDER BEKWAAMHEIDSERTIFIKAAT AS DIÉ VAN HOOF-INGENIEUROFFISIER (SPESIALE GRAAD)

Algemeen

58. (1) As daar in 'n eksamen vir 'n bekwaamheidsertifikaat, uitgesonderd 'n bekwaamheidsertifikaat as Hoof-ingenieuroffisier (Spesiale Graad), gedruip word in 'n vak waarvan onkundigheid daartoe kan lei dat 'n Ingenieuroffisier in die behartiging van enige deel van 'n skip se masjinerie iets doen wat werklik onveilig is of nalaat om iets te doen wat met die oog op veiligheid noodsaaklik is (bv. druiping in vrae oor manipulasie en die aflees van die waterpeilglas, die gevaar van brand en ontploffings in stoom- en motorskepe), word dit as druiping in praktiese kennis beskou en mag 'n kandidaat wat aldus gedruip het, hom nie vir hereksaminering aanmeld alvorens hy bewys van verdere seediens in 'n kwalifiserende hoedanigheid lewer nie.

(2) 'n Kandidaat wat weens onkunde omtrent grondbeginsels of weens algemene gebrek aan kennis in die eksamen druip, mag hom vir 'n tydperk wat deur die eksaminator bepaal moet word maar wat nie drie maande te bowe gaan nie, nie vir hereksaminering aanmeld nie: Met dien verstande dat die Direkteur-generaal behoudens die bepalings van subregulasie (5) na eie oordeel 'n langer tydperk as drie maande kan bepaal.

(3) 'n Kandidaat wat in 'n eksamen druip onder ander omstandighede as wat in subregulasies (1) en (2) uiteengesit word, kan hom te eniger tyd na verstryking van een maand sedert sy jongste poging vir eksamen aanmeld, maar as hy binne 'n tydperk van drie maande drie maal in Deel A of drie maal in Deel B druip, mag hy vir 'n tydperk wat deur die eksaminator bepaal moet word maar wat nie drie maande te bowe gaan nie, nie weer geëksamineer word nie: Met dien verstande dat die Direkteur-generaal behoudens die bepalings van subregulasie (5) na eie oordeel 'n tydperk van langer as drie maande kan bepaal.

(4) Die tydperk verdere seediens wat by subregulasie (1) vereis word, moet deur die eksaminator bepaal word en mag nie drie maande te bowe gaan nie tensy die voorafgaande goedkeuring van die Direkteur-generaal verkry is in 'n geval waar die eksaminator van mening is dat langer diens as drie maande geregverdig is.

(c) Strength and Properties of Materials (one paper of three hours).

(d) Theory of Machines and Mechanics of Fluids (one paper of three hours).

PART B

(2) (a) Electrotechnology (one paper of three hours).

(b) Naval Architecture (one paper of three hours).

(c) Engineering Knowledge (one paper of three hours).

(d) Essay (time allowed three hours).

(e) Machine Design (Drawing) (time allowed six hours).

(3) Exempting qualifications acceptable for the grant of exemption from any of the subjects covered by this examination are outlined in regulation 42 (3) and also in Annex 7 to these regulations.

(4) If a candidate who chooses to take the whole examination at one time passes only in Part B, he shall be eligible to sit for Part A at any further examination and shall be exempt from further examination in Part B.

(5) In order to attain a pass in either Part A or Part B, a candidate shall obtain not less than 60 % of the total marks allocated for each subject.

(6) Partial passes will be endorsed on the candidates certificate of competency as Marine Engineer Officer Class 1 and partial passes shall remain valid for all time.

CHAPTER X

FAILURE IN EXAMINATION FOR A CERTIFICATE OF COMPETENCY OTHER THAN AS CHIEF ENGINEER-OFFICER-SPECIAL GRADE

General

58. (1) Failure in a subject in an examination for a certificate of competency other than as Chief Engineer-Officer-Special Grade, ignorance of which may lead an Engineer-Officer to do something really unsafe in the management of any part of a ship's machinery or to fail to do something essential in the interests of safety (e.g. failure in questions on manipulation and reading of the watergauge, the danger of fire and explosion in steamships or motorships), shall be regarded as failure in practical knowledge, and a candidate so failing shall not present himself for re-examination until he produces proof of further sea service in a qualifying capacity.

(2) A candidate who fails in an examination through ignorance of fundamental principles or on account of general defectiveness shall not present himself for re-examination for a period of up to three months, to be determined by the examiner: Provided that the Director-General in his discretion may, subject to the provisions of subregulation (5), fix a period in excess of three months.

(3) A candidate who fails in an examination in circumstances other than those set out in subregulation (1) and (2) may present himself for examination at any time after one month has elapsed since his previous attempt, but if he fails three times in Part A or three times in Part B within a period of three months he shall not be examined for a period of up to three months, to be determined by the examiner: Provided that the Director-General in his descretion may, subject to the provisions of subregulation (5), fix a period in excess of three months.

(4) The period of further sea service required in terms of subregulation (1) shall be determined by the examiner and shall not exceed three months, unless, in a case where the examiner is of the opinion that a period of service in excess of three months is warranted, the prior approval of the Director-General has been obtained.

(5) Die tydperk wat moet verstryk alvorens 'n kandidaat hom weer vir 'n eksamen mag aanmeld en wat ooreenkomstig subregulasie (2) of (3) deur die Direkteur-generaal bepaal word, of die tydperk verdere seediens wat by subregulasie (4) vereis word, mag in geen geval ses maande te bowe gaan nie.

HOOFSTUK XI

AFNEEM VAN EKSAMENS (ALLE KANDIDATE)

Die Reëls wat nagekom moet word gedurende die eksamen van Marine-ingenieuroffisiere word in Aanhangsel 9 van hierdie regulasies omskryf en daar word van kandidate verwag om hulself met hierdie reëls vertroud te maak.

Straf vir afskryf, ens.

59. 'n Kandidaat wat gedurende die eksamen 'n ongeoorloofde boek of papier raadpleeg of van iemand anders afskryf of aan iemand anders hulp verleen of inligting verstrek of op enige wyse met iemand anders in verbinding tree, of wat enige deel van die probleme afskryf met die doel om hulle uit die eksamenkamer te neem, word geag in die eksamen te gedruip het en mag ses maande lank nie vir hereksaminering aangeneem word nie. 'n Kandidaat wat aan 'n tweede oortreding skuldig bevind word, mag nie toegelaat word om binne 12 maande na sodanige tweede oortreding eksamen te doen nie. Elke oortreding moet deur die eksaminator by die Direkteur-generaal aangemeld word.

Kandidate mag van eie metodes gebruik maak

60. 'n Kandidaat kan die verskillende probleme uitwerk volgens enige metode waaraan hy gewoond is, mits die beginsel van sodanige metode reg is. Vir duidelike stellings, beredenering en berekening in die oplossing van die probleme sal gepaste erkenning verleen word.

Straf vir oortreding van regulasies

61. Indien 'n kandidaat 'n ander regulasie oortree as een vir die oortreding waarvan 'n ander straf by hierdie regulasies voorgeskryf word, of indien 'n kandidaat astrant is teenoor 'n eksaminator of hom in of by die eksamenkamer onordelik of onbehoorlik gedra, kan die eksaminator met hom handel asof hy in die eksamen gedruip het, en indien daar aldus met hom gehandel word, mag hy drie maande lank nie as kandidaat vir hereksamen aanvaar word nie.

HOOFSTUK XII

UITREIKING VAN SERTIFIKATE

Eksamenuitslae

62. Die uitslag van die eksamen vir 'n bekwaamheidsertifikaat moet op die goedgekeurde vorm deur die eksaminator aan die kandidaat meegedeel word.

Vorm van bekwaamheidsertifikaat en dienssertifikaat

63. Behoudens die bepalings van regulasie 65 moet elke bekwaamheidsertifikaat in een van die toepaslike vorms wees soos in Aanhangsel 5 uiteengesit, en moet elke diensertifikaat in die vorm wees soos in Aanhangsel 6 uiteengesit.

Uitreiking van bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 4, Marine-ingenieuroffisier Klas 3, Marine-ingenieuroffisier Klas 2 of Marine-ingenieuroffisier Klas 1

64. As 'n kandidaat vir 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 4, Klas 3, Klas 2 of Klas 1 die ervaring opgedoen, die toepaslike werkwinkel- en seediens verrig en in die toepaslike eksamen voorgeskryf by hierdie regulasies geslaag het, moet die sertifikaat behoudens die bepalings van hierdie regulasies aan hom uitgereik word: Met dien verstande dat hy enige vorige sertifikaat aan die eksaminator moet afgee.

(5) The period of time which must elapse before a candidate may again present himself for examination and which is fixed by the Director-General in terms of subregulation (2) or (3), or the period of further sea service required in terms of subregulation (4), shall in no case exceed six months.

CHAPTER XI

CONDUCT OF EXAMINATIONS (ALL CANDIDATES)

The Rules to be observed during the examination of Marine Engineer Officers are defined in Annex 9 of these Regulations and candidates are expected to make themselves familiar with these Rules.

Penalty for copying, etc

59. A candidate who refers to an unauthorised book or paper, or copies from another or affords any assistance or gives any information to another, or communicates in any way with another during the time of examination, or copies any part of the problems for the purpose of taking them out of the examination room, shall be regarded as having failed the examination, and shall not be accepted for re-examination for a period of six months. A candidate guilty of a second offence shall not be allowed to be examined until 12 months have elapsed after such second offence. Each offence shall be reported to the Director-General by the examiner.

Candidates may use own method

60. A candidate may work out the various problems according to any method he has been accustomed to use, provided such method is correct in principle. Suitable recognition will be given for clear statements, reasoning and calculation in solving the problems.

Penalty for breach of regulations

61. If a candidate contravenes any of these regulations other than a regulation for the contravention of which another penalty is by these regulations prescribed, or is insolent to an examiner or conducts himself in a disorderly or improper manner in or about the examination room, the examiner may treat him as having failed the examination, and if he is so treated he shall not be accepted for re-examination for a period of three months.

CHAPTER XII

ISSUE OF CERTIFICATES

Result of examination

62. The result of the examination for a certificate of competency shall be conveyed by the examiner to the candidate on the form approved.

Form of certificate of competency and certificate of service

63. Subject to the provisions of regulation 65, every certificate of competency shall be in one of the appropriate forms set out in Annex 5 and every certificate of service shall be in the form set out in Annex 6.

Issue of certificate of competency as Marine Engineer-Officer Class 4, Marine Engineer-Officer Class 3, Marine Engineer-Officer Class 2 or Marine Engineer-Officer Class 1

64. If a candidate for a certificate of competency as Marine Engineer-Officer Class 4, Class 3, Class 2 or Class 1 has gained the experience and performed the appropriate workshop and sea service and has passed the appropriate examination prescribed by these regulations, the certificate shall, subject to the provisions of these regulations, be issued to him: Provided that any previous certificate shall be surrendered to the examiner.

Endossering van bekwaamheidsertifikaat

65. (1) Indien 'n kandidaat die houer is van 'n bekwaamheidsertifikaat wat hom die reg gee om in 'n bepaalde graad of hoedanigheid op te tree op 'n skip wat met 'n sekere soort aandrywingsmasjinerie (stoom of motor) toegerus is, en indien sodanige kandidaat op grond van die verrigting van die voorgeskrewe seediens en slaging in die voorgeskrewe eksamen kwalifiseer vir 'n bekwaamheidsertifikaat wat hom die reg gee om in 'n bepaalde graad of hoedanigheid op te tree op 'n skip wat met 'n ander soort aandrywingsmasjinerie (motor of stoom) toegerus is, kan laasgnoemde sertifikaat waarvoor hy aldus gekwalifiseer het, die vorm aanneem van 'n endossement op die sertifikaat waarvan hy reeds die houer is, welke endossement die graad of hoedanigheid waarin sy verdere kwalifikasie hom die reg gee om op te tree, asook die soort aandrywingsmasjinerie van die skip moet meld.

(2) Indien 'n kandidaat die houer is van 'n bekwaamheidsertifikaat (stoom of motor) wat hom die reg gee om in 'n bepaalde graad of hoedanigheid op te tree en hy kwalifiseer vir 'n bekwaamheidsertifikaat (stoom of motor) wat hom die reg gee om in 'n hoër graad of hoedanigheid op te tree, kan op laasgenoemde sertifikaat waarvoor hy aldus gekwalifiseer het, 'n verdere sertifikaat geëndosseer word waarin verklaar word dat hy geregtig is om ook op 'n skip toegerus met stoom- en motoraandryfmasjinerie, na gelang van die geval, op te tree in die graad of hoedanigheid vermeld in eersgenoemde sertifikaat.

(3) Indien 'n kandidaat die houer is van 'n bekwaamheidsertifikaat wat hom die reg gee om in 'n bepaalde graad of hoedanigheid op 'n skip op 'n vreemde vaart op te tree en hy kwalifiseer vir 'n diensendossering wat hom die reg gee om in 'n bepaalde graad of hoedanigheid op 'n kleiner skip op te tree, kan laasgenoemde sertifikaat waarvoor hy aldus gekwalifiseer het, die vorm aanneem van 'n endossement op die sertifikaat waarvan hy reeds die houer is en sodanige endossement moet die graad of hoedanigheid op die kleiner skip meld waarin sy verdere kwalifikasie hom die reg gee om op te tree.

(4) 'n Persoon wat die houer is van 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 1 op 'n skip op vreemde vaart, is geregtig op diens as Hoof-ingenieuroffisier op alle ander soorte skepe.

Uitreiking van bekwaamheidsertifikaat as Hoof-ingenieuroffisier (Spesiale Graad)

66. 'n Bekwaamheidsertifikaat as Hoof-ingenieuroffisier (Spesiale Graad) moet uitgereik word aan 'n kandidaat wat kragtens die bepalings van die Wet daartoe geregtig is of behoudens die bepalings van hierdie regulasies in die voorgeskrewe eksamen geslaag het: Met dien verstande dat 'n kandidaat wat in die voorgeskrewe eksamen geslaag het, sy bekwaamheidsertifikaat waarvan in regulasie 37 of 38 melding gemaak word, aan die eksaminator moet afgee.

HOOFSTUK XIII

DIENSSERTIFIKATE: ALGEMEEN

Aansoek om 'n dienssertifikaat as Marine-ingenieuroffisier Klas 4

67. (1) Waghou-ingenieurs wat binne die drie jaar voor die uitvaardiging van hierdie regulasies vir 'n aaneenlopende tydperk van minstens een jaar diens gedoen het in 'n hoedanigheid waar 'n Klas 4-sertifikaat nou vereis word, kan aansoek doen om 'n dienssertifikaat as Marine-ingenieuroffisier Klas 4.

(2) Aansoekers moet die voorgeskrewe gelde betaal en deur 'n eksaminator ondervra word.

Endorsement of a certificate of competency

65. (1) If a candidate holds a certificate of competency which entitles him to act in a particular grade or capacity in a ship fitted with a certain kind of propelling machinery (steam or motor), and by having performed the prescribed sea service and having passed the prescribed examination, qualifies for a certificate of competency entitling him to act in a particular grade or capacity in a ship fitted with another kind of propelling machinery (motor or steam), the latter certificate for which he has so qualified may be in the form of an endorsement on the certificate which he already holds stating the grade or capacity in which his further qualification entitles him to act, as well as the kind of propelling machinery of the ship.

(2) If a candidate holds a certificate of competency (steam or motor) which entitles him to act in a particular grade or capacity, and qualifies for a certificate of competency (steam or motor) which will entitle him to act in a higher grade or capacity, the latter certificate for which he has so qualified may be endorsed with a further certificate stating that he is also entitled to act in the grade or capacity specified in the former certificate in a ship fitted with steam-driven or motor propelled machinery, as the case may be.

(3) If a candidate holds a certificate of competency which entitles him to act in a particular grade or capacity in a foreign-going ship and qualifies for a service endorsement entitling him to act in a particular grade or capacity in a smaller ship, the latter certificate for which he has so qualified may be in the form of an endorsement on the certificate which he already holds stating the grade or capacity in the smaller ship in which his further qualification entitles him to act.

(4) A person who holds a certificate of competency as Marine Engineer-Officer Class 1 in a foreign-going ship, is entitled to service as Chief Engineer Officer in all other types of ship.

Issue of certificate of competency as Chief Engineer-Officer-Special Grade

66. A certificate of competency as Chief Engineer-Officer-Special Grade shall be issued to a candidate who is entitled thereto in accordance with the provisions of the Act, or, subject to the provisions of these regulations, who has passed the prescribed examination: Provided that a candidate who has passed the prescribed examination shall surrender his certificate of competency referred to in regulation 37 or 38 to the examiner.

CHAPTER XIII

CERTIFICATES OF SERVICE: GENERAL

Applications for certificates of service as Marine Engineer-Officer Class 4

67. (1) Watchkeeping engineers who have served for a continuous period of not less then one year within three years prior to the promulgation of these regulations in a capacity where a Class 4 certificate is now required may apply for a certificate of service as Marine Engineer-Officer Class 4.

(2) Applicants shall pay the prescribed fee and be interviewed by an examiner.

68. (1) Vlootaansoekers kragtens artikel 80 van die Wet moet die rang van Vlootingenieuroffisier of Vloot Tegniese Offisier of Adjudant-offisier Klas 1 verkry het en moet minstens 6 maande seediens verrig het as 'n Vlootwaghouoffisier op 'n stoomskip of motorskip, afhangende van die tipe dienssertifikaat wat vereis word, sedert die datum waarop aan hom 'n toepaslike Vlootwaghousertifikaat toegeken is.

(2) Elke vlootaansoek om 'n dienssertifikaat moet skriftelik deur die Hoof van die Vloot of 'n offisier aan wie hy die taak gedelegeer het, ondersteun word.

AANHANGSEL 1

(1) VOORBEELD VAN VORM VAN GETUIGSKRIF OOR WERKWINKELDIENS

Naam en adres van ingenieurswerkwinkel.....

Ek sertifiseer dat die volgende 'n volledige en juiste opgawe is van die werkwinkeldiens wat deur ..... onder my toesig by bovermelde werkwinkel verrig is.

Dienstydperk: Datums		Totale tydperk	Aard van pligte (kyk hieronder vir gepaste beskrywing)	Besonderhede van tydperke wat vakleerling weekliks vry gehad het om aan tegniese studie te bestee
Van	Tot			

Verslag oor bekwaamheid .....

Verslag oor gedrag.....

Opmerkings (as daar is) .....

Handtekening van werkgewer of sy verteenwoordiger .....

Beskrywing van pligte

I. Monteer- en/of oprigtingswerk in die vervaardiging en/of onderhoud van groot masjinerie (bv. masjiene met 'n hoofas dikker as 153 millimeter).

II. Ander monteerwerk as dié in verband met groot masjinerie.

III. Metaaldraaiwerk (goeie swaar werk).

IV. Masjienwerk (uitgesonderd draaibankwerk).

V. Werk in tekenkantoor as tekenaar of ingenieur.

VI. Ander werk waarvan die aard gespesifiseer moet word.

Behalwe in die geval van VI is dit voldoende om die toepaslike syfer te gebruik.

(2) VOORBEELD VAN VORM VAN GETUIGSKRIF VIR KADETSKAP

Naam en adres van skeepseienaar.....

Naam en adres van tegniese instituut.....

Ons sertifiseer dat die volgende 'n volledige en juiste opgawe is van die ingenieurkadetskap wat deur mnr..... onder ons toesig verrig is.

Die kadetskap het begin op .....

Die kadetskap is suksesvol voltooi op.....

Tyd deurgebring aan 'n goedgekeurde tegniese instituut of technikon .....

Tyd deurgebring ter see as 'n ingenieurkadet .....

Tyd bestee aan goedgekeurde industriële opleiding.....

Kwalifikasie verwerf .....

Handtekening van skeepseienaar se verteenwoordiger .....

Handtekening van technikonverteenwoordiger.....

(3) VOORBEELD VAN VORM VAN GETUIGSKRIF VIR SEEDIENS

Naam en adres van skeepseienaar of maatskappy .....

Ek sertifiseer dat die volgende 'n volledige en juiste opgawe is van die seediens deur mnr..... verrig onder my toesig aan boord van die..... amptelike nommer .....

68. (1) Naval applicants under section 80 of the Act shall have attained the status of Naval Engineer-Officer or Naval Technical Officer or Warrant Officer Class 1 and shall have performed at least 6 months sea service as a Naval Watchkeeping Officer on a steamship or motorship, depending upon the type of certificate of service required, since the date on which he was awarded an appropriate Naval Watchkeeping Certificate.

(2) Every Naval application for a certificate of service shall be supported in writing by the Chief of the Navy or an officer to whom he delegates the duty.

ANNEX 1

(1) SPECIMEN FORM OF TESTIMONIAL FOR WORKSHOP SERVICE

Name and address of engineering works.....

I certify that the following is a full and true statement of the workshop service performed by ..... under my supervision at the above works.

Period of service: Dates		Total period	Nature of duties (for appropriate description see below)	Particulars of weekly release periods to permit apprentice to pursue technical studies
From	To			

Report as to ability .....

Report as to conduct .....

Remarks (if any) .....

Signature of employer or his representative .....

Description of duties

I. Fitting and/or erecting in the manufacture and/or maintenance of substantial machinery (e.g. machinery with main shaft exceeding 153 millimetres in diameter).

II. Fitting other than on substantial machinery.

III. Metal turning (good heavy work).

IV. Machine work (other than lathe).

V. Work in drawing office, as draughtsman or engineer.

VI. Other work, the nature of which should be specified.

The use of the appropriate numerals is sufficient except in the case of VI.

(2) SPECIMEN FORM OF TESTIMONIAL FOR CADETSHIP

Name and address of shipowner .....

Name and address of technical institute.....

We certify that the following is a full and true statement of the engineering cadetship performed by Mr ..... under our supervision.

The cadetship commenced on .....

The cadetship was successfully completed on .....

Time spent at an approved technical institute or technikon.....

Time spent at sea as an engineer cadet .....

Time spent on approved industrial training.....

Qualification gained .....

Signature of Shipowner's representative.....

Signature of Technikon representative.....

(3) SPECIMEN FORM OF TESTIMONIAL FOR SEA SERVICE

Name and address of shipowner or company.....

I certify that the following is a full and true statement of the sea service performed by Mr ..... under my supervision on board the ..... O.N.....

Tydperk van diens (Datums)		Rang van offisier en werklike senioriteit op waghoudiens	Tipe hoofmasjiene en ketels (een of twee skroewe)	Aard van pligte (kyk hieronder vir toepaslike beskrywing)
Van	Tot			

Gedurende die hele tydperk hierbo gemeld, is aan mnr.....

(a) geen verlof tot afwesigheid toegestaan nie;

(b) .....dae verlof tot afwesigheid toegestaan terwyl hy steeds besig was met leertyd.

Verslag oor bekwaamheid .....

Verslag oor gedrag.....

Verslag oor soberheid .....

.....
Handtekening van Hoof-ingenieuroffisier

Opmerkings (as daar is) .....

.....
Ingenieursuperintendent
of
Gesagvoerder of ander verteenwoordiger van eienaars

Stempel

.....

Beskrywing van pligte

I. Monteerwerk hetsy bedags of op gereelde waghoudiens†:

(a) Binne hoofmasjien- en ketelruimte.

(b) Buite hoofmasjien- en ketelruimte.

II. (a) Koel- of ander masjiene wat nie vir die aandrywing van die vaartuig noodsaaklik is nie.

(b) Hulpmasjiene geskei van hoofaandrywingseenhede maar saam met sulke eenhede gebruik.

III. Gereelde waghoudiens† by die hoofmasjiene as:

(a) Senior in volle beheer.

(b) Eerste Assistent.

(c) Tweede Assistent.

IV. Gereelde waghoudiens† by hoofketels:

(a) In beheer van alle stookruime.

(b) In beheer van net 'n afdeling of van een stookruim.

(c) As ketelruimassistent.

V. Gereelde waghoudiens† gelyktydig by hoofmasjiene en ketels:

(a) Senior in volle beheer.

(b) Eerste Assistent.

(c) Tweede Assistent.

Op skepe waar waghoudiens anders as volgens die tradisionele stelsel van minstens agt uit elke 24 uur gehou word, moet 'n kort beskrywing van die duur en frekwensie van die waghoudiens gegee word. Melding moet gemaak word van dagwerktydperke of van paswerk tydens 'n wagskof. Dit is veral van toepassing op vaartuie—

1. wat 'n sentrale beheerkamer het;
2. wat ten volle of gedeeltelik geoutomatiseer is;
3. waarvan die enjinkamer vir 'n gedeelte van die 24 uur onbeman is.

N.B.—Daar word aanbeveel dat hierdie vorm gebruik word wanneer daar oor die ingenieur verslag gedoen word, of wanneer die Hoofingenieur die skip verlaat.

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* Stoom- of motorskip. Naam van skip en amptelike nommer.

† Op gereelde waghoudiens beteken agt uur uit elke 24 uur.

AANHANGSEL 2

LEERPLANNE VIR DIE EKSAMENS VAN MARINE-INGENIEUR-OFFISIER KLAS 4 EN MARINE-INGENIEUROFFISIER KLAS 3

Opmerkings

(1) Die probleme sal van so 'n aard wees dat hulle met 'n kennis van elementêre algebra, meetkunde en vlakdriehoeksmeting opgelos kan word.

(2) Kennis van die gebruik van logaritmes sal vereis word.

(3) Waar die oplossing van 'n probleem meer gevorderde wiskunde of konstantes vereis, sal formules verstrek word.

Period of service (Dates)		Rank of Officer and actual seniority on watch	Type of main engines and boilers (Single or twin-screw)	Nature of duties (For appropriate description see below)
From	To			

During the whole period stated above, Mr.....

(a) was granted no leave of absence

(b) was granted ..... days leave of absence whilst still on articles.

Report as to ability .....

Report as to conduct .....

Report as to sobriety .....

.....
Signature of Chief Engineer-Officer

Remarks (if any) .....

.....
Engineer Superintendent
or
Master or other representative of owners

Stamp

.....

Description of duties

I. On fitters' work either by day or regular watch†:

(a) Within main engine and boiler spaces.
(b) Outside main engine and boiler spaces.

II. (a) On refrigerating or other machinery not essential to the propulsion of the vessel.
(b) On auxiliary engines separated from main propelling units but worked in conjunction therewith.

III. On regular watch† on main engines as:

(a) Senior in full charge.
(b) First Assistant.
(c) Second Assistant.

IV. On regular watch† on main boilers:

(a) In charge of all stokeholds.
(b) In charge of a section or one stokehold only.
(c) As Boiler Room Assistant.

V. On regular watch† on main engines and boilers simultaneously:

(a) Senior in full charge.
(b) First Assistant.
(c) Second Assistant.

In ships where watches are kept on other than the traditional system of not less than eight out of each 24 hours, a brief description of the duration and frequency of the watches should be given. Mention of periods on day work or on fitters' work by watch should be made. This is particularly applicable to vessels that—

1. have a centralised control room;
2. are fully or partly automated;
3. have arrangements such that the engine room is unmanned for some part of the twenty-four hours.

Note.—It is recommended that this form should be used when the engineer is reported on, or when the Chief Engineer-Officer leaves a ship.

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* Steam or motor ship. Name of ship and official number.

† On regular watch means eight hours in every twenty-four hours.

ANNEX 2

SYLLABUSES FOR THE EXAMINATIONS OF MARINE ENGINEER-OFFICER CLASS 4 AND MARINE ENGINEER-OFFICER CLASS 3

Notes

(1) The problems will be such as can be solved by a knowledge of elementary algebra, geometry and plane trigonometry.

(2) A knowledge of the use of logarithms will be required.

(3) Formulae involving higher mathematics or constants required for the solution of any problem will be given.

(4) Grafiese oplossings sal aanvaar word waar nie uitdruklik om die analitiese oplossing gevra word nie.

(5) As hulle wil, kan kandidate in hul berekeninge van tekenliniale of nie-programmeerbare rekenaars gebruik maak, maar in elke geval moet 'n volledige uiteensetting gegee word van die stappe wat tot die antwoord lei.

MARINE-INGENIEUROFFISIER KLAS 4—ALGEMENE INGENIEURSWETENSKAP

(Een vraestel van drie uur. 12 Elementêre vrae uit 12 moet beantwoord word)

Algemeen.—Oppervlaktes, volumes en massamate. Digtheid.

Statika.—Krag, kragtedriehoek. Kragmoment.

Kragpare.—Swaartepunte.

Wrywing.—Wrywingskoëffisiënt. Energie en krag wat as gevolg van wrywing in enkelvoudige laers verlore gaan.

Kinematika.—Lineêre en hoekbeweging. Vergelykings vir verplasing, snelheid en egale versnelling.

Dinamika.—Arbeid, krag. Potensiële en kinetiese energie.

Masjiene.—Eenvoudige hysmasjiene. Snelheidsverhouding, meganiese voordeel en rendement van die volgende masjiene:

Skroefdomkrag, hidrouliese domkrag, toukatrolblokke en wurmgedrewe kettingkatrolle.

Spanning en vervorming.—Trek-, druk- en skuifspanning. Vervorming. Werkspanning en veiligheidsfaktor.

Balke.—Vrydraers en enkelvoudig gesteunde balke met gekonsentreerde belastings.

Hidrostatika.—Digtheid. Beginsel van flottasie.

Elektrisiteit.—Uitwerking van elektriese stroom. Eenhede: ampère, ohm en volt. Selle en batterye—onderhoud en laai. Meetinstrumente.

MARINE-INGENIEUROFFISIER KLAS 4—HITTEWERKTUIE

(Een vraestel van drie uur. 12 Elementêre vrae uit 12 moet beantwoord word)

Grondbeginsels.—Lineêre en volumetriese uitsetting as gevolg van temperatuurveranderinge. Koëffisiënte en verband tussen hulle. Temperatuur en die meet daarvan.

Hitte en hitteoordrag.—Hitte-eenhede. Soortlike warmtekapasiteit. Meganiese ekwivalent van hitte. Hitte-ekwivalent van ontwikkelde krag. Warmte-oordrag deur geleiding, konveksie en straling.

Mengsels.—Hitte- en temperatuurprobleme waarby hoogstens drie stowwe betrokke is.

Gasse.—Wette van Boyle en Charles betreffende ideale gasse. Absolute temperatuur.

Binnebrandenjins en lugkompressors.—Grondbeginsels en motorslag. Berekening van verrigte arbeid volgens gegewe formules. Brandstofverbruik. Indikatuurdrywing, remdrywing en meganiese rendement.

Eienskappe van stoom.—Toestandsverandering. Waarneembare warmte. Latente warmte. Nat, droë en oorverhitte stoom en die hoeveelhede hitte daarby betrokke. Gebruik van verkorte stoomtafels. Rendement van ketels.

Verbranding.—Vaste en vloeibare brandstowwe.

Verkoeling.—Dampverdigtingsiklus.

Ketels en verdamptoestelle.—Verandering van digtheid as gevolg van besoedelde toevoerwater.

MARINE-INGENIEUROFFISIER KLAS 3—ALGEMENE INGENIEURSWETENSKAP

(Een vraestel van drie uur. Net ses vrae moet beantwoord word)

Statika.—Swaartekrageenhede. Kragtedriehoek en -veelhoek. Resultant en ekwilibrant van 'n reeks saamlopende en saamvlakkige kragte. Kragmoment. Kragtepare. Hellende vlak.

Wrywing.—Wrywingskoëffisiënt. Arbeid verrig teen wrywing. Wrywingskoppelaars. Wrywing op hellende vlak en op drade.

Kinematika.—Lineêre en hoekbeweging met konstante versnelling. Betreklike snelhede in net een vlak. Vergelykings vir verplasing, snelheid en egalige versnelling.

Dinamika.—Energiebewaring. Newton se bewegingswette. Momentum. Middelpuntvlietende krag en die toepassing daarvan op onbelaste reêlaars.

Masjiene.—Skroef- en hidrouliese domkragte. Differensiaalkatrolle. Hysmasjiene. Reduksieratwerk. Spanning en vervorming, wet van Hooke. Elastisiteitsmodulus. Trektoetse.

Balke.—Vrydraers en enkelvoudig gesteunde balke met gekonsentreerde of egalig verspreide laste. Skuifkrag- en buigmomentdiagramme. Spanning as gevolg van buiging waar die fundamentele buigvergelyking en die polêre tweede oppervlaktemoment van die profiel verstrek word.

(4) Graphical solutions will be acceptable where the analytical solution is not expressly stated to be required.

(5) Candidates may, if they wish, use slide rules or non-programmable calculators for their calculations, but in each case a full statement of the steps leading to the calculations must be shown.

MARINE ENGINEER-OFFICER CLASS 4—GENERAL ENGINEERING SCIENCE

(One paper of three hours, 12 elementary questions to be attempted out of 12)

General.—Areas, volumes and mass measures. Density.

Statics.—Force, triangle of forces. Moment of a force.

Couples.—Centres of gravity.

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

Kinematics.—Linear and angular motion. Equations for displacement, velocity and uniform acceleration.

Dynamics.—Work, power. Potential and kinetic energy.

Machines.—Simple lifting machines. Velocity ratio, mechanical advantage and efficiency of the following machines.

Screw jack, hydraulic jack, rope pulley blocks and worm-driven chain blocks.

Stress and strain.—Tensile, compressive and shear stress. Strain working stress and factor of safety.

Beams.—Cantilevers and simply supported beams with concentrated loads.

Hydrostatics.—Density. Principle of flotation.

Electricity.—Effects of electrical current. Units-ampère, ohm and volt. Cells and batteries-maintenance and charging. Measuring instruments.

MARINE ENGINEER-OFFICER CLASS 4—HEAT ENGINES

(One paper of three hours, 12 elementary questions to be attempted out of 12)

Elements.—Linear and volumetric expansion due to temperature changes. Coefficients and relationship between them. Temperature and its measurement.

Heat and heat transfer.—Heat units. Specific heat capacity. Mechanical equivalent of heat. Heat equivalent of power developed. Heat transfer by conduction, convection and radiation.

Mixtures.—Heat and temperature problems involving not more than three substances.

Gases.—Boyle's and Charles's Laws for perfect gases. Absolute temperature.

I.C. engines and air compressors.—Elementary principles and cycles of operation. Calculation of work done from given formulae. Fuel consumption. Indicated power. Brake power and mechanical efficiency.

Properties of steam.—Change of state. Sensible heat. Latent heat. Wet, dry and superheated steam and the quantities of heat involved. Use of abridged steam tables. Boiler efficiency.

Combustion.—Solid and liquid fuels.

Refrigeration.—Vapour-compression cycle.

Boilers and evaporators.—Change of density due to contaminated feed water.

MARINE ENGINEER-OFFICER CLASS 3—GENERAL ENGINEERING SCIENCE

(One paper of three hours, six questions only to be attempted)

Statics.—Gravitational units. Triangle and polygon of forces. Resultant and equilibriant of a series of concurrent and co-planar forces. Moment of a force. Couples. Inclined plane.

Friction.—Coefficient of friction. Work done against friction. Friction clutches. Friction on inclined plane and on threads.

Kinematics.—Linear and angular motion with constant acceleration. Relative velocities in one plane only. Equations for displacement, velocity and unform acceleration.

Dynamics.—Conservation of energy. Newton's laws of motion. Momentum. Centrifugal force and its application to unloaded governors.

Machines.—Screw and hydraulic jacks. Differential pulley blocks. Lifting machines. Reduction gearing. Stress and strain, Hooke's Law. Modulus of elasticity. Tensile tests.

Beams.—Cantilevers and simply supported beams with concentrated or uniformly distributed loads. Shearing force and bending moment diagrams. Stress due to bending, given the fundamental bending equation and the polar second moment of area of the section.

Wringing.—Wringmoment as gevolg van krukmeganisme van masjien. Sterkte en styfheid van soliede ronde asse waar die fundamentele wringvergelyking en die polêre tweede oppervlaktemoment verstrek word. Kragoorbringing deur asse.

Dun huide.—Spannings in dun silindervormige huide wat aan inwendige druk onderworpe is.

Lasse.—Sterkte van enkel-, dubbel- en driedubbelgeklinkte oorslag- en stootlasse.

Hidrostatika.—Die ewewig van drywende liggame. Wisseling van vloeistofdruk na gelang van diepte. Totale krag as gevolg van vloeistofdruk op ingedompelde plat vlakke, vertikaal of horisontaal. Drukpunt op 'n reghoekige plat vlak met een rand parallel met die oppervlak van die vloeistof.

Hidroulika.—Volpypstroming van vloeistof deur pype onder konstante drukhoogte. Stroming deur opening. Snelheids-, krimpings- en uitlatingskoëffisiënt. Verhouding tussen spoed van vaartuig en brandstofverbruik met konstante verplasing indien die variasie tussen weerstand en spoed verstrek word.

Elektrisiteit.—Voortbrenging van EMK deur middel van chemiese stowwe en magnete. Wet van Ohm. Serie- en parallelkringe van bronne van EMK en van weerstande. Stroomverdeling van eenvoudige kringe. Geleierweerstand, uitwerking van lengte, oppervlakte, materiaal en temperatuur. Beginsels en funksie van skakelbordaanwysinstrumente. Gebruik van aardlampe. Gebruik van sekerings en stroombrekers.

MARINE-INGENIEUROFFISIER KLAS 3—HITTEWERKTUIE

(Een vraestel van drie uur. Net ses vrae moet beantwoord word)

Grondbeginsels.—Formules vir werk gedoen wat met die formule PVn=C in verband staan. Eerste wet van termodinamika.

Eienskappe van stoom.—Waarneembare, latente en totale warmte. Gebruik van stoomtafels. Inwendige energie.

Mengsels.—Hitte- en temperatuurprobleme waarby drie of meer stowwe betrokke is.

Gasse.—Wet van Boyle, Wet van Charles. Karakteristieke vergelyking. Verhoudings tussen P, V en T wanneer PVn=C. Probleme met betrekking tot lugkompressors, binnebrandmasjiene, lugpompe en lugopberging.

Uitsetting van stoom.—Hipotetiese PV-diagramme. Arbeid verrig g.e.d., diagramfaktor, insluitende die uitwerking van vry ruimte. Gemiddelde ontwerpdruk.

Stoomsiklus.—Uitwerking van modifikasies soos oorverhitting, uitlaatturbine en ontwikkelingstoevoerverhitting op termiese rendement. Ekwivalente verdamping. Rendemente.

Digtheid en ketelsteen.—Basiese berekenings oor die uitwerking van lekkasie in die kondensator en onsuiwere toevoerwater op die digtheid en ketelsteen in ketels.

Stoomturbine.—Grondbeginsels en berekenings.

Verbranding.—Berekening van lug teoreties vereis.

Verkoeling.—Werkverrigtingskoëffisiënt. Die gebruik van tafels van eienskappe van verkoelers.

Binnebrandenjins.—Grondbeginsels van werking, die wyserdiagramme, krag ontwikkel, brandstofverbruik.

Hitteoordrag.—Deur geleiding, konveksie en straling. Uitwerking van isolering.

Brandstowwe.—Kaloriewaarde.

MARINE-INGENIEUROFFISIER KLAS 4 EN MARINE-INGENIEUROFFISIER KLAS 3—INGENIEURSWESE

Kandidate vir 'n gekombineerde stoom- en motorsertifikaat moet bereid wees om in al die items (a) tot (w) geëksamineer te word, maar kandidate sal vir 'n stoomsertifikaat of die stoomendossement op 'n motorsertifikaat nie in items (q) tot (w) en vir 'n motorsertifikaat of die motorendossement op 'n stoomsertifikaat nie in items (j) tot (p) geëksamineer word nie. Kandidate vir die sertifikaat van Marine-ingenieursoffisier Klas 3 of 'n endossement op die sertifikaat van Marine-ingenieuroffisier Klas 3 van wie verwag word om 'n ruimer kennis van die verskillende items in die leerplan aan die dag te lê as kandidate vir die Sertifikaat van Marine-ingenieuroffisier Klas 4 of 'n endossement op 'n Sertifikaat van Marine-ingenieuroffisier Klas 4, moet bereid wees om in items (x) tot (y) geëksamineer te word.

Opmerkings

1. Die kennis van Ingenieurswese wat deur kandidate aan die dag gelê moet word, is dié wat vereis word vir die gebruik, bediening en onderhoud van die masjinerie, toerusting en skeepsdele waarvoor die Ingenieuroffisier gewoonlik verantwoordelik is. Ook word kennis vereis van die metodes om die verskillende onderdele te vervaardig.

2. Kandidate vir sertifikate en endossemente moet 'n skriftelike en daarna 'n mondelinge eksamen aflê.

3. Die skriftelike eksamen vir 'n stoom- of motorsertifikaat bestaan uit twee vraestelle van drie uur elk. In elke vraestel moet 12 uit die 12 vrae beantwoord word vir die Klas 4-eksamen en ses vrae uit die nege vir die Klas 3-eksamen.

Torsico.—Twisting moment due to engine crank mechanism. Strength and stiffness of solid circular shafts given the fundamental torsion equation and the polar second-moment of area. Power transmitted by shafts.

Thin shells.—Stresses in thin cylindrical shells subject to internal pressure.

Joints.—Strength of single, double and treble riveted lap and butt joints.

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

Hydraulics.—Full bore flow of liquid through pipes under constant head. Flow through orifice. Coefficient of velocity, contraction and discharge. Relation between speed of vessel and fuel consumption with constant displacement given the variation between resistance and speed.

Electricity.—Production of e.m.f. by chemical and magnetic means. Ohm's law. Series and parallel circuits of sources of e.m.f. and of resistances. Current distribution of simple circuits. Conductor resistance, effect of length, area, material and temperature. Principles and function of switchboard indicating instruments. Use of earth lamps. Use of fuses and circuit breakers.

MARINE ENGINEER-OFFICER CLASS 3—HEAT ENGINES

(One paper of three hours, six questions only to be attempted)

Elements.—Formulae for work done associated with the formula $PV^n = C$. First law of thermodynamics.

Properties of steam.—Sensible, latent and total heat. Use of steam tables. Internal energy.

Mixtures.—Heat and temperature problems involving three or more substances.

Gases.—Boyle's law. Charles's law. Characteristics equation. Relations between P, V and T when $PV^n=C$. Problems involving air compressors, internal combustion engines, air pumps and air storage.

Expansion of steam.—Hypothetical PV diagrams. Work done m.e.p., diagram factor, including effect of clearance. Mean referred pressure.

Steam cycle.—Effect on thermal efficiency of such modifications as superheating, exhaust turbine and generative feed heating. Equivalent evaporation. Efficiencies.

Density and scale.—Basic calculations on the effect of condenser leakage and impure feed water on the density and scale in boilers.

Steam turbine.—Elementary principles and calculations.

Combustion.—Calculation of theoretical air required.

Refrigeration.—Coefficient of performance. The use of tables of properties of refrigerants.

IC engines.—Elementary principles of operation, the indicator diagrams, power developed, fuel consumption.

Heat transfer.—By conduction, convection and radiation. Effect of insulation.

Fuels.—Calorific value.

MARINE ENGINEER-OFFICER CLASS 4 AND MARINE ENGINEER OFFICER CLASS 3—ENGINEERING KNOWLEDGE

Candidates for a combined Steam and Motor Certificate must be prepared to be examined in all the items (a) to (w), but those for a Steam Certificate or the Steam endorsement of a Motor Certificate will not be examined in items (q) to (w) and those for a Motor Certificate or the Motor Endorsement of a Steam Certificate will not be examined in items (j) to (p).

In addition, candidates for a certificate of Marine Engineer-Officer Class 3 or an endorsement of a certificate of Marine Engineer-Officer Class 3 who will be expected to display a fuller knowledge of the different items in the syllabus than candidates for a certificate of Marine Engineer-Officer Class 4 or an endorsement of a certificate of Marine Engineer-Officer Class 4 must be prepared to be examined in items (x) to (y).

Notes

1. The engineering knowledge to be shown by candidates is that which is required for the use, operation and maintenance of the machinery, equipment and ship structure usually in the charge of the Engineer-Officer. A knowledge of the methods of manufacture of the various components is also required.

2. Candidates for certificates and endorsments are required to take a written examination followed by an oral examination.

3. The written examination for a Steam or Motor Certificate consists of 2 papers of three hours each – 12 questions to be attempted out of 12 in each paper for the Class 4 examination and six questions out of the nine for the Class 3 examination.

4. Die skriftelike eksamen vir 'n gekombineerde stoom- en motorsertifikaat bestaan uit drie vraestelle van drie uur elk. In elke vraestel moet 12 uit die 12 vrae beantwoord word vir die Klas 4-eksamen en ses vrae uit die nege vir die Klas 3-eksamen.

5. Die skriftelike eksamen vir 'n stoom- of motorendossement bestaan uit een vraestel van drie uur. In elke vraestel moet 12 uit die 12 vrae beantwoord word vir die Klas 4-eksamen en ses vrae uit die nege vir die Klas 3-eksamen.

6. Kandidate kan versoek word om hul antwoorde met sketse toe te lig:

(a) Die verskillende behandelings se algemene uitwerking op die fisiese eienskappe van materiale wat algemeen by die bou van skeepsmasjiene en -ketels gebruik word, en die meganiese toetse waaraan hierdie materiale gewoonlik onderwerp word.

(b) Warmte en verbranding. Die eienskappe van stoom, brandstof, smeermiddels en ander vloeistowwe, gasse en dampe wat in masjinerie op 'n skip gebruik word.

(c) Die gebruik, konstruksiebesonderhede en beginsels betrokke by die werking van die drukmeter, voltmeter, ammeter, termometer, pirometer, barometer, salinometer, hidrometer en ander meters wat algemeen deur ingenieurs op 'n skip gebruik word.

(d) Die oorsake, uitwerking en gewone middels teen ketelsteenvorming en korrosie. Voedingswater en blaasdigthede en ketelsteenvorming.

(e) (1) Konstruksiebesonderhede en werkbeginsels van skeepsmasjiene; metodes om hul krag te bepaal. Die beginsels waarvolgens dinamometers en wringingsmeters werk en metodes vir hul yking.

(e) (2) Die metodes om met slytasie in masjinerie en ketels te handel. Die rig van masjiendele. Die verhelping van defekte as gevolg van gebreke in die materiaal of 'n ongeluk. Tydelike of permanente herstelwerk in die geval van ontwrigting of algehele onklaarheid.

(f) Konstruksiebesonderhede en werkingsbeginsels van sentrifugale-, klepsuier- en perspompe. Die algemene vereistes met betrekking tot toevoer-, brandstof-, lens- en ballaspompstelsels.

(g) Die konstruksie-inrigting, besonderhede en werking van stuurmasjiene en stuurgerei, koelmasjiene, hidrouliese masjiene en sodanige stoom- en binnebrandmasjiene as wat as nood- en hulpmasjiene aan boord gebruik word.

(h) Aanwending van die indikateur. Berekening van gemiddelde druk en krag. Wisseling van druk in silinder soos deur indikateurdiagramme getoon.

(i) (1) Voorsorgmaatreëls teen brand of ontploffings as gevolg van olie of gas. Flitspunt. Ontplofbaarheid van gas of damp afgegee deur brandstof of smeerolies wanneer dit met 'n hoeveelheid lug gemeng is. Die gevaar van lekkasie uit olietenks, pype, gasontwikkelaars en verdampers, vernaamlik in kimme en ander ongeventileerde ruimtes. Die werking van draadgaasdiafragmas en die plekke waar sulke inrigtings aangebring behoort te word.

(i) (2) Selfontbranding van steenkool. Ontplofbaarheid van gas afgegee deur steenkool. Ventilasie en stuwing van steenkool.

(i) (3) Brandopsporing. Metodes van brandbestryding. Werking en onderhoud van meganiese en chemiese brandblussers en ander brandbestrydingstoestelle, gasmaskers en veiligheidslampe.

(j) Die metodes om skeepstoommasjiene en stoomketels te bou, die prosesse waaraan die verskillende dele onderwerp word of wat met hul vervaardiging gepaard gaan, en die metodes wat by die montering van die masjinerie op 'n skip aangewend word.

(k) Die verskillende tipes aandryf- en hulpstoommasjiene tans in gebruik, die funksie van elke belangrike deel en die aandag wat deur die verskillende dele van die masjinerie op 'n skip vereis word.

(l) Die metodes om stoominlaat- en uitlaatkleppe te toets en te verstel en die wyse waarop die werking van die masjien deur besliste verstelling van die kleppe beïnvloed word.

(m) Die konstruksiebesonderhede en werking van verdampers, toevoerwaterverwarmers en toevoerwaterfilters.

(n) Skeepsketels van verskillende moderne ontwerpe; die manier om hulle te stut, asook die voorkoming van verskuiwing van ketels wanneer vaartuie hel of rol. Bepaling, deur berekening van geskikte werkdrukke vir ketels met verstrekte afmetings.

(o) Die gebruik en hantering van keteltoebehore en -monterings, veral watermeters en veiligheidskleppe. Nodige voorsorgmaatreëls wanneer stoom ontwikkel en met afsluitkleppe gewerk word, veral met betrekking tot die gevaar wat deur waterslag veroorsaak word.

(p) Konstruksiebesonderhede, werking en onderhoud van installasies wat algemeen gebruik word om lugtrek, oorverhitting van stoom en die verbranding van steenkool of oliebrandstof aan te help.

(q) Die beginsels ten grondslag van binnebrandmasjiene. Die verskil tussen verskillende tipes masjiene. Konstruksiebesonderhede van binnebrandmasjiene wat algemeen in gebruik is.

4. The written examination for a combined Steam and Motor Certificate consists of three papers of three hours each—12 questions to be attempted out of 12 in each paper for Class 4 and 6 out of nine for Class 3.

5. The written examination for a Steam or Motor Endorsement consists of 1 paper of 3 hours—12 questions out of 12 to be attempted for the Class 4 examination, and six questions out of nine for the Class 3 examination.

6. Candidates may be required to illustrate their answers by means of sketches:

(a) The general effects of the various treatments on the physical properties of materials commonly used in the construction of marine engins and boilers, and the mechanical tests to which these materials are normally subjected.

(b) Heat and combustion. The properties of steam, fuel, lubricants and other liquids, gases and vapours used in machinery on board ship.

(c) The use, constructional details and principles involved in the action of the pressure guage, voltmeter, ammeter, thermometer, pyrometer, barometer, salinometer, hydrometer and other meters commonly used by engineers on board ship.

(d) The causes, effects and usual remedies for incrustation and corrosion. Feed water and blow densities, and scale formation.

(e) (1) Constructional details and working principles of marine engines; methods of determining their power. The principal of working and methods of calibration of dynamometers and torsion meters.

(e) (2) The methods of dealing with wear and tear of machinery and boilers. The alignment of machinery parts. The correction of defects due to faults in material or accident. Temporary or permanent repairs in the event of derangement or total breakdown.

(f) Constructional details and principals of action of centrifugal, bucket and force pumps. The general requirements concerning feed, fuel, bilge and ballast pumping systems.

(g) The constructional arrangement, details and working of stearing-engines and gears, refrigerating machinery, hydraulic machinery, and such steam and internal combustion engines as are used for emergency and auxiliary machinery on board ship.

(h) Application of the indicator. Calculation of mean pressure and power. Fluctuation of pressure in cylinder as shown by indicator diagrams.

(i) (1) Precautions against fire or explosions due to oil or gas. Flash point. Explosive properties of gas or vapor given off by fuel or lubricating oils when mixed with a quantity of air. The danger of leakage from oil tanks, pipes, gas producers and vaporisers, particularly in bilges and other unventilated spaces. The action of wire gauze diaphragms and the places in which such devices should be fitted.

(i) (2) Spontaneous combustion of coal. Explosive properties of gas given off by coal. Ventilation and storage of coal.

(i) (3) Fire detection. Methods of dealing with fire. Action and maintenance of mechanical and chemical fire extinguishers and other fire-fighting appliances, respirators and safety lamps.

(j) The methods of constructing marine steam engines and boilers, the processes to which the several parts are submitted, or which are incidental to their manufacture, and the methods employed in fitting the machinery on board ship.

(k) The various types of propelling and auxiliary steam engines now in use, the function of each important part and the attention required by the different parts of the machinery on board ship.

(l) The methods of testing and altering the setting of the steam admission and exhaust valves, and the effect produced in the working of the engine by definite alterations in the settings of the valves.

(m) The constructional details and working of evaporators, feed water heaters and feed water filters.

(n) Marine boilers of various modern designs; the manner of staying them and also the prevention of movement of boilers when vessels are pitching or rolling. The determination by calculation of suitable working pressures for boilers of given dimensions.

(o) The use and management of boiler fittings and mountings, with special reference to water gauges and safety valves. Precautions necessary when raising steam and operating stop valves, with particular reference to the danger arising from water hammer action.

(p) Constructional details, operation and maintenance of installations generally employed for assisting draught, superheating steam and burning coal or oil fuel.

(q) The principles underlying the working of internal combustion engines. The difference between various types of engines. Constructional details of internal combustion engines in general use.

(r) Die aard en eienskappe van die brand- en smeerolies wat gewoonlik in binnebrandmasjiene gebruik word. Die toevoer van lug en brandstof na silinders van masjiene van verskillende tipes. Die konstruksiebesonderhede van apparaat vir die vergassing of verstuiwing van brandstof. Die metodes om silinders en suiers te verkoel. Konstruksiebesonderhede en werking van lugkompressors.

(s) Die metodes vir die bou van skeepsbinnebrandmasjiene. Die prosesse waaraan die verskillende dele onderwerp word of wat met hul vervaardiging gepaard gaan, en die metodes wat by die montering van die masjinerie op 'n skip aangewend word.

(t) Aansit- en omstelinrigtings en die verskillende handelinge wat daarmee in verband staan.

(u) Die aandag wat vir die werking en onderhoud van die verskillende dele van masjinerie nodig is. Die gebruik en hantering van kleppe, pype, verbindings en veiligheidstoestelle wat gebruik word.

(v) Opnoeming en beskrywing van defekte wat uit die werking van masjinerie ontstaan. Die herstel van sulke defekte.

(w) Konstruksiebesonderhede en hantering van hulpstoomketels, hul toebehore en monterings, veral waterpeilglase en veiligheidskleppe. Konstruksiebesonderhede en hantering van hulpmasjinerie.

KANDIDAAT VIR 'N SERTIFIKAAT VAN MARINE-INGENIEUROFFISIER KLAS 3 EN ENDOSSEMENT VAN SODANIGE SERTIFIKAAT

(x) Die administratiewe pligte van 'n Marine-ingenieuroffisier Klas 3: Organisering van sy personeel vir noodpligte en gebruik van veiligheidsuitrusting; organisering van herstelwerk en ondersoeke. Verslae aan eienaars. Die onderhoud en werkende toestand van masjinerie en toestelle wat onder die sorg van 'n Senior Ingenieuroffisier geplaas word. Die nodige aandag om onklaarheid en defekte te voorkom. Die gewone herstelwerk en vernuwings wat nodig is; toesig oor inspeksie van masjinerie en ketels op 'n skip. Gereedmaking van ketels en masjinerie vir ondersoek.

(y) Die bespeuring van onreëlmatighede in die loop van masjiene aan die hand van indikateurdiagramme. Die verhelping van hierdie onreëlmatighede. Toeligting, deur middel van sketse van die verandering in die diagram as gevolg van verstelling of 'n verandering in die werking van die kleppe of ander faktore.

Mondelinge eksamen

Die mondelinge eksamen sal grotendeels op die Praktiese Kennisvakke van die eksamen gebasseer word en sal vrae insluit oor die hantering van masjiene en ketels ter see, die pligte van 'n toesighoudende ingenieur, die werk wat in 'n hawe aan masjiene, ketels en hulpmasjiene gedoen moet word, en die periodieke ondersoek van die werkende dele.

Kandidate moet ook goed vertroud wees met foute wat ter see in masjiene en ketels kan voorkom, en moet in staat wees om te verduidelik hoe sulke foute voorkom en herstel kan word.

AANHANGSEL 3

LEERPLANNE VIR DIE EKSAMENS VAN MARINE-INGENIEUROFFISIER KLAS 2 EN MARINE-INGENIEUROFFISIER KLAS 1

Opmerkings

(1) Die probleme sal van so 'n aard wees dat hulle met 'n kennis van elementêre algebra, meetkunde en vlakdriehoeksmeting opgelos kan word.

(2) Waar die oplossing van 'n probleem meer gevorderde wiskunde of konstantes vereis, sal formules verstrek word.

(3) Grafiese oplossings sal aanvaar word waar nie uitdruklik om die analitiese oplossing gevra word nie.

(4) As hulle wil, kan kandidate in hul berekenings van rekenliniale of nie-programmeerbare rekenaars gebruik maak, maar in elke geval moet 'n volledige uiteensetting gegee word van die stappe wat tot die antwoord lei.

MARINE-INGENIEUROFFISIER KLAS 2—TOEGEPASTE MEGANIKA

(Een vraestel van drie uur. Net ses uit die nege vrae moet beantwoord word)

Statika.—Krag as 'n vektor. Kragtedriehoek en koppelveelhoek. Resulterende en ekwilibrant van 'n stelsel van saamlopende saamvlakkige kragte. Ewewig van drie saamvlakkige kragte. Moment van 'n krag. Kragtepare. Momente van oppervlaktes en volumes. Sentroïede en swaartepunte (beperk tot meetkundige vorms). Ewewigstoestande van vaste liggame. Nodige krag wat parallel met 'n hellende vlak toegepas word om 'n liggaam teen die vlak op of af te laat beweeg of stasionêr te hou (insluitende die uitwerking van wrywing). Arbeid verrig met egalige snelheid met die vlak op.

Wrywing.—Wrywingskoëffisiënt. Wrywingshoek. Energie en krag wat verlore gaan as gevolg van wrywing in enkelvoudige laers.

Kinematika.—Lineêre beweging. Grafieke en vergelykings vir verplasing, spoed, snelheid en gelykmatige versnelling. Snelheid as 'n vektor. Betreklike snelhede in net een vlak. Hoekbeweging. Vergelykings vir verplasing, snelheid en gelykmatige versnelling.

(r) The nature and properties of the fuel and lubricating oils generally used in internal combustion engines. The supply of air and fuels to cylinders of engines of different types. The constructional details of apparatus for carburetting or atomising the fuel. The means of cooling the cylinders and pistons. Constructional details and working of air compressors.

(s) The methods of constructing marine internal combustion engines. The processes to which the several parts are submitted or which are incidental to their manufacture, and the methods employed in fitting the machinery on board ship.

(t) Starting and reversing arrangements and the various operations connected therewith.

(u) The attention required for the operation and maintenance of the various parts of machinery. The use and management of valves, pipes, connections and safety devices employed.

(v) Enumeration and description of defects arising from working of machinery. The rectification for such defects.

(w) Constructional details and management of auxiliary steam boilers, their fittings and mountings, with special reference to watergauges and safety valves. Constructional details and management of auxiliary machinery.

CANDIDATE FOR A CERTIFICATE OF MARINE ENGINEER-OFFICER CLASS 3 AND ENDORSEMENT OF SUCH CERTIFICATE

(x) The administrative duties of a Marine Engineer-Officer Class 3: Organisation of his staff for emergency duties and the use of safety equipment; organisation of repairs and surveys. Reports to owners. The maintenance and working condition of machinery and appliances placed in the charge of a Senior Engineer-Officer. The attention required; to prevent breakdowns and defects. The usual repairs and renewals required; supervision and inspection of machinery and boilers on board ship. Preparation of boilers and machinery for survey.

(y) The detection of irregularities in the running of engines from indicator diagrams. The rectification of these irregularities. Illustration by means of sketches of the change produced in the diagram due to an alteration in the setting or working of the valves or any other factors.

Oral examinations

The oral examination will be based largely upon the Practical Knowledge subjects of the examination and will include questions on the management of engines and boilers at sea, the duties of a supervising engineer, the work to be done to engines, boilers and auxiliary machinery in port and the periodical examination of the working parts.

Candidates should also be well acquainted with machinery and boiler casualties which may occur at sea and should be able to state how these may be prevented and remedied.

ANNEX 3

SYLLABUSES FOR THE EXAMINATIONS OF MARINE ENGINEER-OFFICER CLASS 2 OR MARINE ENGINEER-OFFICER CLASS1

Notes

(1) The problems will be such as can be solved by a knowledge of elementary algebra, geometry and plane trigonometry.

(2) Formulae involving higher mathematics or constants required for the solution of any problem will be given.

(3) Graphical solutions will be acceptable where the analytical solution is not expressly stated to be required.

(4) Candidates may, if they wish, use slide rules on non-programmable calculators for their calculations, but in each case a full statement of the steps leading to the calculations must be shown.

MARINE ENGINEER-OFFICER CLASS 2—APPLIED MECHANICS

(One paper of three hours—six questions only out of nine to be attempted)

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

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

Kinematics.—Linear motion. Graphs and equations for displacement, speed, velocity and uniform acceleration. Velocity as a vector. Relative velocities in one plane only. Angular motion. Equations for displacement, velocity and uniform acceleration.

Dinamika.—Arbeid en krag. Probleme met konstante krag of krag met lineêre variasie. Energie. Potensiaalenergie. Kinetiese verplasingsenergie. Newton se wette van beweging. Behoud van momentum. Sentrifugale krag en die toepassing daarvan op koniese pendule, onbelaste reëlaar, gekromde bane en masjienonderdele. Spanning in dun velling as gevolg van sentrifugale werking.

Masjiene.—Eenvoudige hysmasjien. Grafieke van hyskrag en hysrendement. Lineêre wet. Snelheidsverhouding, hefvoordeel en rendement van die volgende masjiene: wiel en as, differensiaalrat en -as, toukatrolblokke, differensiaalkatrolle, skroefdomkrag, Warwick-skroef, hidrouliese domkrag, wurmgedrewe kettingkatrolle en enkel- en dubbeltakelwindasse. Reduksieratwerk.

Spanning en vervorming.—Direkte spanning en vervorming. Elastisiteitsmodulus. Skuifspanning en -vervorming. Stewigheidsmodulus. Veiligheidsfaktor. Spanning as gevolg van beperkte uitsetting of sametrekking van enkelvoudige onderdele.

Balke.—Skuifkrag- en buigmomentdiagramme vir vrydraers en enkelvoudig gesteunde balke met gekonsentreerde en gelykmatig verspreide laste. Spanning as gevolg van buiging.

Wringing.—Sterkte en styfheid van soliede of hol dryfasse. Spanning as gevolg van wringing. Krag oorgebring deur asse en koppelboute.

Dun huide.—Omtrek- en langsspanning in dun silindervormige huide wat aan inwendige druk onderworpe is.

Hidrostatika.—Ewewig van drywende voorwerpe. Wisseling van vloeistofdruk volgens diepte. Totale krag as gevolg van vloeistofdruk op ingedompelde plat vlakke, hetsy horisontaal of vertikaal. Drukpunt op 'n reghoekige vertikale plat vlak of driehoekige plat vlak albei met een rand parallel met die oppervlak van die vloeistof.

Hidroulika.—Volpypstroming van vloeistof deur pype onder konstante drukhoogte. Stroming deur opening. Snelheids-, vernouings- en uitlaatkoëffisiënt.

MARINE-INGENIEUROFFISIER KLAS 2—HITTE EN HITTEWERKTUIE

(Een vraestel van drie uur. Net ses uit die nege vrae moet beantwoord word)

Hitte.—Temperatuur en die meet daarvan. Absolute temperatuur. Soortlike warmtekapasiteit. Soortlike entalpie van verdamping en smelting. Probleme waarby toestandsveranderings en hoogstens drie stowwe betrokke is. Lineêre, oppervlak- en volumetriese uitsetting as gevolg van temperatuurveranderings. Koëffisiënte en die verband tussen hulle.

Basiese termodinamiese beginsels.—Eienskappe, energie, die Eerste Wet van Termodinamika, vloei- en nie-vloeiprosesse.

Hitteoordrag.—Kwaliteitsbehandeling van hitteoordrag deur geleiding, konveksie en straling. Wette van geleiding en termiese konduktansie en toepassing op probleme.

Gasse.—Wette van Boyle en Charles betreffende ideale gasse. Karakteristieke vergelyking. Konstante R en die gebruik daarvan in eenvoudige probleme. Isotermiese adiabatiese en politropiese prosesse. Verband tussen druk, temperatuur en volume. Arbeid verrig. Verandering in interne energie. Soortlike warmtes Cp en Cv en hul verband met mekaar.

Idealegassiklusse.—Konstantevolumesiklus. Dieselsiklus. Ideale rendement.

Binnebandenjins.—Grondbeginsels en motorslag. Werklike indikateurdiagramme. Gemiddelde effektiewe druk. Arbeid verrig. Krag ontwikkel, aangeduide en remtermiese rendemente, meganiese rendement, totale rendement. Brandstofverbruik. Hittebalans.

Lugkompressors.—Grondbeginsels en motorslag. Berekening van arbeid verrig. Indikateurdiagramme.

Eienskappe van stoom.—Versadigde stoom, droog, nat. Droogheidfraksie. Oorverhitte stoom. Interne energie. Entalpie. Soortlike volume. Stoomtafels. Smoring. Skei- en smoorkalorimeters.

Stoominstallasie.—Voordele van die gebruik van ekspansiestoom. Termiese, meganiese en totale rendement van primêre kragbronne. Ketelrendement, warmtebalans vir masjien- en keteltoetse. Verandering in opgeloste vaste stowwe in ketels en verdampers as gevolg van besoedelde toevoer en die uitwerking van spui. Grondbeginsels van stoomturbines insluitende eenvoudige snelheiddiagramme vir impuls- en reaksieturbines. Krag op blaaie en arbeid verrig op blaaie.

Verbranding.—Vaste en vloeibare brandstof. Hittewaarde. Chemiese vergelykings vir volledige verbranding. Minimum lug teoreties vereis. Oormaat lug.

Verkoeling.—Dampverdigtingsiklus. Verkoelende uitwerking. Verkoelende gewig. Gebruik van tafels van eienskappe van verkoelers. Werkverrigtingskoëffisiënt.

MARINE-INGENIEUROFFISIER KLAS 2—WISKUNDE

(Een vraestel van drie uur. Net ses uit nege vrae moet beantwoord word)

Rekenkunde.—Verhouding en eweredigheid. Persentasie. Variasie, direk en omgekeerd.

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

Machines.—Simple lifting machine. Graphs of load effort and load-efficiency. Linear law. Velocity ratio, mechanical advantage and efficiency of the following machines: wheel and axle, differential wheel and axle, rope pulley blocks, differential pulley blocks, screw jack, Warwick screw, hydraulic jack, worm-driven chain blocks and single and double purchase crab winches. Reduction gearing.

Stress and strain.—Direct stress and strain. Modulus of elasticity. Shear stress and strain. Modulus of rigidity. Factor of safety. Stress due to restricted expansion or contraction of single members.

Beams.—Shearing force and bending moment diagrams for cantilevers and simply supported beams with concentrated and uniformly distributed loads. Stress due to bending.

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

Thin shells.—Circumferential and longitudinal stress in thin cylindrical shells subject to internal pressure.

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

Hydraulics.—Full bore flow of liquid through pipes under constant head. Flow through orifice. Coefficients of velocity, contraction of area and discharge.

MARINE ENGINEER-OFFICER CLASS 2—HEAT AND HEAT ENGINES

(One paper of three hours, six questions only out of nine to be attempted)

Heat.—Temperature and its measurement. Absolute temperature. Specific heat capacity. Specific enthalpy of evaporation and fusion. Problems involving changes of phase and not more than three substances. Linear, superficial and volumetric expansion due to temperature changes. Coefficients and the relationship between them.

Basic thermodynamic principles.—Properties, energy, the First Law of Thermodynamics, flow and non-flow processes.

Heat transfer.—Qualitative treatment of heat transfer by conduction, convection and radiation. Laws of conduction and thermal conductance and applications to problems.

Gases.—Boyle's and Charles' laws for perfect gases. Characteristic equation. Constant R and its use in simple problems. Isothermal, adiabatic and polytropic processes. Relationships between pressure, temperature and volume. Work done. Change in internal energy. Specific heat c_p and c_v and the relationship between them.

Ideal gas cycles.—Constant volume cycle. Diesel cycle. Air standard efficiency.

I. C. Engines.—Elementary principles and cycles of operation. Actual indicator diagrams. Mean effective pressure. Work done, power developed, indicated and brake thermal efficiencies, mechanical efficiency, overall efficiency. Fuel consumption. Heat balance.

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

Properties of steam.—Saturated steam, dry, wet. Dryness fraction. Superheated steam. Internal energy. Enthalpy. Specific volume. Steam tables. Throttling. Separating and throttling calorimeters.

Steam plant.—Advantages of using steam expansively. Thermal, mechanical and overall efficiencies of prime movers. Boiler efficiency, heat balance for engine and boiler trails. Change in dissolved solids in boilers and evaporators due to contaminated feed and effect of blowing down. Elementary principles of steam turbines including simple velocity diagrams for impulse and reaction turbines. Force and work done on blades.

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

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

MARINE ENGINEER-OFFICER CLASS 2—MATHEMATICS

(One paper of three hours—six questions only out of nine to be attempted)

Arithmetic.—Ratio and proportion. Percentage. Variation, direct and inverse.

Algebra.—Eksponente, met inbegrip van gebroke en negatiewe tipes. Gebruik van gewone logaritmes vir vermenigvuldiging, deling, magte en wortels. Gebruik van Neperse logaritmes. Vereenvoudiging van algebraïese uitdrukkings. Optel, aftrek, vermenigvuldiging en deling van algebraïese funksies. Herrangskikking van formules. Ontbinding in faktore. Algebraïese breuke. Kwadrate en derdemagte van veelterme soos $(a \pm b)^2$ en $(a \pm b)^3$. Eenvoudige vergelykings. Kwadratiese vergelykings en oplossing deur ontbinding in faktore of gebruik van algemene formule vir oplossing. Gelyktydige vergelykings.

Grafiekwerk.—Die grafiek $y=ax+b$ aan die hand van òf berekende waardes òf eksperimentele resultate. Berekening van konstantes volgens grafiek. Grafiese oplossing van eenvoudige gelyktydige vergelykings waarby 2 onbekendes betrokke is. Grafiek van $y=ax^2+bx+c$ en grafiese oplossing van vergelyking $ax^2+bx+c=0$.

Driehoeksmeting.—Graad- en radiaalmaat van hoeke. Komplementêre en supplementêre hoeke. Sinus, kosinus en tangens van hoeke tot 360 grade. Sinus- en kosinusreëls en die toepassing daarvan op die oplossing van driehoeke. Oplossing van eenvoudige trigonometriese vergelykings. Ontwikkeling van *sin* $(A \pm B)$ en *cos* $(A \pm B)$. Grafieke van *sin* θ, *cos* θ en a *sin* θ + b *cos* θ.

Meetkunde.—Eienskappe van driehoeke. Stelling van Pythagoras. Som van die hoeke. Verhouding tussen buite- en binnehoeke. Gelykbenige en gelyksydige driehoeke. Gelykvormige en kongruente driehoeke.

Die sirkel.—Eienskappe van koorde en raaklyne. Hoeke in dieselfde segment. Middelpunts- en omtrekshoeke.

Oppervlakte- en volumeberekening.—Oppervlakte van driehoek, veelhoek, parallelogram, trapesium, sirkel, sektor en segment van 'n sirkel en ellips. Oppervlakte en gemiddelde hoogte volgens middelordinaatreël en volgens die reëls van Simpson. Oppervlakteverhoudings van gelykvormige figure. Volumes en oppervlaktes van prismas, piramides, afgeknotte keëls, bolle, silinders en keëls. Massaverhouding, en volumes van gelykvormige liggame. Omwentelingsliggame.

Kalkulus.—Raaklyn aan 'n kromme; betekenis van differensiaalkoëffisiënt. Differensiaalkoëffisiënt van x^n, *sin* x, *cos* x, *tan* x, e^x, *log* ex. Eenvoudige voorbeelde van die differensiaalkoëffisiënt van 'n produk, kwosiënt en funksie van 'n funksie. Toepassing op maksimum en minimum waardes.

Integrasie as die omgekeerde van differensiasie.—Integrale van x^x, $x^{1/x}$, e^{ax}, *sin* ax, *cos* ax, sin^2 ax, cos^2 ax. Bepaalde integraal as die grens van 'n som. Oppervlaktes onder krommes, volumes van omwentelingsliggame, arbeid verrig, gemiddelde en w.g.k.-waardes, sentroïdes en tweede moment van oppervlakte.

MARINE-INGENIEUROFFISIER KLAS 2—TEKENE

(Een vraestel van ses uur. Daar kan uit twee tekeninge gekies word)

Die vraestel in Tekene sal bestaan uit 'n toets van die kandidaat se vermoë om die beginsels van projeksie toe te pas, en kandidate sal versoek word om 'n plan, vertikale projeksie of deursnee of 'n kombinasie van hierdie aansigte van 'n stuk skeepsmasjinerie aan die hand van verstrekte inligting te teken. Al die nodige inligting vir die voltooiing van die tekening sal in die vraestel verstrek word.

MARINE-INGENIEUROFFISIER KLAS 2—ELEKTROTEGNOLOGIE

(Een vraestel van drie uur. Net ses uit die nege vrae moet beantwoord word)

Die elektriese kring.—Eenhede: Ampère, ohm, volt. Verskil tussen elektromotoriese krag en potensiaalverskil. Ohm se wet. Kirchoff se wette. Eenvoudige serie- en parallelkringe wat EMK, stroom en weerstande insluit. Nie-lineêre weerstande parallel met konstantewaarderesistors. Krag en energie. Soortlike weerstand. Temperatuurkoëffisiënt van weerstand. Geleierweerstand, uitwerking van lengte, oppervlakte, materiaal en temperatuur, 2-draadgelykstroomverdelingstelsel. Tipes isolering. Wheatstonebrug, sleepdraadbrug. Toepassings op stuurinrigtings, weerstandpirometers, vervormingsmeters, ens.

Elektrolitiese werking en sekondêre selle.—Teorie van elektrolitiese dissosiasie toegepas op gewone oplossings. Gebruike van elektrolise. Sekondêre selle (suur of alkalies). Konstruksie en beginsels. Onderhoud, laai. Watt-uur en ampère-uurrendemente.

Elektromagnetisme, elektromagnetiese induksie, eenvoudige magnetiese kring.—Eenvoudige teorie van magnetisme. Magnetiese veld. Kraglyne. Veldsterkte. Veldintensiteit. Magnetiese velde as gevolg van stroom in reguit geleiers, lusgeleidings, spoele en solenoïede. Betreklike rigtings van stroom en veld. Wette van Faraday en Lenz. Omvang en rigting van geïndusseerde EMK. Krag voortgebring op 'n stroomdraende geleier. Vloeddigtheid. Uitwerking van yster. Magnetomotoriese krag (mm.k). Permeabiliteit. Reluktansie. Eenvoudige magnetiese kring. Tipiese B/H- en μ/B-krommes.

Elektronika.—Kwalitatiewe behandeling van atoomstruktuur en -binding. Halfgeleiers. Voegdiodes, voegtransistors en die werkeienskappe daarvan. Eenvoudige transistorstroomkringe. Geleiding in gasse, isolators, halfgeleiers en geleiers. Fotoëlektriese effek.

Algebra.—Indices, including fractional and negative types. Use of common logarithms for multiplication, division, powers and roots. Use of Naperian logarithms. Simplification of algebraic expressions. Addition, substraction, multiplication and division of algebraic functions. Rearrangement of formulae. Factorisation. Algebraic fractions. Squares and cubes of polynomials such as $(a \pm b)^2$ and $(a \pm b)^3$. Simple equations. Quadratic equations and solution by factorisation, or use of general formula for solution. Simultaneous equations.

Graphical work.—The graph $y=ax+b$ either from calculated values or from experimental results. Calculation of constants from graphs. Graphical solution of simple simultaneous equations involving two unknowns. Graph of $y=ax^2+bx+c$ and graphical solution of equation $ax^2+bx+c=0$.

Trigonometry.—Measurement of angles in degrees and radians. Complementary and supplementary angles. Sine, cosine and tangent of angles up to 360°. Sine and cosine rules and their application to the solution of triangles. Solution of simple trigonometric equations. Expansion of sin $(A \pm B)$ and cos $(A \pm B)$. Graphs of sin θ, cos θ and a sin θ + b cos θ.

Geometry.—Properties of triangles. Theorem of Pythagoras. Sum of the angles. Relation between exterior and interior angles. Isosceles and equilateral triangles. Similar and congruent triangles.

The circle.—Properties of chords and tangents. Angles in the same segment. Angles at centre and circumference.

Mensuration.—Areas of triangle, polygon, parallelogram, trapezium, circle, sector and segment of a circle and ellipse. Area and mean height by midordinate rule and by Simpson's rules. Ratio of areas of similar figures. Volumes and surface areas of prisms, pyramids, frustuns, spheres, cylinders and cones. Ratio of masses, and volumes of similar solids. Solids of revolution.

Calculus.—Tangent to a curve; meaning of differential coefficient. Differential coefficient of x^n, sin x, cos x, tan x, e^x, log ex. Simple examples of the differential coefficient of a product, quotient and function of a function. Application to maximum and minimum values.

Integration as a reverse of differentiation.—Intergrals of x^x, x^k, e^{ax}, sin ax, cos ax, sin^2 ax, cos^2 ax. Definite integral as the limit of a sum. Areas under curves, volumes of solids of revolution, work done, mean and rms values, centroids and second moment of area.

MARINE ENGINEER-OFFICER CLASS 2—DRAWING

(One paper of six hours. A choice of two drawings will be given)

The Drawing Paper will consist of a test of the ability to apply the principles of projection, and candidates will be asked to draw a plan, elevation or section or a combination of these views of a piece of marine machinery from information supplied. All the required information for the completion of the drawing will be given in the question paper.

MARINE ENGINEER-OFFICER CLASS 2—ELECTROTECHNOLOGY

(One paper of three hours, six questions only out of nine to be attempted)

The electric circuit.—Units-ampere, ohm, volt. Difference between electromotive force and potential difference. Ohm's Law. Kirchoff's Laws. Simple series and parallel circuits involving e.m.f., current and resistances. Non-linear resistors in parallel with constant value resistors. Power and energy. Specific resistance. Temperature coefficient of resistance. Conductor resistance, effect of length, area, material and temperature, d.c. 2-wire distribution system. Types of insulation. Wheatstone network bridge, slide wire bridge; applications to steering gears, resistance pyrometers, strain gauges, etc.

Electrolytic action and secondary cells.—Theory of electrolytic dissociation applied to common solutions. Uses of electrolysis. Secondary cells (acid or alkaline). Construction and principles. Maintenance, charging. Watt-hour and ampere-hour efficiencies.

Electromagnetism, electromagnetic induction, simple magnetic circuit.—Simple magnetic theory. Magnetic field. Lines of force. Field strength. Field intensity. Magnetic fields due to current in straight conductors, loops, coils and solenoids. Relative directions of current and field. Faraday's and Lenz's Laws. Magnitude and direction of induced e.m.f. Force produced on a current carrying conductor. Flux density. Effect of iron. Magneto motive force (m.m.f.). Permeability. Reluctance. Simple magnetic circuit, typical B/H and μ/B curves.

Electronics.—Qualitative treatment of: Atomic structure and bonding. Semi-conductors. Junction diodes, junction transistors and their operating characteristics. Simple transistor circuits. Conduction in gases, insulators, semi-conductors and conducters. Photo-electric effect.

Wisselstroomteorie.—Enkelvoudige periodiese gelykgolwe: Frekwensie, amplitude, oombliks-, maksimum, w.g.k.- en gemiddelde waardes, vormfaktor. Fasorvoorstelling van wisselgroothede. Faseverskil. Die induktor. Induktansie en die uitwerking daarvan op die kring. Die kapasitor. Kapasitansie en die uitwerking daarvan op die kring. Eenvoudige serie- en parallelkringe. Die verband tussen weerstand, reaktansie en impedansie. Eenvoudige behandeling van die kragfaktor. Krag in enkelfasewisselstroomkring.

Instrumente.—Kwalitatiewe behandeling van die beginsels en funksies van wisselstroom- en gelykstroomaanwysinstrumente en -relês. Gebruik van sjunts en serieweerstande ten einde die bestek te vergroot. Gelykrigters en oordraers.

Verdeelstelsels.—Stelsels vir gelykstroom- en wisselstroomskeepsboordinstallasies. Beveiligingstoestelle soos sekerings, stroombrekers, aardlampe. Kabelmateriaal en -installasie. Aansluiting van buitetoevoer.

Gelykstroommasjiene.—Die beginsels, konstruksiebesonderhede en beskerming van gelykstroomserie-, -omtak- en -serie-parallelmotore en -generators. Selfopwekking, EMK en lasspanningvergelykings. Laskenkrommes. Spanningbeheermetodes, parallelskakelingmetodes en lasverdeling vir generators. Behoefte aan en tipes aansitter-, spoed- en draaimomentvergelykings, spoedbeheer van gelykstroommotore.

Wisselstroommasjiene.—Eenvoudige verduideliking van die beginsels, konstruksiebesonderhede en beskerming van alternators, kooi-induksiemotore en enkelfasetransformators. Parallelwerking- en sinchroniseerteorie.

MARINE-INGENIEUROFFISIER KLAS 2—SKEEPSBOUKUNDE

(Een vraestel van drie uur. Net ses uit die nege vrae moet beantwoord word)

Algemeen.—Verplasing. Nat vlak. Blok-, middeldeursnee-, prismatiese en watervlak-oppervlaktekoëffisiënt. Ton per sentimeter indompeling. Toepassing van Simpson se reëls op oppervlaktes, oppervlaktemoment, volumes en volumemoment.

Diepgang en dryfvermoë.—Verandering van gemiddelde diepgang as gevolg van verandering in die digtheid van water. Dryfvermoë en reserwedryfvermoë, permeabiliteit en gevolg van lekkasie in midskeepse kompartemente.

Transversale stabiliteit.—Swaartepunt. Drukkingspunt. Metasenter. Verskuiwing van swaartepunt as gevolg van byvoeging of verwydering van massa, transversale beweging van massa, hangende massa. Stabiliteit onder klein slagsyhoeke (met die tweede oppervlaktemoment van die watervlak of formules gegee). Die hellingstoets.

Weerstand en aandrywing.—Vergelyking van huidwrywingsweerstand van romp met model teen verskillende snelhede. Rf = f. S.Vn. en remanente weerstand. Admiraliteits- en brandstofkoëffisiënte. Verhouding tussen spoed van vaartuig en brandstofverbruik met konstante verplasing en in die veronderstelling dat weerstand wissel soos (spoed)^n. Elementêre behandeling van skroef en eenvoudige probleme in verband met hei, skynbare slip, werklike slip, volgstroom, stootkrag en vermoë.

Struktuursterkte.—Eenvoudige probleme oor sterkte van struktuurdele om vloeistofdruk te weerstaan. Belasting weens drukhoogte van vloeistof.

Skeepsbou.—Algemene terme gebruik by die meting van staalskepe, bv. lengte tussen loodlyne, totale breedte, holte tot opperdek, diepgang en vryboord. Definisies van skeepsbouterme in algemene gebruik. Beskrywings en sketse van struktuurdele in gewone tipes staalskepe. Waterdigte deure. Luike. Roere. Boegstoters. Skroewe. Waterdigte skotte. Dubbele bome. Ankers en kabels. Beskrywende behandeling van die uitwerking van vry vloeistofoppervlak op stabiliteit. Installasies vir die vervoer van gevaarlike goedere in massa.

Ventilasie-inrigtings (natuurlik en meganies) vir pompkamers in tenkskepe en vir ruime en oliebrandstoftenks.

Piektenks voor en agter, inrigtings vir die vul en leegpomp van dubbele boom en dieptenk. Dreinering van Kompartemente. Inrigtings vir die nivellering van beskadigde sykompartemente.

MARINE-INGENIEUROFFISIER KLAS 2—INGENIEURSWESE

Kandidate vir 'n stoomsertifikaat sal nie in items (d) (7) (i) en (i) geëksamineer word nie en kandidate vir 'n motorsertifikaat sal nie in items (d) (6) (i) en (h) geëksamineer word nie.

Kandidate vir die gekombineerde stoom- en motorsertifikaat sal slegs in items (d) (6) (i) en (h) geëksamineer word as hulle die houers is van 'n motorsertifikaat en slegs in items (d) (7) (i) en (i) as hulle die houers is van 'n stoomsertifikaat.

Opmerkings

(i) Die kennis van Ingenieurswese wat deur kandidate aan die dag gelê moet word, is dié wat vereis word vir die gebruik, bediening en onderhoud van die masjinerie, toerusting en skeepsdele waarvoor die ingenieuroffisier gewoonlik verantwoordelik is. Kennis word vereis van die bestuursverantwoordelikhede van 'n gediplomeerde ingenieuroffisier, die kode van veilige werkpraktyke en die wette en regulasies in verband met besoedeling van die omgewing.

(ii) Kandidate kan versoek word om hul antwoorde met vryhandsketse toe te lig.

Alternating current theory.—Simple continuous periodic waves: Frequency, amplitude, instantaneous, maximum, r.m.s. and average values, form factor. Phasor representation of a.c. quantities. Phase difference. The inductor. Inductance and its effect on the circuit. The capacitor. Capacitence and its effect on the circuit. Simple series and parallel circuits. Relationship between resistance, reactance and impedance. Simple treatment of power factor. Power in single phase a.c. circuit.

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

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

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

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

MARINE ENGINEER-OFFICER CLASS 2—NAVAL ARCHITECTURE

(One paper of three hours, six questions only out of nine to be attempted)

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

Draught and buoyancy.—Alteration of mean draught due to change in density of water. Buoyancy and reserve buoyancy, permeability and effect of bilging amidship compartments.

Transverse stability.—Centre of gravity. Centre of buoyancy. Metacentre. Shift of centre of gravity due to addition or removal of mass, transverse movement of mass, suspended mass. Stability at small angles of heel (given the second moment of area of the waterplane or formulae). The inclining experiment.

Resistance and propulsion.—Comparison of skin frictional resistance of hull with model at different speeds, Rf = f.s.v^n and residual resistance. Admiralty and fuel coefficients. Relation between speed of vessel and fuel consumption with constant displacement and assuming that resistance varies as (speed)^n. Elementary treatment of propeller and simple problems on pitch, pitch ratio, apparent slip, real slip, wake, thrust and power.

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

Ship construction.—Common terms used in the measurement of steel ships, e.g. length between perpendiculars, breadth overall, moulded depth, draught and freeboard. Definitions of shipbuilding terms in general use. Descriptions and sketches of structural members in ordinary types of steel ships. Watertight doors, Hatches. Rudders. Bow thrusters. Propellers. Watertight bulkheads. Double bottoms. Anchors and cables. Descriptive treatment of the effect of free surface of liquids on stability. Arrangements for the carriage of dangerous goods in bulk.

Ventilation arrangements (natural and mechanical) for pump rooms in tankers and for holds and oil fuel tanks.

Fore and aft peak tanks, double bottom and deep tank filling and pumping arrangements. Compartmental drainage. Levelling arrangements for damaged side compartments.

MARINE ENGINEER-OFFICER CLASS 2—ENGINEERING KNOWLEDGE

Candidates for a Steam Certificate will not be examined in items (d) (7) (i) and (i) and candidates for a Motor Certificate will not be examined in items (d) (6) (i) and (h).

Candidates for the Combined Certificate will be examined only in items (d) (6) (i) (h) if they possess the Motor Certificate or only in items (d) (7) (i) and (i) if they possess the Steam Certificate.

Notes

(i) The engineering knowledge to be shown by candidates is that which is required for the use, operation and maintenance of the machinery, equipment and ship structure usually in the charge of the engineer officer. A knowledge will be required of the managerial responsibilities of a certificated engineer officer, the code of safe working practices and the laws and regulations relating to the pollution of the environment.

(ii) Candidates may be required to illustrate their answers by means of freehand sketches.

(iii) Die mondelinge eksamen sal vrae insluit oor die hantering van enjins en ketels, elektriese masjinerie, voorkoming van brand en metodes om brande ter see te bestry, die pligte van die toesighoudende ingenieur-offisier, die werk wat in 'n hawe aan masjiene, ketels en hulpmasjinerie gedoen moet word en die periodieke ondersoek van die werkende dele. Kandidate moet ook goed vertroud wees met foute wat ter see in masjinerie en ketels kan voorkom en moet in staat wees om te verduidelik hoe sulke foute voorkom en herstel kan word:

(a) Eienskappe en kenmerke van metale, materiale, vloeistowwe, gasse en dampe wat in masjinerie op 'n skip gebruik word.

(b) Prosesse waaraan die onderdele van masjinerie onderworpe is of wat uit die vervaardiging daarvan voortvloei.

(c) Onderhoud van masjinerie. Metode om met slytasie in masjinerie, elektries en meganies, en ketels te handel. Die rig van masjiendele. Die verhelping van defekte. Tydelike of permanente herstelwerk in die geval van onklaarraking.

(d) Konstruksiebesonderhede en, waar van toepassing, die wyse van bevestiging aan skip, die beginsels betrokke by en die werking van—

(1) watermeter, termometer, salinometer, ammeter, wattmeter, drukmeter en ander meters wat algemeen deur ingenieurs op 'n skip gebruik word;

(2) pompe, pompstelsel, toerusting vir die afskeiding van olierige water;

(3) drukblokke, asse, laers, skroefaskokers, skroewe, skeepsytoebehorens;

(4) stuurinrigting, stabiliseerders;

(5) koelmasjinerie, dekmasjinerie;

(6) (i) turbines, ratwerk, ketels, hulp-toevoerwater/stoominstallasie en verbrandingstoerusting;

(ii) hulpketels en stoominstallasie;

(7) (i) kompressieontstekingsenjins, ratwerk, koppelaars en lugkompressors;

(ii) hulp-kompressieontstekingsenjins en bybehorende masjinerie.

(e) Veilige werkpraktyke, die opknap van masjinerie, meganiese veiligheid in werkwinkel, beskermende toerusting, hystoestel, die binnegaan van tenks.

(f) (1) Voorsorgmaatreëls teen brand of ontploffings. Ontplofbare mengsels. Gevaar van olielekkasie. Ontbrandingsbronne. Veiligheidstoestelle.

(2) Toksisiteit en ander gevaarlike eienskappe van stowwe wat in marinepraktyk gebruik word. Onderhoud van installasie wat met die vervoer van gevaarlike goedere in verband staan.

(3) Brandvoorkoming, -opsporing, -blussing. Werkbeginsel, aanwending en onderhoud van brandblussers, respirators, veiligheidslampe. Vaste brandopsporings- en -blusreëlings vir akkommodasie-, vrag- en masjienruimtes.

(g) Beheerstelsels, outomatisasie en instrumentasie. Periodiek onbewaakte masjinerie, tegnieke en werkpraktyke. Brugbeheer.

(h) Veilige en doeltreffende werking van stoominstallasie. Chemiese behandeling van toevoerwater.

(i) Veilige en doeltreffende werking van kompressieontstekingsenjins. Aanwending van die indikator. Interpretasie van normale kaart.

(j) Veilige en doeltreffende werking van elektriese masjiene en stelsels.

(k) Algemene vereistes betreffende brandstofoliestelsels.

(l) Algemene vereistes betreffende smeerstelsels.

(m) Algemene vereistes aangaande kim, lens-, ballas- en brandpompstelsels.

MARINE-INGENIEUROFFISIER KLAS 1—TOEGEPASTE MEGANIKA

(Een vraestel van drie uur. Net ses uit die nege vrae moet beantwoord word)

Stahka.—Ewewig van nie-saamvlakkige kragte. Rapson-skuif.

Wrywing.—Wrywingskoppelaars. Wrywing op hellende vlak. Wrywing op skroefdraad. Arbeid verrig teen wrywing.

Kinematika.—Lineêre en hoekbeweging met versnelling. Nokke. Snelheid-tydgrafieke en versnelling-tyd-grafieke.

Dinamika.—Versnelling van verbinde liggame. Uitwerking van eenvoudige lugweerstand op beweging onder die invloed van swaartekrag. Die draaimomentvergelyking. Kinetiese verplasings- en rotasie-energie. Vliegwiele. Impulsiewe kragte. Reëlaars, insluitende hulswrywing. Eenvoudige harmoniese beweging. Eenvoudige slinger. Eenvoudige trillings. Dinamiese balansering van massas wat in een vlak draai. Basiese dinamika van die enjinmeganisme.

Spanning en vervorming.—Spannings op skuins vlakke. Komplementêre skuifspanning. Sterkte van enkelvoudige verbindings soos spy- of skroefverbindings. Veerkragtigheid as gevolg van regstreekse spanning. Skielike belasting. Uitwerking van regstreekse belasting en van temperatuurveranderings op saamgestelde dele.

(iii) The viva voce examination will include questions on the management of engines and boilers, electrical machinery, prevention of fire and methods of fighting fires at sea, the duties of the supervising engineer-officer, the work to be done to engines, boilers and auxiliary machinery in port and the periodical examination of the working parts. Candidates should also be well acquainted with machinery and boiler casualties which may occur at sea and be able to state how these may be prevented and remedied:

(a) Properties and characteristics of metals, materials, liquids, gases and vapours used in machinery on board ship.

(b) Processes to which the component parts of machinery are submitted or which are incidental to their manufacture.

(c) Maintenance of machinery. Method of dealing with wear and tear of machinery, both electrical and mechanical, and boilers. Alignment of machinery components. Correction in defects. Temporary or permanent repairs in the event of breakdown.

(d) Construction details, and where applicable the manner of attachment to ship, principles involved and operation of—

(1) water gauge, thermometer, salinometer, ammeter, wattmeter, pressure gauge and other meters and gauges commonly used by engineers on board ship;

(2) pumps, pumping systems, oily water separators;

(3) thrust blocks, shafting, bearings, stern tubes, propellers, ship side fittings;

(4) stearing gear, stabilizers;

(5) refrigeration machinery, deck machinery.

(6) (i) turbines, gearing, boilers, ancillary feed water/steam plant and combustion equipment;

(ii) auxiliary boilers and steam plant;

(7) (i) compression ignition engines, gearing, clutches and air compressors;

(ii) auxiliary compression ignition engines and associated plant.

(e) Safe working practices, overhauling machinery, mechanical safety in workshop, protective equipment, lifting tackle, entering tanks.

(f) (1) Precautions against fire or explosion. Explosive mixtures. Danger of oil leakages. Sources of ignition. Safety devices.

(2) Toxic and other dangerous properties of substances used in marine practice. Maintenance of plant associated with the carriage of dangerous goods.

(3) Fire prevention, detection, extinction. Principle of operation, application and maintenance of fire extinguishers, respirators, safety lamps. Fixed fire detection and extinguishing arrangements for accommodation, cargo and machinery spaces.

(g) Control systems, automation and instrumentation. Periodically unattended machinery, techniques and work practices. Bridge control.

(h) Safe and efficient operation of steam plant. Chemical treatment of feed water.

(i) Safe and efficient operation of compression ignition engines. Application of the indicator. Interpretation of normal card.

(j) Safe and efficient operation of electrical machines and systems.

(k) General requirements concerning fuel oil systems.

(l) General requirement concerning lubricating oil systems.

(m) General requirements concerning bilge, ballast, fire pumping systems.

MARINE ENGINEERING-OFFICER CLASS 1—APPLIED MECHANICS

(One paper of three hours, six questions only out of nine to be attempted)

Statics.—Equilibrium of non coplanar forces. Rapson's slide.

Friction.—Friction clutches. Friction on inclined plane. Friction on threads. Work done against friction.

Kinematics.—Linear and angular motion with accelaration. Cams. Velocity-time and acceleration time graphs.

Dynamics.—Acceleration of connected bodies. Effect of simple air resistance on motion under the effect of gravity. The torque equation. Kinetic energy of translation and of rotation. Flywheels. Impulsive forces. Governors including sleeve friction. Simple harmonic motion. Simple pendulum. Simple vibrations. Dynamic balancing of masses rotating in one plane. Basic dynamics of the engine mechanism.

Stress and strain.—Stresses on oblique planes. Complementary shear stress. Strength of simple connections such as cottered or screwed joints. Resilience due to direct stress. Suddenly applied loads. Effect of direct loading and of temperature changes on compound members.

Balke.—Vrydraers en enkelvoudig gesteunde balke met gekonsentreerde of gelykmatig verspreide laste. Skuifkrag- en buigmomentdiagramme. Spanning as gevolg van buiging waar die fundamentele buigingsvergelyking en die polêre tweede oppervlaktemoment van die profiel verstrek word. Neutrale as van balke met eenvoudige deursnee. Gebruik van defleksieformules.

Wringing.—Wrywing van dryfas toegerus met voering. Diggewikkelde spiraalveer.

Stutte.—Eksentriese belasting van kort kolomme. Gebruik van stutformules.

Hidrostatika.—Drywing in twee vloeistowwe met verskillende relatiewe digthede. Totale krag en drukpunt op ingedompelde oppervlakke soos skotte.

Hidroulika.—Bernoulli se vergelyking en toepassings. Die venturimeter. Krag deur 'n straal uitgeoefen. Plathoekdiagramme vir 'n sentrifugale pomp.

Beheer.—Eenvoudige vloei- en beheerprobleme.

MARINE-INGENIEUROFFISIER KLAS 1—HITTEWERKTUIE

(Een vraestel van drie uur. Net ses uit die nege vrae moet beantwoord word)

Basiese termodinamiese beginsels.—Tweede Wet van Termodinamika en toepassings.

Hitteoordrag.—Gebruik van gemiddelde temperatuurverskil van log. Straling, Stefan-Boltzmann se Wet.

Gasse.—Avogadrose hipotese. Universele gaskonstante. Dalton se wet van parsiële drukke en die toepassing daarvan op mengsels van gasse en dampe soos die uitwerking van luglekkasie in kondensators. Bepaling van n aan die hand van grafiek wat p en V verbind. Bewys van die formule $c_p - c_v = R$.

Gassiklusse.—Gebruik van entropiekaarte. Ope en geslote siklusse vir gasturbines. Carnot- en omgekeerde Carnotsiklusse.

Eienskappe van stoom.—Gebruik van stoomtafels by entropieveranderings. Entalpie-entropie-kaart.

Stoominstallasie.—Basiese Rankinesiklus. Isentropiese rendement. Entalpieverlies in turbines. Vloeiing deur spuitstukke, uitgesonderd bewys van kritieke drukverhouding. Uitwerking van modifikasies soos oorverhitting, herverhitting en regeneratortoevoerverhitting op termiese rendement. Gebruik van entalpie-entropie-kaarte om die stoomtoestand in verskillende stadiums te bepaal. Basiese berekenings oor verdamper- en ketelprestasie.

Verbranding.—Basiese ontleding van uitlaatgasse. Verhouding tussen volumetriese en massaontleding van 'n gasmengsel. Koolstofdioksiedinhoud van uitlaatgasse.

MARINE-INGENIEUROFFISIER KLAS 1—ELEKTROTEGNOLOGIE

(Een vraestel van drie uur. Net ses uit die nege vrae moet beantwoord word)

Die elektriese kring.—Die superposisie- en Thévenin-stelling in netwerkprobleme. Kringe waarby nie-lineêre elemente betrokke is.

Elektromagnetiese induksie, magnetiese kring.—Wedersydse induksie. Energie in 'n elektriese veld opgegaar. Behandeling van spanning- en stroomladings in 'n elektriese kring, waarby induktansie en weerstand betrokke is. Tydkonstante, B/H- en B/amperewindings per meter-krommes en die uitwerking daarvan op eenvoudige magnetiese kringe waarby 'n lugspleet betrokke is. Kwalitatiewe behandeling van histerese.

Elektrostatika.—Tipes kapasitors. Eenvoudige serie- en parallelkringe waarby kapasitors betrokke is. Elektriese krag en elektriese vloeddigtheid, relatiewe permittiwiteit, laai- en ontlaaistrome van'n kapasitor wat in serie geskakel is met 'n weerstand oor gelykstroomtoevoer. Energie in 'n kapasitor opgegaar. Ontwikkeling van statiese elektrisiteit.

Elektronika.—Die eienskappe van voegtransistors. Die uitwerking van spanningsterugkoppeling op versterkerwins, ingangs- en uitgangsimpedansies. Ekwivalente kringe. Gelykrigting. Eenvoudige behandeling van tiristors en Zenerdiodes. Wisselstroomteorie vir driefasestelsels. Stroom- en spanningsverhoudings. Stroom, spanning, krag en arbeidsfaktor toegepas op RLC-kringe. Die impedansiedriehoek. Arbeidsfaktorverbetering. Resonansie. Ster- en deltastelsels.

Gelykstroommasjiene.—Ankerreaksie. Spoedbeheer. Rendement. Toepassing op 'n Ward-Leonardstelsel. Geskiktheid van gelykstroommotore vir die verskillende soorte werk. Motoraansitters; outomatiese tipes. Berekenings in verband met aansitters.

Wisselstroommasjiene.—Die beginsels, konstruksiebesonderhede en beskerming van speekpool-, silindriese en borsellose alternators. Die EMK-vergelyking en outomatiese spanningsreëling vir 'n alternator. Die produksie van draaiende magnetiese velde. Verhouding tussen frekwensie, getal pole en spoed van 'n masjien. Die beginsels, konstruksiebesonderhede en beskerming van induksiemotore. Glip, EMK en frekwensie var rotor. Draaimoment-spoedkenkrommes. Gewikkelde, sleeping-, kooi- er dubbelgewikkelde tipes. Aansitmetodes. Die beginsels en konstruksiebe sonderhede van eenfasetransformators. Die EMK-vergelyking en rende ment. Outotransformators en stroomtransformators.

Beams.—Cantilevers and simply supported beams with concentrated or uniformly distributed loads. Shearing force and bending moment diagrams. Stress due to bending, given the fundamental bending equation and the polar second moment of area of the section. Neutral axis of beams of simple section. Use of deflection formulae.

Torsion.—Torsion of shaft fitted with liner. Close coiled helical spring.

Struts.—Eccentric loading of short columns. Use of strut formulae.

Hydrostatics.—Flotation in two liquids of different densities. Total force and centre of pressure on immersed surfaces such as bulkheads.

Hydraulics.—Barnoulli's equation and applications. Venturi meter. Force exerted by a jet. Blade angle diagrams for a centrifugal pump.

Control.—Simple flow and control problems.

MARINE ENGINEER-OFFICER CLASS 1—HEAT ENGINES

(One paper of three hours, six questions only out of nine to be attempted)

Basic thermodynamic principles.—Second Law of Thermodynamics and applications.

Heat transfer.—Use of log mean temperature difference. Radiation, Stefan-Boltzmann Law.

Gases.—Avagadro's hypothesis. Universal gas constant. Dalton's law of partial pressures and application to mixtures of gases and vapours such as the effect of air leakage into condensers. Determination of n from graph connecting p and V. Proof of the formula $c_p - c_v = R$.

Gas cycles.—Use of entropy charts. Open and closed cycles for gas turbines. Carnot and reversed Carnot cycles.

Properties of steam.—Use of steam tables to deal with changes of entropy. Enthalpy-entropy chart.

Steam plant.—Basic Rankine cycle. Isentropic efficiency. Enthalpy drop in turbines. Flow through nozzles excluding proof of critical pressure ratio. Effect on thermal efficiency of such modifications as superheating, reheating and regenerative feed heating. Use of enthalpy-entropy charts to determine steam condition at various stages. Basic calculation on evaporator and boiler performance.

Combustion.—Basic analysis of exhaust gases. Relation between volumetric and mass analysis of a gas mixture. Carbon dioxide content of exhaust gases.

MARINE ENGINEER-OFFICER CLASS 1—ELECTROTECHNOLOGY

(One paper of three hours, six questions only out of 9 to be attempted)

The electric circuit.—The Superposition and Thevenin's Theorems in network problems. Circuits involving non-linear elements.

Electromagnetic induction, magnetic circuit.—Mutual inductance. Energy stored in an electric field. Treatment of voltage and current charges in an electric circuit involving inductance and resistance. Time constant, B/H and B/Ampere turns per metre curves and their effects on simple magnetic circuits involving an air gap. Qualitative treatment of hysteresis.

Electrostatics.—Types of capacitor. Simple series and parallel circuits involving capacitors. Electric force and electric flux density, relative permittivity, charging and discharging currents of a capacitor connected in series with a resistor across d.c. supply. Energy stored in a capacitor. Generation of static-electricity.

Electronics.—The characteristics of junction transistors. The effect of voltage feedback on amplifier gain, input and output impedances. Equivalent circuits. Rectification. Simple treatment of thyristors and zener diodes.

Alternating current theory for three phase systems.—Current and voltage relationships. Current, voltage, power and power factor applied to RLC circuits. The impedance triangle. Power factor improvement. Resonance. Star and delta systems.

D.C. machines.—Armature reaction. Speed control. Efficiency. Application to a Ward Leonard system. Suitability of d.c. motors for the various types of work. Motor starters; automatic types. Calculations on starters.

A.C. machines.—The principles, constructional details and protection of salient pole, cylindrical and brushless alternators. The e.m.f. equation and automatic voltage regulation for an alternator. The production of rotating magnetic fields. Relation between frequency, number of poles and speed of a machine. The principles, constructional details and protection of induction motors. Slip, rotor e.m.f. and frequency. Torque-speed curves. Wound, slip ring, cage and double wound types. Starting methods. The principles and constructional details of single-phase transformers. The e.m.f. equation and efficiency. Auto-transformers and current transformers.

MARINE-INGENIEUROFFISIER KLAS 1—SKEEPSBOUKUNDE

(Een vraestel van drie uur. Net ses uit die nege vrae moet beantwoord word)

Algemeen.—Natvlakformules. Simpson se reëls toegepas op tweede moment van oppervlakte, volumes, sentroïede en drukpunte. Skuifkrag en buigmoment van gelaaide skip in stil water.

Transversale stabiliteit.—Moment van statiese stabiliteit. GZ-krommes. Dwarskrommes van stabiliteit. Hidrostatiese krommes gewoonlik aan skepe verskaf. Uitwerking van vry vloeistofoppervlak en verdeling van tenks. Gevare as gevolg van die versameling van water gedurende brandbestryding. Praktiese vereistes om stabiliteit ter see te verseker. Behartiging van water- en brandstoftenks. Vulling en lediging van tenks ter see.

Langsstabiliteit.—TM en SM oorlangs en statiese stabiliteit. Flottasiepunt en berekening daarvan. Moment van trimverandering met een sentimeter.

Diepgang, trim en oorhelling.—Veranderings as gevolg van byvoeging of verwydering van brandstof, ballas of vrag. Veranderings as gevolg van verandering in digtheid van seewater. Veranderings as gevolg van lekkasie in kompartemente, met aanwending van die metodes betreffende verlore dryfvermoë en bygevoegde massa. Kragte op roer en spanning in roerstok. Oorhelling wanneer gedraai word, met inbegrip van uitwerking van middelpuntvliedende krag en van krag op roer.

Weerstand en aandrywing.—Afleiding van Admiraliteits- en brandstofkoëffisiënte. Die wet van ooreenstemmende snelhede. Froude se wet van vergelyking. Eenvoudige probleme oor die voorberekening van volskaalse weerstand aan die hand van modeleksperimente. Probleme oor skroewe waarby ingesluit die gebruik van volgstroomfaktor, e.k. (effektiewe krag), g.k. (gelewerde krag), kwasie-aandrywingskoëffisiënt, stootkrag en vermoë. Kwalitatiewe behandeling van kavitasie.

Skeepsbou.—Kragte op skip onder verskillende toestande, met inbegrip van die uitwerking van hyging en stamp. Konstruksie van alle dele van staalskepe. Gebruik van trekvaste staal en aluminium. Strukturele inrigtings vir brandbeveiliging. Droogdokking. Ontwerpkenmerke van skepe vir algemene en strukturele inrigtings vir die vervoer van gevaarlike goedere.

Meting en klassifisering van skepe.—Betekenis van "geklassifiseerde" en "ongeklassifiseerde" skepe. Gewone terme gebruik by die meting van moderne staalskepe. Gewone terme gebruik by die meting van tonnemaat, bv. bruto tonnemaat, netto tonnemaat, toelating vir dryfkrag.

Laslyn.—Algemene terme, merke en hoofkriteria gebruik by die oodrag van vryboorde. Onderhoud van oordragvoorwaardes.

Reddingstoerusting.—Werking en hantering van toerusting vir reddingsbote en -vlotte.

MARINE-INGENIEUROFFISIER KLAS 1—INGENIEURSWESE

Kandidate vir 'n stoomsertifikaat sal nie in items (d) (6) (i) en (i) geëksamineer word nie en kandidate vir 'n motorsertifikaat sal nie in items (d) (5) (i) en (h) geëksamineer word nie.

Kandidate vir die gekombineerde sertifikaat sal slegs in items (d) (5) (i) en (h) geëksamineer word as hulle houers is van die motorsertifikaat of slegs in items (d) (6) (i) en (i) as hulle houers is van die stoomsertifikaat.

Opmerkings

(i) Die kennis van Ingenieurswese wat deur kandidate aan die dag gelê moet word, is dié wat vereis word vir die gebruik, bediening en onderhoud van die masjinerie, toerusting en skeepsdele waarvoor die Ingenieuroffisier gewoonlik verantwoordelik is. Kennis van die bestuurverantwoordelikhede van 'n gediplomeerde ingenieuroffisier word vereis.

(ii) Kandidate kan versoek word om hul antwoorde met vryhandsketse toe te lig.

(iii) Die mondelinge eksamen sal vrae insluit oor die bestuur van enjins en ketels, elektriese masjinerie, voorkoming van brand en metodes om brande ter see te bestry, die pligte van die toesighoudende ingenieuroffisier, die werk wat in 'n hawe aan masjiene, ketels en hulpmasjinerie gedoen moet word en die periodieke ondersoek van die werkende dele. Kandidate moet ook goed vertroud wees met foute wat ter see in masjinerie en ketels kan voorkom en moet in staat wees om te verduidelik hoe sulke foute voorkom en herstel kan word:

(a) Eienskappe en kenmerke van metale, materiale, vloeistowwe, gasse en dampe wat in masjinerie op 'n skip gebruik word.

(b) Prosesse waaraan die onderdele van masjinerie onderworpe is of wat uit die vervaardiging daarvan voortvloei.

(c) Onderhoud van masjinerie. Metode om met slytasie in masjinerie, elektries en meganies, en ketels te handel. Die rig van masjiendele. Die verhelping van defekte. Tydelike of permanente herstelwerk in die geval van onklaarraking.

(d) Konstruksiebesonderhede, wyse van bevestiging aan skip.

Beginsels betrokke by die werking van—

(1) pompe, pompstelsels, toerusting vir die afskeiding van olierige water;

(2) drukblokke, asse, laers, skroefaskokers, skroewe, skeepsytoebehorens;

MARINE ENGINEER-OFFICER CLASS 1—NAVAL ARCHITECTURE

(One paper of three hours, six questions only out of nine to be attempted)

General.—Wetted surface formulae. Simpson's rules applied to second-moments of areas, volumes, centroids and centres of pressure. Shearing force and bending moment of loaded ship in still water.

Transverse stability.—Moment of statical stability. GZ curves. Cross curves of stability. Hydrostatic curves commonly supplied to ship. Effect of free liquid surface and subdivision of tanks. Dangers due to water accumulation during fire-fighting. Practical requirements to ensure stability at sea. Management of water and fuel tanks. Filling and emptying tanks at sea.

Longitudinal stability.—Longitudinal BM and GM and statical stability. Centre of flotation and its calculation. Moment to change trim by one centimetre.

Draught, trim and heel.—Changes due to adding or removing fuel, ballast or cargo. Changes due to alteration in density of sea water. Changes due to bilging of compartments, using the lost buoyancy and added mass methods. Forces on rudder and stress in rudder stock. Heel when turning, including effect of centrifugal force and of force on rudder.

Resistance and propulsion.—Derivation of Admiralty and fuel coefficients. The law of corresponding speeds. Froude's law of comparison. Simple problems on the prediction of full-scale resistance from model experiments. Problems on propellers involving the use of wake factor, ep, dp, QPC, thrust and power. Qualitative treatment of cavitation.

Ship construction.—Forces on ship under various conditions, including the effect of panting and pounding. Construction of all parts of steel ships. Use of high tensile steel and aluminium. Structural fire protection arrangements. Dry docking. Design features of ships for general and structural arrangements for the carriage of dangerous goods.

Ship measurement and classification.—Meaning of "classed" and "unclassed" ships. Common terms used in measurement of modern steel ships. Common terms used in tonnage measurements, e.g. gross tonnage, nett tonnage, propelling power allowance.

Load line.—Common terms, markings and main criteria used in assignment of freeboards. Maintenance of conditions of assignment.

Life saving equipment.—Operation and handling gear for lifeboats and liferafts.

MARINE ENGINEER-OFFICER CLASS 1—ENGINEERING KNOWLEDGE

Candidates for a Steam Certificate will not be examined in items (d) (6) (i) and (i) and candidates for a Motor Certificate will not be examined in items (d) (5) (i) and (h).

Candidates for the Combined Certificate will be examined only in items (d) (5) (i) and (h) if they possess the Motor Certificate or only in items (d) (6) (i) and (i) if they possess the Steam Certificate.

Notes

(i) The engineering knowledge to be shown by candidates is that which is required for the use, operation and maintenance of the machinery, equipment and ship structure usually in the charge of the engineer officer. A knowledge of the managerial responsibilities of a certificated engineer officer will be required.

(ii) Candidates may be required to illustrate their answers by means of freehand sketches.

(iii) The oral examination will include questions on the management of engines and boilers, electrical machinery, prevention of fire and methods of fighting fires at sea, the duties of the supervising engineer, the work to be done to engines, boilers and auxiliary machinery in port and the periodical examination of the working parts.

Candidates should also be well acquainted with machinery and boiler casualties which may occur at sea and be able to state how these may be prevented and remedied:

(a) Properties and characteristics of metals, materials, liquids, gases and vapours used in machinery on board ship.

(b) Processes to which the component parts of machinery are submitted or which are incidental to their manufacture.

(c) Maintenance of machinery. Method of dealing with wear and tear of machinery, both electrical and mechanical, and boilers. Alignment of machinery components. Correction of defects. Temporary or permanent repairs in the event of breakdown.

(d) Constructional details, manner of attachment to ship.

Principles involved with operation of—

(1) pumps, pumping systems, oily water separators;

(2) thrust blocks, shafting, bearings, stern tubes, propellers, ship side fittings;

(3) stuurinrigting, stabiliseerders;

(4) koelmasjiene, dekmasjienerie;

(5) (i) turbines, ratwerk, ketels, hulp-toevoerwater/stoominstallasie en verbrandingstoerusting;

(ii) hulpketels en bybehorende stoominstallasie;

(6) (i) kompressieontstekingsenjins, ratwerk, koppelaars, lugkompressors;

(ii) hulp-kompressieontstekingsenjins en bybehorende toerusting;

(7) turboëlektriese, dieselelektriese en gasturbine-aandrywing.

(e) Veilige werkpraktyke, die opknap van masjinerie, meganiese veiligheid in werkwinkels, beskermende toerusting, hystoestel, die binnegaan van tenks.

(f) (1) Voorsorgmaatreëls teen brand of ontploffings. Ontplofbare mengsels. Gevaar van olielekkasies. Veiligheidstoestelle. Ontbrandingsbronne.

(2) Toksisiteit en ander gevaarlike eienskappe van stowwe wat in marinepraktyk gebruik word. Onderhoud van instalasie wat met die vervoer van gevaarlike goedere in verband staan.

(3) Brandvoorkoming, -opsporing, -blussing. Werkbeginsel, aanwending en onderhoud van brandblussers, respirators, veiligheidslampe. Vaste brandopsporings- en -blusreëlings vir akkommodasie-, vrag- en masjienruimtes.

(g) Beheerstelsels, outomatisasie en instrumentasie. Periodiek onbewaakte masjinerie, tegnieke en werkpraktyke. Brugbeheer.

(h) Veilige en doeltreffende werking van stoominstallasie. Die bepaling van asdrywing en die herken van onreëlmatigheid in die prestasie van masjinerie en installasie. Ontleding en interpretering van inligting met behulp van moniteertoerusting verkry. Chemiese behandeling van toevoerwater.

(i) Veilige en doeltreffende werking van kompressieontstekingsenjins. Die bepaling van asdrywing en herkenning van onreëlmatigheid in die prestasie van die masjinerie en installasie. Ontleding en interpretering van inligting met behulp van moniteertoerusting verkry.

(j) Veilige en doeltreffende werking van elektriese masjiene en stelsels.

(k) Algemene vereistes betreffende brandstofoliestelsels.

(l) Algemene vereistes betreffende smeerstelsels.

(m) Kennis van die toepaslike statute van belang vir marine-ingenieuroffisiere. Die administratiewe pligte van 'n Hoofingenieur, d.w.s. die organisasie en opleiding van personeel vir normale sowel as nooddienste, met inbegrip van die gebruik van veiligheidstoerusting, en die organisasie van reparasies en ondersoeke en verwante verslae.

AANHANGSEL 4

LEERPLAN VIR DIE EKSAMEN VAN HOOF-INGENIEUROFFISIER (SPESIALE GRAAD)

Daar word van kandidate verwag om 'n meer uitgebreide kennis van al die items in die leerplanne van die eksamens vir Marine-ingenieuroffisier Klas 2 en Marine-ingenieuroffisier Klas 1 aan die dag te lê.

TOEGEPASTE TERMODINAMIKA I (SPESIALE GRAAD)

Gasturbines, die uitwerking van tussenkoeling, herverhitting en hitteruilers. Invloed van komponentrendemente, verliese, drukverhouding en maksimum siklustemperatuur op prestasie. Berekening van die prestasie van gespesifiseerde installasie.

Wenslike eienskappe van koelmiddels. Dampkompressiesiklusse; een- en meertrapuitsetting en -kompressie. Hittepompaanwendings.

Siklusanalise van stoominstallasie met inbegrip van die uitwerking van oorverhitting, herverhitting, regeneratiewe toevoerverhittig met gespesifiseerde inrigting van toevoerverhitters, dreineringskoelers, pompe. Bestendigevloeianalise van enkel- en kaskadeverdampers.

Aksialestoomturbines. Prestasie, impuls, reaksie, bladrendement, trap- en totale isentropiese rendemente, kondisiekromme, herverhittingsfaktor, hoë- en laedrukwerking.

Beskrywende kennis van ontbranding en vlamvoortplanting in binnebrandenjins; tipes verbrandingskamers en die invloed daarvan op ontstekingsvertraging, brandstof-lugmenging, spesifieke brandstofverbruik. Setaangetal as 'n brandstofaanslagindeks. Dissosiasie.

Praktiese binnebrandenjinsiklusse. Aanjaging.

Werking van suierkompressors, kompressors met radiale vloei en kompressors met aksiale vloei. Blaaie in draaimasjiene. Gelykmatigevloei-analise. Prestasie-eienskappe.

Hitteoordrag in skeepsinstallasie. Parallel- en teenvloeihitteruilers waarby vloeistowwe van konstante spesifieke warmte betrokke is. Oppervlak- en totale koëffisiënt, gebruik van dimensielose parameters in konveksiehitteoordrag.

Die toets en prestasie van skeepshitte-enjins.

TOEGEPASTE TERMODINAMIKA 2 (SPESIALE GRAAD)

Prosesse, vloei en nie-vloei, toepassing van die termodinamikawette vir volmaakte en onvolmaakte vloeistowwe.

Ideale siklusse, stoom of gas, mengsel van gasse.

(3) steering gears, stabilizers;

(4) refrigeration machines, deck machinery;

(5) (i) turbines, gearing, boilers, ancillary feed water/steam plant and combustion equipment;

(ii) auxiliary boilers and associated steam plant;

(6) (i) compression ignition engines, gearing, clutches, air compressors;

(ii) auxiliary compression ignition engines and associated equipment;

(7) turbo-electric, diesel electric, gas turbine drives.

(e) Safe working practices, overhauling machinery, mechanical safety in workshops, protective equipment, lifting tackle, entering tanks.

(f) (1) Precautions against fire or explosion. Explosive mixtures. Danger of oil leakages. Safety devices. Sources of ignition.

(2) Toxic and other dangerous properties of substances used in marine practice. Maintenance of plant associated with the carriage of dangerous goods.

(3) Fire prevention, detection, extinction. Principle of operation, application and maintenance of fire extinguishers, respirators, safety lamps. Fixed fire detection and extinguishing arrangements for accommodation, cargo and machinery spaces.

(g) Control systems, automation and instrumentation. Periodically unattended machinery, techniques and work practices. Bridge control.

(h) Safe and efficient operation of steam plant. The determination of shaft power and the recognition of irregularity in the performance of machinery and plant. Analysis and interpretation of information gained from monitoring equipment. Chemical treatment of feed water.

(i) Safe and efficient operation of compression ignition engines. The determination of shaft power and recognition of irregularity in the performance of the machinery and plant. Analysis and interpretation of information gained from monitoring equipment.

(j) Safe and efficient operation of electrical machines and systems.

(k) General requirements concerning fuel oil systems.

(l) General requirements concerning lubricating oil systems.

(m) Knowledge of the appropriate statutes of concern to marine engineer officers. The administrative duties of a Chief Engineer, i.e. the organisation and training of staff for both normal and emergency duties including the use of safety equipment, and the organisation of repairs and surveys and associated reports.

ANNEX 4

SYLLABUS FOR THE EXAMINATION OF CHIEF ENGINEER-OFFICER (SPECIAL GRADE)

Candidates are expected to show a more extensive knowledge of all the items in the syllabuses for the examination of Marine Engineer-Officer Class 2 and Marine Engineer-Officer Class 1.

APPLIED THERMODYNAMICS I (SPECIAL GRADE)

Gas turbines, effect of intercooling, reheating, and heat exchangers. Influence of component efficiencies, losses, pressure ratio and maximum cycle temperature on performance. Calculation of performance of specified plant.

Desirable characteristics of refrigerants. Vapour compression cycles: single and multiple stage expansion and compression. Heat pump applications.

Cycle analysis of steam plant including effects of superheating, reheating, regenerative feed heating with specified arrangement of feed heaters, drain coolers, pumps. Steady flow analysis of single and multiple effect evaporators.

Axial flow steam turbines. Performance, impulse, reaction, blading efficiency, stage and overall isentropic efficiencies, condition curve, reheat factor. Compounding.

Descriptive knowledge of ignition and flame propagation in internal combustion engines; types of combustion chambers and their influence on ignition delay, fuel air mixing, specific fuel consumption. Cetane number as an index of fuel rating. Dissociation.

Practical internal combustion engines cycles. Supercharging.

Operation of compressors; radial flow, axial flow, reciprocating. Blading in rotary machines. Steady flow analysis. Performance characteristics.

Heat transfer in marine plant. Parallel and counterflow heat exchangers involving fluids of constant specific heat. Surface and overall co-efficient, use of dimensionless parameters in convection heat transfer.

The testing and performance of marine heat engines.

APPLIED THERMODYNAMICS 2 (SPECIAL GRADE)

Processes, flow and non-flow, application of the Thermodynamic Laws for perfect and imperfect fluids.

Ideal cycles, steam or gas, mixtures of gases.

Stelsels, beskikbare energie, beskikbaarheid in sikliese prosesse en in nie-sikliese geslotestelselprosesse. Entropie.

Hitteoordrag waarby slanke vinne (vinrendement), saamgestelde dele, plat en wiskundig geboë oppervlakke betrokke is en met interne hitteontwikkeling.

Afleiding en oplossing van fundamentele vergelykings vir probleme in verband met bestendige tweedimensionale en onbestendige eendimensionale geleiding. Oorgangshittevloei.

Mengsels van gasse en dampe, higrometrie, gebruik van psigrometriese kaart. Vogtigheidsverhoging en ontvogtiging. Direktekontakwater- en -gasverkoeling.

Toepasing op lugversorging- en skeepsinstallasies.

Beskrywende kennis van laminêre vlamvoortplanting, minimum vonkontstekingsenergie, blussingsafstand, spontane ontsteking, vlambaarheidsperke. Brandstowwe.

Ontbrandingsrendement, uitwerking van lug/brandstof-verhouding. Eerste Wet van Termodinamika toegepas op ontbrandingsprosesse.

Wrywinglose eendimensionale vloei deur kanale met verskillende deursnee-oppervlaktes, hittebyvoeging en eksternearbeid kritiekedruk-verhouding. Mach-getal.

Stagnasie-eienskappe (temperatuur, druk) by 'n punt in die vloeistofstroom. Windtonneltoetsing.

Adiabatiese eendimensionale vloei van nie-ideale gasse in spuitstukke.

Toepassing van grondbeginsels op bestaande en voorgestelde masjinerie en toerusting. Siklusanalise van gespesifiseerde differensiaalmasjinerie, skeeps sowel as nie-skeeps.

STERKTELEER EN EIENSKAPPE VAN MATERIALE (SPESIALE GRAAD)

Atoomstruktuur, elektrone, protone, neutrone (eenvoudige Bohr-atoom); elektronskille, energievlakke, ionisasiepotensiale. Rangskikking van atome in materiale; tipes atoombinding; kristallyne en amorfe materiale; aard van metaal-, organiese (hoëpolimeer-) en keramiekmateriale, kristalstruktuur van metale; stolling van harse.

Gebreke in materiale en invloed op meganiese eienskappe; vervorming in enkelkristalle van polikristallyne; metale; herkristallisering van vervormde metale, basiese versterkingsmeganismes in metaalmateriale (vervormingsverharding, vaste-oplossingverharding en dispersieverharding); vervorming van polimere, vorm- en verwerkingsmetodes.

Meganiese eienskappe van metale, polimere en ander ingenieursmateriale (d.w.s. sterkte, elastisiteit, hardheid, kruip, vermoeidheid, slagweerstand, slytasie, rekbaarheid en brosheid, insluitende uitwerking van temperatuur en vervormingstempo). Uitwerking van spanningkonsentrasies.

Die struktuur en eienskappe van gietmetale en allooie; tipiese defekte in gietstukke -inkrimping en gasongaafheid, oorblywende spannings. Strukturele- en meganiese-eienskapveranderings wat voortvoei uit koudbewerking, uitgloeiing en warmbewerking van metale; vergelyking van meganiese eienskappe van giet en ruprodukte. Die las van metale, inkrimping, oksidasie, oorblywende spannings en kraking wat met sweis in verband staan. Die uitwerking van sweis op struktuur en eienskappe van basismetaal. Elemente van binêre fasediagramme toegepas op die versterking van metale, die vorming van vaste oplossings en gedispergeerde fases; presipiteerverharding, blusverharding en tempering. Die invloed van allooistruktuur op sterkte-, rekbaarheid-, breuk- en kruipeienskappe.

Bekendstelling van TTT-diagramme vir staalsoorte, die verharding van koolstof- en mediumallooistaalsoorte, en die invloed van verhardbaarheid op sweisgedrag.

Oksidasie en korrosie van metale en allooie; spanningskorrosiekraking, korrosievermoeidheid; beskerming teen korrosie. Destruktiewe en niedestruktiewe toetsing van materiale (sterkte, rekbaarheid, afskuiwing, slag, vermoeidheid, hardheid, X-straal, gammastraal, ultrasonies). Metodes om metale te vorm en te bewerk. Eenvoudige spanning en vervorming; elastisiteitskonstantes saamgestelde spannings en vervormings; normale en skuifspannings; komplimentêre skuifspannings; Poisson se verhouding; verband tussen elastiese konstantes; hoofspannings en -vlakke; hoofvervormings; vervormingsenergie as gevolg van komplekse spanning; teorieë van elastiese weiering. Spannings en vervormings in dunwand- en dikwandsilinders onder vloeistofdruk; saamgestelde silinders. Buigmomente, helling en defleksie in vrysteun- en ingeboude balke en vrydraers. Verdeling van spanning in balke. Blad- en plat spiraalvere. Vervormingsenergie as gevolg van buiging. Style onder aksiale en eksentriese belastings; wringing van asse, kragtransmissie deur asse. Heliese toespoel- en oopspoelvere. Spanning en defleksie in raamwerk, analities en grafies behandel.

Systems, available energy, availability in cyclic processes and in non-cycle closed system processes. Entropy.

Heat transfer involving slender fins (fin efficiency) composite sections, flat and mathematically curved surfaces and with internal heat generation.

Derivation and solution of fundamental equations for steady two dimensional and unsteady one dimensional conduction problems. Transient heat flow.

Mixtures of gases and vapours, hygrometry, use of psychometric chart. Humidification and de-humidification. Direct contact water and gas cooling.

Application to air conditioning and non-marine plant.

Descriptive knowledge of laminar flame propagation, minimum spark ignition energy, quenching distance, spontaneous ignition, flammability limits. Fuels.

Combustion efficiency, effect of air/fuel ratio. First Law of Thermodynamics applied to combustion processes.

Frictionless one dimensional flow through ducts of varying cross sectional area, heat addition and external work critical pressure ratio. Mach number.

Stagnation properties (temperature, pressure) at a point in the fluid-stream. Wind tunnel testing.

Adiabatic one dimensional flow of imperfect gases in nozzles.

Application of fundamental principles to existing and proposed plant and equipment. Cycle analysis of specified hybrid plant both marine and non-marine.

STRENGTH AND PROPERTIES OF MATERIALS (SPECIAL GRADE)

Structure of the atom, electrons, protons, neutrons (simple Bohr atom); electron shells, energy levels, ionisation potentials. Arrangement of atoms in materials; types of atomic bond; crystalline and amorphous materials; nature of metallic, organic (highpolymer) and ceramic materials, crystal structure of metals; setting of resins.

Imperfections in materials and influence on mechanical properties; deformation in single crystals of polycrystalline metals; recrystallisation of deformed metals, basic strengthening mechanisms in metallic materials (strain hardening, solid-solution-hardening and dispersion hardening); deformation of polymers, methods of forming and working.

Mechanical properties of metals, polymers and other engineering materials (i.e. strength, elasticity, hardness, creep, fatique, resistance to impact, wear, ductile and brittle behaviour including effect of temperature and strain rate). Effects of stress concentrations.

The structure and properties of cast metals and alloys; typical defects in castings—shrinkage and gas unsoundness, residual stresses. Structural and mechanical property changes resulting from cold working, annealing and hot working of metals; comparison of mechanical properties of cast and raw products. The joining of metals, shrinkage, oxidation, residual stresses and cracking associated with welding. The effect of welding on structure and properties of parent metal. Elements of binary phase diagrams applied to the strengthening of metals, the formation of solid solutions and dispersed phases; precipitation—hardening, quench-hardening and tempering. The influence of alloy structure on strength, ductility, fracture and creep characteristics.

Introduction to TTT diagrams for steels, the hardening of carbon and medium alloy steels, and the influence of hardenability on welding behaviour.

Oxidation and corrosion of metals and alloys; stress-corrosion cracking, corrosion fatique; protection against corrosion. Destructive and non-destructive testing of materials (strength, ductility, shear, impact, fatique, hardness, X-ray, gamma ray, ultra sonic). Methods of forming and working metals. Simple stress and strains; elastic constants. Compound stresses and strains; normal and shear stresses; complementary shear stresses; Poisson's ratio; relation between elastic constants; principal stresses and planes; principal strains; strain energy due to complex stress; theories of elastic failure. Stresses and strains in thin wall and thick wall cylinders under fluid pressure; compound cylinders. Bending moments, slope and deflection in freely supported and built-in beams and cantilevers. Distribution of stress in beams. Leaf and flat spiral springs. Strain energy due to bending. Struts subjected to axial and eccentric loadings; torsion of shafts, transmission of power by shafting. Close coiled and open coiled helical springs. Stress and deflection in framework treated analytically and graphically.

MASJIENLEER EN HIDROMEGANIKA (SPESIALE GRAAD)

Vlakkinematika van meganismes. Oombliklike rotasiesenters. Relatiewe snelheid van masjiendele volgens berekening en grafiese metodes. Verplasings-, snelheids- en versnellingsdiagramme. Berekening van verplasingsnelheid en versnelling van skuifkrukmeganismes. Nokke. Vorm- en werkingsleer van rattande. Heliese keëlwurm, reguittandrataandrywing en ratstelle. Inersiekragte op enjinmeganismes. Balansering van roterende massas, primêre balansering van suierdele. Sekondêre balansering van enjins. Draaimomentdiagramme. Vliegwiele. Reëlaars. Trilling van meganiese stelsels insluitende geforseerde trilling en die effek van viskeuse demping. Wringossillasies van asse. Werweling van asse.

Giroskoopleer en -werking.

Wrywing en kettingaandrywing, koppelaars.

Smering, leer van grenslaagsmering, koeël- en rollaers.

Outomatiese beheer.—Analise van beheerstelsels met terugvoering wat voorgestel kan word deur eerste- en tweedeordedifferensiaalvergelykings. Voorbeelde uit marinepraktyk van servomeganismes en regulators.

Oordragfunksies.—Kombinasie van nie-wisselwerkende elemente; oop- en geslotelusoordragfunksies.

Stelselresponsie.—Oorgangs- en bestendige responsie van stelsels met trap- en kontinue veranderings van gewenste waarde en las; tydkonstante, natuurlike frekwensies, dempingsverhouding, logaritmiese dekrement, bestendige afwyking. Die beginsel van superponering. Harmoniese gevoeligheid: vektorverteenwoordiging van ingang en uitgang; amplitudeverhouding, faseverskuiwing, resonansie, prestasieverbetering: terugvoer- en vooruitvoermetodes; afgeleide en integrale werking, drietermkontroleerders.

Stabiliteit.—Die eienskappevergelyking, bepaling van wortels.

Hidrostatika.—Fundamentele eienskappe van vloeistowwe. Viskositeit, oppervlakspanning. Resulterende druk op plat- en geboë oppervlakke, -drukwerkpunt. Vertikale stabiliteit van die atmosfeer.

Hidrodinamika.—Stroomlyn-, laminêre en turbulente stroming, invloed van soliede grense op vloeistofbeweging. Bernoulli se wet, kontinuïteit van stroming. Verdeling van druk en snelheid in vry en geforseerde vortekse. Weerstand van viskeuse vloeistof in stroomlyn- of turbulente beweging. Gebruik van koëffisiënte om weerstand- en stroomlynkrimping te korrigeer. Meet van snelheid van onsaamdrukbare stroming deur pitot- en statiese drukbuise, openinge, kepe en Venturimeter. Drukverlies as gevolg van buigings, skielike vergrotings en krimpings—hidroulise gradiënt. Dinamiese gelykvormigheid. Stroming tussen parallelle vlakke en in ronde pype. Kritieke snelhede vir stroming in pype. Reynolds-getal. Rayleigh se formules. Waterslag. Slag en reaksie van stralers. Die leer van sentrifugale pompe, suierpompe, akkumulators en ander hidrouliese masjiene vir skeepswerking.

ELEKTROTEGNOLOGIE (SPESIALE GRAAD)

Netstellings en die toepassing daarvan op lineêre, passiewe en aktiewe nette. Nette met wedersydse induktansie. Tweedeelnette. Elektriese meetkringe. Vervormingsmeterkringe. Oorgangsverskynsels en ossillasies in RLC-kringe. Skakeltuig en verdeelstelsels. Kortsluitbeveiliging.

Saamgestelde magnetiesekringberekenings, energie in 'n magnetiese veld opgegaar, self- en onderlinge induktansie of kapasitansie op gelykstroomkringe.

Algemene beginsels van elektrostatika. Intensiteit en sterkte van elektriese velde, Gauss en Coulomb se stellings. Potensiaal en kapasitansie, potensiaalgradiënt. Lading en ontlading van kapasitors, insluitende ossillatorlading en -ontlading.

Ontwikkeling van sinusvormige EMK-golfvorm, waardes van stroom en spanning.

Wisselstroomkringe waarby weerstand, kapasitansie, induktansie en resonansie ingesluit is.

Fasorvoorstelling. Arbeidsfaktor. Enkel- en driefasekringe met ster- en deltaverbindings. Arbeid- en energiemeting in gebalanseerde en ongebalanseerde driefasekringe. Bofrekwensies in enkelfasekringe.

Vakuum- en gasgevulde kleppe en buise, halfgeleierdiodes, tiristors en transistors. Fotoëlektriese effekte en toepassings. Versterkers en gelykrigters. Terugvoereffekte op versterkers.

Bou van gelykstroommasjiene. Wikkelings, insluitende meervoudige wikkelings. Effeningsringe. Kommutasie. Ankerreaksie. Hulppole. Eienskappe van gelykstroommotore en generators gebruik in marinepraktyk. Motorspoed, -draaimoment, aansit en beheer. Toepassing van amplidine en metadine op spoed-, stroom- en spanningbeheer. Werking van gelykstroomgenerators parallel geskakel.

Toets van gelykstroommasjiene, direkte en indirekte metodes—skeiafstand van verliese, vertraging- en regeneratiewe toetsmetodes.

Bou van wisselstroommasjiene. Vloedverdeling in speekpool- en niespeekpoolvelde. EMK ontwikkel in spoele en verspreide wikkelings. Ankerreaksie. Alternators en die gebruik daarvan as sinchrone motore. Spanningreëling.

Parallelle werking van alternators. Statiese en draaispanningreëlaars. Instrumente. Transformators- fasordiagramme, ekwivalente kring, spanningreëling en rendement. Veelfase-induksiemotore- teorie, eienskappe en aansitinrigtings. Sinchrone masjiene—ekwivalente kring, sinchrone—impedansie-spanningreëling.

THEORY OF MACHINES AND MACHANICS OF FLUIDS (SPECIAL GRADE)

Plane kinematics of mechanisms. Instantaneous centres of rotation. Relative velocity of machine parts by calculation and graphic methods. Displacement, velocity and acceleration diagrams. Calculation of displacement, velocity and acceleration of slider crank mechanisms. Cams. Theory of shape and action of gear teeth. Helical, bevel worm, spur gearing and gear trains. Inertia forces on engine mechanisms. Balancing of rotating masses, primary balancing of reciprocating parts, secondary balancing of engines. Turning moment diagrams. Flywheels. Governors. Vibrations of mechanical systems including forced vibration and the effect of viscous damping. Torsional oscillations of shafting. Whirling of shafts.

Gyroscopic theory and action.

Friction and chain drives, clutches.

Lubrication, theory of boundary film lubrication, ball and roller bearings.

Automatic control.—Analysis of control systems with feedback which can be represented by first and second order differential equations. Examples from marine practice of servo mechanisms and regulators.

Transfer functions.—Combination of non interacting elements; open and closed loop transfer functions.

System response.—Transient and steady state response of systems with step and ramp changes of desired value and load; time constant, natural frequencies, damping ratio, logarithmic decrement, steady state deviation. The principle of superposition. Harmonic response: vectorial representation of input and output; amplitude ratio, phase displacement, resonance, performance improvement: feedback and feedforward methods; derivative and integral action, three term controllers.

Stability.—The characteristics equation, determination of roots.

Hydrostatics.—Fundamental properties of fluids. Viscosity, surface tension. Resultant pressure on plane and curved surfaces, centre of pressure. Vertical stability of the atmosphere. Hydrodynamics: Streamline, laminar and turbulent flow, influence of solid boundaries on fluid motion. Bernoulli's principle, continuity of flow. Distribution of pressure and velocity in free and forced vortices. Resistance of viscous fluid in streamline or turbulent motion. Use of coefficients to correct for resistance and streamline contraction. Measurement of velocity of incompressible flow by Pitot and static pressure tubes, orifices, notches and Venturi meter. Loss of head due to bonds, sudden enlargements and contractions—hydraulic gradient. Dynamical similarity. Flow between parallel surfaces and in circular pipes. Critical velocities for flow in pipes. Reynolds' number, Rayleigh's formulae. Water-hammer. Impact and reaction of jets. The theory of centrifugal pumps, reciprocating pumps, accumulators and other hydraulic machines with a marine application.

ELECTROTECHNOLOGY (SPECIAL GRADE)

Network theorems and their application to linear passive and active networks. Networks with mutual inductance. Two part networks. Electrical measurement circuits. Strain guage circuits. Transients and oscillations in R.L.C. circuits. Switchgear and distribution systems. Short circuit protection.

Composite magnetic circuit calculations, energy stored in a magnetic field, self and mutual inductance or capacitance on d.c. circuits.

General principles of electrostatics. Intensity and strength of electrostatics. Intensity and strength of electric fields, Theorems of Gauss and Coulomb. Potential and capacitance, potential gradient. Charge and discharge of capacitors including oscillatory charge and discharge.

Generation of sinusoidal e.m.f. waveform, values of current and voltage.

A.C. circuits involving resistance, capacitance, inductance and resonance.

Phasor representation. Power factor. Single and threephase circuits with star and delta connections. Power and energy measurement in three-phase balanced and unbalanced circuits. Harmonics in single-phase circuits.

Vacuum and gas-filled valves and tubes, semi-conductor diodes, thyristors and transistors. Photo-electric effects and applications. Amplifiers and rectifiers. Feedback effects on amplifiers.

Construction of d.c. machines. Windings including multiple windings. Equaliser rings. Commutation. Armature reaction. Interpoles. Characteristics of d.c. motors and generators used in marine practice. Motor speed, torque, starting and control. Application of amplidyne and metadyne to control of speed, current and voltage. Operation of d.c. generators in parallel.

Testing of d.c. machines direct and indirect methods—separation of losses, retardation and regeneration of testing.

Construction of a.c. machines. Flux distribution in salient pole and non-salient pole fields. E.m.f. generated in coils and distributed windings. Armature reaction. Alternators and their use as synchronous motors. Voltage regulation.

Parallel operation of alternators. Static and rotary voltage regulators. Instruments. Transformers—phasor diagrams, equivalent circuit, voltage regulation and efficiency. Polyphase induction motors—theory, characteristics and starting arrangements. Synchronous machines—equivalent circuit, synchronous impedance voltage regulation.

Outomatiese beheer, simulasie, gebruik van analoë. Ontwikkeling van integrale en afgeleide werking deur passiewe en aktiewe elektriese stroomkringe. Ontleding van beheerstelsels met terugvoer. Ingang- en uitgangeienskappe. Oorgangs-, bestendige en bofrekwensieresponsie van stelsels. Instrumente -aanwyser, opnemer, integreerder, detektor, omsetter en -dataoorsender. Aanpas van onderdele.

SKEEPSBOUKUNDE (SPESIALE GRAAD)

Stabiliteit.—Hidrostatiese krommes, statiese krommes en dwarskrommes van stabiliteit. Dinamiese stabiliteit. Vryvlakprobleme. Gronding.

Onderverdeling van passasierskepe.—Onderwaterlengtekrommmes en die gebruik daarvan.

Sterkte van skepe.—Golwe. Trogoïdale golwe. Sinusgolwe. Golfenergie. Golfspektra.

Statiese voorstelling. Plaaslike en langssterkteberekenings. Statiese sterkte grafies en deur berekening behandel. Dinamiese effekte. Waarskynlikheidsbenadering van langssterkte. Ossillasie, rol en hei van skepe. Kwalitatiewe behandeling van trillings.

Weerstand en aandrywing van skepe.—Modeleksperimente en wette van vergelyking. Dinamiese gelykvormigheid. Viskositeit en die effekte daarvan op vloeistofwrywing. Dimensionele ontleding en die nie-dimensionele faktorbenadering van Reynolds- en Fraude-getalle. Ander metodes vir bepalings van krag, bv. Admiraliteitskoëffisiëntformule, Taylorkrommes. Kringkonstantes en die gebruik daarvan.

Skroewe, meetkunde van die heliks tipiese snelheidsdriehoek wat skeepshelling en invalshoek insluit. Stukrag, draaimoment en rendement. Bladelementteorie—hefkrag en sleur op stroombladvak. Aksiale momentum. Skroefkoëffisiënte en die gebruik daarvan. Kavitasie. Wisselwerking tussen skroef en skip. Romprendement en die faktore daarvan. Totale aandrywingskoëffisiënt.

Skeepsbou en materiaal gebruik by skeepsbou. Moderne ontwikkeling in strukturele ontwerp. Die gebruik van trekvaste staal, sagte staal, aluminium en ander materiale. Diskontinuïteite. Sweis. Korrosie en aangroeisels. Strukturele brandbeskerming.

Algemene beginsels van laslyntoewysing en tonnemaatmetings.

INGENIEURSWESE (SPESIALE GRAAD)

Vrae sal gestel word om die kandidaat se kennis te toets van tegnologiese ondersoeke wat die ingenieurspraktyk beïnvloed het en belangrike ontwikkelings wat daaruit voortgevloei het sonder die beperkings van die Klas 1- en Klas 2-eksamenleerplanne.

OPSTEL (SPESIALE GRAAD)

Die doel met die opstel is om die kandidate se bekwaamheid te toets om goeie grammatiese Engels saam te stel en te skryf en om hulle menings, bevindings en wenke uit te druk in opstelle oor onderwerpe wat in verband staan met die ingenieur in die samelewing, of oor onderwerpe van aktuele belang.

INGENIEURSTEKENE EN -ONTWERP

Die opstel van 'n werktekening van enige deel van skeepsmasjinerie, ketels, meganiese uitrusting of dele van skeepstruktuur wat meebring die rangskikking van samestellende dele uit gegewe besonderhede, en ontwerpberekenings wat gevra word.

AANHANGSEL 5

REPUBLIEK VAN SUID-AFRIKA

Bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas.....
..... van 'n skip toegerus met.....
.....aandryfmasjinerie

No.....

Hierby word gesertifiseer dat.....
aan al die vereistes voldoen het wat by wet voorgeskryf is vir die verlening van hierdie Bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas .....van 'n skip toegerus met.....aandryfmasjinerie.

Hierdie sertifikaat word derhalwe aan hom verleen kragtens artikel .....van die Handelskeepvaartwet, 1951 (Wet 57 van 1951), soos gewysig. Hy moet ook die houer wees van 'n gepaste Gevaarlikevrag-endossement waar sodanige endossement vereis word ten opsigte van 'n skip waarvoor hy andersins gekwalifiseer is.

Gedateer te....., op hede die.....dag van .....19.....

.....
Minister van Vervoerwese

Automatic control, simulation, use of analogues. Generation of integral and derivative action by passive and active electrical circuits. Analysis of control systems with feedback. Input and output characteristics. Transient, steady state and harmonic response of systems. Instruments—indicating, recording, integrating, detection, conversion and data transmission. Matching of components.

NAVAL ARCHITECTURE (SPECIAL GRADE)

Stability.—Hydrostatic curves, statical curves and cross curves of stability. Dynamical stability. Free surface problems. Grounding.

Subdivision of passenger ships.—Floodable length curves and their use.

The strength of ships.—Waves. Trochoidal waves. Sinusoidal waves. Wave energy. Wave spectra. Statistical representation. Local and longitudinal strength calculations. Statical strength treated graphically and by calculation. Dynamical effects. Probability approach to longitudinal strength. Oscillation, rolling and pitching of ships. Qualitative treatment of vibrations.

Resistance and propulsion of ships.—Model experiments and laws of comparison. Dynamical similarity. Viscosity and its effects on fluid friction. Dimensional analysis and the non-dimensional factor approach to Reynolds' and Froude's numbers. Other methods of estimating power, e.g. Admiralty coefficient formula, Taylors curves. Circular constants and their use.

Propellers, geometry of the helix, typical triangle of velocities introducing slip and angle of incidence. Thrust, torque and efficiency. Blade element theory—lift and drag on aerofoil section. Axial momentum. Propeller coefficients and their use. Cavitation. Interaction between screw and ship. Hull efficiency and its factors. Overall propulsion coefficient.

Ship construction and materials used in ship building. Modern developments in structural design. Use of high tensile steels, mild steel, aluminium and other materials. Discontinuities. Welding. Corrosion and fouling. Structural fire protection.

General principles of load line assignment and tonnage measurements.

ENGINEERING KNOWLEDGE (SPECIAL GRADE)

Questions will be set to test the candidate's knowledge of technological investigations which have influenced engineering practice and important developments arising therefrom free from the limitations of the Class 1 and Class 2 examination syllabuses.

ESSAY (SPECIAL GRADE)

The purpose of the Essay is to test the candidates' ability to compose and write good grammactical English and to express their opinions, conclusions and suggestions in essays on subjects connected with the engineer in society or on topics of current interest.

ENGINEERING DRAWING AND DESIGN (SPECIAL GRADE)

To produce a working drawing of any part of marine machinery, boilers, mechanical equipment or parts of ship structure involving the arrangement of constituent members from given particulars and the design calculations asked for.

ANNEX 5

REPUBLIC OF SOUTH AFRICA

Certificate of Competency as Marine Engineer-officer Class.....
..... of a ship fitted with.....
propelling machinery

No.....

This is to certify that..... has satisfied all the requirements prescribed by law for the granting of this Certificate of Competency as Marine Engineer-officer Class.....
of a ship fitted with ..... propelling machinery. This certificate is therefore granted to him in terms of section ..... of the Merchant Shipping Act, 1951 (Act 57 of 1951), as amended. He must also hold an appropriate Dangerous Cargo Endorsement where such is required in respect of any ship for which he is otherwise qualifed.

Dated at..... this .....day of .....19.....

.....
Minister of Transport Affairs

PERSOONSBESKRYWING VAN KANDIDAAT

Lengte (m)	Kleur van oë	Kleur van hare	Geboorte-datum	Geboorte-plek

Ras	Persoonlike merke of eienaardighede (as daar is)

Hierdie sertifikaat word uitgereik op grond van 'n eksamen waarin geslaag is te ....., op hede die .....dag van .....19.....

.....
Handtekening van bevoegde beampte of eksaminator

Kantoordatumstempel

.....
Handtekening van houer

STRAWWE VIR BEDRIEGLIKE HANDELINGE IN VERBAND MET HIERDIE SERTIFIKAAT

Enigeen wat—

(a) 'n bekwaamheidsertifikaat wat kragtens Wet 57 van 1951 uitgereik is, vervals; of

(b) 'n vervalste dokument wat heet 'n bekwaamheidsertifikaat te wees wat kragtens Wet 57 van 1951 uitgereik is, vertoon of andersins uitgee terwyl hy weet dat dit vervals is; of

(c) 'n bekwaamheidsertifikaat wat ingetrek of opgeskort is of wat verstryk het of waarop hy nie geregtig is nie, wetens vertoon of andersins gebruik; of

(d) 'n bekwaamheidsertifikaat aan 'n persoon leen van wie hy weet dat hy nie daarop geregtig is nie, of toelaat dat so 'n persoon dit gebruik;

begaan 'n misdryf en is by skuldigbevinding strafbaar met 'n boete van R2 000 of met gevangenisstraf van twee jaar of met beide sodanige boete en gevangenisstraf [sien artikels 313 (2) en 315 van Wet 57 van 1951].

L.W.—Enigeen, behalwe die eienaar hiervan, wat in besit kom van hierdie sertifikaat, moet dit dadelik aan die Direkteur-generaal: Vervoer, Pretoria, stuur.

ADDISIONELE KWALIFIKASIES

REPUBLIEK VAN SUID-AFRIKA

BEKWAAMHEIDSERTIFIKAAT AS HOOF-INGENIEUROFFISIER—SPESIALE GRAAD

No.....

Aan.....

Nademaal u aan al die vereistes wat by wet voorgeskryf is vir die verlening aan u van 'n Bekwaamheidsertifikaat as Hoof-ingenieuroffisier—Spesiale Graad voldoen het, word hierdie sertifikaat kragtens artikel ..... van die Handelskeepvaartwet, 1951 (Wet 57 van 1951), soos gewysig, aan u verleen.

Gedateer te ..... op hede die .....dag van .....19.....

.....
Minister van Vervoerwese

Sertifikaat moet geëndosseer word vir stoom- of motorskip, of vir stoom en motor.

PERSOONSBESKRYWING VAN KANDIDAAT

Lengte (m)	Kleur van oë	Kleur van hare	Geboorte-datum	Geboorte-plek

Ras	Persoonlike merke of eienaardighede (as daar is)

PERSONAL DESCRIPTION OF CANDIDATE

Height (m)	Colour of eyes	Colour of hair	Date of birth	Place of birth

Race	Personal marks or peculiarities (if any)

This certificate is given upon an examination passed at .....on the ..... day of .....19.....

Office date stamp

.....
Signature of proper officer or examiner

.....
Signature of holder

PENALTIES FOR FRAUDULENT ACTS CONNECTED WITH THIS CERTIFICATE

Any person who—

(a) forges any certificate of competency issued under Act 57 of 1951; or

(b) produces or otherwise passes off any forged document purporting to be a certificate of competency issued under Act 57 of 1951, which he knows to be forged; or

(c) knowingly produces or otherwise uses any certificate of competency which has been cancelled or suspended or which has expired or to which he is not entitled; or

(d) lends to any person who he knows is not entitled thereto a certificate of competency or allows it to be used by any such person;

is guilty of an offence and on conviction is liable to a fine of R2 000 or two years' imprisonment or both [see sections 313 (2) and 315 of Act 57 of 1951].

N.B.—Any person other than the owner hereof becoming possessed of this certificate should transmit it forthwith to the Director-General: Transport, Pretoria.

ADDITIONAL QUALIFICATIONS

REPUBLIC OF SOUTH AFRICA

CERTIFICATE OF COMPETENCY AS CHIEF ENGINEER OFFICER—SPECIAL GRADE

No.....

To .....

Whereas you have satisfied all the requirements prescribed by law for the granting to you of a Certificate of Competency as Chief Engineer Officer—Special Grade this certificate is granted to you in terms of section .....of the Merchant Shipping Act, 1951 (Act 57 of 1951), as amended.

Dated at..... this .....day of .....19.....

.....
Minister of Transport Affairs

Certificate to be endorsed for steamship or motorship or for combined steam and motor.

PERSONAL DESCRIPTION OF CANDIDATE

Height (m)	Colour of eyes	Colour of hair	Date of birth	Place of birth

Race	Personal marks or peculiarities (if any)

Hierdie sertifikaat word uitgereik op grond van 'n eksamen waarin geslaag is te ....., op hede die .....dag van .....19.....

.....
Handtekening van bevoegde beampte of eksaminator

Kantoordatumstempel

.....
Handtekening van houer

STRAWWE VIR BEDRIEGLIKE HANDELINGE IN VERBAND MET HIERDIE SERTIFIKAAT

Enigeen wat—

(a) 'n dienssertifikaat wat kragtens Wet 57 van 1951 uitgereik is, vervals; of

(b) 'n vervalste dokument wat heet 'n dienssertifikaat te wees wat kragtens Wet 57 van 1951 uitgereik is, vertoon of andersins uitgee terwyl hy weet dat dit vervals is; of

(c) 'n dienssertifikaat wat ingetrek of opgeskort is of wat verstryk het of waarop hy nie geregtig is nie, wetens vertoon of andersins gebruik; of

(d) 'n dienssertifikaat aan 'n persoon leen van wie hy weet dat hy nie daarop geregtig is nie, of toelaat dat so 'n persoon dit gebruik;

begaan 'n misdryf en is by skuldigbevinding strafbaar met 'n boete van R2 000 of met gevangenisstraf van twee jaar of met beide sodanige boete en gevangenisstraf [sien artikels 313 (2) en 315 van Wet 57 van 1951].

L.W.—Enigeen, behalwe die eienaar hiervan, wat in besit kom van hierdie sertifikaat, moet dit dadelik aan die Direkteur-generaal: Vervoer, Pretoria, stuur.

AANHANGSEL 6

REPUBLIEK VAN SUID-AFRIKA

Dienssertifikaat as Marine-ingenieuroffisier Klas .... van 'n skip toegerus met .... aandryfmasjinerie

No .....

Hierby word gesertifiseer dat hierdie dienssertifikaat toegeken word aan ....., wat voldoen het aan al die bepalings van artikel 80 van die Handelskeepvaartwet, 1951 (Wet 57 van 1951), soos gewysig. Hy moet ook die houer wees van 'n gepaste Gevaarlikevragendossement waar sodanige endossement vereis word ten opsigte van 'n skip waarvoor hy andersins gekwalifiseer is.

Gedateer te ..... , op hede die .....dag van .....19.....

.....
Minister van Vervoerwese

PERSOONSBESKRYWING VAN KANDIDAAT

Lengte (m)	Kleur van oë	Kleur van hare	Geboorte-datum	Geboorte-plek

Ras	Persoonlike merke of eienaardighede (as daar is)

Uitgereik by die hawe ..... op hede die ..... dag van .....19.....

.....
Handtekening van bevoegde beampte of eksaminator

Kantoordatumstempel

.....
Handtekening van houer

STRAWWE VIR BEDRIEGLIKE HANDELINGE IN VERBAND MET HIERDIE SERTIFIKAAT

Enigeen wat—

(a) 'n bekwaamheidsertifikaat wat kragtens Wet 57 van 1951 uitgereik is, vervals; of

(b) 'n vervalste dokument wat heet 'n bekwaamheidsertifikaat te wees wat kragtens Wet 57 van 1951 uitgereik is, vertoon of andersins uitgee terwyl hy weet dat dit vervals is; of

This certificate is given upon an examination passed at ..... on the ..... day of.....19.....

Office date stamp

.....
Signature of proper officer or examiner

.....
Signature of holder

PENALTIES FOR FRAUDULENT ACTS CONNECTED WITH THIS CERTIFICATE

Any person who—

(a) forges any certificate of service issued under Act 57 of 1951; or

(b) produces or otherwise passes off any forged document purporting to be a certificate of service issued under Act 57 of 1951, which he knows to be forged; or

(c) knowingly produces or otherwise uses any certificate of service which has been cancelled or suspended or which has expired or to which he is not entitled; or

(d) lends to any person who he knows is not entitled thereto a certificate of service or allows it to be used by any such person;

is guilty of an offence and on conviction is liable to a fine of R2 000 or two years' imprisonment or both [see sections 313 (2) and 315 of Act 57 of 1951].

N.B.—Any person other than the owner hereof becoming possessed of this certificate should transmit it forthwith to the Director-General: Transport, Pretoria.

ANNEX 6

REPUBLIC OF SOUTH AFRICA

Certificate of service as Marine Engineer-officer Class .... of a ship fitted with .....propelling machinery

No. .....

This is to certify that ..... having complied with the provisions of section 80 of the Merchant Shipping Act, 1951 (Act 57 of 1951), as amended, is hereby granted this certificate of service. He must also hold an appropriate Dangerous Cargo Endorsement where such is required in respect of any ship for which he is otherwise qualified.

Dated at..... this .....day of .....19.....

.....
Minister of Transport Affairs

PERSONAL DESCRIPTION OF CANDIDATE

Height (m)	Colour of eyes	Colour of hair	Date of birth	Place of birth

Race	Personal marks or peculiarities (if any)

Issued at the port of ..... this.....day of..... 19.....

Office date stamp

.....
Signature of proper officer or examiner

.....
Signature of holder

PENALTIES FOR FRAUDULENT ACTS CONNECTED WITH THIS CERTIFICATE

Any person who—

(a) forges any certificate of competency issued under Act 57/1951; or

(b) produces or otherwise passes off any forged document purporting to be a certificate of competency issued under Act 57 of 1951, which he knows to be forged; or

(c) 'n bekwaamheidsertifikaat wat ingetrek of opgeskort is of wat verstryk het of waarop hy nie geregtig is nie, wetens vertoon of andersins gebruik; of

(d) 'n bekwaamheidsertifikaat aan 'n persoon leen van wie hy weet dat hy nie daarop geregtig is nie, of toelaat dat so 'n persoon dit gebruik;

begaan 'n misdryf en is by skuldigbevinding strafbaar met 'n boete van R2 000 of met gevangenisstraf van twee jaar of met beide sodanige boete en gevangenisstraf [sien artikels 313 (2) en 315 van Wet 57 van 1951].

L.W.—Enigeen, behalwe die eienaar hiervan, wat in besit kom van hierdie sertifikaat, moet dit dadelik aan die Direkteur-generaal: Vervoer, Pretoria, stuur.

(c) knowingly produces or otherwise uses any certificate of competency which has been cancelled or suspended or which has expired or to which he is not entitled; or

(d) lends to any person who he knows is not entitled thereto a certificate of competency or allows it to be used by any such person;

is guilty of an offence and on conviction is liable to a fine of R2 000 or two years' imprisonment or both [see sections 313 (2) and 315 of Act 57 of 1951].

N.B.—Any person other than the owner hereof becoming possessed of this certificate should transmit it forthwith to the Director-General: Transport, Pretoria.

AANHANGSEL 7

LYS VAN VRYSTELLINGSKWALIFIKASIES

Bekwaamheidsertifikaat-eksamen	Vrystellingskwalifikasies op 'n vak-vir-vakgrondslag, waar van toepassing	Bekwaamheidsertifikaat-eksamen	Vrystellingskwalifikasies op 'n vak-vir-vakgrondslag, waar van toepassing	Bekwaamheidsertifikaat-eksamen	Vrystellingskwalifikasies op 'n vak-vir-vakgrondslag, waar van toepassing
Marine-ingenieuroffisier Klas 4 *of* Marine-ingenieuroffisier Klas 3 *of* Marine-ingenieuroffisier Klas 2	(a) Die voltooiing van die kursus vir die Nasionale Diploma in Marine-ingenieurswese met 'n minimum van 40 % in al die vakke *of* (b) Die Nasionale Diploma in Meganiese Ingenieurswese *of* (c) Die Nasionale Tegniese Sertifikaat Deel 6 *of* (d) Die voltooiing van 90 % van die vakke van 'n tweedejaar-B.Sc.-ingenieurskursus (die besluit van die eksaminator is finaal) *of* (e) 'n Bekwaamheidsertifikaat as Meganiese of Elektriese Ingenieur vir Fabrieke uitgereik deur die Departement van Mannekrag. Vrystelling van alle vakke behalwe Skeepsboukunde en Ingenieurswese.	Marine-ingenieuroffisier Klas 1	(a) Die Nasionale Diploma in Marine-ingenieurswese *of* (b) Die Nasionale Hoër Diploma in Meganiese Ingenieurswese *of* (c) Die Nasionale Tegniese Diploma *of* (d) Die voltooiing van 80 % van die vakke van 'n derdejaar-B.Sc.-ingenieurskursus na goeddunke van die eksaminator *of* (e) 'n Bekwaamheidsertifikaat as Meganiese of Elektriese Ingenieur vir Fabrieke uitgereik deur die Departement van Mannekrag. Vrystelling van alle vakke behalwe Skeepsboukunde en Ingenieurswese	Hoof-ingenieuroffisier (Spesiale Graad) Stoomskepe *of* motorskepe *of* stoom en motor gekombineerd	(a) Registrasie as 'n Professionele Ingenieur ingevolge die Wet op Professionale Ingenieurs, Wet 81 van 1968, op grond van slaging in 'n basiese eksamen *of* (b) Die Nasionale Diploma in Tegnologie (Meganiese Ingenieurswese)

Let Wel: (i) In die geval van Hoof-ingenieuroffisier (Spesiale Graad) is die eksamenkwalifikasies gelys bykomend by die hou van 'n bekwaamheidsertifikaat as Marine-ingenieuroffisier Klas 1 van stoomskepe of motorskepe op vreemde vaart, of 'n gekombineerde sertifikaat.

(ii) Klas 2- en Klas 1-kandidate wat houers is van die toepaslike sertifikaat van die Departement van Mannekrag sal slegs in Skeepsboukunde en Ingenieurswese geëksamineer word.

ANNEX 7

LIST OF EXEMPTING QUALIFICATIONS

Certificate of Competency Examination	Exempting Qualifications on a subject for subject basis where applicable	Certificate of Competency Examination	Exempting Qualifications on a subject for subject basis where applicable	Certificate of Competency Examination	Exempting Qualification on a subject for subject basis where applicable
Marine Engineer Officer Class 4 *or* Marine Engineer Officer Class 3 *or* Marine Engineer Officer Class 2	(a) The completion of the course for the National Diploma in Marine Engineering with a minimum of 40 % in all subjects *or* (b) The National Diploma in Mechanical Engineering *or* (c) The National Technical Certificate Part 6 *or* (d) The completion of 90 % of the subjects of a second year B.Sc. Engineering Course (The decision of the examiner will be final) *or* (e) A Mechanical or Electrical Engineer's Certificate of Competency for Factories issued by the Department of Labour. Exemption from all subjects except Naval Architecture and Engineering Knowledge	Marine Engineer Officer Class 1	(a) The National Diploma in Marine Engineering *or* (b) The National Higher Diploma in Mechanical Engineering *or* (c) The National Technical Diploma *or* (d) The completion of 80 % of the subjects of a third year B.Sc. Engineering Course at the discretion of the examiner *or* (e) A Mechanical or Electrical Engineer's Certificate of Competency for Factories issued by the Department of Labour. Exemption from all subjects except Naval Architecture and Engineering Knowledge	Chief Engineer Officer (Special Grade) Steamships *or* Motorships *or* Combined Steam and Motor (non Statutory)	(a) Registration as a Professional Engineer under the Professional Engineers Act No. 81 of 1968 by reason of passing a degree level examination *or* (b) The National Diploma in Technology. (Mechanical Engineering)

Note: (i) In the case of Chief Engineer Officer (Special Grade), the examination qualifications listed are additional to holding a certificate of competency as Marine Engineer Officer Class 1 of foreign-going steamships or motorships or a combined certificate.

(ii) Class 2 and Class 1 candidates who hold the appropriate Department of Labour certificate will only be examined in Naval Architecture and Engineering Knowledge.

AANHANGSEL 8

EKSAMENROOSTERS VIR MARINE-INGENIEUROFFISIER KLAS 4, KLAS 3, KLAS 2, KLAS 1 EN VIR HOOF-INGENIEUROFFISIER (SPESIALE GRAAD)

Rooster vir Klas 4 en Klas 3

Dag	Deel van eksamen	Oggendsessie (9–12)	Middagsessie (1–4)
Maandag	B	Ingenieurswese (Een vraestel—drie uur)	Ingenieurswese (Een vraestel—drie uur)
Woensdag.....	A	Algemene Ingenieurswetenskap (Een vraestel—drie uur)	Hittewerktuie (Een vraestel—drie uur)

Opmerking.—Die mondelinge eksamen word afgelê na voltooiing van die skriftelike vraestelle op 'n tyd deur die eksaminator bepaal.

Rooster vir Klas 2

Dag	Deel van eksamen	Oggendsessie (9–12)	Middagsessie (1–4)
Maandag	B	Ingenieurswese (Een vraestel—drie uur)	Ingenieurswese (Een vraestel—drie uur) Opmerking: Afsonderlike vraestelle word opgestel vir stoom-en motor-kandidate
Dinsdag.....	B	Elektrotegnologie (Een vraestel—drie uur)	Skeepsboukunde (Een vraestel—drie uur)
Woensdag.....	A	Toegepaste Meganika (Een vraestel—drie uur)	Hittewerktuie (Een vraestel—drie uur)
Donderdag	A	A Wiskunde (Een vraestel—drie uur)	
Vrydag.....	A	Ingenieurstekene (Een vraestel—ses uur) (9–3)	

Opmerking.—Die mondelinge eksamen word afgelê na voltooiing van die skriftelike vraestelle op 'n tyd deur die eksaminator bepaal.

Rooster vir Klas 1

Dag	Deel van eksamen	Oggendsessie (9–12)	Middagsessie (1–4)
Maandag	B	Ingenieurswese (Een vraestel—drie uur)	Ingenieurswese (Een vraestel—drie uur) Opmerking: Afsonderlike vraestelle word opgestel vir stoom-en motor-kandidate
Dinsdag.....	B	Elektrotegnologie (Een vraestel—drie uur)	Skeepsboukunde (Een vraestel—drie uur)
Woensdag.....	A	Toegepaste Meganika (Een vraestel—drie uur)	Hittewerktuie (Een vraestel—drie uur)

Opmerking.—Die mondelinge eksamen word afgelê na voltooiing van die skriftelike vraestelle op 'n tyd deur die eksaminator bepaal.

HOOF-INGENIEUROFFISIER (SPESIALE GRAAD)

Eksamenrooster

Dag	Eerste week Deel A	Tweede week Deel B	
	Slegs in die oggend	Oggend	Middag
Maandag	Toegepaste Termodinamika 1	Elektrotegnologie	
Dinsdag.....	Toegepaste Termodinamika 2	Skeepsboukunde	
Woensdag.....	Sterkteleer en Eienskappe van Materiale	Ingenieurswese	Opstel
Donderdag	Masjienleer (Hidromeganika)	Masjienontwerp	

ANNEX 8

TIME-TABLES OF EXAMINATIONS FOR MARINE ENGINEER OFFICER CLASS 4, CLASS 3, CLASS 2, CLASS 1, AND SPECIAL GRADE

Time-table for Class 4 and Class 3

Day	Part of examination	Morning session (9–12)	Afternoon session (1–4)
Monday.....	B	Engineering Knowledge (one paper—three hours)	Engineering Knowledge (one paper—three hours)
Wednesday.....	A	General Engineering Science (one paper—three hours)	Heat Engines (one paper—three hours)

Note.—The oral examination will be taken on completion of the written papers at a time fixed by the Examiner.

Time-table for Class 2

Day	Part of examination	Morning session (9–12)	Afternoon session (1–4)
Monday.....	B	Engineering Knowledge (one paper—three hours)	Engineering Knowledge (one paper—three hours). Note: Separate papers are set for Steam and Motor candidates
Tuesday	B	Electrotechnology (one paper—three hours)	Naval Architecture (one paper—three hours)
Wednesday.....	A	Applied Mechanics (one paper—three hours)	Heat Engines (one paper—three hours)
Thursday	A	A Mathematics (one paper—three hours)	
Friday.....	A	Engineering Drawing (one paper—six hours) (9–3)	

Note.—The oral examination will be taken on completion of the written papers at a time fixed by the Examiner.

Time-table for Class 1

Day	Part of examination	Morning session (9–12)	Afternoon session (1–4)
Monday.....	B	Engineering Knowledge (one paper—three hours)	Engineering Knowledge (one paper—three hours). Note: Separate papers are set for Steam and Motor candidates
Tuesday	B	Electrotechnology (one paper—three hours)	Naval Architecture (one paper—three hours)
Wednesday.....	A	Applied Mechanics (one paper—three hours)	Heat Engines (one paper—three hours)

Note.—The oral examination will be taken on completion of the written papers at a time fixed by the Examiner.

CHIEF ENGINEER-OFFICER (SPECIAL GRADE)

Time-table of examination

Day	First week Part A	Second week Part B	
	Morning only	Morning	Afternoon
Monday.....	Applied Thermodynamics 1	Electrotechnology	
Tuesday	Applied Thermodynamics 2	Naval Architecture	
Wednesday.....	Strength and Properties of Materials	Engineering Knowledge	Essay
Thursday	Theory of Machines (Mechanics of Fluids)	Machine Design	

AANHANGSEL 9

REËLS WAT NAGEKOM MOET WORD GEDURENDE DIE EKSAMEN VAN MARINE-INGENIEUROFFISIERE

1. Kandidate mag geen ander boeke, aantekeninge, memoranda of papier by hulle hê as dié wat vir gebruik in die eksamen aan hulle verskaf is nie. Indien 'n kandidaat sodanige aantekeninge ens. met hom saamgebring het, moet hy dit aan die eksaminator oorhandig voordat hy met die vraestel begin.

2. Kandidate sal toegelaat word om wiskundetafels, vloeistofeienskaptabelle en entalpie-entropie-kaarte te gebruik wat deur die eksaminator voorsien word.

3. Tekenborde en tekenhake sal waar nodig voorsien word, maar kandidate moet hulle eie tekeninstrumente saambring.

4. Gedurende die eksamen moet stilte bewaar word.

5. 'n Kandidaat mag nie sy sitplek of die eksamenkamer sonder die toestemming van die eksaminator verlaat nie. Indien hy die kamer verlaat, mag hy nie sonder die toestemming van die eksaminator met 'n vraestel of probleem waarmee hy besig was, voortgaan nie.

6. Kandidate word aangeraai om die vrae sorgvuldig te lees en hul aandag by die gegewe probleme te bepaal en slegs te antwoord wat gevra word. Hierdie advies is van toepassing op alle dele van die eksamen, maar veral op Tekene.

7. Daar mag nie op die vraestelle en wiskundetafels, wat die eiendom van die Marine-afdeling is, geskryf word nie en dit mag op geen manier geskend word nie. Sagte potlode moet op entalpie-entropie-kaarte gebruik word.

8. Vrae moet uitgewerk word slegs op die los papier wat voorsien word en daar mag slegs op een kant van die bladsy geskryf word. Elke bladsy moet onderteken word. Alle werk uitgesonderd sketse en tekeninge moet in ink gedoen word. Elke vraag moet op 'n skoon bladsy begin word. Die nommer van die vraag moet op elke bladsy verskyn. Al die werk moet uiteengesit word en geen stukkies papier word toegelaat nie.

9. Die skryf van goeie Engels of Afrikaans en leesbare handskrif sal in aanmerking geneem word. Punte sal afgetrek word vir swak grammatika, foutiewe spelling en punktuasiefoute. Erkenning sal gegee word vir duidelike stellings, beredenering en berekenings by die oplos van probleme.

10. Indien addisionele papier verlang word, sal dit deur die eksaminator voorsien word. Die nodige besonderhede moet ook op die los omslag gegee word en elke bladsy of vel teken- of grafiekpapier wat gebruik is, moet deur die kandidaat onderteken word.

11. Kandidate kan vir hulle berekenings van rekenliniale of nie-programmeerbare rekenmasjiene gebruik maak, maar moet in elke geval in ink 'n volledige uiteensetting gee van die stappe wat nodig is om die antwoord te verkry, anders sal geen punte vir die antwoorde toegeken word nie. Rekenmasjiene word nie in die wiskunde-eksamen toegelaat nie.

12. Kandidate mag nie gedurende die eksamen met mekaar kommunikeer nie. Hulle mag nie aantekeninge maak of hulle antwoorde op eksamenvrae afskryf met die doel om dit uit die lokaal te neem nie. Vraestelle mag onder geen omstandighede weggeneem of geskend word nie.

13. 'n Kandidaat wat skuldig is aan die oortreding van hierdie reëls is onderhewig aan al die strawwe vir druiping en kan van verdere eksaminering uitgesluit word vir 'n tydperk soos deur die eksaminator bepaal.

AANHANGSEL 10

STRAWWE VIR ONBEHOORLIKE INGENIEUROFFISIERBEMANNING VAN SKEPE

1. Elke ingenieuroffisier in bevel van 'n ingenieurwaghoudiens op skepe met 'n geregistreerde kraglewering van 750 kW of meer moet die houer wees van 'n toepaslike Klas 4-bekwaamheidsertifikaat of -dienssertifikaat (stoom of motor).

2. Nòg die Gesagvoerder nòg die Hoof-ingenieuroffisier mag 'n ingenieuroffisier toelaat om in bevel van 'n ingenieurwaghoudiens te wees op 'n skip met 'n geregistreerde kraglewering van 750 kW of meer tensy hy die houer is van 'n bekwaamheidsertifikaat of 'n dienssertifikaat as Marine-ingenieuroffisier Klas 4 (stoom of motor).

3. 'n Eienaar mag nie 'n ingenieuroffisier aanwys om in 'n hoedanigheid op te tree waarvoor hy nie ooreenkomstig hierdie regulasies behoorlik gediplomeer is nie.

4. 'n Gesagvorder of Hoof-ingenieuroffisier wat deel (ii) van die aantekeninge by hierdie aanhangsel oortree, is skuldig aan 'n misdryf en is by summiere skuldigbevinding strafbaar met 'n boete van hoogstens R2 000.

5. 'n Eienaar wat deel (iii) van die aantekeninge by hierdie aanhangsel oortree, is skuldig aan 'n misdryf en is by summiere skuldigbevinding strafbaar met 'n boete van hoogstens R2 000.

6. 'n Bekwaamheid- of dienssertifikaat bly geldig vir seediens net so lank as wat die houer voldoen aan die standaarde en voorwaardes ten opsigte van mediese geskiktheid en bekwaamheid om in die toepaslike hoedanigheid op te tree soos deur die Direkteur-generaal gespesifiseer.

ANNEX 9

RULES TO BE OBSERVED DURING THE EXAMINATION OF MARINE ENGINEER-OFFICERS

1. Candidates must not have with them any books, notes, memoranda or paper other than that supplied for use at the examination. If any candidate has brought any such notes etc., with him he must hand them to the examiner before beginning his work.

2. Candidates will be allowed to use mathematical tables, Tables of Properties of Fluids and also Enthalpy-Entropy charts provided by the examiner.

3. Drawing boards and T-squares will be provided when required but candidates must bring to the examination the drawing instruments they require.

4. Silence must be observed during the examination.

5. A candidate shall not, without the consent of the examiner, leave his seat or the examination room. If he leaves the room he shall not, without the consent of the examiner, go on with any paper or problem on which he was engaged.

6. Candidates are advised to read the questions carefully and to confine their attention to the problems as presented without dealing with extraneous matter. This advice is applicable to all parts of the examination but especially to the Drawing.

7. The question papers and mathematical tables, which are the property of the Marine Division, must not be written upon or defaced in any way. Soft pencils should be used on Ethalpy-Entropy charts.

8. Questions must be worked only on the loose paper provided and only one side of the paper is to be written on, each sheet must be signed. All work other than sketching and drawing must be done in ink. Start all questions on a new sheet. The number of the question must appear on each sheet. All work must be shown and no scrap paper is allowed.

9. English or Afrikaans composition and legible handwriting will be taken into account. Bad grammar, faulty spelling and errors of punctuation will be discredited. Suitable recognition will be given for clear statements, reasoning and calculations in solving problems.

10. Additional paper, if required, will be provided by the examiner. The particulars required should also be given on the loose folder and each sheet or drawing or graph paper used must be signed by the candidate.

11. Candidates may, if they wish, use slide rules or non programmable calculators for their calculations but in each case the full working statement necessary for arriving at the result must be shown in ink, otherwise no significance will be attached to the answer. Calculating machines are not allowed in the mathematics examination.

12. Candidates must not communicate with each other during the examination. They must not take notes or write down their answers to examination questions in order to take them from the room. On no account must question papers be taken away or defaced.

13. A candidate guilty of any breach of these rules will be subjected to all the penalties of failure and may be excluded from further examination for such a period as the examiner may decide.

ANNEX 10

PENALTIES FOR IMPROPER ENGINEER-OFFICER MANNING OF SHIPS

1. Every engineer officer in charge of an engineering Watch in ships of 750 kilowatt registered power or more shall hold an appropriate (steam or motor) Class 4 certificate of competency or certificate of service.

2. Neither the Master nor the Chief Engineer-Officer shall permit any Engineer-Officer to be in charge of an engineering Watch in a ship of 750 kilowatt registered power or more unless he holds a certificate of competency or a certificate of service as Marine Engineer-Officer Class 4 (Steam or Motor).

3. An owner shall not appoint any Engineer-Officer to act in a capacity for which he is not duly certificated in accordance with these Regulations.

4. Any Master or Chief Engineer-Officer who contravenes part (ii) of the notes to this Annex shall be guilty of an offence and liable on summary conviction to a fine not exceeding R2 000.

5. Any owner who contravenes part (iii) of the notes to this Annex shall be guilty of an offence and be liable on summary conviction to a fine not exceeding R2 000.

6. A certificate of competency or service shall remain valid for seagoing service only so long as the holder can comply with the standards and conditions as to medical fitness and competency to act in the appropriate capacity as specified by the Director-General.

AANHANGSEL 11

AANTEKENINGE OOR DIE VEILIGE OFFISIERBEMANNING VAN SKEPE EN DIE BEPERKING VAN KONSESSIES

(1) 'n Skip mag met slegs een gediplomeerde ingenieuroffisier minder vaar as wat statutêr vereis word: Met dien verstande dat die rede vir die tekort toegeskryf kan word aan siekte of onbevoegdheid van die offisier of aan ander onvoorsiene omstandighede wat die betrokke offisier raak. Alle redelike stappe moet egter gedoen gewees het om die offisier te vervang en die maksimum tydperk wat die skip met een offisier te min mag vaar, mag nie minder wees nie as—

(a) 28 dae in die geval van 'n skip wat op vreemdevaartdiens ter see uitvaar;

(b) 14 dae in die geval van 'n skip wat op kusdiens ter see uitvaar;

(c) sewe dae in die geval van hawediensvaartuie.

(2) Om vir die vergunning in aanmerking te kom, moet alle redelike stappe gedoen gewees het om die offisier te vervang, en die gesagvoerder moet, wanneer hy van die betrokke plek af ter see uitvaar 'n bevoegde beampte in kennis stel van sy voorneme om die betrokke gekwalifiseerde offisier nie aan boord te hê nie en hy moet 'n inskrywing van daardie inkennisstelling in die skip se amptelike logboek maak.

(3) Een tydperk van 7, 14 of 28 dae, soos toepaslik, mag nie onmiddellik gevolg word deur 'n verdere tydperk waartydens die skip met 'n gekwalifiseerde ingenieuroffisier te min vaar nie.

(4) 'n Bevoegde beampte beteken 'n konsulêre beampte deur die Suid-Afrikaanse Regering aangewys met betrekking tot 'n hawe buite Suid-Afrika. In die geval van 'n hawe in Suid-Afrika is die bevoegde beampte gewoonlik 'n Hoofbeampte deur die Departement van Vervoer aangewys.

(5) Indien 'n persoon 'n pos aanvaar waarvoor hy nie gekwalifiseer is nie en ter see gaan sonder die goedkeuring van 'n bevoegde beampte soos voorheen omskryf, is hy by summiere skuldigbevinding strafbaar met 'n boete van hoogstens R200.

AANHANGSEL 12

DIENSENDOSSEMENTE

Klasse 2, 3 en 4

Die eksamen vir 'n diensendossement word slegs mondeling afgeneem en sal gebaseer wees op die werking, onderhoud en bestuur van skeepsmasjinerie waarop die klas sertifikaat van toepassing is, veral die herken van onreëlmatighede in die werkverrigting van sodanige masjinerie en die ontleding en interpretering van inligting van moniteertoerusting verkry.

Dit sal ook kennis vereis van die toepaslike statute van belang vir marine-ingenieuroffisiere en van die administratiewe pligte van 'n Hoof-ingenieuroffisier, d.w.s. die organiseer en oplei van personeel vir normale sowel as noodpligte, met inbegrip van die gebruik van veiligheidstoerusting, en die organiseer van herstelwerk en opnames en daarmee gepaardgaande verslae.

'n Diensendossement mag nie aan 'n vreemdeling toegestaan word sonder die vooraf verkreë goedkeuring van die Direkteur-generaal nie.

In die geval van wangedrag, dronkenskap, onbevoegdheid, ens. kan 'n ondersoeker ná 'n volledige ondersoek aanbeveel dat die diensendossement gekanselleer moet word sonder dat geregtelike stappe gedoen word soos wat nodig sou wees indien die basiese sertifikaat betrokke was.

AANHANGSEL 13

ENDOSSERINGS IN VERBAND MET DIE VERVOER VAN GEVAARLIKE VRAGTE (ADDISIONELE OPLEIDING)

Gevaarlikevragendossement.—Die Marine-ingenieuroffisierregulasies bepaal dat 'n skip waarop hierdie regulasie van toepassing is wat 'n massavrag het wat in sy geheel of gedeeltelik as gevaarlik gespesifiseer is van die datum van uitvaardiging van hierdie regulasies as Hoof-ingenieuroffisier en as Tweede Ingenieuroffisier onderskeidelik ingenieuroffisiere wat ingevolge hierdie regulasies gekwalifiseer is aan boord moet hê wie se bekwaamheid/of dienssertifikate geëndosseer is om te toon dat hulle aan die vereistes ten opsigte van opleiding en diens soos deur die Direkteur-generaal voorgeskryf, voldoen het. Indien 'n ander ingenieuroffisier as 'n Hoof-ingenieuroffisier en Tweede ingenieuroffisier as vragoffisier optree en regstreekse verantwoordelikheid het vir die laai, lossing en versorging in transito, of die hantering van vrag, moet sodanige ingenieuroffisier die houer wees van 'n bekwaamheid- of 'n diensertifikaat wat desgelyks geëndosseer is.

Gevaarlike vrag.—Die gevaarlike vrag aldus gespesifiseer, bestaan uit enige ru vloeibare petroleum of petroleumproduk soos omskryf in die Regulasies, en enige vloeibare chemiese stof gelys in Hoofstuk VI van die International Maritime Organisation (IMO)-publikasie getiteld *"Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk"* en die byvoegsels daarvan en enige vloeibare gas gelys in Hoofstuk XIX van die IMO-publikasie getiteld *"Code for the Construction and Equipment of Ships carrying Liquified Gases in Bulk"* en die byvoegsels daarvan. Hierdie IMO-publikasies kan verkry word van die publikasiekantoor van die Inter-Governmental Maritime Consultative Organisation, Picadilly 101–104, London W1V OAE.

ANNEX 11

NOTES ON THE SAFE OFFICER MANNING OF SHIPS AND THE LIMITATION OF CONCESSIONS

(1) A ship may sail with *one but only one* certificated engineer officer short of statutory requirements: Provided the cause of sailing short is the illness, incapacity or other unforeseen circumstances affecting the officer concerned. However all reasonable steps must have been taken to replace the officer and the maximum period for which a ship shall sail with one officer short shall not exceed—

(a) 28 days in the case of a ship going to sea on Foreign-Going Service;

(b) 14 days in the case of a ship going to sea on Coastal Service;

(c) seven days in the case of Harbour Service Craft.

(2) For the concession to apply all reasonable steps must have been taken to replace the officer, and the master, when going to sea from the place in question must notify a proper officer of his intention not to carry the qualified officer in question and make an entry of that notification in the ship's official log.

(3) One period of 7, 14 or 28 days as appropriate must not be followed immediately by any further period during which the ship sails short of a qualified engineer officer.

(4) A proper officer means a consular officer appointed by the South African Government in relation to a Port in the country outside South Africa. For a port in South Africa the proper officer is usually a Principal Officer appointed by the Department of Transport.

(5) If a person accepts a post for which he is not qualified and proceeds to sea without the sanction of a proper officer as previously defined, he shall be liable on summary conviction to a fine not exceeding R200.

ANNEX 12

SERVICE ENDORSEMENTS

Classes 2, 3 and 4

The examination for a Service Endorsement will be oral only, and will be based on the operation, maintenance and management of marine machinery appropriate to the Class of Certificate, particularly the recognition of irregularity in the performance of that machinery and the analysis and interpretation of information gained from monitoring equipment.

It will also require knowledge of the appropriate statutes of concern to marine Engineer-Officers and of the administrative duties of a Chief Engineer-Officer i.e. the organisation and training of staff for both normal and emergency duties including use of safety equipment, and the organisation of repairs and surveys and associated reports.

No alien may be granted a Service Endorsement without the prior approval of the Director-General.

In the event of a misdemeanour, drunkenness, inefficiency, etc., an examiner may after a full investigation recommend that the Service Endorsement be cancelled without recourse to legal proceedings as would be required if the basic certificate was involved.

ANNEX 13

ENDORSEMENTS RELATING TO THE CARRIAGE OF DANGEROUS CARGOES (ADDITIONAL TRAINING)

Dangerous cargo endorsement.—The Marine Engineer-Officer Regulations provide that a ship to which these regulations apply which has a bulk cargo specified in whole or in part as being a dangerous cargo, shall as from the date of promulgation of these Regulations carry as Chief Engineer-Officer and as Second Engineer-Officer respectively, engineer-officers qualified under these Regulations whose Certificates of Competency or Certificates of Service have been endorsed to show that they have satisfied conditions as to training and service as may be specified by the Director-General. If an engineer-officer other than the Chief Engineer-Officer and Second Engineer-Officer is acting as cargo officer and has immediate responsibility for loading, discharging and care in transit or handling of cargo, that engineer-officer shall hold a Certificate of Competency or a Certificate of Service similarly endorsed.

Dangerous cargo.—The dangerous cargo so specified consists of any crude liquid petroleum or petroleum product as difined in the Regulations, and any liquid chemical listed in Chapter VI of the International Maritime Organisation (IMO) publication entitled "Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk" and any supplement thereto, and any liquefied gas listed in Chapter XIX of the IMO publication entitled "Code for the Construction and Equipment of Ships carrying Liquefied Gases in Bulk" and Supplement thereto. These IMO publications may be obtained from the publications office of the Inter-Governmental Maritime Consultative Organisation, 101–104 Piccadilly, London W1V OAE.

Kwalifikasie en opleiding.—Sekere senior ingenieuroffisiere kan kwalifiseer op grond van vroeëre diens maar alle ander gediplomeerde ingenieuroffisiere moet spesialisopleiding aan land voltooi het tesame met 'n tydperk van skeepsboordopleiding en/of toepaslike seediens. Die addisionele kwalifikasies vereis ten opsigte waarvan die Departement 'n gevaarlikevragendossement (petroleum), 'n gevaarlikevragendossement (vloeibare chemiese stowwe) en 'n gevaarlikevragendossement (vloeibare gas) uitreik, is soos volg:

1. Voltooiing van ses maande bevredigende diens as Hoof-ingenieuroffisier of as Tweede Ingenieuroffisier op skepe wat die betrokke gevaarlike vrag vervoer binne die sesjaartydperk onmiddellik voor die aansoekdatum en voltooi voor die uitvaardiging van hierdie regulasies.

2. Alternatiewelik die voltooiing, in elke geval binne die sesjaartydperk voor die aansoekdatum van sowel 'n opleidingskursus in verband met die vervoer van die betrokke gevaarlike vrag as 'n gespesifiseerde tydperk van skeepsboordopleiding of -diens.

Die opleidingskursus moet òf deur die Departement goedgekeur gewees het, òf aangebied gewees het by 'n sentrum wat deur die Direkteur-generaal goedgekeur is.

Die skeepsboordopleiding of -diens kan uit enigeen van die volgende bestaan:

(a) Veertien dae skeepsboordopleiding tesame met drie maande gekrediteerde skeepsboorddiens,

(b) ses maande gekrediteerde skeepsboorddiens,

(c) 28 dae intensiewe skeepsboordopleiding goedgekeur deur die Direkteur-generaal.

Skeepsboordopleiding en -diens

3. Skeepsboordopleiding moet in botallige hoedanigheid wees op skepe wat vragte vervoer van die tipe waarvoor die endossement verlang word of op ballasdeurvaarte tussen die vervoer van sulke vragte.

4. Gekrediteerde skeepsboorddiens beteken diens op skepe wat die drie tipes vrag vervoer wat 'n endossering vereis, maar as die vrag nie van die tipe is waarvoor die endossering verlang word nie, tel sodanige diens slegs die helfte tot 'n maksimum van die helfte van die hoeveelheid van sodanige diens gespesifiseer in paragraaf 2.

5. *Aansoek.*—Aansoek om 'n gevaarlikevragendossement kan by 'n bevoegde beampte gedoen word. 'n Aansoeker wat na behore gekwalifiseer is, hoef net een aansoek om meer as een endossement in te dien.

Elke aansoek moet gesteun word deur getuigskrifte wat skeepsboordopleiding en -diens dek, tesame met kollegesertifikate wat getuig van die bevredigende voltooiing van enige kollegeopleidingskursus bygewoon.

Qualification and training.—Certain senior engineer-officers may qualify on the strength of past service but all others certificated engineer-officers must have completed specialist training ashore, together with a period of shipboard training and/or appropriate sea service. The additional qualifications required in respect of which the Department will issue a Dangerous Cargo Endorsement (Petroleum), a Dangerous Cargo Endorsement (Liquid Chemicals) and a Dangerous Cargo Endorsement (Liquefied Gas) are as follows:

1. Completion of six months satisfactory service as Chief Engineer-Officer or Second Engineer-Officer in ships carrying the relevant dangerous cargo within the six years period immediately preceding the date of application and completed before the promulgation of these Regulations.

2. Alternatively, the completion, in each case within the six year period prior to the date of application, of both a training course on the carriage of the relevant dangerous cargo and a specified period of shipboard training or service.

The training course must have been either approved by the Department or conducted at a centre approved by the Director-General.

The shipboard training or service may consist of any one of the following arrangements:

(a) Fourteen days shipboard training together with three months credited shipboard service,

(b) six months credited shipboard service,

(c) 28 days intensive shipboard training approved by the Director-General.

Shipboard training and service

3. Shipboard training must be in supernumerary capacity in ships carrying cargoes of the type for which the endorsement is sought, or on ballast passages between carrying such cargoes.

4. Credited shipboard service means service in ships carrying the three types of cargo requiring an endorsement, but if the cargo is not of the type for which the endorsement is sought, such service will count only at half rate up to a maximum of half the amount of such service specified in paragraph 2.

5. *Application.*—Application for a Dangerous Cargo Endorsement may be made to any Proper Officer. An applicant who is suitably qualified need only make one application for more than one endorsement.

Each applicant must be supported by testimonials covering shipboard training and service, together with college certificates attesting satisfactory completion of any college training course attended.

VEREISTES WAARAAN KANDIDATE VIR EKSAMINERING AS INGENIEURSOFFISIERE MOET VOLDOEN

Klas 4	Klas 3	Klas 2	Klas 1
Vergoedende seediens vir tekort aan werkwinkeldiens: *Tipe diens* (a) Kort of lang seereise (b) Modderskuit, baggerskip of sleepboot (c) Vissersvaartuig van meer as 350 kW (a) Tel voltyds (b) en (c) tel $^2/_3$ van die volle tyd *Dienstydperktekort* (a) Lang seereise (b) Kort seereise as stoker, olieman, hulpmasjinis, magasynman, masjinis of ingenieur (a) tel $^2/_3$ van die tyd plus vaktoets (b) tel $^1/_2$ van die tyd plus vaktoets	*Vergoedende diens vir tekort aan tipe werkwinkeldiens:* Lang of kort seereise op skepe van minstens 1 000 kW $^2/_3$ van die tyd vir lang seereise $^1/_2$ van die tyd vir kort seereise Geen vergoeding toegelaat vir tekort aan tyd nie maar kandidate wat Klas 4-sertifikate ontvang, moet toegelaat word om seetyd te begin vir Klas 3 of Klas 2 na bv. ses maande		
Seediens (meer as 350 kW) Stoom of motor—6 maande Gekombineerd—8 maande Endossement—2 maande Diensendossement—6 maande Terwyl in besit van 'n Klas 4-bekwaamheidsertifikaat. (a) Lang of kort seereise—volle diens (b) Modderskuit, baggerskip of sleepboot—$^2/_3$ van die diens (c) Vissersvaartuig: 350 kW tot 1 000 kW—$^2/_3$ van die diens (d) Vissersvaartuig van meer as 1 000 kW—volle diens *Let wel: Masjiniste kwalifiseer nadat hulle hulle Graad 1- of Graad 2-sertifikaat as masjinis ontvang het.*	*Seediens (meer as 750 kW)* Stoom of motor—21 maande Endossement—9 maande Diensendossement — 12 maande terwyl in besit van 'n Klas 3-bekwaamheidsertifikaat (a) volle diens (b) $^2/_3$ van die diens soos vir Klas 4 (c) $^2/_3$ van die diens soos vir Klas 4 (d) volle diens	*Seediens (meer as 1 000 kW)* Stoom of motor—21 maande Endossement—9 maande Diensendossement — 12 maande terwyl in besit van 'n Klas 2-bekwaamheidsertifikaat Tipe: Lang seereise—voltyds Kort seereise—$^2/_3$ van die tyd Dagwerk: 8 maande voltyds plus $^1/_2$ van die tyd tot maks. van 12 maande Sleepbote, modderskuite, baggerskepe, loodsbote en vissersvaartuie van meer as 1 000 kW—$^1/_4$ van die tyd tot maks. van 6 maande	*Seediens (meer as 3 000 kW)* Stoom of motor—21 maande Endossement—9 maande (na Klas 2 verkry is) Tipe: Lang seereise—voltyds Kort seereise—$^2/_3$ van die tyd Sleepbote, modderskuite, loodsbote, baggerskepe of vissersvaartuie—$^1/_4$ van die tyd tot maks. van 6 maande

Let wel: Geen vreemdeling mag vir 'n Diensendossement kwalifiseer wat hom toelaat om as Hoof-ingenieursoffisier op te tree sonder die spesiale verlof van die Direkteur-generaal nie.

ELIGIBILITY OF CANDIDATES FOR EXAMINATION OF ENGINEERING OFFICERS

Class 4	Class 3	Class 2	Class 1
Compensating sea service for deficiency of Workshop Service: *Type of Service* (a) Long or short voyages (b) Hopper, dredger or tug (c) Fishing vessel over 350 kW (a) Counts full time (b) and (c) counts $^2/_3$ full time. *Deficiency of period of service* (a) Long voyages (b) Short voyages as fireman, oiler, donkeyman storekeeper, motorman or engineer (a) counts $^2/_3$ time plus trade test (b) counts $^1/_2$ time plus trade test	*Compensatory service for shortage of type of Workshop Service:* Long or short voyages with a minimum of 1 000 kW $^2/_3$ time for long voyages $^1/_2$ time for short voyages No compensation allowed for deficiency of time but candidates obtaining Class 4 certificates should be allowed to commence sea time for Class 3 or Class 2 after say 6 months		
Sea service (over 350 kW) S. or M.—6 months Combined—8 months Endorsement—2 months Service Endorsement—6 months Whilst holding a Class 4 Certificate of Competency (a) Long or short voyages—full rate (b) Hopper, dredger or tug—$^2/_3$ rate (c) Fishing 350 kW to 1 000 kW—$^2/_3$ rate (d) Fishing over 1 000 kW—full rate *Note: Motormen to qualify after obtaining their Grade 1 or Grade 2 Certificates as Motormen.*	*Sea Service (over 750 kW)* S. or M.—21 months Endorsement—9 months Service Endorsement—12 months whilst holding a Class 3 Certificate of Competency (a) full rate (b) $^2/_3$ rate as per Class 4 (c) $^2/_3$ rate as per Class 4 (d) full rate	*Sea Service (over 1 000 kW)* S. or M.—21 months Endorsement—9 months Service Endorsement—12 months whilst holding a Class 2 Certificate of Competency Type: Long Voyages—full time Short Voyages—$^2/_3$ time Daywork: 8 months full time plus $^1/_2$ time to max. 12 months Tugs, hoppers, dredgers, pilot vessels and fishing boats over 1 000 kW—$^1/_4$ time to 6 months maximum	*Sea Service (over 3 000 kW)* S. or M.—21 months Endorsement—9 months (after obtaining Class 2) Type: Long voyages—full time Short Voyages—$^2/_3$ time Tugs, hoppers, pilot boats, dredgers or fishing vessels—$^1/_4$ rate up to 6 months maximum

Note: No Alien may qualify for a Service Endorsement thereby permitting him to act as Chief Engineer-Officer without the special permission of the Director-General.

No. R. 2656 **29 November 1985**

EKSAMENREGULASIES VIR BEKWAAMHEIDSERTIFIKATE VIR DEKOFFISIERE, 1985

Die Minister van Vervoerwese het, kragtens artikel 356 (1) van die Handelskeepvaartwet, 1951 (Wet 57 van 1951), soos gewysig, die Eksamenregulasies vir Gesagvoerders en Navigasie-offisiere, 1975, afgekondig by Goewermentskennisgewing R. 2041, gedateer 31 Oktober 1975, herroep, en het kragtens genoemde artikel die regulasies in die Bylae hiervan uitgevaardig.

BYLAE

Ordening van regulasies.

HOOFSTUK 1

Regulasie No.

1.1 Inleiding.
1.2 Woordomskrywings en -betekenis.
1.3 Klasse van sertifikate.
1.4 Vrywillige eksamens vir Gesagvoerder (Spesiale Graad).
1.5 Sertifikate "Nie-handelsdiens" geëndosseer.
1.6 Sertifikate deur ander administrasies uitgereik.
1.7 Sertifikate "Gevaarlike vrag" geëndosseer.
1.8 Sertifikate voor die inwerkingtreding van hierdie regulasies uitgereik.

HOOFSTUK 2

2.1 Bewys van nasionaliteit.
2.2 Eksamendatums en plekke waar eksamens afgeneem word.
2.3 Hoe om aansoek te doen.
2.4 Hoe om in spesiale gevalle aansoek te doen.
2.5 Poging tot omkopery.
2.6 Getuigskrifte verlang.
2.7 Onbevredigende gedrag.
2.8 Doofheid en ander liggaams- en geestesgebreke.
2.9 Kandidaat se kennis van Engels of Afrikaans.
2.10 Uitreiking van sertifikate.
2.11 Onvoldoende diens.
2.12 Dienssertifikate ingevolge die Handelskeepvaartwet, ten opsigte van Suid-Afrikaanse Vlootpersoneel.
2.13 Diens in vlootvaartuie.

HOOFSTUK 3

KLASSE VAN SERTIFIKATE

3.1 Klas 6-sertifikaat.
3.2 Klas 3-, 4- en 5-sertifikaat.
3.3 Klas 2-sertifikaat.
3.4 Klas 1-sertifikaat
3.5 Sertifikaat as Gesagvoerder (Spesiale Graad).
3.6 Bevelvoeringsendossemente.
3.7 Bykomende kwalifikasies moet verstrek word.
3.8 Gesigtoetssertifikaat.
3.9 Sertifikaat in elektroniese navigasiestelsels.
3.10 Navigasiebeheerkursussertifikaat.
3.11 Sertifikaat in noodhulp ter see.
3.12 Skeepskaptein se sertifikaat in mediese opleiding.
3.13 Sertifikaat van bywoning van 'n brandbestrydingskursus.
3.14 Beperkte bekwaamheidsertifikaat in radiotelefonie.
3.15 Skriftelike eksamens.
3.16 Vrystelling van skriftelike eksamens.
3.17 Geldigheid van bevelvoeringsendossement.
3.18 Endossering van sertifikaat.
3.19 Afskrif van verlore sertifikaat.

HOOFSTUK 4

DIE BEREKENING VAN DIENS TER SEE

4.1 Algemeen.
4.2 Bewys van diens in ander skepe as Suid-Afrikaanse skepe.
4.3 Nie-handelskeepvaartdiens.
4.4 Seedienskorting.
4.5 Seevaartkolleges.
4.6 Diens in Vlootopleidingskolleges.
4.7 Kadetopleidingskepe.
4.8 Persone in besit van hoër akademiese kwalifikasies.

HOOFSTUK 5

OPLEIDINGSKEMAS

5.1 Inleiding.
5.2 Standaardopleidingskema.
5.3 Beplande opleiding gedurende seetydperke.
5.4 Voortgesette studies ter see.

No. R. 2656 **29 November 1985**

EXAMINATION REGULATIONS FOR CERTIFICATES OF COMPETENCY FOR DECK OFFICERS, 1985

The Minister of Transport has, in terms of section 356 (1) of the Merchant Shipping Act, 1951 (Act 57 of 1951), as amended, repealed the Examination Regulations for Masters and Navigating Officers, 1975, promulgated under Government Notice R. 2041, dated 31 October 1975, and has, in terms of the said section, made the regulations set forth in the Schedule hereto.

SCHEDULE

Arrangement of regulations.

CHAPTER 1

Regulation No.

1.1 Introduction.
1.2 Definitions and Interpretations.
1.3 Classes of Certificates.
1.4 Voluntary Examinations for Master Special Grade.
1.5 Certificates endorsed "Non-Trading Service".
1.6 Certificates issued by other administrations.
1.7 Hazardous Cargo endorsement.
1.8 Certificates issued prior to the coming into effect of these regulations.

CHAPTER 2

2.1 Proof of Nationality.
2.2 Days and Places of Examinations.
2.3 How to apply.
2.4 How to apply in special cases.
2.5 Attempted bribery.
2.6 Testimonials required.
2.7 Unsatisfactory conduct.
2.8 Deafness and other physical and mental disabilities.
2.9 Candidates' knowledge of English or Afrikaans.
2.10 Issue of certificates.
2.11 Insufficient service.
2.12 Certificates of Service under the Merchant Shipping Act in respect of South African Navy personnel.
2.13 Service performed in naval ships.

CHAPTER 3

CLASSES OF CERTIFICATES

3.1 Class 6 certificate.
3.2 Classes 3, 4 and 5 certificates.
3.3 Class 2 certificate.
3.4 Class 1 certificate.
3.5 Master Special Grade certificate.
3.6 Command Endorsements.
3.7 Additional qualifications to be produced.
3.8 Sight Test certificate.
3.9 Electronic Navigation Systems certificate.
3.10 Navigation Control Course certificate.
3.11 First Aid at Sea certificate.
3.12 Ship Captain's Medical Training certificate.
3.13 Fire-Fighting Course attendance certificate.
3.14 Restricted certificate of competency in Radiotelephony.
3.15 Written Examinations.
3.16 Exemptions from written examinations.
3.17 Validity of Command Endorsements.
3.18 Endorsement of certificate.
3.19 Copy of lost certificate.

CHAPTER 4

ESTIMATING SEA SERVICE

4.1 General.
4.2 Evidence as to service in ships other than South African ships.
4.3 Non-Trading service.
4.4 Remission of sea service.
4.5 Colleges for Nautical Training.
4.6 Service in Naval Training Colleges.
4.7 Cadet training ships.
4.8 Persons holding higher academic qualifications.

CHAPTER 5

TRAINING SCHEMES

5.1 Introduction.
5.2 Standard Scheme of training.
5.3 Planned training during sea periods.
5.4 Continued studies at sea.

HOOFSTUK 6

EKSAMENPROSEDURE

6.1 Algemeen.
6.2 Gebruik van boeke en tafels tydens die eksamen.
6.3 Gebruik van instrumente.
6.4 Ongeoorloofde boeke en papiere streng verbode.
6.5 Verlangde graad van akkuraatheid.
6.6 Geldigheid van gedeeltelike slagings.
6.7 Uitstelverlening.
6.8 Mondelinge eksamens.

HOOFSTUK 7

7.1 Vervoer van gevaarlike goedere.
7.2 Bykomende kwalifikasies vir uitreiking van gevaarlike vragendossement.

HOOFSTUK 8

EKSAMENGELDE

8.1 Wanneer eksamengelde betaal moet word.
8.2 Waar eksamengelde betaal moet word.
8.3 Tabel van eksamengelde.
8.4 Terugbetaling van eksamengelde.

BYLAES

Aanhangsel A: Vergelyking van Bekwaamheidsertifikate.
Aanhangsel B: Voorbeeld van 'n Waghoudienssertifikaat.
Aanhangsel C: Gesigtoets.
Aanhangsel D: Verduidelikende opmerking by leerplanne.
Aanhangsel E: Klas 6-bekwaamheidsertifikaat; leerplan.
Aanhangsel F: Klas 5-bekaamheidsertifikaat; leerplan.
Aanhangsel G: Klas 4-bekwaamheidsertifikaat; leerplan.
Aanhangsel H: Klas 3-bekwaamheidsertifikaat; leerplan.
Aanhangsel I: Klas 2-bekwaamheidsertifikaat; leerplan.
Aanhangsel J: Klas 1-bekwaamheidsertifikaat, Bevare Seekaptein; leerplan.
Aanhangsel K: Endossement as Gesagvoerder (Beperkte Handel), en endossement as Gesagvoerder (Kortseehandel); leerplan.
Aanhangsel L: Voorgeskrewe merk van skip.
Aanhangsel M: Simbole en afkortings.
Aanhangsel N: Gesagvoerder (Spesiale Graad); doelwitte en leerplan.
Aanhangsel O: Kursus in elektroniese navigasiestelsels.
Aanhangsel P: Kursus in navigasiebeheer.

HOOFSTUK 1

1.1 INLEIDING

Hierdie regulasies spesifiseer die bekwaamheidstandaarde en die voorwaardes waaraan voldoen moet word voordat 'n bekwaamheidsertifikaat uitgereik word. Hierdie regulasies verstrek besonderhede van die inskrywingsvoorwaardes vir en die afneem van eksamens deur die Departement van Vervoer vir Bekwaamheidsertifikate in 'n dekhoedanigheid vir diens op geregistreerde handel- en ander skepe.

1.2 WOORDOMSKRYWINGS EN BETEKENIS

In hierdie regulasies beteken die uitdrukking "die Wet" die Handelskeepvaartwet, 1951 (Wet 57 van 1951), en tensy die samehang anders aandui, het enige uitdrukking wat in hierdie regulasies gebruik word en waaraan daar in die Wet 'n betekenis geheg is, dié betekenis aldus daaraan geheg.

"Direkteur-generaal" beteken die Direkteur-generaal: Vervoer.

"Eksaminator" beteken die persoon wat kragtens artikel 77 (4) van die Wet aangestel is.

"Beperkte Handel" beteken beperk tot binne die seegebied aangrensend aan die Suider-Afrikaanse kus tussen die grense van Kaap Delgado in die ooste en die Kongorivier in die weste en strek 250 seemyl van die kus af.

"Minister" beteken die Minister van Vervoerwese.

"Seemyl" beteken 1 852 meter.

"Kortseehandel" beteken beperk tot 'n gebied met 'n lengte van hoogstens 500 seemyl en strek 250 seemyl van die kus af tussen die grense van Ponto Do Ouro en die monding van die Kunenerivier.

CHAPTER 6

EXAMINATION PROCEDURE

6.1 General.
6.2 Use of books and tables at the examination.
6.3 Use of instruments.
6.4 Unauthorised books and papers strictly forbidden.
6.5 Degree of precision required.
6.6 Validity of partial passes.
6.7 Referrals.
6.8 Oral examinations.

CHAPTER 7

7.1 Carriage of dangerous cargo.
7.2 Additional qualifications for issue of dangerous cargo endorsement.

CHAPTER 8

FEES

8.1 When to pay fees.
8.2 Where to pay fees.
8.3 Table of fees.
8.4 Refund of fees.

ANNEXURES

Annexure A: Comparison of Certificates of Competency.
Annexure B: Specimen of a Watch-keeping Certificate.
Annexure C: Sight Test.
Annexure D: Explanatory Note to syllabuses.
Annexure E: Class 6 Certificate of Competency; syllabus.
Annexure F: Class 5 Certificate of Competency; syllabus.
Annexure G: Class 4 Certificate of Competency; syllabus.
Annexure H: Class 3 Certificate of Competency; syllabus.
Annexure I: Class 2 Certificate of Competency; syllabus.
Annexure J: Class 1 Certificate of Competency, Master Mariner; syllabus.
Annexure K: Master (Limited Trade) Endorsement, and Master (Short Sea Trade) Endorsement; syllabus.
Annexure L: Prescribed Marking.
Annexure M: Symbols and Abbreviations.
Annexure N: Master Special Grade; Objectives and syllabus.
Annexure O: Electronic Navigation Systems Course.
Annexure P: Navigation Control Course.

CHAPTER 1

1.1 INTRODUCTION

These regulations specify the standards of competency and the conditions to be satisfied before a Certificate of Competency shall be issued. These regulations give particulars of the conditions for entry to, and the conduct of the examinations held by the Department of Transport for Certificates of Competency in a deck capacity for service in registered trading and other ships.

1.2 DEFINITIONS AND INTERPRETATIONS

In these regulations the expression "the Act" means the Merchant Shipping Act, 1951 (Act 57 of 1951), and unless the context otherwise indicates, any expression used in these regulations to which a meaning has been assigned in the Act, bears the meaning so assigned.

"Director-General" means the Director-General: Transport.

"examiner" means the person appointed in terms of section 77 (4) of the Act.

"Limited Trade" means restricted to within the sea area adjacent to the southern African coast between the limits of Cape Delgado in the East and the Congo river in the West and extending 250 nautical miles from the shore.

"Minister" means Minister of Transport Affairs.

"nautical mile" means 1852 metres.

"Short Sea Trade" means restricted to an area of not more than 500 nautical miles in length and extending 250 nautical miles from the shore between the limits of Punta Do Oro and the mouth of the Kunene River.

"SODW-konvensie" beteken die Internasionale Konvensie insake die Standaarde van Opleiding, Diplomering en Waghou vir Seevaarders, 1978.

1.3 KLASSE VAN SERTIFIKATE

Hierdie regulasies maak voorsiening vir die volgende klasse van sertifikate:

Bekwaamheidsertifikaat (Dekoffisier) Bevare Seekaptein Klas 1;

Bekwaamheidsertifikaat (Dekoffisier) Klas 2;

Bekwaamheidsertifikaat (Dekoffisier) Klas 3;

Bekwaamheidsertifikaat (Dekoffisier) Klas 4;

Bekwaamheidsertifikaat (Dekoffisier) Klas 5;

Bekwaamheidsertifikaat (Dekoffisier) Klas 6.

1.3.1 Hierbenewens bestaan daar twee bevelvoeringsendossemente wat verwerf kan word deur afsonderlike eksamens, een van toepassing op bevelvoerders in die beperkte handelsgebied, bekend as die endossement as Bevelvoerder (Beperkte Handel) en een van toepassing op Bevelvoerders in die Kortseehandelsgebied, bekend as die endossement as Bevelvoerder (Kortseehandel).

1.4 VRYWILLIGE EKSAMENS VIR GESAGVOERDER (SPESIALE GRAAD)

Die Departement van Vervoer neem vrywillige eksamens af vir Bevelvoerder (Spesiale Graad) in ooreenstemming met die bepalings van Bylae N wat by hierdie regulasies aangeheg is.

1.5 SERTIFIKATE "NIE-HANDELSDIENS" [GEËNDOSSEER]

Offisiere wat minder diens gelewer het as die vereiste minimum diens op handelsvaartuie vir 'n sekere klas sertifikaat ooreenkomstig die regulasies, Bekwaamheidsertifikate verwerf wat beperk is tot indiensneming in niehandelskepe. Sodanige sertifikate word "Niehandelsdiens" geëndosseer. Hierdie endossement word verwyder by voltooiing van sodanige gespesifiseerde tydperke in handelskepe, soos deur die Direkteur-generaal vereis.

1.6 SERTIFIKATE DEUR ANDER ADMINISTRASIES UITGEREIK

Bekwaamheidsertifikate uitgereik deur die Regering van 'n land wat tot die SODW-konvensie toegetree het, word aanvaar as ekwivalent aan die toepaslike sertifikaat wat kragtens die Wet en hierdie regulasies uitgereik word.

1.7 SERTIFIKATE "GEVAARLIKE VRAG" GEËNDOSSEER

Enige skip met 'n massavrag wat in sy geheel of gedeeltelik as gevaarlike vrag gespesifiseer word, moet as bevelvoerende offisier en as tweede-in-bevel onderskeidelik, dekoffisiere aan boord hê wat, benewens die kwalifikasies wat gewoonlik by hierdie regulasies van hulle vereis word, aan sodanige bykomende vereistes voldoen as wat die Direkteur-generaal mag verlang, en hierdie bykomende vereistes moet op hulle bekwaamheidsertifikate geëndosseer word.

1.8 SERTIFIKATE VOOR DIE INWERKINGTREDING VAN HIERDIE REGULASIES UITGEREIK

Sertifikate ingevolge die Wet uitgereik voor die inwerkingtreding van hierdie regulasies word beskou as ekwivalent aan die onderskeie klasse van sertifikate beoog in hierdie regulasies, ooreenkomstig Bylae A hiervan.

"STCW Convention" means the International Convention on the Standards of Training, Certification and Watchkeeping for Seafarers, 1978.

1.3 CLASSES OF CERTIFICATES

These regulations provide for the following classes of certificates:

Certificate of Competency (Deck Officer) Class 1 Master Mariner;

Certificate of Competency (Deck Officer) Class 2;

Certificate of Competency (Deck Officer) Class 3;

Certificate of Competency (Deck Officer) Class 4;

Certificate of Competency (Deck Officer) Class 5;

Certificate of Competency (Deck Officer) Class 6.

1.3.1 In addition, there are two command endorsements, obtainable by separate examinations, one appropriate for masters in the Limited Trade area known as the Master (Limited Trade) endorsement and one appropriate for Masters in the Short Sea Trade area known as the Master (Short Sea Trade) endorsement.

1.4 VOLUNTARY EXAMINATIONS FOR MASTER SPECIAL GRADE

The Department of Transport shall conduct voluntary examinations for Master Special Grade in accordance with the provisions of Annexure N attached to these regulations.

1.5 CERTIFICATES ENDORSED "NON-TRADING SERVICE"

Officers who have performed less than the required minimum service on trading vessels for a certain class of certificate in accordance with the regulations, shall be able to obtain Certificates of Competency limited to employment in non-trading ships. Such certificates shall be endorsed "Non-Trading Service". This endorsement shall be removed upon completion of such specified periods in trading ships as may be required by the Director-General.

1.6 CERTIFICATES ISSUED BY OTHER ADMINISTRATIONS

Certificates of Competency issued by the government of a country which has acceded to the STCW Convention shall be accepted as equivalent to the appropriate certificate issued in terms of the Act and these regulations.

1.7 HAZARDOUS CARGO ENDORSEMENT

Any ship which has a bulk cargo specified in whole or part as being a dangerous cargo, shall carry as officer in command and as second in command respectively, deck officers who, in addition to holding the qualifications required generally of them under these regulations, shall satisfy such additional requirements as may be required by the Director-General, and these additional requirements shall be endorsed on their Certificates of Comptency.

1.8 CERTIFICATES ISSUED PRIOR TO THE COMING INTO EFFECT OF THESE REGULATIONS

Certificates issued under the Act prior to the coming into effect of these regulations shall be deemed to be equivalent to the various classes of certificates contemplated in these regulations, in accordance with Annexure A appended hereto.

HOOFSTUK 2

2.1 BEWYS VAN NASIONALITEIT

2.1.1 Van elke kandidaat vir 'n sertifikaat van enige graad word vereis om bewys te lewer van Suid-Afrikaanse nasionaliteit of van permanente verblyf in Suid-Afrika.

2.1.2 Die bewys wat by subregulasie 2.1.1 verlang word, behels gewoonlik die voorlê van 'n identiteitsdokument of paspoort, of 'n sertifikaat van naturalisasie of 'n permanente verblyfspermit na gelang van die geval.

2.2 EKSAMENDATUMS EN PLEKKE WAAR EKSAMENS AFGENEEM WORD

Die eksamendatums en plekke waar eksamens afgeneem word, word elke jaar deur die Direkteur-generaal in vlootkennisgewings aan seeliede gepubliseer.

2.3 HOE OM AANSOEK TE DOEN

2.3.1 Kandidate vir die hele of slegs 'n gedeelte van 'n eksamen moet 'n aansoekvorm, goedgekeur deur die Direkteur-generaal, invul. Die ingevulde vorm, tesame met die toepaslike geld (sien Hoofstuk 8), en die getuigskrifte, ontslagsertifikate, bewys van nasionaliteit, bekwaamheidsertifikaat of dienssertifikaat, as daar is, en waghoudienssertifikaat of enige ander sertifikate, soos vereis, moet minstens twee weke voor die dag van die eksamen ingelewer word by die senior eksaminator by die hawe waar die eksamen afgeneem gaan word.

Kandidate moet enige onderbrekings in hulle diens tot tevredenheid van die eksaminator verduidelik. Die aansoekvorm moet noukeurig en volledig ingevul word.

2.3.2 'n Kandidaat wat enige deel of gedeeltes van die eksamen voltooi het en verlang om by 'n daaropvolgende eksamen in die ander deel of gedeeltes geëksamineer te word vir daardie klas sertifikaat, moet twee weke kennis van sy voorneme gee. Kandidate wat van hierdie reëling gebruik wil maak, moet aparte aansoekvorms vir elke deel van die eksamen invul.

2.3.3 Kandidate wat by hul tweede of daaropvolgende poging in die skriftelike deel van die eksamen druip, kom nie in aanmerking vir 'n verdere poging nie tot die datum bepaal vir die eksamen wat volg op die volgende vir daardie klas sertifikaat of bevelvoeringsendossement. Hierdie beperking is nie van toepassing op kandidate aan wie in een vak in die skriftelike deel uitstel verleen is of wat in die mondelinge of seingedeelte van die eksamen druip nie. Twee agtereenvolgende pogings om 'n skriftelike eksamen af te lê, berus by die eksaminator.

2.4 HOE OM IN SPESIALE GEVALLE AANSOEK TE DOEN

2.4.1 In gevalle waar kandidate twyfel of hul diens aan die vereistes van die regulasies voldoen en verlang om hulle saak vir spesiale oorweging voor te lê, moet hulle al hul sertifikate, ontslagsertifikate, getuigskrifte en waghoudienssertifikate, soos verlang, tesame met die volledig ingevulde aansoekvorm aan die eksaminator voorlê.

2.4.2 Voorleggings van kandidate oorsee kan aan 'n eksaminator gepos word. In hierdie geval moet oorspronklike dokumente nie gestuur word nie maar volle besonderhede oor die geval wat, indien nodig, gesteun word deur gewaarmerkte fotokopieë van dokumente, moet ingesluit word.

2.5 POGING TOT OMKOPERY

Enige kandidaat wat 'n beampte van die Departement van Vervoer geld aanbied, word geag hom aan wangedrag skuldig te gemaak het en sal weggewys word. Sodanige kandidaat sal nie weer tot 'n eksamen toegelaat word voordat 'n tydperk van minstens 12 maande verloop het nie.

CHAPTER 2

2.1 PROOF OF NATIONALITY

2.1.1 Every candidate for a certificate of any grade shall be required to produce proof of South African nationality or of permanent residence in South Africa.

2.1.2 The proof required in subregulation 2.1.1 shall in general involve the production of an identity document or passport, or certificate of naturalisation or a permanent residency permit as the case may be.

2.2 DAYS AND PLACES OF EXAMINATIONS

The days on which, and places where examinations are to be held shall be published annually by the Director-General in Marine Notices.

2.3 HOW TO APPLY

2.3.1 Candidates for the whole or part of an examination shall complete a form of application as approved by the Director-General. The completed form, together with the appropriate fee (see Chapter 8), and testimonials, discharge certificates, proof of nationality, certificate of competency or service, if any, and watch-keeping or any other certificates, as required, should be lodged with the senior examiner at the port where the examination is going to be conducted, at least two weeks before the day of the examination.

Candidates shall be required to explain to the satisfaction of the examiner any gaps in their service. The form of application shall be accurately and fully completed.

2.3.2 A candidate who has completed any part or parts of the examination and wishes to be examined in the other part or parts at a subsequent examination for that class of certificate, shall be required to give two week's notice of his intention. Candidates who wish to take advantage of these arrangements shall be required to complete separate application forms for each part of the examination.

2.3.3 Candidates who fail in the written part of an examination at their second or subsequent attempt shall not be considered eligible for a further attempt until the date set for the examination following upon the next for that class of certificate or command endorsement. This restriction shall not apply to candidates who are deferred in one subject in the written part or who fail in the oral or signals part of the examination. Two successive attempts at a written examination shall be at the discretion of the examiner.

2.4 HOW TO APPLY IN SPECIAL CASES

2.4.1 In cases where candidates are in doubt as to whether their service complies with the requirements of the regulations and wish to submit their cases for special consideration, all certificates, discharges, testimonials and watch-keeping certificates as required, together with the form of application duly completed, shall be submitted to an examiner.

2.4.2 Submissions from candidates abroad may be made by post to an examiner. In this case original documents shall not be forwarded but full details of the case, which shall be supported if necessary by certified photo-copies of documents, shall be included.

2.5 ATTEMPTED BRIBERY

Any candidate who offers a gratuity to any officer of the Department of Transport shall be regarded as having committed an act of misconduct and shall be rejected. Such a candidate shall not be allowed to be examined again until a period of at least 12 months has elapsed.

2.6 GETUIGSKRIFTE VERLANG

Getuigskrifte aangaande karakter, met inbegrip van soberheid, en ondervinding en bekwaamheid aan boord 'n skip vir minstens die laaste 12 maande seediens wat die datum van aansoek om eksaminering voorafgaan; en aangaande goeie gedrag ter see vir dieselfde tydperk, word van alle kandidate vereis. Sodanige getuigskrifte moet, behalwe in spesiale omstandighede, deur die Gesagvoerder geteken word. (Sien Bylae B.)

2.7 ONBEVREDIGENDE GEDRAG

Kandidate of potensiële kandidate wat, na ondertekening van ooreenkomste met die bemanning, versuim het om by hulle vaartuie aan te sluit, of wat, nadat hulle aangesluit het hulle skepe om 'n ander rede as ontslag verlaat het, of wat hulle aan boord aan wangedrag skuldig gemaak het, moet bevredigende bewys lewer van twee jaar daaropvolgende diens met goeie gedrag ter see, tensy die Direkteur-generaal dit na ondersoek goeddink om hierdie tydperk te verminder.

2.8 DOOFHEID EN ANDER LIGGAAMS- EN GEESTESONGESKIKTHEID

2.8.1 Indien die eksaminator in die loop van die eksamen vind dat 'n kandidaat doof is of 'n spraakgebrek het of aan die een of ander liggaamlike of geestesgebrek ly, en by verdere ondersoek daarvan oortuig is dat die mate van gebrek sodanig is dat dit die kandidaat onbekwaam maak vir die vervulling van die gewone pligte ter see as die houer van 'n bekwaamheidsertifikaat, moet hy die kandidaat nie toelaat om die eksamen te voltooi nie. Elke sodanige geval moet aan die Direkteur-generaal gerapporteer word en as die kandidaat die houer is van 'n bestaande sertifikaat moet daardie sertifikaat saam met die verslag deurgestuur word.

2.8.2 As die kandidaat daarna 'n mediese sertifikaat toon te dien effekte dat sy gehoor, spraak, of liggaams- of geestestoestand verbeter het of normaal is, moet die Direkteur-generaal die kandidaat se aansoek om eksamen heroorweeg.

2.9 KANDIDAAT SE KENNIS VAN ENGELS OF AFRIKAANS

2.9.1 Die kandidaat kan kies of hy die eksamen in Engels of in Afrikaans wil aflê.

2.9.2 Kandidate moet ter bevrediging van die eksaminator bewys lewer dat hulle Engels of Afrikaans goed genoeg kan praat en skryf om hul pligte aan boord van 'n Suid-Afrikaanse vaartuig te verrig. As 'n kandidaat druip weens 'n gebrek aan kennis van Engels of Afrikaans, mag hy nie gehereksamineer word voordat 'n verdere ses maande verloop het nie.

2.10 UITREIKING VAN SERTIFIKATE

Kandidate wat in hulle eksamens slaag, ontvang vorm TV5/106 wat ingedien moet word wanneer hulle hul sertifikate gaan afhaal by die hawe deur hulle op hul aansoekvorms aangedui. 'n Kandidaat wat net gedeeltelik in die eksamen geslaag het of daarin gedruip het, ontvang vorm TV5/107 van die eksaminator, waarop die eksamenuitslae verstrek word. Die kandidaat moet hierdie vorm hou en dit by die eksaminator indien wanneer hy weer om eksaminering aansoek doen.

2.11 ONVOLDOENDE DIENS

Indien daar bevind word dat 'n kandidaat wat in die eksamen geslaag het, nie oor voldoende diens beskik om hom geregtig te maak op 'n sertifikaat van daardie klas waarvoor hy geslaag het nie, word 'n sertifikaat van sodanige klas nie aan hom uitgereik nie. Indien die Direkteur-generaal egter daarvan oortuig is dat die fout in die berekening van die kandidaat se diens nie voorgekom het weens enige fout van of opsetlike wanvoorstelling deur die kandidaat nie, word die sertifikaat aan die kandidaat toegeken sodra die dienstekort aangevul is.

2.6 TESTIMONIALS REQUIRED

Testimonials as to character, including sobriety, and as to experience and ability on board ship for at least the last 12 months of sea service preceding the date of application to be examined; and as to good conduct at sea for the same period, shall be required of all candidates. Such testimonials shall, except in special circumstances, be signed by the Master. (See Annexure B.)

2.7 UNSATISFACTORY CONDUCT

Candidates or potential candidates who, after having signed crew agreements, have neglected to join their vessels, or who, after having joined have left their ships other than upon discharge, or who have committed misconduct on board shall be required to produce satisfactory proof of two year's subsequent service with good conduct at sea, unless the Director-General after investigation, may see fit to reduce this period.

2.8 DEAFNESS AND OTHER PHYSICAL AND MENTAL DISABILITIES

2.8.1 If in the course of the examination the examiner finds that a candidate is afflicted with deafness, with an impediment in speech or with some other physical or mental infirmity, and upon further investigation is satisfied that the degree of infirmity is such as to render the candidate incapable of discharging adequately the ordinary sea-going duties of the holder of a certificate of competency, he shall not allow the candidate to complete the examination. Every such case shall be reported to the Director-General and if the candidate is the holder of an existing certificate that certificate shall be forwarded with the report.

2.8.2 If the candidate subsequently produces a medical certificate to the effect that his hearing, speech, or physical or mental condition has improved or is normal, the Director-General shall reconsider the candidate's application for examination.

2.9 CANDIDATE'S KNOWLEDGE OF ENGLISH OR AFRIKAANS

2.9.1 The candidate shall have the option of undertaking the examination in either English or Afrikaans.

2.9.2 Candidates shall be required to prove to the satisfaction of the examiner that they can speak and write English or Afrikaans sufficiently well to perform the duties required of them on board a South african vessel. If a candidate fails through ignorance of English or Afrikaans, he shall not be re-examined until a further six months has elapsed.

2.10 ISSUE OF CERTIFICATES

Candidates who pass their examinations shall receive a form TV5/106 which must be produced when collecting certificates at the port designated by them on their application forms. A candidate who is partially successful or unseccessful in his examination shall receive from the examiner form TV5/107, giving the results of the examination. The candidate must retain this form and produce it to the examiner when next making application for examination.

2.11 INSUFFICIENT SERVICE

If, after a candidate has passed the examination, it is discovered that his service is insufficient to entitle him to receive a certificate of that class for which he passed, a certificate of such class shall not be granted to him. If, however, the Director-General is satisfied that the error in calculation of the candidate's service did not occur through any fault or wilful misrepresentation on his part, the certificate shall be granted when the candidate has made up the deficiency in service.

2.12 DIENSSERTIFIKAAT INGEVOLGE DIE HANDELSKEEPVAARTWET, TEN OPSIGTE VAN SUID-AFRIKAANSE VLOOTPERSONEEL

2.12.1 'n Aansoeker om 'n dienssertifikaat Klas 4 (Dekoffisier) moet die rang van Luitenant bereik het en moet minstens vyf jaar diens in 'n seevarende skip voltooi het waarvan minstens twee jaar terwyl hy die houer was van 'n volle waghoudienssertifikaat.

2.12.2 'n Aansoeker om 'n dienssertifikaat Klas 2 moet die rang van Luitenant bereik het en moet minstens sewe jaar diens in 'n seevarende skip voltooi het waarvan minstens vier jaar terwyl hy die houer was van 'n volle waghoudienssertifikaat.

2.12.3 Elke aansoek om 'n dienssertifikaat moet skriftelik gesteun word deur die Hoof van die Vloot.

2.13 DIENS OP VLOOTVAARTUIE

2.13.1 Diens in 'n dekhoedanigheid op 'n skip van die Suid-Afrikaanse Vloot word ten volle aanvaar as kwalifiserende diens vir doeleindes van 'n Bekwaamheidsertifikaat Klas 5 en twee derdes daarvan word aanvaar vir doeleindes van 'n Bekwaamheidsertifikaat Klas 4.

2.13.2 'n Tydperk van hoogstens twee maande mag geëis word vir sodanige kwalifiserende diens ten opsigte van bywoning van 'n opleidingskursus in 'n vlootinstelling op land op die grondslag van twee maande opleiding vir een maand erkenning.

2.13.3 Diens in die vloot van 'n ander land as die Republiek sal aanvaar word ooreenkomstig die bepalings van regulasie 2.13.1 as die kandidaat in staat is om tot bevrediging van die Direkteur-generaal bewys te lewer van sodanige diens.

2.13.4 Waghoudiens deur 'n uitvoerende offisier van 'n seevarende skip van die Suid-Afrikaanse Vloot word ten volle aanvaar as kwalifiserende diens vir 'n Bekwaamheidsertifikaat Klas 3 en twee derdes word aanvaar vir 'n Bekwaamheidsertifikaat Klas 2.

2.13.5 Behoudens die bepalings van regulasie 3.1.1 moet 'n kandidaat vir 'n bekwaamheidsertifikaat bewys lewer van minstens 12 maande diens in handelskepe.

HOOFSTUK 3

KLASSE VAN SERTIFIKATE

3.1 *Klas 6* (Sien Bylae E)

'n Kandidaat moet minstens 20 jaar oud wees en moet minstens 12 maande seediens verrig het in enige aanvaarbare dekhoedanigheid in vaartuie groter as 25 bruto ton, synde een van die volgende:

(a) Gewone handelsvaartuie;

(b) vissersvaartuie;

(c) vaartuie van klas V, VI of XII; of

(d) vaartuie betrokke by plaaslike operasies wat nie ten volle binne die grense van voorgeskrewe hawens val nie.

3.2 *Klasse 3, 4 en 5* (Sien Bylaes H, G en F onderskeidelik)

3.2.1 'n Kandidaat moet minstens 20 jaar oud wees en moet seediens gelewer het, hetsy—

(a) drie jaar lank as 'n kadet of leerling-dekoffisier wat 'n opleidingsprogram ondergaan het wat deur die Direkteur-generaal erken word; of

(b) vier jaar lank in enige aanvaarbare dekhoedanigheid. Minstens ses maande van die finale 12 maande seediens moes bestee gewees het aan pligte in verband met brugwaghoudiens onder toesig van 'n gediplomeerde offisier.

2.12 CERTIFICATE OF SERVICE UNDER THE MERCHANT SHIPPING ACT IN RESPECT OF SOUTH AFRICAN NAVY PERSONNEL

2.12.1 An applicant for a certificate of service as Class 4 (Deck Officer) shall have attained the rank of Lieutenant and shall have completed at least five years' service in a sea-going ship, of which at least two years shall have been performed whilst holding a full watch-keeping certificate.

2.12.2 An applicant for a certificate of service as Class 2 shall have attained the rank of Lieutenant and shall have completed at least seven years' service in a sea-going ship of which at least four years shall have been performed whilst holding a full watch-keeping certificate.

2.12.3 Every application for a certificate of service shall be supported in writing by the Chief of the Navy.

2.13 SERVICE PERFORMED IN NAVAL SHIPS

2.13.1 Service performed in a deck capacity in a ship of the South African navy shall be accepted in full as qualifying service for the purpose of a Certificate of Competency Class 5 and at two thirds rate for the purpose of a Certificate of Competency Class 4.

2.13.2 A period not exceeding two months may be claimed towards such qualifying service in respect of attendance at a training course in a naval establishment ashore on the basis of two month's training for one month's recognition.

2.13.3 Service in the navy of a country other than the Republic shall be accepted in accordance with the provisions for regulation 2.13.1 if the candidate is able to establish his claim to such service to the satisfaction of the Director-General.

2.13.4 Watch-keeping service performed by an executive officer in a sea-going ship of the South African Navy shall be accepted as qualifying service at full rate of a Certificate of Competency Class 3 and at two thirds rate for a Certificate of Competency Class 2.

2.13.5 Except as provided for in regulation 3.1.1 a candidate for a certificate of competency shall produce evidence of at least 12 months' service in trading ships.

CHAPTER 3

CLASSES OF CERTIFICATES

3.1 *Class 6* (See Annexure E)

A candidate shall not be less than 20 years of age and shall have served at sea for not less than 12 months in any acceptable deck capacity in vessels of over 25 gross tons, being either—

(a) ordinary trading vessels;

(b) fishing vessels;

(c) vessels of class V, VI or XII; or

(d) vessels engaged in local operations other than wholly within the harbour limits of prescribed harbours.

3.2 *Classes 3, 4 and 5* (See Annexures H, G and F respective)

3.2.1 A candidate shall be not less than 20 years of age and shall have served at sea, either—

(a) for three years as a cadet or trainee deck officer undergoing a training programme recognised by the Director-General; or

(b) for four years in any acceptable deck capacity. At least six months of the final 12 months' sea service shall have been spent on duties associated with bridge watchkeeping under the supervision of a certificated officer.

3.2.2 Die tydperke van seediens in paragrawe (a) en (b) van subregulasie (1) vermeld, kan deur kwytskelding verminder word tot 'n maksimum van 12 maande vir bywoning van goedgekeurde opleidingskursusse.

3.2.3 Elke kandidaat vir 'n Klas 3-sertifikaat moet die houer wees van 'n hoër akademiese kwalifikasie wat wiskunde en fisika insluit. Vir doeleindes van hierdie subregulasie beteken 'n "hoër akademiese kwalifikasie"—

(a) die Transvaalse Eindsertifikaat van die Middelbare Skool;

(b) die Skooleindsertifikaat van die Oranje-Vrystaat;

(c) die Natalse Senior Sertifikaat;

(d) die Kaapse Senior Sertifikaat;

(e) die Nasionale Senior Sertifikaat met slaagpunte in vyf vakke; of

(f) enige kwalifikasie wat na die mening van die Direkteur-generaal van Nasionale Opvoeding gelyk is aan enige van die sertifikate vermeld in paragrawe (a) tot (e).

3.3 *Klas 2-sertifikaat* (sien Bylae I)

'n Kandidaat moet minstens 21 jaar oud wees en moet minstens 18 maande seediens verrig het as 'n waghou-offisier terwyl hy die houer was van 'n Klas 3-bekwaamheidsertifikaat. Minstens ses maande van hierdie diens moes verrig gewees het in vaartuie op seereise van minstens 500 seemyl.

3.4 *Klas 1-sertifikaat* (sien Bylae J)

'n Kandidaat moet 'n Suid-Afrikaanse burger van minstens 23 jaar oud wees en moet diens verrig het—

(a) vir minstens twee jaar ter see as waghou-offisier terwyl hy die houer was van 'n sertifikaat nie laer nie as Klas 3; en daarbenewens

(b) minstens 18 maande ter see as waghou-offisier terwyl hy die houer was van 'n sertifikaat nie laer nie as Klas 2. Minstens 18 maande van hierdie totale tydperk van drie en 'n half jaar moes deurgebring gewees het in vaartuie op seereise van minstens 500 seemyl.

3.5 *Sertifikaat as Gesagvoerder (Spesiale Graad)*

Die eksamen vir 'n Sertifikaat as Gesagvoerder (Spesiale Graad) is bedoel vir offisiere wat hulle hoogste kwalifikasies wil verbeter en wat die houers wil wees van 'n sertifikaat van die hoogste graad wat deur die Minister toegeken word.

3.6 *Bevelvoeringsendossemente*

3.6.1 Daar is twee vlakke van bevelvoeringsendossemente van Bekwaamheidsertifikate vir dekoffisiere, een van Gesagvoerders in diens in die Beperkte Handelsgebied en die ander vir Gesagvoerders in diens van die Kortseehandelsgebied.

3.6.2 'n Kandidaat vir Gesagvoerder (Kortseehandel)-bevelvoeringsendossement moet 36 maande lank ter see as waghou-offisier gedien het terwyl hy in besit was van 'n bekwaamheidsertifikaat wat nie 'n Klas 6-bekwaamheidsertifikaat is nie.

3.6.3 'n Kandidaat vir 'n bevelvoeringsendossement as Gesagvoerder (Beperkte Handel) moet die houer wees van 'n Klas 2-, Klas 3- of Klas 4-bekwaamheidsertifikaat en moes 36 maande lank ter see diens gedoen het as 'n waghou-offisier terwyl hy die houer was van sodanige sertifikaat, waarvan minstens 18 maande gelewer moes wees op seereise buite die grense van die Kortseehandelsgebied.

3.2.2 The periods of sea service referred to in paragraphs (a) and (b) of subregulation (1) may be reduced by remission up to a maximum of 12 months for attendance at approved courses of training.

3.2.3 Every candidate for a Class 3 certificate shall hold a higher academic qualification which shall include mathematics and physics. For the purpose of this subregulation, a "higher academic qualification" means—

(a) the Transvaal Secondary School Certificate;

(b) the Orange Free State School-leaving Certificate;

(c) the Natal Senior Certificate;

(d) the Cape Senior Certificate;

(e) the National Senior Certificate with passes in five subjects; or

(f) any qualification which the Director-General: National Education regards as being equivalent to any of the certificates mentioned in paragraphs (a) to (e).

3.3 *Class 2 Certificate* (See Annexure I)

A candidate shall be not less than 21 years of age and shall have served not less than 18 months at sea as a watch-keeping officer while holding a Class 3 Certificate of competency. At least six months of this period shall be served in vessels engaged in voyages of not less than 500 nautical miles.

3.4 *Class 1 Certificate* (see Annexure J)

A candidate shall be a South African citizen of not less than 23 years of age and shall have served—

(a) for not less than two years at sea as a watch-keeping officer while holding a certificate not lower than Class 3; and in addition

(b) for not less than 18 months at sea as a watch-keeping officer while holding a certificate not lower than Class 2. At least 18 months of this total period of three and a half years shall be served in vessels engaged in voyages of not less than 500 nautical miles.

3.5 *Master Special Grade certificate*

The examination for a Master Special Grade certificate is intended for officers who wish to improve their superior qualifications and who wish to have a certificate of the highest grade granted by the Minister.

3.6 *Command Endorsements*

3.6.1 There are two levels of command endorsements of Certificates of Competency for deck officers, one appropriate for Masters employed in the Limited Trade area and the other for Masters employed in the Short Sea Trade area.

3.6.2 A candidate for a Master (Short Sea Trade) Command Endorsement shall have served for 36 months at sea as a watch-keeping officer whilst holding a certificate of competency other than a Class 6 Certificate of Competency.

3.6.3 A candidate for a Master (Limited Trade) Command Endorsement shall hold a Class 2, Class 3 or Class 4 Certificate of Competency and shall have served for 36 months at sea as a watch-keeping officer whilst holding such certificate, of which service at least 18 months shall have been spent on voyages outside the limits of the Short Sea Trade area.

3.6.4 Die minimum totale handelsdiens wat vereis word vir die uitreiking van 'n geëndosseerde bekwaamheidsertifikaat wat nie 'n Klas 6-sertifikaat is nie, of vir 'n Bevelvoeringsendossement, is soos volg:

(a)

Klas van sertifikaat	5	4	3	2	1
Langseereishandelsdiens (maande).....	—	20	20	32	44
Kortseereishandelsdiens (maande)	20	—	—	—	—

(b)

Bevelvoerings-endossement	Beperkte handel	Kortseehandel
Handelsdiens	10 maande buite die grense van die Kortseehandelsgebied	18 maande binne of buite die grense van die Kortseehandelsgebied

Die oorblywende tydperk seediens wat vereis word vir toelating tot die eksamen kan bestaan uit diens in enige handel- of nie-handelskip groter as 100 bruto ton, behoudens die bepalings van regulasie 4.

3.7 *Addisionele kwalifikasies moet verstrek word*

Van al die kandidate word verwag om dokumentêre bewys te lewer van bykomende kwalifikasies in hul besit, voordat hulle kwalifiseer vir die uitreiking van bekwaamheidsertifikate of vir bevelvoeringsendossemente op bestaande sertifikate. Die bykomende kwalifikasies gespesifiseer vir elke klas van sertifikaat en bevelvoeringsendossement daarvan, word in onderstaande tabel uiteengesit.

3.6.4 The minimum total trading service required for the issue of an unendorsed Certificate of Competency other than a Class 6 Certificate, or for a Command Endorsement, shall be as follows:

(a)

Class of certificate	5	4	3	2	1
Long voyage trading service (months).....	—	20	20	32	44
Short voyage trading service (months).....	20	—	—	—	—

(b)

Command endorsements	Limited trade	Short sea trade
Trading service...	10 months outside the limits of the short sea trade area	18 months in or outside the limits of the short sea trade area

The remaining period of sea service required for admission to the examination may be made up of service in any trading or *non-trading ship* in excess of 100 gross tons, subject to the provisions of regulation 4.

3.7 *Additional qualifications to be produced*

All candiates shall be required to produce documentary evidence of additional qualifications held, before qualifying for the issue of certificates of competency or for command endorsements upon existing certificates. The additional qualifications specified for each class of certificate and command endorsement thereto, are set out in the table hereunder.

Addisionele kwalifikasie	Klas van sertifikaat of bevelvoeringsendossement									
	1	2	* 2e	3	* 3e	4	* 4e	5	* 5e	6
Gesigtoetssertifikaat.....	X	X	X	X	X	X	X	X	X	X
Navigasiebeheerkursus.....	X	X	X		X		X		X	
Sertifikaat in noodhulp ter see.....				X		X		X		X
Skeepskaptein se sertifikaat in mediese opleiding.....	X	X	X		X		X		X	
Brandbestrydingskursussertifikaat.....				X		X		X		X
Kursus in elektroniese navigatiestelsels.....				X		X		X		
Sertifikaat as Bekwame Dekseeman.....				X		X		X		
Sertifikaat as Bekwame Reddingsbootman.....				X		X		X		X
Beperkte Bekwaamheidsertifikaat in Radiotelefonie.....				X		X		X		X

* Dui die Bevelvoeringsendossement vir Kortseehandel of Beperkte Handel aan na gelang van die geval.

Additional qualification	Class of certificate or Command endorsement									
	1	2	* 2e	3	* 3e	4	* 4e	5	* 5e	6
Sight Test certificate.....	X	X	X	X	X	X	X	X	X	X
Navigation Control Course	X	X	X		X		X		X	
First Aid at Sea certificate				X		X		X		X
Ship Capt's Medical Training certificate	X	X	X		X		X		X	
Fire-Fighting course certificate				X		X		X		X
Electronic Navigation Systems Course				X		X		X		
Efficient Deck Rating certificate.....				X		X		X		
Efficient Lifeboatman certificate				X		X		X		X
Restricted certificate of competence in Radiotelephony.....				X		X		X		X

* Indicates the Short Sea Trade or Limited Trade command endorsement as the case may be

3.8 *Gesigtoetssertifikaat*

3.8.1 Hierdie sertifikaat word uitgereik na slaging van die Departement van Vervoer se Marine-afdeling se gesigtoets vir kandidate wat geëksamineer wil word vir bekwaamheidsertifikate en is ses maande lank geldig. Geen kandidaat word vir enige deel van 'n eksamen aanvaar nie tensy hy in besit is van 'n geldige gesigtoetssertifikaat.

3.9 *Sertifikaat in elektroniese navigasiestelsels*

'n Sertifikaat in elektroniese navigasiestelsels is slegs geldig as dit verkry is na voltooing van 10 maande seediens in die dekafdeling. Geen kwytskelding van hierdie tydperk word toegelaat nie.

3.10 *Navigasiebeheerkursussertifikaat*

'n Navigasiebeheerkursussertifikaat is slegs geldig as dit verkry is na voltooiing van 18 maande seediens as 'n gediplomeerde waghou-offisier. Die besit van hierdie sertifikaat is 'n voorvereiste vir die uitreiking van die Klas 2-bekwaamheidsertifikaat en die Bevelvoeringsendossementsertifikaat.

3.11 *Sertifikaat in noodhulp ter see*

'n Sertifikaat in noodhulp ter see is vyf jaar lank geldig vanaf die datum van slaging in die eksamen. Kandidate wat geëksamineer wil word ten einde dié sertifikaat te verwerf, moes die toepaslike kursus aan 'n goedgekeurde kollege gevolg het.

3.12 *Skeepskaptein se sertifikaat in mediese opleiding*

'n Skeepskaptein se sertifikaat in mediese opleiding is vyf jaar lank geldig vanaf die datum van slaging in die eksamen. Vir toelating tot die Skeepskaptein se mediese opleidingskursus moet 'n kandidaat in besit wees van 'n geldige sertifikaat in noodhulp ter see.

3.13 *Sertifikaat van bywoning van 'n brandbestrydingskursus*

Kursusse in brandbestryding duur vier dae en bywoningsertifikate is slegs 'n beperkte tyd lank geldig.

3.14 *Beperkte bekwaamheidsertifikaat in radiotelefonie*

'n Beperkte bekwaamheidsertifikaat in radiotelefonie word deur die Direkteur-generaal van Pos- en Telekommunikasiewese uitgereik aan kandidate wat die kwalifiserende eksamen slaag. Besonderhede van hierdie eksamen kan op aanvraag verkry word van die Marineradio-opnemer by die Hoofposkantoor van Durban of Kaapstad.

3.15 *Skriftelike eksamen*

3.15.1 'n Kandidaat wat kwalifiseer vir 'n bekwaamheidsertifikaat Klas 2, 4 of 5 kan na eie keuse eksamen aflê in die skriftelike gedeelte van die eksamen vir die volgende hoër klas sertifikaat sonder dat hy bewys hoef te lewer van verdere seediens of enige bykomende kwalifikasie. Eweneens kan 'n kandidaat wat vir 'n Klas 2-sertifikaat kwalifiseer na eie keuse eksamen aflê in die skirftelike gedeelte van die eksamen vir 'n bevelvoeringsendossement (en mondelinge toetse vir Skeepsake en Wet van die eksamen vir Kortseehandelsbevelvoering endossement) sonder dat hy bewys hoef te lewer van verdere seediens en enige bykomende kwalifikasie. Getuigskrifte word ooreenkomstig regulasie 2.6 vereis.

3.15.2 'n Kandidaat mag nie in die mondelinge en, indien van toepassing, die seingedeelte van 'n eksamen geëksamineer word nie totdat die tydperk van waghoudiens gespesifiseer vir die uitreiking van 'n sertifikaat of endossement van daardie klas of graad voltooi is nie.

3.8 *Sight Test Certificate*

3.8.1 This certificate shall be issued upon the passing of the Department of Transport Marine Division's sight test for candidates wishing to be examined for certificates of competency and shall be valid for six months. No candidate shall be accepted for any part of an examination unless he is in possession of a valid sight test certificate.

3.9 *Electronic Navigation Systems certificate*

An electronic navigation systems certificate shall only be valid if obtained after the completion of 10 months' sea service in the deck department. No remission from this period shall be allowed.

3.10 *Navigation Control Course certificate*

A navigation control course certificate shall only be valid if obtained after the completion of 18 months' sea service as a certificated watch-keeping officer. Possession of this certificate shall be a pre-requisite for issue of the Class 2 Certificate of Competency and Command Endorsement certificates.

3.11 *First Aid at Sea certificate*

A First Aid at Sea certificate shall be valid for five years from the date of passing the examination. Candidates wishing to be examined to obtain this certificate shall have attended the appropriate course at an approved college.

3.12 *Ship Captain's Medical Training certificate*

A Ship Captain's Medical Training certificate shall be valid for five years from the date of passing the examination. For admission to the Ship Captain's Medical Training course a candidate shall be in possession of the valid First Aid at Sea certificate.

3.13 *Fire-Fighting Course attendance certificate*

Fire-Fighting courses shall be of four days duration and attendance certificates issued shall not be subject to a limiting period of validity.

3.14 *Restricted certificate of competency in Radiotelephony*

A Restricted certificate of competence in Radiotelephony shall be issued by the Director-General of Posts and Telecommunications to candidates who pass the qualifying examination. Details of this examination may be obtained by application to the *Marine Radio Surveyor* at the Main Post Offices of Durban or Cape Town.

3.15 *Written Examination*

3.15.1 A candidate qualifying for the issue of a certificate of competency of Class 2, 4 or 5 may, at his option, sit for the written portion of the examination for the next higher class of certificate without producing evidence of further sea service or any additional qualification. Similarly, a candidate qualifying for the issue of a Class 2 certificate may, at his option, sit for the written portion of the examination for a command endorsement (and Business and Law orals of the Short Sea Trade Command endorsement examination) without producing evidence of further sea service or any additional qualification. Testimonials shall be required in accordance with regulation 2.6.

3.15.2 A candidate shall not be examined in the oral and, if appropriate, signals parts of an examination until the period of watch-keeping service specified for the issue of a certificate or endorsement of that class or grade has been completed.

3.15.3 'n Slaagsyfer in die skriftelike gedeelte van die eksamen vir 'n Klas 1-bekwaamheidsertifikaat, of vir 'n bevelvoeringsendossement, is vir 'n tydperk van vyf jaar geldig; maar 'n slaagsyfer in die skriftelike gedeelte van die eksamen vir ander klasse sertifikate, en in die mondelinge en, indien van toepassing, die seingedeelte van sodanige eksamens is slegs vir 'n tydperk van een jaar geldig.

3.15.4 'n Kandidaat, synde 'n kadet of leerlingdekoffisier wat besig is met 'n goedgekeurde opleidingsprogram en wat 'n minumum van 10 maande seediens verrig het, kan 'n skriftelike eksamen aflê bestaande uit daardie vraestelle in die Klas 3-leerplan wat bykomend is by Klas 4, te wete Beginsels van Navigasie, Toegepaste Wetenskap en Wiskunde. Aan kandidate wat in hierdie oorbruggingseksamen slaag en wat gevolglik kwalifiseer vir die Klas 4-sertifikaat, word 'n Klas 3-sertifikaat toegeken na bevredigende voltooiing van die vereiste seediens. Kandidate vir die oorbruggingseksamens hoef behoudens die Gesigtoetssertifikaat in regulasie 3.8 (1) genoem geen van die bykomende kwalifikasies te toon nie, maar moet getuigskrifte ooreenkomstig regulasie 2.6 toon.

3.16 *Vrystellings van skriftelike eksamens*

3.16.1 'n Kandidaat wat die houer is van 'n klas 2-sertifikaat, word vir 'n tydperk van vyf jaar vrygestel van die toepaslike vraestelle oor Skeepsbou en Skeepstabiliteit en Skeepsboordwerksaamhede wanneer eksamen afgelê word vir 'n endossement as Gesagvoerder (Beperkte Handel) of Gesagvoerder (Kortseehandel). 'n Kandidaat wat deur in 'n eksamen te slaag kwalifiseer vir die Klas 4-sertifikaat kan te eniger tyd kwalifiseer vir 'n Klas 3-sertifikaat deur in die oorbruggingseksamen in Beginsels van Navigasie, Wiskunde en Toegepaste Wetenskap op Klas 3-vlak te slaag.

3.17 *Geldigheid van Bevelvoeringsendossemente*

3.17.1 As 'n offisier wat die houer is van die endossement as Gesagvoerder (Beperkte Handel) op 'n Klas 3-sertifikaat vir 'n Klas 2-sertifikaat kwalifiseer, word daardie ensossement outomaties op sy nuwe sertifikaat oorgeplaas.

3.17.2 As 'n offisier wat die houer is van 'n endossement as Gesagvoerder (Kortseehandel) vir 'n hoër bekwaamheidsertifikaat kwalifiseer, behou hy daardie endossement totdat hy deur in 'n eksamen te slaag, kwalifiseer vir 'n endossement as Gesagvoerder (Beperkte Handel) of 'n Klas 1-sertifikaat maar kan nie waarneem as gesagvoerder van enige ander skip as dié waarop 'n endossement as Gesagvoerder (Kortseehandel) van toepassing is nie.

3.18 *Endossering van sertifikate*

Bekwaamheidsertifikate kan geëndosseer word wanneer die houers oor die volgende kwalifikasies beskik: (Let egter op dat dit nie normaalweg nodig is waar die kwalifikasie 'n vereiste is vir die uitreiking van die sertifikaat nie:)

(i) Pos- en Telekommunikasiewese se bekwaamheidsertifikaat in radiotelefonie (Beperk);

(ii) 'n erkende radio-onderhoudsertifikaat;

(iii) 'n sertifikaat van bywoning van 'n navigasiebeheerkursus deur die Direkteur-generaal goedgekeur;

(iv) 'n sertifikaat van bywoning van 'n goedgekeurde brandbestrydingsopleidingskursus;

(v) 'n goedgekeurde sertifikaat in noodhulp ter see;

(vi) 'n erkende skeepskapteinsertifikaat in mediese opleiding;

(vii) 'n goedgekeurde sertifikaat in elektroniese navigasiestelsels;

(viii) 'n Gevaarlikevragendossement van die Departement van Vervoer.

3.15.3 A pass in the written part of the examination for a Class 1 Certificate of Competency, or for a command endorsement, shall be valid for a period of five years; but a pass in the written part of the examination for other classes of Certificates and in the oral, and, if appropriate, signals parts of such examinations shall be valid for a period of one year only.

3.15.4 A candidate, being a cadet or trainee deck officer undergoing an approved training programme and who has a minimum of 10 months' sea service, may sit for a written examination consisting of those papers in the Class 3 syllabus which are additional to Class 4, to wit, Principles of Navigation, Applied Sciences and Mathematics. Candidates who pass in this bridging examination and who subsequently qualify for the Class 4 Certificate, shall be granted a Class 3 Certificate on their satisfactorily completing the requisite sea service. Candidates for the bridging examinations shall not be required to produce any of the additional qualifications other than the Sight Test certificate mentioned in regulation 3.8 (1) but shall be required to present testimonials in accordance with regulation 2.6.

3.16 *Exemptions from written examinations*

3.16.1 A candidate holding a Class 2 certificate shall be exempt for a period of five years from the appropriate Ship Construction and Stability and Ship-board Operations papers when sitting for the examination for a Master (Limited Trade) or Master (Short Sea Trade) endorsement. A candidate qualifying by examination for the issue of a Class 4 certificate may at any time qualify for the issue of a Class 3 certificate by passing the bridging examination in Principles of Navigation, Mathematics and Applied Science at Class 3 level.

3.17 *Validity of Command Endorsements*

3.17.1 An officer holding the Master (Limited Trade) endorsement to a Class 3 certificate who subsequently qualifies for the issue of a Class 2 certificate shall automatically have that endorsement transferred to his new certificate.

3.17.2 An officer holding a Master (Short Sea Trade) endorsement who subsequently qualifies for the issue of a higher certificate of competency shall retain that endorsement until he qualifies by examination for a Master (Limited Trade) endorsement or a Class 1 certificate but shall be unable to act as master of any ship other than a ship for which a Master (Short Sea Trade) endorsement is appropriate.

3.18 *Endorsement of certificates*

Certificates of competency may be endorsed when the holders have the following qualifications (It should be noted however that this is not normally necessary where the qualification is a requirement for the issue of the certificate):

(i) Post and Telecommunications certificate of competence in radiotelephony (Restricted);

(ii) a recognised radio maintenance certificate;

(iii) a certificate of attendance at a Navigation Control course approved by the Director-General;

(iv) a certificate of attendance at an approved fire-fighting trainging course;

(v) an approved first aid at sea certificate;

(vi) a recognised ship captain's medical training certificate;

(vii) an approved electronic navigation systems certificate;

(viii) a Department of Transport dangerous cargo endorsement.

3.19 *Afskrif van verlore sertifikaat*

3.19.1 'n Aansoeker om 'n gewaarmerkte afskrif van 'n verlore sertifikaat, ongeag of dit 'n bekwaamheid- of diens-sertifikaat is, moet 'n aansoekvorm invul en dit aan 'n bevoegde beampte by die naaste hawe oorhandig en terselfdertyd die toepaslike bedrag betaal. 'n Verklaring aangaande die omstandighede waarin die sertifikaat verlore geraak het, moet deur die aansoeker voor die bevoegde beampte gedoen word. Die bevoegde beampte moet dan die aansoekvorm aan die Direkteur-generaal deurstuur wat dan 'n gewaarmerkte afskrif van die verlore sertifikaat vir oorhandiging aan die aansoeker moet stuur.

3.19.2 As die aansoeker kan bewys dat die sertifikaat as gevolg van skipbreuk of 'n brand aan boord verlore geraak het, word geen betaling gevorder nie.

HOOFSTUK 4

DIE BEREKENING VAN SEEDIENS

4.1 *Algemeen*

4.1.1 Kwalifiserende seediens vir bekwaamheidsertifikate en bevelvoeringsendossemente daarvan moet in die dekafdeling verrig word. Vir 'n eerste sertifikaat tel diens wat as 'n utiliteitseeman gelewer is twee derdes totdat die eerste jaar van kwalifiserende diens voltooi is (d.w.s. vir 'n maksimum van 18 maande), daarna tel dit ten volle.

4.1.2 Die kwalifiserende diens gespesifiseer vir enige besondere bekwaamheidsertifikaat of endossement daarvan, word verrig binne 'n tydperk van 10 jaar wat die datum voorafgaan waarop die eksamen die eerste keer afgelê is, na goeddunke van die senior eksaminator in individuele gevalle.

4.1.3 Slegs diens op skepe groter as 100 bruto ton word aanvaar as kwalifiserende diens vir enige ander bekwaamheidsertifikaat as Klas 5 of 6.

4.1.4 Diens op skepe van meer as 100 bruto ton wat lang seereise aflê, tel ten volle vir alle klasse van sertifikate.

4.1.5 Diens op skepe wat kortseehandel- of Beperktehandelseereise aflê, word alles as kwalifiserende diens vir 'n Klas 5- of 6-sertifikaat aanvaar, en vir alle ander klasse sertifikate geld twee derdes daarvan as kwalifiserende diens. Dit word ten volle aanvaar vir die toepaslike Bevelvoeringsendossement.

4.1.6 Diens op skepe van meer as 25 bruto ton maar minder as 100 bruto ton word ten volle aanvaar vir 'n Klas 5- of 6-sertifikaat tot 'n maksimum van 12 maande. Diens op skepe van minder as 25 bruto ton word slegs, indien toepaslik, vir 'n Klas 6-sertifikaat aanvaar.

4.1.7 Kwalifiserende diens word bereken vanaf die datum van indiensneming tot die datum van ontslag van die skip af. Ontslagsertifikate word aanvaar as bewys van seediens behoudens verwysing na die Ooreenkomste wanneer nodig. Wanneer diens in bevel van 'n wag vereis word, moet waghoudienssertifikate ook getoon word.

4.1.8 Kadette of leerling-dekoffisiere vir sertifikate van Klasse 3, 4 en 5 moet 'n verklaring voorlê van die Gesagvoerder(s) onder wie die kandidate gedien het of van hul werkgewer(s) waarin gemeld word dat hulle gedurende die laaste 12 maande van hul seediens minstens ses maande bestee het aan dienste wat verband hou met waghoudiens op die brug onder toesig van 'n gediplomeerde offisier.

4.1.9 Kandidate wat nie kadette of leerling-dekoffisiere vir sertifikate van Klasse 3, 4 en 5 is nie, moet 'n verklaring voorlê van die Gesagvoerder(s) onder wie die kandidate

3.19 *Copy of lost certificate*

3.19.1 An applicant for a certified copy of a lost certificate, whether of competency or service, shall complete a form of application and hand it to a Proper Officer at the nearest port, paying at the same time the appropriate fee. A declaration as to the circumstances in which the certificate was lost shall be made by the applicant before the Proper Officer. The Proper Officer shall then send the form of application to the Director-General, who shall forward a certified copy of the lost certificate for delivery to the applicant.

3.19.2 No fee shall be chargeable if the applicant can show that the certificate was lost through shipwreck or fire on board ship.

CHAPTER 4

ESTIMATING SEA SERVICE

4.1 *General*

4.1.1 Qualifying sea service for certificates of competency and command endorsement thereto shall be performed in the deck department. For a first certificate, service as a General Purpose Rating shall count at two thirds rate until the first year of qualifying service is completed (i.e. for a maximum of 18 months), thereafter it shall count in full.

4.1.2 The qualifying service specified for any particular certificate of competency or endorsement thereto shall be performed within a period of 10 years preceding the date upon which the examination is first taken, subject to the discretion of the senior examiner in individual cases.

4.1.3 Only service in ships of more than 100 gross tons shall be accepted as qualiying service for any Certificate of Competency other than Class 5 or 6.

4.1.4 Service in ships of more than 100 gross tons engaged in long voyages shall be counted in full for all classes of certificates.

4.1.5 Service in ships engaged in Short Sea Trade or Limited Trade voyages shall be accepted in full for a Class 5 or 6 certificate and at two thirds rate for all other classes of certificates. It shall be accepted in full for the appropriate Command Endorsement.

4.1.6 Service in ships of more than 25 gross tons but less than 100 gross tons shall be accepted in full for a Class 5 or 6 certificate up to a maximum of 12 months. Service in ships of less than 25 gross tons shall only be accepted, if appropriate, for a Class 6 certificate.

4.1.7 Qualifying service shall be reckoned from the date of engagement to the date of discharge from a ship. Subject to reference with the Agreements when necessary, certificates of discharge shall be accepted as proof of sea service. Where service in charge of a watch is required, certificates of watch-keeping service shall also be produced.

4.1.8 Cadets or trainee deck officers for Classes 3, 4 and 5 certificates shall produce a statement from the Master(s) under whom the candidates have served or from their employer(s) that during the final 12 months of their sea service at least six months have been spent on duties associated with bridge watch-keeping under the supervision of a certificated officer.

4.1.9 Candidates other than cadets or trainee deck officers for Classes 3, 4 and 5 certificates, shall produce a statement from the Master(s) under whom the candidates have

gedien het of van hul werkgewer(s) waarin gemeld word dat hulle gedurende die laaste 12 maande van hul seediens minstens ses maande bestee het aan dienste wat verband hou met waghoudiens op die brug onder toesig van 'n gediplomeerde offisier; hierdie pligte kan insluit uitkyk op die brug, maar nie dié van stuurman nie, behalwe in die mate van twee maande uit elke ses.

4.1.10 Kadette of leerling-dekoffisiere moet bevredigende bewys lewer dat hulle dwarsdeur die gespesifiseerde tydperk seediens 'n opleidingsprogram gevolg het. Kandidate wat in gebreke bly om bevredigende bewys te lewer dat hulle 'n opleidingsprogram, goedgekeur deur die Departement van Vervoer, gevolg het, moet 'n bykomende tydperk seediens verrig voordat hulle tot die eksamen toegelaat word.

4.1.11 Waar waghoudiens vereis word, moet kandidate deur die voorlegging van sertifikate, onderteken deur die Gesagvoerders van die vaartuie waarin hulle diens gedoen het, bewys lewer dat hulle minstens 8 uur uit elke 24 uur diens waarop aanspraak gemaak word as waghou-offisiere waargeneem het.

4.2 *Bewys van diens in ander skepe as Suid-Afrikaanse skepe*

4.2.1 Waar 'n kandidaat op kwalifiserende diens op 'n skip wat nie in die Republiek geregistreer is nie, aanspraak maak en sodanige diens nie deur die Direkteur-generaal geverifieer kan word nie, moet die diens bevestig word deur 'n amptelike owerheid van die land waaraan die skip behoort het waarop die kandidaat gedien het.

4.2.2 As daar enigsins twyfel oor die afdoendheid van die gelewerde bewys bestaan, moet al die dokumente na die Direkteur-generaal verwys word vir sy beslissing.

4.3 *Nie-handelsdiens*

4.3.1 Sien regulasie 2.13 vir diens op vlootvaartuie gelewer.

4.3.2 Diens uitsluitlik verrig op treilers en ander diepseevissersvaartuie met 'n tonnemaat van meer as 100 bruto registerton tel ten volle as kwalifiserende diens vir sertifikate van Klasse 3, 4 en 5, maar kandidate moet daarbenewens minstens 12 maande lank gedien het op ander vaartuie as vissersvaartuie.

4.3.3 Diens in vlootvaartuie en ander soortgelyke vaartuie wat gereeld ter see gaan, tel ten volle as kwalifiserende diens vir sertifikate van Klas 3, 4 en 5, maar kandidate moet daarbenewens minstens nog 12 maande lank gedien het op vaartuie wat kort of lang seereise onderneem.

4.3.4 Diens op sekere nie-handelsvaartuie soos van tyd tot tyd voorgeskryf deur die Direkteur-generaal tel, behoudens die bepalings van regulasie 3.3 en 3.4 ten volle as die werklike tyd op see deurgebring twee derdes of meer van die totale tydperk diens aan boord van 'n skip uitmaak. As die werklike seediens minder is as hierdie verhouding tel een-en-'n-half keer die werklike seediens as kwalifiserende diens. Kandidate moet benewens die bewys van seediens wat van alle kandidate vereis word, 'n verklaring of sertifikaat van die eienaars van die skip voorlê wat die hoeveelheid tyd aandui wat werklik op see deurgebring is en elke aansoek moet na verdienste deur die eksaminator behandel word.

4.3.5 Bystandsdiens gedurende die finale konstruksiestadiums van 'n nuwe vaartuig tel tot 'n maksimum van drie maande ten volle as kwalifiserende diens vir 'n Klas 1-bekwaamheidsertifikaat of vir 'n bevelvoeringsendossement vir 'n bekwaamheidsertifikaat, mits 'n offisier daarna gedurende die eerste seereis op sodanige vaartuig diens verrig.

served or from their employer(s) that during the final 12 months of their sea service at least six months have been spent on duties associated with bridge watch-keeping under the supervision of a certificated officer; these duties may include keeping a lookout on the bridge but not those of helmsman except to the extent of two months out of every six.

4.1.10 Cadets or trainee deck officers shall produce satisfactory evidence that a training programme has been followed throughout the specified period of sea service. Candidates who fail to produce satisfactory evidence that they have followed a training programme approved by the Department of Transport shall be required to perform an additional period of sea service before being admitted to the examination.

4.1.11 Where watch-keeping service is required, candidates shall prove by the production of certificates signed by the Masters of the vessels in which they have served, that they have acted as watch-keeping officers for not less than eight hours out of every 24 hours service claimed.

4.2 *Evidence as to service in ships other than South African Ships*

4.2.1 Where a candidate claims qualifying service in a ship not registered in the Republic and such service cannot be verified by the Director-General, the service shall be confirmed by an official authority of the country to which the ship in which the candidate served, belonged.

4.2.2 If the sufficiency of the proof given appears to be at all doubtful, all papers shall be referred to the Director-General for decision.

4.3 *Non-Trading service*

4.3.1 See regulation 2.13 for service performed in Naval vessels.

4.3.2 Service performed exclusively in trawlers and other deep sea fishing vessels over 100 gross register tons, shall count in full towards the qualifying service for Classes 3, 4 and 5 certificates but candidates shall, in addition, have served for at least 12 months in vessels other than fishing vessels.

4.3.3 Service in naval craft and other similar vessels which regularly proceed to sea, shall count in full towards the qualifying service for Classes 3, 4 and 5 certificates but candidates shall, in addition, have served for at least 12 months in vessels engaged in short or long voyages.

4.3.4 Service in certain Non-Trading vessels as promulgated by the Director-General from time to time shall, subject to the provisions of regulation 3.3 and 3.4 be counted in full if the time actually spent in service at sea constitutes or exceeds two-thirds of the total period of service on board ship. If the actual sea service falls below this proportion one and one-half times the actual sea service shall be counted as qualifying service. Candidates shall be required to produce, in addition to the evidence of sea service required of all candidates, a statement or certificate from the owners of the ship showing the amount of time actually spent at sea and each application shall be treated on its merits by the examiner.

4.3.5 Service standing by a new vessel during the final stages of construction: Provided that an officer subsequently serves in such a vessel on the maiden voyage, shall count in full towards the qualifying service for a Class 1 Certificate of Competency or for a Command Endorsement for a Certificate of Competency up to a maximum of 3 months.

4.4 *Vrystelling van seediens*

4.4.1 Die vasgestelde tydperke seediens vir sertifikate van Klasse 3, 4 en 5 kan verminder word deur vrystellings verleen ten opsigte van bywoning van goedgekeurde opleidingskursusse, en, in die geval van sertifikate van Klasse 4 en 5, deur erkenning van sekere hoër akademiese kwalifikasies.

4.4.2 Kandidate kan onder meer as een hoof vir vrystelling kwalifiseer, maar die totale vrystelling wat verleen is mag in geen geval 12 maande te bowe gaan nie.

4.4.3 Geen vrystelling van seediens word toegelaat ten opsigte van die kwalifiserende diens wat vereis word vir sertifikate van Klasse 1 en 2 of vir 'n Bevelvoerings- endossement nie, en ook nie ten opsigte van die vereiste tydperk van minstens ses maande wat bestee moet word aan pligte in verband met brugwaghoudiens gedurende die finale 12 maande seediens vir 'n sertifikaat van Klas 3, 4 of 5 nie.

4.4.4 Elke kadet of leerling-offisier wat beskou wil word as iemand wat 'n verminderde tydperk kadetskap ingevolge regulasie 3.2.2 gevolg het, moet 'n brief toon van die eienaars, of van die Gesagvoerder of Gesagvoerders onder wie hy diens verrig het, wat meld dat al sy diens tydens sy tydperk aan boord op 'n bevredigende wyse verrig is en dat hoogstens twee maande van daardie diens deurgebring is aan boord van skepe wat in 'n droogdok enjinherstelwerk ondergaan het of andersins stilgelê het. Hoogstens die helfte van hierdie toegewing mag deurgebring gewees het as bystandsdiens gedurende die finale konstruksiestadiums van 'n nuwe vaartuig.

4.5 *Kolleges vir Seevaartopleiding*

4.5.1 'n Gedeelte van dieselfde diens wat na die ouderdom van 16 verrig is by 'n kollege vir seevaartopleiding op land, kan as kwytskeld van seediens toegelaat word mits—

(a) die kollege deur die Direkteur-generaal erken word;

(b) na 'n inspeksie deur een van sy vakkundige beamptes, die Direkteur-generaal oortuig is dat die kollege opleiding verskaf wat die tyd daar deurgebring regverdig en wat beskou word as deel van die vereiste tydperk kwalifiserende diens vir 'n bekwaamheidsertifikaat; en

(c) die kandidaat 'n sertifikaat betreffende bevredigende bywoning voorlê van die owerhede wanneer hy die kollege verlaat.

4.5.2 Hierdie reëlings is van toepassing op vier soorte kolleges—

(i) kolleges waar 'n persoon inwoon en 'n aantal jare lank opleiding ontvang, of kursusse wat minstens een akademiese jaar lank duur in navigasie en seemanskap volg. Die maksimum vrystelling van seediens wat toegelaat word ten opsigte van bywoning van so 'n kollege, word tydens goedkeuring vasgestel, maar mag nie 12 maande te bowe gaan nie;

(ii) tegniese kolleges of soortgelyke nie-residensiële inrigtings waar persone kadetkursusse in navigasie en seemanskap bywoon voordat hulle ter see gaan. Die maksimum vrystelling van seediens in hierdie gevalle word tydens goedkeuring vasgestel, maar mag nie 12 maande te bowe gaan nie;

(iii) residensiële tegniese kolleges waar kadette en leerlingnavigasie-offisiere 'n stapelkursus bywoon wat bestaan uit 'n tydperk van voor-seeopleiding gevolg deur twee verdere opleidingstydperke by dieselfde kollege, teen ongeveer die middel en aan die einde van hulle tydperk van kwalifiserende diens wat verminder word deur vrystelling van seediens. Die maksimum vrystelling van seediens wat toegelaat word ten opsigte van sodanige

4.4 *Remission of Sea Service*

4.4.1 The specified periods of sea service for Classes 3, 4 and 5 certificates may be reduced by remissions granted in respect of attendance at approved courses of training, and, in the case of Classes 4 and 5 certificates, in recognition of certain higher academic qualifications.

4.4.2 Candidates may qualify for remission under more than one heading, but in no case shall the total remission granted exceed 12 months.

4.4.3 No remission of sea service shall be allowed in respect of the qualifying service required for Classes 1 and 2 certificates or for Command Endorsement, nor in respect of the period of at least six months required to be spent on duties associated with bridge watchkeeping during the final 12 months sea service for a Class 3, 4 or 5 certificate.

4.4.4 Every cadet or trainee deck officer wishing to be considered as having followed a reduced period cadetship under regulation 3.2.2 shall produce a letter from the owners, or from the Master or Masters under whom he has served, stating that all his service while on board ship was performed in a satisfactory manner, and that not more than two months of that service was spent on board ships in drydock undergoing engine repairs or otherwise laid up. Not more than half of this allowance shall be spent standing by a new vessel during the final stages of construction.

4.5 *Colleges for Nautical training*

4.5.1 A proportion of the same time spent after the age of 16 at a college for nautical training conducted on premises ashore, may be allowed as a remission of sea service provided that—

(a) the college is recognised by the Director-General;

(b) after an inspection by one of his professional officers, the Director-General is satisfied that the college gives a training that justifies time spent there, being reckoned as part of the necessary qualifying time for a certificate of competency; and

(c) the candidate produces a certificate as regards satisfactory attendance from the authorities of the college on leaving.

4.5.2 The colleges to which these arrangements shall apply are of four kinds—

(i) colleges at which a person resides and receives training for a period of years, or courses for not less than one academic year, in navigation and seamanship. The maximum remission of sea service that shall be allowed in respect of attendance at such a college shall be fixed at the time of approval, but shall not exceed 12 months;

(ii) technical colleges or similar non-residential institutions where persons attend cadet courses in navigation and seamanship before going to sea. The maximum remission of sea service in these cases shall be fixed at the time of approval, but shall not exceed 12 months;

(iii) residential technical colleges where cadets and trainee navigating officers attend a sandwich course consisting of a period of pre-sea training followed by two further periods of training at the same college, at approximately the middle and at the end of their period of qualifying service reduced by remissions of sea service. The

skemas word tydens goedkeuring vasgestel, maar mag nie 12 maande te bowe gaan nie. Bywoning van die voorseeopleidinggedeelte van die stapelkursus op sigself laat kadette en leerling-navigasie-offisiere nie vir vrystelling van seediens kwalifiseer nie;

(iv) tegniese kolleges of soortgelyke nie-residensiële inrigtings waar kandidate senior kursusse in navigasie bywoon na voltooiing van ongeveer die helfte van die kwalifiserende diens vir sertifikate van Klasse 3, 4 of 5. Die maksimum vrystelling van seediens in hierdie gevalle word tydens goedkeuring vasgestel, maar mag nie 12 maande te bowe gaan nie. In die geval van kolleges van klasse (i) en (ii) moet die sertifikaat aandui of die kandidaat die kursus voltooi het. In die geval van kolleges van klasse (ii), (iii) en (iv) moet die sertifikaat of sertifikate wat die kandidaat ooreenkomstig regulasie 4.5 (1) (c) voorlê, boonop getuig van die kandidaat se voortgesette en gereelde bywoning van al die goedgekeurde klasse.

4.5.3 'n Kandidaat wat by verskillende geleenthede twee of meer kolleges bygewoon het, en aan wie goedkeuring vir vrystelling van seediens toegeken is, kan vrystelling van seediens ontvang ten opsigte van die bywoning van elk van sodanige kolleges, behoudens die voorwaarde dat die totale toegelate vrystelling van seediens nooit 12 maande te bowe mag gaan nie.

4.5.4 'n Lys van goedgekeurde kolleges vir seevaartopleiding word van tyd tot tyd deur die Direkteur-generaal afgekondig.

4.6 *Diens in Vlootopleidingskolleges*

Die helfte van die tyd deurgebring aan 'n Suid-Afrikaanse Vlootkollege kan as vrystelling van seediens tel, en 'n soortgelyke toegewing word gemaak ten opsigte van tyd bestee aan kursusse by inrigtings op land na bevordering tot Waarnemende Onderluitenant, behoudens die voorwaarde dat die totale vrystelling van seediens ten opsigte van alle tyd bestee aan opleiding op land, nie ses maande te bowe gaan nie.

4.7 *Kadetopleidingskepe*

4.7.1 Vrystelling van seediens word verleen aan kadette en leerlingdekoffisiere wat vir 'n minimum tydperk diens doen op kadet-opleidingskepe wat spesiaal deur die Departement van Vervoer goedgekeur is. Die maksimum vrystelling van seediens wat toegelaat word ten opsigte van kadet-opleidingskeepsdiens word tydens goedkeuring vasgestel.

4.7.2 Elke kadet of leerlingdekoffisier wat vrystelling verlang vir kadetopleidingskeepsdiens moet 'n sertifikaat, geteken deur die Gesagvoerder, voorlê waarin gemeld word dat sy gedrag en bekwaamheid bevredigend was.

4.8 *Persone met hoër akademiese kwalifikasies*

As 'n kandidaat vir 'n bekwaamheidsertifikaat, Klas 4 en Klas 5, die houer is van 'n hoër akademiese kwalifikasie soos in regulasie 3.2.3 vermeld, word uit hoofde van sodanige kwalifikasie aan hom vrystelling van seediens verleen van hoogstens nege maande van die drie of vier jaar kwalifiserende diens in regulasie 3.2.1 voorgeskryf. Sodanige vrystelling geld bo en behalwe enige vrystelling kragtens regulasie 4.5.2, maar die totale vrystelling is onderworpe aan 'n maksimum van 12 maande.

HOOFSTUK 5

OPLEIDINGSKEMAS

5.1 *Inleiding*

Kadette of leerlingdekoffisiere kan na bevredigende voltooiing van die gespesifiseerde minimum opleidingstydperk kwalifiseer vir 'n eerste bekwaamheidsertifikaat hetsy op

maximum remission of sea service that shall be allowed in respect of such schemes shall be fixed at the time of approval, but shall not exceed 12 months. Attendance at the pre-sea part of the sandwich caurse shall not by itself qualify for remission of sea service;

(iv) technical colleges or similar non-residential institutions where candidates attend senior courses in navigation after completing approximately half the qualifying service for a Class 3, 4 or 5 certificate. The maximum remission of sea service in these cases shall be fixed at the time of approval, but shall not exceed 12 months. In the case of colleges of classes (i) and (ii) the certificate shall show whether he has completed the course. In the case of colleges of classes (ii), (iii) and (iv) the certificate or certificates which the candidate produces in accordance with regulation 4.5 (1) (c), shall in addition testify to the candidate's continuous and regular attendance at all the approved classes.

4.5.3 A candidate who, at different times, has attended two or more colleges to which approval for remission of sea service has been granted, may be allowed a remission of sea service in respect of attendance at each of them, subject always to the condition that the total remission of sea service allowed shall not exceed 12 months.

4.5.4 A list of approved colleges of nautical training shall be promulgated from time to time by the Director-General.

4.6 *Service in Naval Training Colleges*

Half the time spent at a South African Naval College, shall be allowed to count as a remission of sea service, and a similar allowance shall be made in respect of time spent on courses at shore establishments after promotion to Acting Sub-Lieutenant, subject to the condition that the total remission of sea service in respect of all time spent in training ashore shall not exceed 6 months.

4.7 *Cadet training ships*

4.7.1 Remissions of sea service shall be granted to cadets and trainee deck officers who serve a minimum period in cadet training ships specially approved by the Department of Transport. The maximum remission of sea service that shall be allowed in respect of cadet training ship service shall be fixed at the time of approval.

4.7.2 Every cadet or trainee deck officer seeking remission for cadet training ship service shall be required to produce a certificate signed by the Master stating that his conduct and proficiency were satisfactory.

4.8 *Persons holding higher academic qualifications*

A candidate for a certificate of competency, Class 4 and Class 5 who holds a higher academic qualification as specified in regulation 3.2.3, shall in respect of such qualification be allowed a remission of sea service not exceeding nine months of the 3 or 4 years qualifying service prescribed in regulation 3.2.1. Such remission shall be in addition to any remission granted under regulation 4.5.2 subject to an overall maximum of 12 months.

CHAPTER 5

TRAINING SCHEMES

5.1 *Introduction*

Cadets or trainee deck officers may qualify for a first certificate of competency at either Class 3, 4 or level upon satisfactory completion of the minimum training period

die Klas 3-, 4- of 5-vlak, mits hulle gedurende die hele opleidingstydperk 'n opleidingsprogram deurloop wat deur die Departement van Vervoer erken word. Opleidingsprogramme wat op hierdie manier deur die Departement van Vervoer erken word, bestaan uit stapelkursusse waartydens studente afwisselende opleidingstydperke ter see, waar die klem op praktiese opleiding val, en dan weer by 'n vlootkollege, waar die klem op teoretiese studies val, deurbring.

5.2 *Standaardopleidingskemas*

Die standaardopleidingskema maak voorsiening vir vier fases:

Fase I—Aanvanklike seetydperk.

Fase II—Eerste Kollegefase.

Fase III—Intermediêre Seetydperk.

Fase IV—Finale Kollegefase.

Die aanvanklike seetydperk duur normaalweg ongeveer 12 maande. Kadette moet minstens 24 maande lank diens op 'n skip verrig het voordat hulle toegelaat word tot Fase IV (Finale Kollegefase) en moet die vorige fases bevredigend voltooi het. Kollegefases maak studente geregtig op vrystelling van seetyd tot die toelaatbare maksimum, mits hulle skriftelike bewys kan lewer van volle en bevredigende bywoning soos aangeteken in die bywoningsregister.

5.3 *Beplande opleiding gedurende seetydperke*

5.3.1 Dit is 'n wesentlike kenmerk van die standaardopleidingskema dat studente 'n tydperk van minstens 24 maande beplande opleiding ter see moes voltooi het. Bewys van beplande opleiding ter see neem normaalweg die vorm aan van 'n dekkadet se rekordboek, behoorlik ingevul deur die Gesagvoerders en offisiere van die skepe waarop seediens verrig word.

5.3.2 Versuim om bevredigende bewys te lewer van beplande opleiding ter see wanneer by voltooiing van die kursus aansoek gedoen word om toelating tot die eksamen vir 'n bekwaamheidsertifikaat sal meebring dat 'n bykomende tydperk bevredigende seediens soos gespesifiseer deur die Direkteur-generaal verrig moet word voordat toelating tot die eksamen verleen word.

5.3.3 Dit is die kadet of leerlingoffisier se verantwoordelikheid om te verseker dat sy dekkadetrekordboek behoorlik bygehou en geëndosseer word; en dit is die Gesagvoerder en die betrokke senior offisiere se verantwoordelikheid om die toepaslike gedeeltes in te vul wanneer hul tevrede is dat die take behoorlik uitgevoer is.

5.4 *Voortgesette studie ter see*

'n Kandidaat wat die kursus bevredigend voltooi het, kan die Klas 4-eksamen aflê mits sodanige kandidaat voldoen het aan al die voorwaardes wat gestel word aan kandidate wat aansoek doen om toelating tot die Departement van Vervoer se eksamen.

HOOFSTUK 6

EKSAMENPROSEDURE

6.1 *Algemeen*

6.1.1 Die eksamen begin elke dag op 'n tyd deur die eksaminator bepaal. Daar is elke dag 'n etenspouse. Kandidate moet sover moontlik vroegtydig kennis kry van die dag en tyd van hulle mondelinge eksamen en, indien toepaslik, van hul eksamen in seinwerk.

6.1.2 Afgesien van iemand wie se pligte dit van hom vereis om aanwesig te wees, word niemand in die eksamenkamer toegelaat nie.

6.1.3 Algehele stilte moet in die eksamenkamer gehandhaaf word terwyl 'n skriftelike eksamen aan die gang is.

specified, provided that during the whole of that training period they undergo a programme of training recognised by the Department of Transport. Programmes of training which shall be recognised by the Department of Transport in this way consist of sandwich-type courses where students spend alternate periods under training at sea, where emphasis is upon practical training, and at a nautical college, where the emphasis is upon theoretical studies.

5.2 *Standard Scheme of training*

The standard scheme of training shall provide for four phases:

Phase I—Initial Sea Period.

Phase II—First College Phase.

Phase III—Intermediate Sea Period.

Phase IV—Final College Phase.

The Initial Sea Period shall normally be of about 12 months. Cadets shall have served on board ship for not less than 24 months before they shall be admitted to the Phase IV (Final College Phase) and have satisfactorily completed the earlier Phases. College Phases shall entitle students to remission of seatime up to the allowed maximum, provided students can produce written evidence of full and satisfactory attendance as recorded in the attendance register.

5.3 *Planned training during sea periods*

5.3.1 It is an essential feature of the Standard Scheme of training that students shall have completed a period of planned training at sea of not less than 24 months. Proof of planned training at sea shall normally take the form of a Deck Cadet's Record Book duly completed by the Masters and officers of the ships in which sea service is performed.

5.3.2 Failure to produce satisfactory evidence of planned training at sea when making application for admission to the examination for a certificate of competency upon completion of the course, shall entail the performance of such additional period of satisfactory sea service as the Director-General may specify, before admission to the examination is granted.

5.3.3 It shall be the responsibility of the cadet or trainee officer to ensure that his Deck Cadet's Record Book is properly maintained and endorsed; and the responsibility of the Master and appropriate senior officers to complete the relevant sections when they are satisfied that the tasks have been properly carried out.

5.4 *Continued studies at sea*

A candidate who has satisfactorily completed the course may sit for the Class 4 examination provided all conditions required of candidates applying for admission to the Department of Transport's examination have been met by such candidate.

CHAPTER 6

EXAMINATION PROCEDURE

6.1 *General*

6.1.1 The examination shall begin each day at a time appointed by the examiner. A luncheon interval shall be given each day. As far as possible, candidates shall be given ample notice of the day and time of their oral and, if appropriate, signals examination.

6.1.2 No person other person other than those whose duties require them to be present shall be allowed in the examination room.

6.1.3 Complete silence must be maintained in the examination room while a written examination is in progress.

6.2 *Gebruik van boeke en tafels in die eksamen*

6.2.1 Die volgende tafels en boeke kan deur die eksaminator in die eksamenkamer verskaf word: "Nautical Almanac"; "Burton's Nautical Tables"; "Norie's Tables"; Getytafels van die Admiraliteit, Vol. 1 en Vol. 2.

6.2.2 'n Kandidaat wat ander tafels wil gebruik as dié wat hierbo genoem is, kan sodanige tafels in die eksamenkamer inbring op voorwaarde dat hy hulle voor die aanvang van die eksamen met die oog op besigtiging en goedkeuring aan die eksaminator toon. Hierdie tafels mag geen aantekeninge in manuskrip bevat nie. Behoudens die eksaminator se goedkeuring word geen beperking op die gebruik van enige tafels geplaas nie, maar 'n kandidaat moet die teorie begryp waarop die tafels gebaseer is en sodanige tafels moet in staat wees om 'n antwoord binne die vereiste noukeurigheidsperke te verskaf. Wanneer daar by die beantwoording van 'n vraag gebruik gemaak word van ander tafels as dié wat deur die eksaminator verskaf word, moet die naam van die tafels en 'n aanduiding van wat werklik uit hulle verkry is, op die kandidaat se eksamenskrif verstrek word.

6.3 *Gebruik van instrumente*

6.3.1 Alle instrumente wat vir gebruik in die eksamen nodig is, sal deur die eksaminator verskaf word, maar 'n kandidaat kan toegelaat word om sy eie tekeninstrumente en rekenliniale te gebruik mits die eksaminator se goedkeuring voor die aanvang van die eksamen verkry word. As 'n rekenliniaal gebruik word, moet 'n aantekening te dien effekte op die kandidaat se eksamenskrifte aangebring word.

6.3.2 'n Kandidaat wat gebruik maak van 'n rekenliniaal of 'n rekentoestel vir sy berekenings, moet die volledige stappe wat nodig is om die resultate te verkry, in ink in die eksamenskrif uiteensit. Indien die stappe nie uiteengesit is nie, word geen punte ten opsigte van die betrokke resultate toegeken nie.

6.3.3 Die gebruik van rekenliniale en rekentoestelle is onderworpe aan die goedkeuring van die eksaminator wat hom daarvan moet gewis dat inligting op rekenliniale nie oormatig is nie en dat rekentoestelle nie geprogrammeer kan word nie. Die eksaminator moet ook die gebruik van rekentoestelle verbied in eksamens in suiwer en toegepaste wiskunde waar die basiese wiskundige beginsels bewys moet word.

6.4 *Ongeoorloofde boeke en papiere streng verbode*

6.4.1 Behoudens die bepalings van regulasie 6.2 (2) mag 'n kandidaat nie ander boeke, aantekeninge, memorandums of papiere by hom hê as wat vir gebruik in die eksamen verskaf is nie en indien 'n kandidaat wel boeke, aantekeninge, memorandums of papiere met hom saamgebring het, moet hy hulle aan die eksaminator oorhandig voordat hy met die eksamen begin.

As hierdie regulasie oortree word, word die oortreder geag in die eksamen te gedruip het en mag hy ses maande lank nie vir hereksaminering aangeneem word nie.

6.4.2 Kandidate wat 'n boek, instrument of ander eiendom van die Departement van Vervoer skend of andersins beskadig, se diensdokumente (d.w.s. sertifikate, getuigskrifte, ens.) sal teruggehou word totdat hulle die beskadigde boek of instrument vervang het.

6.4.3 Geen kandidaat mag die eksamenkamer sonder toestemming verlaat nie, en as hy die kamer verlaat, moet hy die eksamenskrif waarmee hy besig is, inlewer. 'n Kandidaat mag onder geen omstandighede toegelaat word om die gebou te verlaat terwyl die eksamen aan die gang is nie. 'n Kandidaat wat hierdie regulasie oortree, word geag die eksamen te gedruip het.

6.2 *Use of books and tables at the examination*

6.2.1 The following tables and books may be supplied by the examiner in the examination room. Nautical Almanac; Burton's Nautical Tables; Norie's Tables; Admiralty Tide Tables Vol. I and Vol. 2.

6.2.2 A candidate who wishes to use tables other than the above may bring such tables into the examination room, on condition that he submits them to the examiner for scrutiny and approval before the examination begins. These tables shall not contain any manuscript notes. Subject to the examiner's approval, no restriction shall be placed on the use of any tables, but a candidate must understand the theory on which the tables are based, and such tables must be capable of giving an answer withing the required limits of accuracy. When tables other than those supplied by the examiner are used in answering a question, the name of the tables and a note of what is actually obtained from them shall be stated on the candidate's paper.

6.3 *Use of instruments*

6.3.1 All instruments necessary for use in the examination will be supplied by the examiner, but a candidate may be allowed to use his own drawing instruments, slide rule and calculating instrument, provided that the examiner's approval is obtained before the examination begins. If a slide rule or calculating instrument is used, a note to this effect shall be entered on the candidate's answer papers.

6.3.2 A candidate who uses a slide rule or a calculating instrument for his calculations shall show in ink on the answer paper the full working statement necessary for arriving at the results. If the statement is not so shown, no marks shall be given in respect of the results concerned.

6.3.3 The use of slide rules and calculating instruments is subject to the approval of the examiner who shall satisfy himself that information on slide rules is not excessive and that calculating instruments cannot be programmed. The examiner shall also prohibit the use of calculating instruments in examinations in pure and applied mathematics in which basic mathematical principles have to the demonstrated.

6.4 *Unauthorised books and papers strictly forbidden*

6.4.1 Subject to the provisions of regulation 6.2 (2), a candidate shall not have with him any books, notes, memoranda or papers other than those supplied for use at the examination, and if a candidate has brought any books, notes, memoranda or papers with him, he shall hand them to the examiner before commencing the examination.

If this regulation is contravened the offender shall be regarded as having failed the examination and shall not be accepted for re-examination for a period of six months.

6.4.2 Candidates who deface or otherwise damage any book instrument or other property of the Department of Transport, shall have their service papers (i.e. certificates, testimonials, etc.) retained until they have replaced the damaged book or instrument.

6.4.3 No candidate shall leave the examination room without permission and without handing in the paper upon which he is engaged. In no circumstances shall a candidate be allowed to leave the building while the examination is in progress. A candidate who contravenes this regulation shall be regarded as having failed the examination.

6.4.4 Alle werk moet getoon word en geen kandidaat mag toegelaat word om probleme op skeurpapier uit te werk of om op die vloeipapier wat vir gebruik in die eksamen verskaf word, te skryf nie. Kladwerk moet aan die einde van elke eksamen ingelewer word.

6.4.5 'n Kandidaat wat gedurende die eksamen 'n ongeoorloofde boek of papier raadpleeg of van iemand anders afskryf of aan iemand anders hulp verleen of inligting verstrek of wat hulp of inligting van iemand anders ontvang, of op enige wyse met 'n ander persoon as die eksaminator in verbinding tree, of wat enige deel van die antwoorde afskryf met die doel om hulle uit die eksamenkamer te neem, word geag in die eksamen te gedruip het en mag vir 'n tydperk van tot 12 maande nie vir hereksamen aangeneem word nie.

6.4.6 Kandidate wat enige van die bepalings van hierdie regulasie oortree of wat parmantig is teenoor die eksaminator of wat hul skuldig maak aan onordelike of onbehoorlike gedrag in of by die eksamenkamer, word geag die eksamen te gedruip het en mag nie vir sodanige tydperk as wat die Direkteur-generaal bepaal vir hereksamen aangeneem word nie.

6.4.7 Kandidate kan probleme oplos volgens enige metode waaraan hulle gewoond is, mits die beginsel reg is en mits sodanige metode die vereiste juistheidsgraad verleen en op die vraestel aangetoon word.

6.5 *Verlangde graad van akkuraatheid*

6.5.1 Kandidate moet so akkuraat werk as wat die beskikbare gegewens en die betrokke tipe probleem toelaat. Inligting uit tafels moet so noukeurig wees as wat die inherente akkuraatheid van die tafels toelaat en finale antwoorde hoef nie noukeuriger te wees as wat geregverdig is nie.

6.5.2 Wanneer hulle berekenings doen om 'n skip se posisie te bepaal, word daar van kandidate verwag om dit tot 0,1 van 'n boogminuut en tot die naaste sekonde in tyd te doen.

Enige berekeningsmetode waarvolgens 'n standlyn bepaal word, moet 'n antwoord korrek tot hoogstens 'n halwe seemyl gee.

By die berekening van kompasfoute, liggings en koerse moet die antwoord korrek tot 0,5 van 'n graad bereken word.

By die berekening van getye moet die antwoord binne 15 cm van die presiese antwoord wees.

6.6 *Geldigheid van gedeeltelike slagings*

Slaging in die hele skriftelike deel van die eksamen vir 'n Klas1-Bekwaamheidsertifikaat of vir 'n bevelvoeringsendossement is geldig vir 'n tydperk van vyf jaar, maar slaging in die skriftelike deel van die eksamen vir ander klasse sertifikate en in die mondelinge en seingedeelte is slegs geldig vir 'n tydperk van 12 maande. Die mondelinge Klas 5-eksamen in Weerkunde en Skeepsake en Wet word beskou as deel van hulle onderskeie skriftelike eksamens.

Slaging in Gedeelte A of Gedeelte B van die gesagvoerder (Spesiale Graad)-eksamen bly vir altyd geldig.

6.7 *Uitstelverlening*

Kandidate vir bekwaamheidsertifikate, wat in hoogstens een vak in die skriftelike eksamen druip, kan, mits hulle die vereiste slaagpunt behaal, indien daardie skriftelike eksamen uit minstens vier vraestelle bestaan, net in daardie vak hereksamineer word binne ses maande vanaf die aanvangsdatum van die skriftelike gedeelte van die eksamen as geheel. 'n Kandidaat wat dan in daardie vak slaag, word geag in die skriftelike gedeelte van die eksamen as geheel te

6.4.4 All work shall be shown and no candidate shall be allowed to work out problems on waste paper or to write on the blotting paper supplied for use in the examination. Rough working shall be handed in at the end of each examination.

6.4.5 Any candidate who, during the time of the examination, is discovered referring to any aunauthorised book or paper, or copying from another person, or affording any assistance or giving any information to another person, or accepting assistance or information from another person, or communicating in any way with another person other than the examiner or copying any part of the answers for the purpose of taking them out of the examination room, shall be regarded as having failed the examination and shall not be accepted for re-examination for a period of up to 12 months.

6.4.6 Candidates who contravene any of the provisions of this regulation, or who are guilty of insolence to the examiner, or of disorderly or improper conduct in or about the examination room, shall be regarded as having failed the examination and shall not be accepted for re-examination for such period as the Director-General may determine.

6.4.7 Candidates may solve problems by any method they are accustomed to use, provided that such method is correct in principle, affords the required degree of precision, and it is shown on the paper.

6.5 *Degree of precision required*

6.5.1 Candidates shall work to a degree of precision consistent with the data available and the type of problem in question. 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, and no more.

6.5.2 When making calculations to obtain a ship's position, candidates are expected to work to 0,1 of a minute of arc and to the nearest second of time.

Any method of calculation used to obtain a position line shall be capable of giving an answer to within a maximum of one half of a nautical mile.

In the calculation of compass errors, bearings and courses, the answers shall be worked to within 0,5 of a degree.

Tidal calculations shall be worked to provide an answer within 15 cm of a precise result.

6.6 *Validity of partial passes*

A pass in the whole of the written part of the examination for a Class 1 Certificate of Competency or for a Command Endorsement, shall be valid for a period of five years, but a pass in the written part of the examination for other classes of certificates and in the orals and signals parts shall be valid for a period of 12 months only. The Class 5 Meteorology and Short Sea Business and Law oral examinations shall be considered part of their respective written examination. A pass at Part A or Part B of the Master's Special Grade examination shall hold good for all time.

6.7 *Referrals*

Candidates for certificates of competency who fail in not more than one subject in the written examination may, provided that they have attained the required aggregate for a pass, if that written examination consists of not less than four papers, be re-examined in that subject only, within six months from the date of commencement of the written part of the examination taken as a whole. A candidate who then passes in that subject shall be deemed to have passed in the

geslaag het, maar as hy versuim om binne die voorgeskrewe tydperk van ses maande aansoek te doen om hereksaminering of as hy by sodanige hereksaminering in die uitgestelde vak druip, word hy geag in die skriftelike gedeelte van die eksamen as geheel te gedruip het.

As 'n kandidaat daarna in 'n uitgestelde vak slaag, is die datum waarop hy in die skriftelike eksamen geslaag het ook die datum waarop hy in die uitgestelde vak geslaag het.

6.8 *Mondelinge eksamens*

6.8.1 Die mondelinge eksamen is bedoel om die kandidaat se bekwaamheid in die praktiese aspekte van 'n offisier se plig vas te stel.

6.8.2 Besondere aandag word gedurende mondelinge eksamens aan die kandidaat se kennis van die sekstant geskenk. Kandidate moet die vertikale sowel as horisontale hoeke kan meet, en hulle word prakties geëksamineer oor hul kennis van die verstellings en die gebruik van die stelskroewe. Hulle moet sowel op as buite die boog korrek kan aflees en moet die syfout en indeksfout kan bepaal deur van die horison, die son of 'n ster gebruik te maak.

6.8.3 Gedurende die mondelinge eksamen moet die eksaminator die kandidate se kennis toets betreffende die strekking en betekenis van die Regulasies ter Voorkoming van Botsings ter See. Die vermoë om die Regulasies bloot woord vir woord te herhaal is nie voldoende om te verseker dat 'n kandidaat die eksamen slaag nie, maar dit sal ook nie noodwendig meebring dat die kandidaat druip nie: Met dien verstande dat die eksaminator oortuig is dat die kandidaat die volle betekenis, inhoud en praktiese toepassing van die regulasies begryp. Eksaminators moet die kandidaat nie in die posisie stel om 'n seilskip te hanteer nie, maar moet die kandidaat se vermoë toets om 'n seilskip se ligte uit te ken en die kandidaat se kennis van 'n seilskip se moontlike maneuvers na gelang van die windrigting toets.

6.8.4 Die eksaminator kan aan die kandidaat vrae stel wat voortspruit uit die skriftelike werk wat deur die kandidaat gelewer is.

6.8.5 'n Kandidaat wat weens 'n ernstige gebrek aan praktiese kennis in die mondelinge deel van die eksamen vir enige bekwaamheid sertifikaat druip kan na goeddunke van die eksaminator aangesê word om verdere seediens te verrig voordat hy hereksamineer word. Sondanige seediens mag nie ses maande te bowe gaan nie en kan in enige hoedanigheid op die dek van enige seevarende skip verrig word.

6.8.6 'n Kandidaat wat nie op die bepaalde tyd vir enige skriftelike of mondelinge eksamen opdaag nie, kan by gebrek aan redelike bewys dat die afwesigheid onvermydelik was, druip. Die eksamengeld word verbeur.

HOOFSTUK 7

7.1 *Vervoer van gevaarlike vrag*

'n Skip wat 'n massavrag het wat in sy geheel of gedeeltelik as gevaarlike vrag gespesifiseer is, moet as offisier-in-bevel en as tweede-in-bevel onderskeidelik, dekoffisiere aan boord hê, wat, benewens die feit dat hulle houers is van die kwalifkasies wat algemeen van hulle vereis word, ook aan bykomende vereistes voldoen soos wat deur die Direkteur-generaal gespesifiseer mag word.

7.2 *Bykomende kwalifikasies vir uitreiking van gevaarlike vragendossement*

Die vereiste bykomende kwalifikasies ten opsigte waarvan die Direkteur-generaal 'n Gevaarlikevragendossement (Vloeibare gas), 'n Gevaarlikevragendossement (Vloeibare chemikalieë) en 'n Gevaarlikevragendossement (Petroleum) uitreik, is soos volg:

Die persone aangestel as Gesagvoerder en tweede-in-bevel van 'n skip wat gevaarlike vrag vervoer, moet òf—

(a) voorheen 6 maande lank bevredigende diens voltooi het as Gesagvoerder of tweede-in-bevel van 'n skip wat die betrokke gevaarlike vrag vervoer, nie langer as

written part of the examination as a whole; but failure to make application for re-examination within the prescribed period of six months, or failure in the referred subject at such re-examination, shall result in failure in the written part of the examination as a whole.

Where a candidate subsequently passes a referred subject, the date of passing the written examination shall be the date on which he passed the referred subject.

6.8 *Oral examinations*

6.8.1 The oral examination shall be intended to ascertain a candidate's competency in the practical aspects of an officer's duty.

6.8.2 Particular attention shall be paid to candidates' knowledge of the sextant during oral examinations. Candidates shall be required to measure both vertical and horizontal angles, and shall be examined practically on their knowledge of the adjustments and the use of the adjusting screws. They shall be required to read correctly both on and off the arc and find the side error and index error using the horizon, the sun or a star.

6.8.3 During the course of the oral examination the examiner shall test candidates' knowledge of the sense and intention of the Regulations for Preventing Collision At Sea. Mere ability to repeat the Regulations word for word shall not suffice to ensure a candidate passing the examination nor shall the lack of it necessarily entail failure, provided that the examiner is satisfied that the candidate grasps the full significance, content and practical application of the Regulations. Examiners shall not place a candidate in the position of handling a sailing ship, but shall test the candidate's ability to recognise a sailing ship's lights and the candidate's knowledge of a sailing ship's possible manoeuvres according to the direction of the wind.

6.8.4 The examiner may ask the candidate questions arising from the written work produced by the candidate.

6.8.5 A candidate failing in the oral part of the examination for any certificate of competency through serious weakness in practical knowledge may, at the examiner's discretion, be required to perform further sea service before being re-examined. Such sea service shall not exceed six months and may be performed in any capacity on deck in any seagoing ship.

6.8.6 A candidate who fails to appear for any written or oral examination at the appointed time may be failed by default in absence of reasonable proof that failure to attend was unavoidable. The examination fee shall be forfeited.

CHAPTER 7

7.1 *Carriage of dangerous cargo*

A ship which has a bulk cargo specified in whole or in part as being a dangerous cargo shall carry as officer in command and as second in command respectively, deck officers who, in addition to holding the qualifications required generally of them, shall satisfy such additional requirements as the Director-General may specify.

7.2 *Additional qualifications for issue of dangerous cargo endorsement*

The additional qualifications required in respect of which the Director-General shall issue a Dangerous Cargo Endorsement (Liquefied Gas), Dangerous Cargo Endorsement (Liquid Chemicals) and a Dangerous Cargo Endorsement (Petroleum) shall be as follows:

The persons appointed as master and second in command of a ship carrying dangerous cargo shall have either—

(a) previously completed 6 month's satisfactory service as master or second in command of a ship carrying the appropriate dangerous cargo not more than 36 months

36 maande voor die datum waarop hierdie regulasies in werking getree het nie en moet 'n getuigskrif van sy werkgewer te dien effekte kan toon; òf

(b) 'n opleidingskursus voltooi het in die vervoer van die betrokke gevaarlike vrag, goedgekeur deur die Direkteur-generaal en òf—

(i) in 'n bo-tallige hoedanigheid 14 dae lank aan boord van 'n skip opleiding ontvang het gerig op die verskaffing van 'n algehele besef van die operasies in verband met die betrokke gevaarlike vrag en die gepaardgaande gevare en moet 3 maande gekrediteerde diens in 'n ondergeskikte hoedanigheid aan boord van 'n skip voltooi het; òf

(ii) 6 maande gekrediteerde diens in 'n ondergeskikte hoedangheid aan boord van 'n skip voltooi het en moet, na die mening van die Gesagvoerder van die skip waarop sodanige diens voltooi is, 'n persoon wees wat bekwaam is om vraghanteringspligte veilig te vervul; òf

(iii) in bo-tallige hoedanigheid 28 dae lank aan boord van 'n skip intensiewe opleiding ontvang het, goedgekeur deur die Direkteur-generaal, gerig op die skep van 'n algehele besef van die betrokke operasies in verband met gevaarlike vrag en die gepaardgaande gevare. Die diens aan boord van 'n skip verrig wat in hierdie regulasie vermeld word, word ten volle gekrediteer indien dit verrig word aan boord van 'n skip wat die betrokke gevaarlike vrag vervoer. Hierdie diens word met die helfte gekrediteer indien dit verrig word op 'n skip wat enige ander gevaarlike vrag vervoer.

HOOFSTUK 8

EKSAMENGELDE

8.1 *Wanneer om eksamengelde te betaal*

'n Kandidaat wat die eksamen vir 'n bekwaamheidsertifikaat of endossement wil aflê, moet die eksamengeld voor die datum van die eksamen betaal, en geen kandidaat mag toegelaat word om die eksamen af te lê nie tensy hy die kwitansie vir die eksamengeld aan die eksaminator toon.

8.2 *Waar die eksamengeld betaal moet word*

Die eksamengeld moet aan die bevoegde beampte betaal word en dié moet 'n kwitansie uitreik waarop vermeld word—

(a) die naam van die kandidaat;

(b) die betaalde bedrag; en

(c) die graad van die eksamen of endossement.

8.3 *Tabel van eksamengelde*

8.3.1 Die betaalbare eksamengelde is soos volg:

(a) Klas 6: (Mondelinge eksamen): R30.

(b) Klas 5: Die hele eksamen: R40.

(c) Klas 4: Die hele eksamen: R50.

(d) Klas 3: Die hele eksamen: R60.

(e) Klas 2: Die hele eksamen: R70.

(f) Klas 1: Die hele eksamen: R80.

(g) Gesagvoerder (Beperkte Handel) — Endossement: R40.

(h) Gesagvoerder(Kortseehandel)—Endossement: R30.

(i) Gesagvoerder Spesiale Graad: Deel A en Deel B: R100 elk.

(j) Eksamengeld vir kredietvakke, vir hereksaminering in die mondelinge eksamen, of vir eksamen in 'n uitgestelde vak: 50 % van die betrokke eksamengeld.

before the date that these regulations have come into force and shall be able to produce a testimonial from his employer to that effect; or

(b) completed a training course for the carrying of the appropriate dangerous cargo approved by the Director-General and either—

(i) received in a supernumerary capacity 14 days' shipboard training designed to give an overall appreciation of the appropriate dangerous cargo operations and associated hazards and completed 3 months' credited shipboard service in a subordinate capacity; or

(ii) completed 6 months' credited shipboard service in a subordinate capacity and be, in the opinion of the master of the ship in which such service is completed, a person competent to carry out safely cargo handling duties; or

(iii) received in a supernumerary capacity 28 days' intensive shipboard training approved by the Director-General designed to give an overall appreciation of the appropriate dangerous cargo operations and associated hazards. The shipboard service referred to in this regulation shall be credited in full if performed on a ship carrying the appropriate dangerous cargo. It shall be credited at half-rate if served in a ship carrying any other dangerous cargo.

CHAPTER 8

FEES

8.1 *When to pay fees*

A candidate for examination for a certificate of competency or endorsement shall pay the examination fee prior to the date of the examination, and no candidate shall be allowed to sit for the examination unless he produces to the examiner the receipt for the fee paid.

8.2 *Where to pay fees*

The prescribed fee shall be paid to the proper officer who shall issue a receipt stating—

(a) the name of the candidate;

(b) the amount paid, and

(c) the grade of examination or endorsement.

8.3 *Table of fees*

8.3.1 The fees payable for examination shall be as follows:

(a) Class 6: (Oral examination): R30.

(b) Class 5: The whole examination: R40.

(c) Class 4: The whole examination: R50.

(d) Class 3: The whole examination: R60.

(e) Class 2: The whole examination: R70.

(f) Class 1: The whole examination: R80.

(g) Master (Limited Trade) Endorsement: R40.

(h) Master (Short Sea Trade) Endorsement: R30.

(i) Master Special Grade: Part A and Part B: R100 each.

(j) Fee for examination for credit subjects, for re-examination in the oral examination, or for examination in a referred subject: 50 % of the appropriate fee.

(k) Eksamengeld vir 'n kandidaat wat eksamen aflê volgens regulasie 3.15.1: Die volle eksamengeld vir die betrokke eksamen plus twee derdes van die eksamengeld vir die hoër graad eksamen.

(l) Eksamengeld vir 'n kandidaat wat eksamen aflê volgens regulasie 3.15.2: Een derde van die eksamengeld vir die betrokke eksamen.

8.3.2 'n Bedrag van R3 is betaalbaar vir die gesigtoetse vir kleur en vorm: Met dien verstande dat as sodanige toetse en die eksamen vir 'n bekwaamheidsertifikaat of endossement terselfdertyd plaasvind, geen afsonderlike bedrag vir sodanige toetse betaalbaar is nie.

8.3.3 'n Bedrag van R20 is betaalbaar vir die uitreiking van 'n dienssertifikaat ongeag die klas daarvan.

8.3.4 'n Bedrag van R10 is betaalbaar vir die uitreiking van 'n gewaarmerkte afskrif van 'n verlore bekwaamheidsertifikaat of verlore dienssertifikaat: Met dien verstande dat geen bedrag betaalbaar is indien die sertifikaat as gevolg van skipbreuk of brand aan boord van 'n skip verlore gegaan het nie.

8.3.5 Die bedrag in subregulasie 8.3.1 (b) (c) (d) (e) en (f) sluit die bedrag vir die seinwerkeksamen in as dié eksamen en die eksamen vir 'n bekwaamheidsertifikaat terselfdertyd afgelê word. As kandidate die eksamen in seinwerk afsonderlik van een of albei dele van die eksamen vir 'n bekwaamheidsertifikaat aflê, is 'n spesiale bedrag van R15 vir elke eksamen betaalbaar.

8.4 *Terugbetaling van eksamengelde*

8.4.1 Indien 'n kandidaat weens omstandighede buite sy beheer nie in staat is om die eksamen af te lê waarvoor hy eksamengeld betaal het nie, kan hy skriftelik by die bevoegde beampte om terugbetaling van sodanige eksamengeld aansoek doen. Indien die bevoegde beampte van mening is dat die aansoek op 'n redelike grond berus, moet hy die aansoek deurstuur aan die Direkteur-Generaal wat die terugbetaling kan magtig.

8.4.2 Indien 'n kandidaat nie 'n eksamen ooreenkomstig regulasie 2.8.1 voltooi nie, kan hy skriftelik by die bevoegde beampte aansoek doen om terugbetaling van die eksamengeld wat deur hom betaal is en sodanige geld moet aan hom terugbetaal word.

8.4.3 Indien 'n kandidaat wat die gelde soos by regulasie 8.3.1 voorgeskryf vir 'n eksamen vir 'n bekwaamheidsertifikaat of endossement betaal het, in een of albei dele van die gesigtoetse vir kleur en vorm druip en verkies om die res van die eksamen nie te voltooi nie, kan hy skriftelik by die bevoegde beampte aansoek doen om terugbetaling van die eksamengeld wat deur hom betaal is en sodanige geld, min R3, moet aan hom terugbetaal word.

8.4.4 Indien 'n kandidaat in geen deel van die eksamen slaag nie, word, behoudens die bepalings van hierdie regulasie, geen deel van die eksamengeld aan hom terugbetaal nie.

8.4.5 Indien die aansoek om 'n dienssertifikaat nie slaag nie, moet die geld wat deur die applikant betaal is aan hom terugbetaal word.

Klas bekwaamheidsertifikaat, uitgereik kragtens die Handelskeepvaartwet, 1951	Ekwivalente klas bekwaamheidsertifikaat uitgereik kragtens hierdie Regulasies
Gesagvoerder (Vreemde vaart)	Klas 1 (Bevare seekaptein)
Hoofnavigasie-offisier	Klas 2
Tweede Navigasie-offisier	Klas 3
Gesagvoerder (Kusvaart)	Klas 4 plus Gesagvoerder (Kortseehandel) Bevelvoeringsendossement
Navigasie-offisier (Kusvaart)	Klas 5

(k) Fee for a candidate sitting for the examination as in regulation 3.15.1: Full fee for appropriate examination plus two thirds of the fee for the higher grade examination.

(l) Fee for a candidate as in regulation 3.15.2: One third of the fee for the appropriate examination.

8.3.2 A fee of R3 shall be paid to undergo the colour and form vision tests: Provided that when such tests are undertaken at the same time as the examination for a certificate of competency or endorsement, no separate fee shall be paid for such test.

8.3.3 A fee of R20 shall be paid for the issue of a certificate of service irrespective of class.

8.3.4 A fee of R10 shall be paid for the issue of a certified copy of a lost certificate of competency or lost certificate of service: Provided that no fee shall be paid if the certificate was lost through ship-wreck or fire on board ship.

8.3.5 The fee in subregulation 8.3.1 (b), (c), (d), (e) and (f) shall include the fee for the examination in signalling if taken at the same time as the examination for a certificate of competency. Where candidates take the examination in signalling separately from one or both parts of the examination for a certificate of competency, a special fee of R15 shall be paid for each examination.

8.4 *Refund of fees*

8.4.1 If through circumstances beyond the control of a candidate he is unable to undergo the examination for which a fee has been paid by him he may apply, in writing, to the proper officer for a refund of such fee. If the proper officer considers that the application is based upon reasonable grounds, he shall transmit it to the Director-General, who may authorise the refund.

8.4.2 If a candidate does not, in terms of regulation 2.8.1 complete an examination, he may apply, in writing, to the proper officer for a refund of the fee paid by him, and such fee shall be refunded to him.

8.4.3 If a candidate who has paid the fee prescribed in regulation 8.3.1 for an examination for a certificate of competency or endorsement fails to pass in either or both parts of the colour and form vision tests and elects not to complete the rest of the examination, he may apply in writing to the proper officer for a refund of the fee paid by him, and such fee less R3 shall be refunded to him.

8.4.4 Subject to the provisions of this regulation, if a candidate fails to pass any part of the examination, no part of the fee shall be refunded to him.

8.4.5 If the application for a certificate of service is unsuccessful, the fee paid by the applicant shall be refunded to him.

ANNEXURE A

COMPARISON OF CERTIFICATES OF COMPETENCY

Class of Merchant Shipping Act, 1951, certificate of competency	Equivalent class of certificate of competency issued under these regulations
Master Foreign Going	Class 1 (Master Mariner).
Chief Navigating Officer	Class 2.
Second Navigating Officer	Class 3.
Master Coasting	Class 4 plus Master (Short Sea Trade) Command Endorsement.
Navigating Officer Coasting	Class 5.

AANHANGSEL B

VOORBEELD VAN WAGHOU-DIENSSERTIFIKAAT VIR 'N KLAS 1- OF KLAS 2-SERTIFIKAAT EN VIR 'N BEVELVOERINGS-ENDOSSEMENT

DEEL 1

Hierby word gesertifiseer dat m. ..... op ss./ms. ..... van ..... tot ..... in die hoedanigheid van (1ste) (2de) (3de) (4de) waghou-offisier onder my bevel diens gedoen het. Gedurende hierdie tydperk was bogenoemde offisier in volle bevel van 'n wag van minstens ..... uur uit elke 24 uur terwyl die vaartuig ter see was op onbeperkte*/beperkte*/kort-*/seereise.

Daarbenewens het hy gereeld ander pligte in verband met die roetine en onderhoud van die skip vervul.

Brugwaghoudienste was gedurende die volgende tydperke en op geen ander tye verdubbel nie. .....

.....

Gedurende hierdie tydperke het bogenoemde offisier as die *senior/junior van twee brugwaghou-diensoffisiere gedien. Gedurende die tydperk diens soos hierbo uiteengesit, is aan bogenoemde offisier—

*(a) geen verlof tot afwesigheid toegestaan nie;

(b) verlof tot afwesigheid soos volg toegestaan:

.....

welke tydperk/tydperke* afgetrek is van die totale verlof waarop hy geregtig is.

.....

Handtekening van Gesagvoerder

.....

Datum

DEEL 2

Gedurende die tydperk ..... was die vaartuig in die finale stadiums van konstruksie en bogenoemde offisier het aan boord gedien.

Handtekening van* Maatskappy se Skeepsuperintendent

.....

Gesagvoerder

.....

Datum

Skrap indien nie van toepassing nie

*Skrap soos toepaslik

(Agterkant van Waghou-dienssertifikaat)

M ..... het vir gemelde tydperk as ..... in ss./ms. ..... onder my bevel gedien.

Sy gedrag gedurende die tydperk ommesyde genoem, was .....

Sy vermoë was .....

Sy soberheid was .....

.....

Gesagvoerder

.....

Datum

AANHANGSEL C (SIEN AANHANGSEL 3.7)

OOGTOETSE

Die eksamendatums en -plekke moet volgens afspraak met die eksaminator by die naaste hawe gereël word.

Die afneem van die toetse

Die doel van hierdie toetse is om te verseker dat die kandidaat se gesigsvermoë skerp genoeg is om hom in staat te stel om die ligte van skepe ter see in die verte raak te sien en te identifiseer. Vir hierdie doel moet hy in die gesigtoetse, beide vir vorm en kleur, sekere minimum standaarde behaal.

'n Gesigtoets bestaan uit 'n lettertoets en 'n lanterntoets wat in daardie volgorde afgeneem word. Die toetse word onder strenge toesig van 'n gesigtoetseksaminator afgeneem, wat aantekening hou van alle foute wat deur die kandidaat in sowel die lettertoets as in die lanterntoets begaan word.

Elke kandidaat wat toegelaat wil word tot 'n eksamen vir 'n eerste bekwaamheidsertifikaat as dekoffisier of visserman moet die houer wees van 'n gesigtoetssertifikaat wat toon dat hy binne die sesmaandetydperk wat die eksamendatum voorafgegaan het in sowel die letter as die lanterntoets geslaag het.

ANNEXURE B

SPECIMEN CERTIFICATE OF WATCH-KEEPING SERVICE FOR A CLASS 1 OR CLASS 2 CERTIFICATE AND FOR A COMMAND ENDORSEMENT

PART 1

This is to certify that M. ..... has served on S.S./M.V. ..... from ..... to ..... in the capacity of (1st) (2nd) (3rd) (4th) watch-keeping officer under my command. During this period the above-named officer was in full charge of a watch for not less than ..... hours out of every 24 hours whilst the vessel was at sea on *Unlimited/*Limited/*Short Sea/voyages.

In addition he has regularly carried out other duties in connection with the routine and maintenance of the ship. Bridge watches were doubled during the following periods and at no other times .....

.....

During those periods the above-named officer served as the *Senior/Junior of two bridge-keeping officers. During the period of engagement stated above the above-names officer—

*(a) was granted no leave of absence.

(b) was granted leave of absence as follows:

.....

which period(s) *was/were deducted from his total leave entitlement.

.....

Signature of Master

.....

Date

PART 2

During the period ..... the vessel was in the final stages of construction and the above-named officer served on board.

Signature of *Company Marine Superintendent

.....

Master

.....

Date

Delete if not applicable.

* Delete as appropriate.

(Reverse of Certificate of Watch-keeping Service)

M ..... has served as ..... on SS/MV ..... under my command for the periods stated.

His conduct during the period stated overleaf has been .....

.....

His ability has been .....

His sobriety has been .....

.....

Master

.....

Date

ANNEXURE C (SEE ANNEXURE 3.7)

SIGHT TESTS

Examination days and places shall be by appointment as arranged with the examiner at the nearest port.

The conduct of the tests

The purpose of these tests shall be to ensure that the candidate's eyesight is sufficiently good to enable him to pick up and identify correctly the lights of distant ships at sea. For this purpose a person shall be required to reach certain minimum standards both of form and colour vision.

A sight test shall comprise of a letter and a lantern test taken in that order. The tests shall be conducted under the strict personal supervision of a Sight Test Examiner who shall keep a record of all mistakes made by the candidate both in the letter test and in the lantern test.

Every candidate seeking admission to an examination for a first certificate of competency as a deck officer or fisherman shall hold a sight test certificate showing that he has passed in both letter and lantern tests within the six months period preceding the date of the examination. For certificates of competency subsequent to the first, a sight test certificate fulfilling the conditions in respect of the letter test only shall be required.

Vir bekwaamheidsertifikate wat op die eerste een volg, word 'n gesigtoetssertifikaat vereis wat net aan die voorwaardes ten opsigte van die lettertoets voldoen.

Kandidate moet hulle nie haas wanneer hulle die lanterntoets aflê nie. Hulle moet hulle vergewis van die kleure van die ligte voordat hulle die kleure aan die eksaminator noem. Die kandidaat se mededelings bepaal die uitslag van die toets; onoplettendheid kan die kandidaat laat druip en hom dus verhinder om sy gekose loopbaan ter see te volg.

Daar word van kandidate verwag om die toets af te lê wanneer hulle in goeie gesondheid verkeer, anders kan hulle gesigskerpte aangetas wees. Kandidate kan die gesigtoets nes hulle verkies met of sonder hulpmiddels aflê ('n gewone bril of kontaklense) maar kandidate wat verkies om die letter- of lanterntoets of albei met sodanige hulpmiddels af te lê, moet 'n bykomende minimum standaard ten opsigte van elke oog sonder hulpmiddels behaal.

A. LETTERTOETS

1. (a) Die lettertoets word volgens die 'Snellen-beginsel afgelê deur middel van letterblaaie wat op so 'n manier onregstreeks met behulp van 'n gepoleerde spieël besigtig word dat die letters 'n virtuele afstand van ses meter van die oog af is. Elke blad het sewe reëls waarvan die derde, vierde, vyfde, sesde en sewende reël onderskeidelik met die standaarde 6/24, 6/18, 6/12, 6/9 en 6/6 ooreenstem.

(b) Elke oog van die kandidaat word afsonderlik getoets.

2. *Verlangde standaard van gesigskerpte*

(a) 'n Kandidaat wat verkies om die toets sonder hulpmiddels af te lê moet al die reëls tot en met die sewende met sy beste oog en al die reëls tot en met die sesde met die ander oog reg aflees.

(b) 'n Kandidaat wat verkies om die toets met hulpmiddels af te lê, moet eers die toets daarsonder aflê en dan moet hy al die reëls tot en met die vyfde met sy beste oog en al die reëls tot en met die derde met die ander oog reg aflees. Daarna word hy met hulpmiddels getoets en dan moet hy al die reëls tot en met die sewende met sy beste oog en al die reëls tot en met die sesde met die ander oog reg aflees.

3. *Toetsmetode*

Die toetsblaaie en die beligtingseenheid moet voldoen aan BS 4274-1960 en moet op so 'n manier in 'n kabinet geplaas word dat die middel van elke blad, as dit besigtig word, op ooghoogte is van 'n gemiddelde persoon in 'n sittende houding. Wanneer die kandidaat in die regte houding sit, word een van die blaaie belig en word hy gevra om die letters van links na regs van die boonste tot die onderste reël af te lees.

As die kandidaat met hulpmiddels of daarsonder of in albei gevalle nie daarin slaag om die verlangde standaard te behaal nie, moet 'n bykomende blad vir elke oog aan hom getoon word in daardie deel of dele van die toets waarin hy gedruip het.

As daar na afloop van die lettertoets gemeen word dat die kandidaat die verlangde standaard behaal het, moet hy die lanterntoets aflê, tensy hy oor 'n bekwaamheidsertifikaat beskik waarvoor 'n lanterntoets wat deur die Direkteur-generaal erken word 'n voorwaarde vir uitreiking was.

As daar na afloop van die lettertoets gemeen word dat die kandidaat nie die verlangde standaard behaal het nie, moet die volgende alternatiewe aan hom verduidelik word:

(a) Die eksamen kan beëindig en 'n druipsertifikaat uitgereik word, en die eksamen kan na 'n tydperk van minstens een maand by betaling van 'n verdere bedrag herhaal word.

(b) Die kandidaat kan die lanterntoets ook aflê. In so 'n geval word 'n opgawe van al die foute wat in die lettertoets begaan is en al die foute, as daar is, wat in die lanterntoets begaan is, vir sy beslissing aan die Direkteur-generaal gestuur. 'n Lettertoets word partymaal gedruip vanweë 'n gesigsgebrek wat geneesbaar is. Wanneer 'n kandidaat dus nie in 'n lettertoets slaag nie, moet hy aangeraai word om 'n oogarts te spreek sodat dié kan vasstel wat die aard van die gebrek is en of dit genees kan word.

B. LANTERNTOETS

4. Die toets moet afgeneem word in 'n vertrek wat so verdonker is dat dit geen daglig inlaat nie.

5. Donkerteaanpassing. 'n Kandidaat wat hom by donkerte moet aanpas, moet minstens tien minute lank in 'n kamer gehou word wat heeltemal of deels verdonker is.

6. Apparaat. Die lantern vir die toets moet so ontwerp wees dat dit drie kleure naamlik rooi, wit en groen, een-een deur 'n groot opening of twee-twee op 'n keer langs mekaar deur klein openinkies kan vertoon. Wanneer klein openinkies gebruik word, kan enige kombinasie van die drie kleure of van dieselfde kleur vertoon word. Die lantern moet reg voor 'n spieël staan sodat die voorkant daarvan presies 3,05 m van die spieël af is en die ligte wat in die spieël weerkaats word, duidelik waarneembaar is van waar die kandidaat naby die lantern sit.

7. Toetsmetode. Die toets begin met 'n reeks ligte wat deur die groot opening vertoon word, gevolg deur vier volledige kringlope en een onderbroke kringloop van ligte wat deur die klein openinkies vertoon word. Die kandidaat moet die kleure van die ligte opnoem wanneer hulle verskyn.

Candidates are required, when taking the lantern test, not to attempt to hurry. They are required to satisfy themselves as to the colours of the lights shown before reporting them to the examiner. The result of the test shall be judged by what the candidate reports; carelessness may cause failure and thus prevent the candidate from taking up a chosen career at sea.

Candidates are required to take the test when in good health otherwise their vision may be impaired. Candidates may take the sight test with or without aid (conventional spectacles or contact lenses) at their option but candidates who opt to use aids for the letter or lantern test or both shall additionally reach a minimum standard in each eye without aids.

A. LETTER TEST

1. (a) The letter test shall be conducted on Snellen's principle by means of sheets of letters viewed indirectly through a polished mirror so as to place the letters at a virtual distance of 6 metres from the eye. Each sheet contains 7 lines, the 3rd, 4th, 5th, 6th and 7th lines corresponding to standards 6/24, 6/18, 6/12, 6/9 and 6/6 respectively.

(b) Candidates shall be tested in each eye separately.

(2) *Standard of vision required.*

(a) A candidate who opts to take the test without aids shall be required to read correctly down to and including line 7 with the better eye and down to and including line 6 with the other eye.

(b) A candidate who opts to take the test using aids shall first take the test without aids when he shall be required to read correctly down to and including line 5 with the better eye and line 3 with the other eye. The candidate shall then be tested with aids and shall be required to read correctly down to and including line 7 with the better eye and down to and including line 6 with the other eye.

3. *Method of testing.*

The test sheets and means of illumination shall be in accordance with BS 4274-1960 and shall be contained in a cabinet placed so that the centre of each sheet as viewed shall be at the height of eye of the average person in a sitting position. When the candidate is sitting in the correct position one of the sheets shall be exposed and he shall be asked to read the letters from left to right beginning at the top and going downwards.

If with aids or without aids or in both cases the candidate fails to reach the required standard an additional sheet shall be given for each eye in that part or parts of the test in which he has failed.

If at the conclusion of the letter test the candidate is considered to have reached the required standard, he shall then proceed to the lantern test unless he holds a certificate of competency for which a lantern test recognised by the Director-General would have been a condition for its issue.

If at the conclusion of the letter test the candidate is considered not to have reached the required standard, the following alternatives shall be explained:

(a) The examination may be stopped, a certificate of failure issued, and the examination may be repeated on payment of a further fee after a period of not less than one month.

(b) The candidate may proceed to the lantern test. In this case a record of all mistakes made in the letter test and all mistakes, if any, made in the lantern test shall be forwarded to the Director-General for his decision on the test.

Failure to pass the letter test may sometimes be due to a defect in vision which may be curable. Whenever, therefore, a candidate fails to pass this test he shall be advised to consult an ophthalmologist with a view to ascertaining the nature of the defect and whether it is curable.

B. LANTERN TEST

4. The test shall be conducted in a room so darkened as to exclude all daylight.

5. Darkness adaptation. A candidate who needs darkness adaption shall be kept in a completely or partially darkened room for at least 10 minutes.

6. Apparatus. The lantern used for the test shall be designed to show three coloures: Red, white and green, singly through a large aperture or two at a time, side by side, through small apertures. When the small apertures are used any combination of the three colours may be shown or they may be of the same colour. The lantern shall be positioned directly in front of a mirror so that the front part of the lantern is exactly 3,05 m from the mirror and the lights reflected in the mirror show clearly when viewed by the candidate seated close to the lantern.

7. Method of testing. The test shall commence with a series of lights shown through the large aperture followed by four complete circuits and one broken circuit of lights shown through the small apertures. The candidate shall be required to name the colours of the lights as they appear.

C. TOETSRESULTAAT

8. (a) 'n Kandidaat wat geen fout in die laterntoets begaan nie of wat, wanneer hy na die ligte in die klein openinkies kyk, groen-wit of rooi-wit nie meer as ses maal in vier volledige kringlope verwar nie, word geag in die kleurgesigstoets te geslaag het.

(b) As die kandidaat in enige stadium van die laterntoets rooi vir groen aansien of andersom, word hy geag nie in die kleurgesigstoets te geslaag het nie.

(c) 'n Kandidaat word op 'n toepaslike vorm verwittig dat hy geslaag of gedruip het of dat sy geval vir oorweging verwys is.

(d) 'n Kandidaat wat nie plaaslik in die lanterntoets slaag nie, word nie hertoets nie behalwe na goeddunke van die Direkteur-generaal by wie regstreeks skriftelik aansoek gedoen moet word.

AANHANGSEL D

VERKLARENDE OPMERKING BY LEERPLANNE

Tydens die eksamens moet van die SI-stelsel gebruik gemaak word.

Die leerplanne moet van graad tot graad progressief wees. Daar word altyd aanvaar dat die leerplan vir 'n hoër graad in sowel die skriftelike as die mondelinge eksamens die leerplan vir die ooreenstemmende vak, as daar is, vir sertifikate van 'n laer graad insluit. In die eksamen kan vrae gestel word wat twee of meer van die paragrawe in die leerplan kombineer.

Waar die omvang van die kennis wat van die kandidaat verlang word nie uit die voorgeskrewe leerplan blyk nie, moet dit bepaal word deur 'n werkkomitee wat uit 'n verteenwoordiger van elk van die betrokke opleidingsinrigtings, die Departement van Vervoer en die Nywerheid bestaan.

Alhoewel Engels of Afrikaans nie as 'n aparte vak by hierdie leerplanne ingesluit is nie, word daar van kandidate verwag om goeie gehalte Engels of Afrikaans in hulle beskrywende antwoorde te gebruik en sal die punte wat behaal word, tot op sekere hoogte hulle vaardigheid in die gebruik van Engels of Afrikaans weerspieël.

Hoogstens 20 % van die totale getal punte vir elke vak toegeken, kan afgetrek word vir swak uiteensetting, swak grammatika en foutiewe spelling.

Opmerking.—In die leerplanne word daar melding gemaak van kennis van die Botsingsregulasies. Hiermee word bedoel die Internasionale Regulasies vir die Voorkoming van Botsings ter See, 1977.

Hierdie Regulasies is onderworpe aan wysiging ooreenkomstig die vereistes van Internasionale Konvensies bekragtig deur die Regering van die Republiek van Suid-Afrika.

AANHANGSEL E

KLAS 6—BEKWAAMHEIDSERTIFIKAAT: LEERPLAN

Leerplan vir die mondelinge eksamen

Algemeen

(a) Die leerplan moet so ontwerp wees dat kandidate by wyse van 'n praktiese toets geëksamineer kan word aan boord van die vaartuig waarop die aansoeker dien, hoewel enige sodanige eksamen in die reël by die Departement se eksamensentrums afgelê word.

(b) Van 'n kandidaat word daar verwag om bekwaamheid in die gebruik van navigasiemiddele, brandbestrydingstoerusting en reddingstoerusting wat geïnstalleer is in die klas vaartuig waarop hy dien, en in praktiese noodhulp, te toon.

(c) Van 'n kandidaat word daar verwag om te toon dat hy 'n redelike kennis het van die navigasieverordeninge wat op die betrokke omskrewe waters van toepassing is.

AFDELING 1

Praktiese navigasie, kaartwerk en loodskuns

(a) 'n Basiese kennis van getye, seestrome, vaar- en seisoensweerpatrone binne die gebied.

(b) 'n Praktiese demonstrasie van kaartwerk binne die konteks van die toerusting aan boord van die vaartuig, soos volg:

Om, indien die variasie en die deviasie van die magnetiese kompas verstrek word, die ware koerse tot kompaskoerse te herlei, en omgekeerd.

Om die kompaskoers tussen twee posisies te bepaal. Die uitwerking van stroom op spoed. Toelating vir drif.

Om, indien die kompaskoers waarin gestuur word, die spoed van die skip en die rigting en snelheid van die stroom verstrek word, die behoue ware koers te bepaal.

Om 'n posisie op 'n kaart te bepaal deur middel van peilings en afstand.

Om die koers te bepaal waarin met inagneming van 'n stroom gestuur moet word.

Om, indien die koers waarin gestuur word en die afgelegde afstand verstrek word, die rigting en snelheid van die stroom tussen twee posisies te bepaal.

Om 'n posisie op 'n kaart te bepaal deur middel van gelyktydige kruispeilings.

C. TEST RESULTS

8. (a) A candidate who makes no mistakes in the test conducted by means of the lantern or who, when reading the small aperture lights confuses green-white or red-white not more than six times in four complete circuits shall be deemed to have passed the colour vision test.

(b) If at any stage of the test conducted by means of the lantern, the candidate mistakes red for green or vice versa, he shall be deemed to have failed the colour vision test.

(c) Candidates shall be notified on an appropriate form of their success or failure, or that their case has been referred for consideration.

(d) A candidate who fails the lantern test locally shall not be re-tested except at the discretion of the Director-General, to whom direct application shall be made in writing.

ANNEXURE D

EXPLANATORY NOTE TO SYLLABUSES

The examinations shall use the SI system of units.

The syllabuses shall be progressive from grade to grade. The syllabus for a higher grade in both written and oral examinations shall always be regarded as including the syllabus for the corresponding subject, if any, for certificates of a lower grade. Questions in the examination may be set combining more than one of the paragraphs in the syllabus.

The depth of knowledge required of the candidate shall, where it is not clear from the prescribed syllabus, be established by a Working Committee consisting of a representative of each appropriate training institution, the Department of Transport and the Industry.

Although English or Afrikaans is not included in these syllabuses as a separate subject, candidates are required to show a good standard of English or Afrikaans in their descriptive answers and the marks obtained shall to some extent be a reflection of their skill in the use of English or Afrikaans.

Marks shall be lost for poor composition, bad grammar and incorrect spelling, up to a maximum of 20 % of the total marks awarded for each subject.

Note.—Reference is made in the syllabuses to a knowledge of the Collision Regulations. These are The Substitution for the International Regulations for Preventing Collision at Sea, 1977.

These Regulations shall be subject to amendment in accordance with the requirements of International Conventions ratified by the Government of the Republic of South Africa.

ANNEXURE E

CLASS 6—CERTIFICATE OF COMPETENCY; SYLLABUS

Oral Syllabus

General

(a) The syllabus shall be designed to allow candidates to be examined by means of a practical test on board the vessel in which the applicant serves, although any such examination shall as a rule be conducted at the Department's examination centres.

(b) A candidate shall be required to show proficiency in the use of navigational aids, fire-fighting equipment and life-saving equipment installed in the class of vessel in which he serves, and in practical first aid.

(c) A candidate shall be required to show that he has a reasonable knowledge of the navigation bye-laws which apply to the relevant defined waters.

SECTION 1

Practical navigation, chart work and pilotage

(a) A working knowledge of tides, currents, operational and seasonal weather patterns within the area.

(b) A practical demonstration of chart work within the context of the equipment on board the vessel, as follows:

Given variation and the deviation of the magnetic compass, to convert true courses into compass courses and vice versa.

To find the compass course between two postions.

The effect of current on speed.

Allowance for leeway.

Given compass course steered, the speed of the ship and direction and rate of the current, to find the true course made good.

To fix a position on a chart by bearing and range.

To find the course to steer allowing for a current.

Given the course steered and distance run, to determine the set and rate of the current experienced between two positions.

To fix a position on a chart by simultaneous cross bearings.

(c) 'n Eksamen oor inligting op 'n kaart verstrek.

Verwysing:

Boeie.

Ligte.

Radiobakens.

Navigasiehulpmiddels.

Dieptes en gesteldheid van die seebodem en die gebruik van lodings.

Diepte- en hoogtekontoere.

Getystrome, verkeersbane en skeidingsones.

Herkenning van die kus.

Kaartkorreksie.

(d) Kandidate moet eksamen aflê oor die keuse van geskikte ankerplekke, die nadering van 'n ankerplek en die binnevaar van smal waters; aan wal gaan in dik en helder weer.

(e) Die praktiese gebruik van elektroniese navigasiehulpmiddels waarmee 'n vaartuig toegerus is.

AFDELING 2

Praktiese seemanskap en seine

(a) Die vermoë om 'n kompaspeiling of -peilings te neem.

Die vermoë om kompaspeilings deur middel van oorgangspeilings na te gaan.

Hoe om 'n barometer en termometer af te lees en te verstaan.

Die versorging en onderhoud van vloeistofkompasse.

Hoe om elektriese en magnetiese steurings te vermy.

(b) Touwerk en optakeling. Knope, steke en touverbindings wat gewoonlik gebruik word.

Bindsels, oorkruisbindsels, toue en kettingstoppers.

Kort- en oogsplitsing van driestringtou.

(c) Voorbereiding om te begin vaar. Pligte voordat die skip uitvaar; 'n hawe aandoen; 'n dok binnegaan. Langs kaaie, hawehoofde of ander skepe vasmeer en aan boeie vasmaak. Roerbevele. Stuurbevele aan stuurman. Uitwerking van skroewe op die stuur van 'n skip. Die uitwerking van strome, wind, vlak water, en diepgang op maneuvrering. Hoe om te stop, agteruit te beweeg en te manuevreer. Kort draai met 'n skip. Noodmaneuvers. Hoe om 'n skip in 'n noodgeval voor 'n enkele anker te bring. Man oorboord. Anker sleep. Die merk en gebruik van 'n gewone loodlyn.

(d) Ankers, kabels, hulle gebruik en stuwing. Kennis van die gebruik van alle dektoestelle met inbegrip van noodstuurgerei.

(e) Volledige kennis van die inhoud en toepassing van die Botsingsregulasies en daardie aanhangsels wat betrekking het op veilige navigasie, soos van toepassing op die handel of operasies waarby die kandidaat betrokke is.

Noodseine; strawwe vir misbruik.

Kennis van die inhoud en gebruik van die Suid-Afrikaanse Handelskeepvaartkennisgewings en die Suid-Afrikaanse Vlootkennisgewing aan Seeliede. Plaaslike boeistelsels; stelsel vir die merk van wrakke.

(f) (i) Hantering van skepe in stormweer.

Hantering van 'n ontredderde skip.

Ekstra voorsorg wat getref moet word voordat stormweer intree.

(ii) Die sleep en op sleeptou neem van 'n skip.

(g) Die optakeling van 'n loodsleer.

(h) Pligte van die persoon in beheer van die skp ter see, voor anker en in die hawe.

(i) Soek-en-reddingswerk.

Hulp aan 'n skip of vliegtuig in nood.

Redding van die passasiers en bemanning van 'n ontredderde skip, of van 'n vliegtuig wat 'n noodlanding op see gemaak het.

Ophaal van bote ter see.

Stappe wat gedoen moet word wanneer 'n skip ontredderd is en in nood verkeer.

Verlating van skip; oorlewingsprosedure.

Kommunikasie met die land. 'n Boot op die strand laat loop of land.

Die gebruik van vuurpyle en vuurpylapparate, soos van toepassing op die vaartuig.

Beveiliging van passasiers en bemanning in geval van skipbreuk.

Hoe om in reddingsbote en reddingsvlotte aan die lewe te bly.

'n Kennis in breë trekke van die regulasies betreffende reddings- en brandblustoestelle, hul versorging en gebruik.

Maatreëls wat getref moet word wanneer 'n skip per ongeluk beskadig word, met inbegrip van botsings, stranding, beskadiging tydens stormweer en lekkasies, en die belangrikheid van die korrekte gebruik van waterdigte deure.

'n Skip op die strand stuur. Metodes om 'n brand aan boord van 'n skip te hanteer. Voorkoming van brand ter see en in die hawe.

(c) An examination on information given on a chart.

Reference:

Buoys.

Lights.

Radio beacons.

Navigational aids.

Depths and nature of bottom and use of soundings.

Depth and height contours.

Tidal streams, traffic lanes and separation zones.

Recognition of the coast.

Chart correction.

(d) Candidates shall be examined on the selection of suitable anchorages, approaching anchorage and entering narrow waters; landfalls in thick and clear weather.

(e) The practical use of electronic aids to navigation fitted in the vessel.

SECTION 2

Practical seamanship and signals

(a) Ability to take a compass bearing or bearings.

Ability to check compass bearings by transit.

To read and understand a barometer and thermometer.

The care and maintenance of liquid compasses.

The avoidance of electrical and magnetic interference.

(b) Rope work and rigging. Knots, hitches and bends in common use.

Seizing, rackings, rope and chain stoppers.

Short and eye splicing of three-strand rope.

(c) Preparations for getting under way. Duties prior to proceeding to sea; and making harbour; entering a dock. Berthing alongside quay, jetties, or other ships and securing to buoys. Helm orders. Conning the ship. Effects of propellers on the steering of a ship. The effect of current, wind, shallows, and draught on manoeuvrings. Stopping, going astern, manoeuvring. Turning a ship short-round. Emergency manoeuvres. Bringing a ship to single anchor in an emergency. Use of two anchors. Man overboard. Dragging anchor. Markings and use of ordinary leadline.

(d) Anchors, cables, their use and stowage. Knowledge of the use of all deck appliances including emergency steering gear.

(e) A full knowledge of the content and application of the Collision Regulations and those Annexures concerned with safe navigation, as applicable to the trade or operations in which the candidate is employed.

Distress signals; penalties for misuse.

A knowledge of the contents and use of the South African Merchant Shipping Notices and South African Navy Notice to Mariners. Local systems of buoyage; wreck marking.

(f) (i) Management of ships in heavy weather.

Handling a disabled ship.

Extra precautions to be taken before the onset of heavy weather.

(ii) Towing and being towed.

(g) Rigging of a pilot ladder.

(h) Duties of the person in charge of the ship at sea, at anchor and in port.

(i) Search and rescue.

Assisting a ship or aircraft in distress.

Rescuing the passengers and crew of a disabled ship or ditched aircraft.

Recovering boats at sea.

Action to be taken when disabled and in distress.

Abandoning ship; survival procedures.

Communications with shore. Beaching and landing.

The use of rockets and rocket apparatus, as applicable to the vessel.

Preservation of crew and passangers in the event of wreck.

Survival in lifeboats and liferafts.

An outline knowledge of the regulations concerning lifesaving and fire-fighting appliances, their care and use.

Measures to be taken following accidental damage, including collision, grounding, heavy weather damage and leaks, and the importance of the correct use of watertight doors.

Beaching a ship.

Methods of dealing with fire on board ship.

Prevention of fire at sea and in port.

(j) Maatreëls wat getref moet word om die uitstort te voorkom van olie gedurende die inneem van bunkerolie of olievragwerk.

(k) Internasionale Seinboek.

(l) Die vermoë om tot ses woorde per minuut deur middel van Morsekode uit te stuur en te ontvang.

AFDELING 3

Algemene skeepskennis

(a) Die name en funksies van die vernaamste dele van 'n skip.

Algemene definisies van hoofafmetings. 'n Praktiese begrip van algemene pompinrigting vir vulling en die inlaai van ballas, soos van toepassing op die betrokke vaartuig.

(b) Die betekenis van die uitdrukkings *dryfvermoë* en *ladingsgewig*.

(c) 'n Praktiese kennis van die beginsels van stabiliteit en trim en faktore wat dit beïnvloed. Die gevaar van gedeeltelik gevulde tenks.

(d) Algemene beginsels betrokke by die stuwing en hantering van vrag. 'n Algemene kennis van die vervoer van gevaarlike goedere, waar dit van toepassing is in die handel of operasie. Gebruik van verplasing- en ton-per-sentimeterskale. Korreksie vir varswatertoelating.

(e) Inskrywings moet in die dekjoernaal gemaak word, met inbegrip van verslae in die geval van die besering of dood van bemanningslede en ander personeellede aan boord van die skip.

(f) Wetlike verpligtinge in die geval van strandings, botsings en ander ongevalle.

(g) Laslynmerke. Inskrywings en verslae ten opsigte van vryboord, diepgang en toelatings.

(h) Sertifikate, met inbegrip van Registrasiesertifikate, wat op kusvaarders moet wees.

(i) Die wet betreffende die aanmelding van gevare vir navigasie.

(k) Voorkoming van besoedeling van die see deur olie. Die hou van rekords ingevolge die Wet op die voorkoming en Bestryding van Besoedeling van die See deur Olie, waar van toepassing op die vaartuig.

(l) Die Beaufort-windskaal.

Kennis van basiese weerkunde ten einde in staat te wees om die moontlike veranderinge in die weer weens die beweging van 'n laagdrukstelsel te voorspel en die toestande wat aanleiding tot mis kan gee te identifiseer. Slegs genoeg kennis word vereis om intelligent gebruik te kan maak van die SAUK se televisie- en radiovoorspellings en van die weervoorspellingskaart van koerante en kaarte wat deur die Weerburo vir kuswaters uitgereik word.

AANHANGSEL F

KLAS 5—BEKWAAMHEIDSERTIFIKAAT: LEERPLAN

Kaartwerk en praktiese navigasie

Vraestel 1 (drie uur prakties en skriftelik)

Kaartwerk

(a) Om, waar die variasie en die deviasie van die magnetiese kompas of die girofout verstrek word, die ware koerse te herlei tot kompaskoerse, en omgekeerd.

Om, waar 'n monsterdeviasietafel verstrek word, die deviasie te bepaal en op grond daarvan die ware koerse tot magnetiese en kompaskoerse te herlei.

Om die kompaskoers tussen twee posisies te bepaal.

Die uitwerking van stroom op snelheid.

Toelating vir drif.

Om, waar die kompaskoers waarin gestuur word, die snelheid van die skip en die rigting en snelheid van die stroom verstrek word, die behoue ware koers te bepaal.

Om die koers te bepaal waarin met inagneming van 'n stroom gestuur moet word.

Om, waar die koers waarin gestuur word en die afgelegde afstand verstrek word, die rigting en snelheid van die stroom tussen twee posisies te bepaal.

(b) Om 'n posisie op 'n kaart te bepaal deur middel van gelyktydige kruispeilings, peilings en afstand, of deur middel van posisionele inligting met radionavigasiehulpmiddels verkry, of deur middel van enige kombinasie, met die aanbring van die nodige korreksies. Die gebruik van kruisnetkaarte.

(c) Om die posisie deur peilings van een of meer voorwerpe met 'n meetvaart tussen hulle en met inagneming van 'n stroom vas te stel en om te bepaal hoe ver die skip by 'n gegewe punt sal verbyvaar. Die gebruik van standlyne volgens enige metode verkry, met inbegrip van aardstandlyne en -sirkels. Die gebruik van oorgangspeilings.

(d) Elementêre kennis van deurvaartbeplanning en uitvoering. Landings in dik en helder weer. Die uitkies van geskikte ankerplekke, nadering van 'n ankerplek en die binnevaar van smal waters. Die gebruik van vermymerke en horisontale en vertikale gevaarhoeke. Die afstand van ligte wat gesien kan word.

(j) Measures to be taken to prevent the spillage of oil during bunkering or oil cargo work.

(k) International Code of Signals.

(l) Ability to transmit and receive signals by morse code up to six words per minute.

SECTION 3

General ship knowledge

(a) The names and functions of the principal parts of a ship. General definitions of main dimensions. A practical understanding of general pumping arrangements for bilges and ballasting, as applicable to the vessel concerned.

(b) The meaning of the terms "Buoyancy" and "Deadweight".

(c) A practical knowledge of the principles of stability and trim and factors affecting same. The danger of slack tanks.

(d) General principles of cargo stowage and handling. A general knowledge of the carriage of Dangerous Goods, where applicable in the trade or operation. Use of displacement and tonne per centimetre scales. Correction to apply for freshwater allowance.

(e) Entries to be made in the Deck Log Book including reports to be made in the event of injury to or death of crew or other personnel on board ship.

(f) Legal duties in the case of strandings, collisions and other accidents.

(g) Load Line marks. Entries and reports in respect of freeboard, draught and allowances.

(h) Certificates required to be carried by coastal ships, including Certificates of Registry.

(i) The law relating to the reporting of dangers to navigation.

(k) Avoidance of pollution of the sea by oil. The keeping of records under the Oil Pollution Act where applicable to the vessel.

(l) The Beaufort wind scale.

A knowledge of basic meteorology so as to be able to forecast the probable changes in the weather due to the passage of a depression and to know the conditions that might give rise to fog.

The knowledge required shall not be more than is necessary to make intelligent use of SABC television and radio forecasts and of forecasts with weather maps given in newspapers and maps issued by the Weather Bureau for coastal waters.

ANNEXURE F

CLASS 5—CERTIFICATE OF COMPETENCY: SYLLABUS

Chartwork and practical navigation

Paper 1 (three hours practical and written)

Chartwork

(a) Given variation and the deviation of the magnetic compass, or gyro error, to convert true courses into compass courses and vice versa. Given a sample table of deviations to extract the deviation, thence to convert true courses into magnetic and compass courses. To find the compass course between two positions.

The effect of current on speed.

Allowance for leeway.

Given compass course steered, the speed of the ship and direction and rate of the current, to find the true course made good.

To find the course to steer allowing for a current. Given the course steered and distance run, to determine the set and rate of the current experienced between two positions.

(b) To fix a position on a chart by simultaneous cross bearings, by bearing and range, by positional information from radio aids to navigation or by any combination, applying the necessary corrections. The use of lattice charts.

(c) To fix the position by bearings of one or more objects with a run between, allowing for a current, and to find the distance at which the ship will pass off a given point. The use of position lines obtained by any method, including terrestrial position lines and position circles. The use of transit bearings.

(d) Elementary knowledge of passage planning and execution. Landfalls in thick and clear weather. The selection of suitable anchorages, approaching anchorage and entering narrow waters. The use of clearing marks and horizontal and vertical danger angles. Distance of sighting lights.

(e) Om die tyd en hoogte van hoog- en laagwater by 'n standaard- en sekondêre hawe deur middel van getyverskille te bepaal, met gebruikmaking van die getytafels van die Britse Admiraliteit, Vol. 2; die gebruik van getykrommes soos deur die Britse Admiraliteit gepubliseer.

(f) Die vertolking van 'n kaart of plan; veral die inligting oor ligte, boeie, radiobakens en ander navigasiehulpmiddels; diepte- en hoogtekontoere; getystrome; verkeersbane en skeidingsones.

Herkenning van die kus en radarantwoordbakens.

Kaartkorreksie.

Dieptes en gesteldheid van die seebodem. Die gebruik van lodings.

Opmerkings.—In hierdie vraestel kan vrae gestel word wat beskrywende antwoorde sowel as werk op die kaart wat voorsien word, vereis.

Mondelinge vrae, wat betrekking het op enige deel van die leerplan, kan ook gevra word. Kandidate word spesifiek geëksamineer oor hul kennis van die standaardkaartsimbole en -afkortings.

Praktiese navigasie

(a) Praktiese vrae oor platkaart- en Mercatornavigasie.

(b) Die gebruik van koppelkoerstafels om die skip se posisie op 'n gegewe tydstip te bepaal indien die kompaskoerse, variasies, deviasie en die meetvaart soos deur die log aangegee of volgens tyd en geskatte snelheid bereken, verstrek word en daar met die moontlike uitwerking van wind en stroom rekening gehou word.

(c) Bepaling van kompasfout deur waarneming van hemelliggame en, vir 'n magnetiese kompas, die deviasie vir die boegrigting.

(d) Bepaling van die breedtegraad deur middel van die meridiaanshoogte van die son, maan of 'n ster.

KLAS 5—BEKWAAMHEIDSERTIFIKAAT

Algemene skeepskennis

Vraestel 2 (twee uur skriftelik)

(a) Algemene begrippe van skeepsbou en planne en gegewens wat aan boord van 'n skip beskikbaar is.

Algemene pompinrigting.

Algemene definisies van hoofafmetings. Die name van die vernaamste dele van 'n skip.

(b) Algemene begrip van:

Verplasing;

ladingsgewig;

dryfvermoë; reserwedryfvermoë; begrip van die basiese optrede in die geval van gedeeltelike verlies van intakte dryfvermoë.

Gebruik van verplasings- en ton-per-cm-dompelskale om massa van vrag of ballas volgens diepgang of vryboord te bepaal.

Laslynmerke.

Die uitwerking van die relatiewe digtheid van water op diepgang en vryboord.

Toelating vir varswater.

(c) (i) Algemene begrip van—

swaartepunt;
dryfpunt;
metasenterhoogte;
oprighefkrag;
oprigmoment.

(ii) Die gebruik van stabiliteit- en hidrostatiese gegewens aan skepe verskaf, met inbegrip van stabiliteitgegewens in vereenvoudigde vorm. Die uitwerking van die byvoeging en verwydering van gewigte. Die gevaar van gedeeltelik gevulde tenks, met verwysing na die onderverdeling daarvan.

(iii) Die optuiging van 'n skip vir die laai en aflaai van vrag, die gebruik van laaibome, windasse en krane. Die instel van pyplyne op olieprodukte-vervoerders. Die stuwing en bevestiging van vrag, met inbegrip van stortvrag.

Kennis van die veiligheidsmaatreëls tydens die laai en aflaai van olie, chemikalieë en ander gevaarlike kommoditeite by die grootmaat. Ventilasiestelsels van ruime en tenks.

KLAS 5—BEKWAAMHEIDSERTIFIKAAT

Weerkunde

(Mondeling)

(a) Hoe om 'n barometer (aneroïed en presisie-aneroïed), termometer, hidrometer en higrometer af te lees en te verstaan. Die instrumente wat deur die Weerburo verskaf word, sal as standaard gebruik word.

(b) Barometerdruk; gebruik van barometriese waarnemings saam met weertekens.

(c) Die Beaufort-windskaal. Metodes vir die skatting van die rigting en die krag van die wind ter see.

(e) To find the time and height of high and low water at Standard ports and at Secondary ports by tidal differences using Admiralty Tide Tables, Vol. 2; the use of tide curves as published in the Admiralty Tide Tables.

(f) The interpretation of a chart or plan; particularly the information given about lights, buoys, radio beacons and other navigational aids; Depths and height contours; Tidal streams; Traffic lanes and separation zones. Recognition of the coast and radar responsive targets.

Chart correction.

Depths and nature of bottom. Use of soundings.

Note.—Questions may be set in this paper requiring descriptive answers as well as work on the chart provided. Oral questions, which may relate to any part of the syllabus, may also be asked. Candidates shall be specifically examined as to their knowledge of the standard chart symbols and abbreviations.

Practical navigation

(a) Practical questions on plane and Mercator sailing.

(b) The use of the traverse tables to obtain the position of the ship at any time, given compass courses, variation, deviation and the run recorded by log or calculated by time and estimated speed, allowing for the effects of wind and current.

(c) To find compass error by observation of heavenly bodies and, for a magnetic compass, the deviation for the direction of the ship's head.

(d) To find the Latitude by Meridian altitude of the sun, moon or a star.

CLASS 5—CERTIFICATE OF COMPETENCY

General ship knowledge

Paper 2 (two hours written)

(a) General ideas on ship construction and on plans and data available on board ship.

General pumping arrangements.

General definition of main dimensions.

The names of the principal parts of a ship.

(b) General understanding of:

Displacement;

Deadweight;

Buoyancy; Reserve buoyancy; understanding of fundamental actions to be taken in the event of partial loss of intact buoyancy.

Use of displacement and tonne per centimetre immersion scales to determine mass of cargo or ballast from draughts or freeboard.

Load line marks.

Effects of relative density of water on draught and freeboard.

Fresh water allowance.

(c) (i) General understanding of—

centre of gravity;
centre of buoyancy;
metacentric height;
righting lever;
righting moment.

(ii) The use of stability and hydrostatic data supplied to ships, including stability data in simplified form. The effect of adding and removing weights. The danger of slack tanks, with reference to subdivision thereof.

(iii) Rigging a ship for loading and discharging cargo, the use of derricks, winches and cranes.

"Lining up" pipelines on oil products carriers.

The stowage and securing of cargoes including bulk cargoes.

A knowledge of the safety precautions to be taken during the loading and discharging of bulk oil, chemicals and other dangerous commodities. Ventilation systems of holds and tanks.

CLASS 5—CERTIFICATE OF COMPETENCY

Meteorology

(Oral)

(a) To read and understand a barometer (aneroid and precision aneroid), thermometer, hydrometer and hygrometer. The instruments supplied by the Weather Bureau shall be taken as standard.

(b) Barometric pressure; use of barometric observations in conjunction with weather signs.

(c) The Beaufort wind scale. Methods of estimating direction and force of wind at sea.

(d) Die kenmerke van, en die weer wat gepaard gaan met die vernaamste drukstelsels, bv. antisiklone, laedrukstelsels. Verhouding tussen drukverspreiding en wind. Die Wet van Buys Ballot.

(e) Kennis van die weerinligting wat beskikbaar is vir skeepvaart in die kusgebied tussen die Kuneneriviermonding en Punto Do Ouro.

(f) Kennis van die weerberiggewingprosedures vir skepe.

(g) Kennis van plaaslike—

(a) strome;

(b) seisoensweerpatrone;

(c) voorkoms van abnormale golwe.

KLAS 5—BEKWAAMHEIDSERTIFIKAAT

Mondeling en prakties

(a) (i) Hoe om 'n asimutspieël, pelorus of ander instrument te gebruik vir die neem van peilings.

(ii) Hoe om 'n mikrometersekstant te gebruik vir die meet van vertikale en horisontale hoeke; hoe om 'n sekstant op sowel as buite die boog af te lees.

(iii) Gebruik, versorging en beperkings van die magnetiese en tolkompas en verwante toerusting, met inbegrip van die stuuroutomaat.

(b) (i) Die optakeling van skepe, metodes om die sterktegraad en veilige werklas van toue te bepaal, met inbegrip van sintetiesevesel- en draadtoue.

(ii) Stuwing en bevestiging van vragte. Regulasies en aanbevelings betreffende die vervoer daarvan.

(c) (i) Voorbereiding om te begin vaar. Pligte voordat skip uitvaar, 'n hawe aandoen, 'n dok binnegaan. Langs kaaie, hawehoofde of ander skepe vasmeer en aan boeie vasmaak.

(ii) Roerbevele. Stuurbevele aan stuurman. Uitwerking van skroewe op die stuur van 'n skip. Stop, tru, maneuvreer in die omgewing van loodsvaartuie en ander vaartuie. Opneem van die loods. Kort draai. Noodmaneuvers. Hoe om 'n skip in 'n noodgeval voor 'n enkele anker te bring. Man oorboord.

(iii) 'n Behoorlike kennis van die beginsels van navigasiewaghou ter see en voor anker soos neergelê deur die IMO. Pligte van die dekoffisiere in die hawe.

(d) (i) Ankers, kabels; hulle gebruik en stuwing.

(ii) Elementêre kennis van skeepsmasjinerie. Kennis van die gebruik van alle dektoestelle, met inbegrip van noodstuurgerei.

(iii) Die gebruik en versorging van vuurpyl- en lyngooiapparaat.

(e) (i) Die gebruik en versorging van reddingstoerusting. Die hantering van bote en oorlewingsvaaartuie; die ophaal van bote ter see. 'n Boot op die strand laat loop of land. Hoe om in reddingsbote en oorlewingsvaartuie aan die lewe te bly. Soek- en reddingsprosedures.

(ii) Die gebruik en versorging van brandblustoestelle, met inbegrip van die rookhelm en selfstandige asemhaalapparaat.

(iii) Driloefeninge en inspeksies. Organisasie van noodspanne.

(f) (i) Volledige kennis van die inhoud en toepassing van die regulasies betreffende die voorkoming van botsings ter see, en van die Aanhangsels wat op veilige navigasie betrekking het. (Kandidate sal nie in die posisie gestel word om 'n seilskip te hanteer nie, maar daar sal van hulle verwag word om sodanige seilskip se ligte uit te ken en kennis te dra van so 'n skip se moontlike maneuvers na gelang van die rigting van die wind.)

(ii) Nood- en loodsseine; strawwe vir misbruik.

(iii) Kennis van die inhoud van die Departement van Vervoer se Handelskeepvaartkennisgewings en die gebruik van die Britse Admiraliteit se "Notices to Mariners" en die Suid-Afrikaanse Vlootkennisgewings aan Seeliede.

(iv) IALA-boeistelsels; wrakmerkstelsel.

(v) Herkenning van soorte skepe, met inbegrip van seilvaartuie.

(g) Die eksaminator kan aan die kandidaat vrae stel wat uit die skriftelike werk voortspruit, as dit vanweë swak prestasie deur die kandidaat nodig geag word.

KLAS 5—BEKWAAMHEIDSERTIFIKAAT

Seine

(a) Uitstuur en ontvang van seine—

(i) in Morse-kode met flitslamp, tot ses woorde per minuut; en

(ii) deur die "Internasionale Seinkode" te gebruik.

(b) *Prakties*

Hoe om draradiotoerusting voor te berei vir gebruik in reddingsbote en reddingsvlotte, antennes op te rig en al die noodfasiliteite wat saam met die toerusting verskaf word, te bedien.

(d) The characteristics of, and weather associated with, the principal pressure systems, e.g. anti-cyclones, depressions. Relationship between pressure distribution and wind. Buys Ballot's Law.

(e) A knowledge of the weather information available to shipping in the coastal area between the Kunene Rivier mouth and Punta Da Oro.

(f) A knowledge of procedures for the reporting of weather by ships.

(g) A knowledge of local—

(a) currents;

(b) seasonal weather patterns;

(c) occurrence of abnormal waves.

CLASS 5—CERTIFICATE OF COMPETENCY

Oral and practical

(a) (i) To use an azimuth mirror, pelorus or other instrument for taking bearings.

(ii) To use a micrometer sextant for taking vertical and horizontal angles; to read a sextant both on and off the arc.

(iii) Use, care and limitations of the magnetic and gyro compass and associated equipment, including automatic pilot.

(b) (i) The rigging of ship, methods of ascertaining the proof and safe working loads of ropes including synthetic fibre and wire ropes.

(ii) Stowage and securing of cargoes. Regulations and recommendations affecting their carriage.

(c) (i) Preparations for getting under way. Duties prior to proceeding to sea, making harbour, entering a dock. Berthing alongside quays, jetties, or other ships and securing to buoys.

(ii) Helm orders. Conning the ship. Effects of propellers on the steering of a ship. Stopping, going astern, manoeuvring in the vicinity of pilot vessels and other craft. Picking up the pilot. Turning short round. Emergency manoeuvres. Bringing a ship to single anchor in an emergency. Man overboard.

(iii) A proper knowledge of the principles of navigational watch-keeping at sea and at anchor as laid down by IMO. Duties of the deck officers in port.

(d) (i) Anchors, cables; their use and stowage.

(ii) Elementary knowledge of ships' machinery. Knowledge of the use of all deck appliances including emergency steering gear.

(iii) The use and care of rocket line-throwing apparatus.

(e) (i) The use and care of life-saving equipment. Management of boats and survival craft; recovering boats at sea. Beaching or landing. Survival procedure in boats and survival craft. Search and rescue procedures.

(ii) The use and care of fire appliances including the smoke helmet and self-contained breathing apparatus.

(iii) Drills and musters. Organisation of emergency parties.

(f) (i) A full knowledge of the content and application of the Collision Regulations and of those annexes concerned with safe navigation. (Candidates shall not be placed in the position of handling a sailing craft, but shall be expected to recognise the lights carried by such a craft and to have a knowledge of her possible manoeuvres according to the direction of the wind.)

(ii) Distress and pilot signals; penalties for misuse.

(iii) A knowledge of the contents and use of Department of Transport Merchant Shipping Notices, Admiralty Notices to Mariners and the South African Navy Notices to Mariners.

(iv) IALA systems of buoyage; wreck marking system.

(v) Recognition of ship types, including sailing vessels.

(g) The examiner may ask the candidate questions arising out of the written work, if it is deemed necessary on account of weakness shown by the candidate.

CLASS 5—CERTIFICATE OF COMPETENCY

Signals

(a) To send and receive signals—

(i) in Morse-code by flash lamp up to six words per minute; and

(ii) using the International Code of Signals.

(b) *Practical.*

To prepare portable radio equipment for operation in lifeboat or liferaft, erect aerial and operate all the distress facilities on the equipment provided.

AANHANGSEL G

KLAS 4—BEKWAAMHEIDSERTIFIKAAT: LEERPLAN

Algemene skeepskennis

Vraestel 1 (drie uur skriftelik)

(a) Algemene begrippe van skeepsbou en van die gebruik van planne en gegewens wat aan boord van 'n skip beskikbaar is. Algemene definisies van hoofafmetings. Die name van die vernaamste dele van 'n skip.

Van die kandidaat word verwag om sy praktiese vertroudheid te toon met—

langs- en dwarsspante;
balke en balkknieë
waterdigte skotte;
luikopeninge en afsluittoestelle;
roere;
stuurgerei;
huid- en dekbeplating;
dubbele bome en piektenks;
kimme;
sy- en vleueltenks;
skroefraam;
skroewe en skroefasse;
skroefaskokers;
peilkokers;
lugpype;
algemene pompinrigtings.

Verstewiging en versterking om hyging, stamp en langsspanning te weerstaan. Die oorsaak en voorkoming van korrosie in 'n skip se bouwerk.

(b) Algemene begrippe van sweiswerk, klinkwerk en vlamsnywerk en die voorsorgmaatreëls wanneer sulke werksaamhede aan boord van die skip aan die gang is.

(c) (i) Die betekenis van die uitdrukkings—

blokkoëffisiënt; prismakoëffisiënt; verplasing; midskeepsgroottekoëffisiënt; ladingsgewig; watervlakgroottekoëffisiënt; nat vlak.

(ii) Gebruik van verplasings- en ton-per-cm-dompelskale om gewig van vrag of ballas volgens diepgang of vryboord te bepaal.

Laslynmerke.

Digtheid, relatiewe digtheid, beginsel van Archimedes; flottasie.

Uitwerking van digtheid van water op diepgang en vryboord.

Toelating vir varswater. Die seehidrometer en sy aanwending. Dryfvermoë; reserwedryfvermoë; begrip van die fundamentele optrede in die geval van die gedeeltelike verlies van ongeskonde dryfvermoë.

(d) (i) Algemene begrip, met definisies, van—

swaartepunt; stabiele, onstabiele en neutrale ewewig;
dryfpunt;
metasenterhoogte;
oprighefkrag;
oprigmoment;

(ii) Die gebruik van stabiliteit- en hidrostatiese gegewens aan skepe verskaf. Die uitwerking van die byvoeging en verwydering van gewigte. Die gevaar van gedeeltelik gevulde tenks, met spesiale verwysing na die onderverdeling daarvan.

(e) Optuiging van 'n skip vir die laai en aflaai van vrag, die gebruik van laaibome, windasse en krane. Die instel van pyplyne op olieproduktevervoerders.

Die stuwing, skeiding en garnering van vragte. Oorsake van sweet en voorsorgmaatreëls voor, tydens en na stuwing ter voorkoming van skade weens sweet. Kennis van die veiligheidsmaatreëls tydens die laai en aflaai van olie, chemikalieë en ander gevaarlike kommoditeite by die grootmaat. Berekening van ruimte deur deelvrag in beslag geneem, en van oorblywende ruimte. Herleiding van massamaat van vrag tot ruimtemaat, en omgekeerd. Die opstel en gebruik van vragplanne. Ventilasiestelsels van ruime en tenks. Voorsorgmaatreëls by die binnegaan van vragruime, balastenks en onbesette ruime.

(f) Versorging en onderhoud van alle reddings- en brandbestrydingstoerusting, reddingsboot- en reddingsvlottoerusting, lig- en geluidseintoestelle.

KLAS 4—BEKWAAMHEIDSERTIFIKAAT

Kaartwerk

Vraestel 2 (twee uur, mondelinge vrae uitgesluit)

(a) Om, waar die variasie en die deviasie van die magnetiese kompas of die girofout verstrek word, die ware koerse te herlei tot kompaskoerse, en omgekeerd.

ANNEXURE G

CLASS 4—CERTIFICATE OF COMPETENCY: SYLLABUS

General ship knowledge

Paper 1 (three hours written)

(a) General ideas on ship construction and on the use of plans and data available on board ship. General definitions of main dimensions. The names of the principal parts of a ship.

The candidate shall be expected to show his practical acquaintance with—

longitudinal and transverse framing;
beams and beam knees;
watertight bulkheads;
hatchways and closing appliances;
rudders;
steering gear;
shell and deck plating;
double bottoms and peak tanks;
bilges;
side and wing tanks;
stern frames;
propellers and propeller shafts;
stern tubes;
sounding pipes;
air pipes;
general pumping arrangements;

The stiffening and strengthening to resist panting, pounding and longitudinal stresses; cause and prevention of corrosion in a ship's structure.

(b) General ideas on welding, riveting and burning and the precautions to be taken when such processes are carried out abroad ship.

(c) (i) The meaning of the terms—

block coefficient; prismatic coefficient; displacement; amidships area coefficient; deadweight; waterplane area coefficient; wetted surface.

(ii) Use of displacement and tonne per centimetre immersion scales to determine weight of cargo or ballast from draughts or freeboard.

Load line marks.

Density, relative density, principle of Archimedes; flotation.

Effect of density of water on draught and freeboard. Fresh water allowance. The marine hydrometer and its uses.

Buoyancy; Reserve buoyancy; understanding of fundamental actions to be taken in the event of partial loss of intact buoyancy.

(d) (i) General understanding, with definitions of—

centre of gravity; stable, unstable and neutral equilibrium;
centre of buoyancy;
metacentric height;
righting lever;
righting moment.

(ii) The use of stability and hydrostatic data supplied to ships. The effect of adding and removing weights. The danger of slack tanks, with special reference to subdivision thereof.

(e) Rigging a ship for loading and discharging cargo, the use of derricks, winches, and cranes. 'Lining up' pipelines on oil products carriers. The stowage, separation and dunnaging of cargoes.

Causes of sweating and precautions to be taken before, during and after stowing to prevent damage by sweat. A knowledge of the safety precautions to be taken during the loading and discharging of bulk oil, chemicals and other dangerous commodities.

Calculation of capacities taken up by part cargoes and of space remaining. Conversion of mass measurement of cargo into space measurement and vice versa. The making and use of cargo plans. Ventilation systems of holds and tanks. Precautions to be taken before entering cargo and ballast tanks and void spaces.

(f) Care and maintenance of all life-saving and fire-fighting appliances, light and sound signalling apparatus.

CLASS 4—CERTIFICATE OF COMPETENCY

Chartwork

Paper 2 (two hours excluding Oral questions)

(a) Given variation and the deviation of the magnetic compass or gyro error, to convert true courses into compass courses and vice versa.

Om, waar 'n monsterdeviasielys verstrek word, die deviasie te bepaal en op grond daarvan die ware koerse tot magnetiese en kompaskoerse te herlei.

Om die kompaskoers tussen twee posisies te bepaal.

Die uitwerking van stroom op snelheid.

Toelating vir drif.

Om, waar die kompaskoers waarin gestuur word, die snelheid van die skip en die rigting en snelheid van die stroom verstrek word, die behoue ware koers te bepaal.

Om die koers te bepaal waarin met inagneming van 'n stroom gestuur moet word.

Om, waar die koers waarin gestuur word en die afgelegde afstand verstrek word, die rigting en snelheid van die stroom tussen twee posisies te bepaal.

(b) Om 'n posisie op 'n kaart te bepaal deur middel van gelyktydige kruispeilings, peilings en afstand, of deur middel van posisionele inligting met radionavigasiehulpmiddels verkry, of deur middel van enige kombinasie, met die aanbring van die nodige korreksies.

Die gebruik van kruisnetkaarte. Die gebruik van 'n reaksiegradeboog.

(c) Om die posisie deur peilings van een of meer voorwerpe met die meetvaart tussen hulle en met inagneming van 'n stroom, vas te stel en om te bepaal hoe ver die skip by 'n gegewe punt sal verbyvaar. Die gebruik van standlyne volgens enige metode vasgestel, met inbegrip van aardstandlyne, standsirkels, en 'n enkele standlyn. Die gebruik van oorgangspeilings.

(d) Elementêre kennis van deurvaartbeplanning en uitvoering. Landings in dik en helder weer. Die uitkies van geskikte ankerplekke, nadering van 'n ankerplek en die binnevaar van smal waters. Die gebruik van vermymerke en horisontale en vertikale gevaarhoeke. Die afstand van ligte wat gesien kan word.

(e) Om die tyd en hoogte van hoog- en laagwater by 'n standaard- en sekondêre hawe deur middel van getyverskille te bepaal, met gebruikmaking van die tafels van die Britse Admiraliteit, Volume I en II.

Die gebruik van tafels en getykrommes om die tyd wanneer die gety 'n gegewe hoogte bereik of die hoogte van die gety op 'n gegewe tyd te bepaal, en dan op grond daarvan die benaderde korreksie wat aangebring word aan lodings of aan seekaarthoogtes van kusvoorwerpe.

(f) Die vertolking van 'n kaart of plan, veral die gegewe inligting oor boeie, ligte, radiobakens en ander navigasiehulpmiddels; diepte- en hoogtekontoere; getystrome; verkeersbane en skeidingsones. Herkenning van die kus en radarantwoordbakens.

Kaartkorreksie.

Dieptes en gesteldheid van die seebodem. Die gebruik van lodings.

Die gebruik van gnomoniese kaarte.

Opmerking.—In hierdie vraestel kan vrae gestel word wat beskrywende antwoorde sowel as werk op die kaart wat voorsien word, vereis. Mondelinge vrae, wat op enige deel van die leerplan betrekking kan hê, kan ook gevra word. Die kandidaat word mondeling geëksamineer oor sy kennis van die standaardkaartsimbole en -afkortings.

KLAS 4—BEKWAAMHEIDSERTIFIKAAT

Praktiese navigasie

Vraestel 3 (twee uur skriftelik)

(a) Praktiese probleme in verband met platkaart- en Mercatornavigasie.

(b) Die gebruik van koppelkoerstafels om die skip se posisie op 'n gegewe tyd te bepaal indien die kompaskoerse, variasies, deviasie en die meetvaart soos deur die log aangegee of volgens tyd of geskatte snelheid bereken, verstrek word en daar met die moontlike uitwerking van wind en stroom rekening gehou word.

(c) Bepaling van die breedtegraad deur middel van die meridiaanshoogte van 'n hemelliggaam, bokant of onderkant die Pool.

(d) Om deur middel van waarneming van 'n hemelliggaam naby of buite die meridiaan die rigting van die standlyn en 'n punt waardeur dit loop, te bepaal.

(e) Bepaling van 'n posisie deur gebruikmaking van standlyne verkry uit twee of meer waarnemings met of sonder meetvaart.

(f) Bepaling van die ware peiling van 'n hemelliggaam, die kompasfout en aan die hand daarvan die deviasie van die magnetiese kompas vir die boegrigting.

(g) Berekening van die benaderde tyd (tot die naaste minuut) van die meridiaansgang van 'n hemelliggaam; berekening van 'n benaderde hoogte vir die instel van die sekstant om die meridiaanshoogte van 'n hemelliggaam vas te stel.

KLAS 4—BEKWAAMHEIDSERTIFIKAAT

Weerkunde

Vraestel 4 (twee uur skriftelik)

(a) Die beginsels van drukmeting. Die gebruik van standaardstelmerk.

Kennis van die aneroïed- en presisie-aneroïedbarometer en die barograaf.

Given a sample list of deviations, to extract the deviation thence to convert true courses into magnetic and compass courses.

To find the compass course between two positions.

The effect of current on speed.

Allowance for leeway.

Given compass course steered, the speed of the ship and direction and rate of the current, to find the true course made good.

To find the course to steer allowing for a current.

Given the course steered and distance run, to determine the set and rate of the current experienced between two positions.

(b) To fix a position on a chart by simultaneous cross bearings, by bearing and range, by positional information from radio aids to navigation or by any combination, applying the necessary corrections. The use of lattice charts. The use of a station pointer.

(c) To fix the position by bearings of one or more objects with the run between, allowing for a current and to find the distance at which the ship will pass off a given point. The use of position lines obtained by any method, including terrestrial position lines, position circles, and a line of soundings. Use of transit bearings.

(d) Elementary knowledge of passage planning and execution. Landfalls in thick and clear weather. The selection of suitable anchorages, approaching anchorage and entering narrow waters. The use of clearing marks, also horizontal and vertical danger angles. Distance of sighting lights.

(e) To find the time and height of high and low water at Standard ports and at Secondary ports by tidal differences, using Admiralty Tide Tables, Vols 1. and II. The use of tables and tide curves to find the time at which the tide reaches a specified height or the height of the tide at a given time and thence the approximate correction to be applied to soundings or to charted heights of shore objects.

(f) The interpretation of a chart or plan; particularly the information given about Buoys, Lights, Radio beacons and other navigational aids; Depth and height contours; Tidal streams; Traffic lanes and Separation zones.

Recognition of the coast and radar responsive targets. Chart correction.

Depths and nature of bottom. Use of soundings. The use of gnomonic charts.

Note.—Questions may be set in this paper requiring descriptive answers as well as work on the chart provided. Oral questions, which may relate to any part of the syllabus, may also be asked. The candidate shall be orally examined as to his knowledge of the standard chart symbols and abbreviations.

CLASS 4—CERTIFICATE OF COMPETENCY

Practical navigation

Paper 3 (two hours written)

(a) Practical problems on Plane and Mercator sailing.

(b) The use of the traverse tables to obtain the position of the ship at any time, given compass courses, variation, deviation and the run recorded by log or calculated by time and estimated speed, allowing for the effects of wind and current, if any.

(c) To find the latitude by meridian altitude of a heavenly body, above or below the Pole.

(d) From an observation of any heavenly body near or out of the meridian, to find the direction of the position line and a position through which it passes.

(e) To obtain a position by the use of position lines obtained from two or more observations with or without run.

(f) To find the true bearing of a heavenly body, the compass error and thence the deviation of the magnetic compass for the direction of the ship's head.

(g) To calculate the approximate time (to the nearest minute) of the meridian passage of a heavenly body; to calculate an approximate altitude for setting on the sextant to obtain the meridian altitude of a heavenly body.

CLASS 4—CERTIFICATE OF COMPETENCY

Meteorology

Paper 4 (two hours written)

(a) The principles of pressure measurement. The use of standard datum.

Knowledge of the aneroid and precision aneroid barometer and the barograph.

(b) Die beginsels van die termometer, maksimum en minimum termometers.

See- en lugtemperatuurwaarnemings en voorsorgmaatreëls wat getref moet word.

Die beginsel van die higrometer, waarnemings wat gedoen moet word om 'n relatiewe vogtigheid te verkry. Versorging van en aandag aan instrumente.

(c) Die Beaufort-windskaal. Metodes vir die skatting van die rigting en die krag van die wind ter see.

(d) Kennis van die verspreiding van gemiddelde druk.

Daaglikse en seisoensveranderings in atmosferiese druk. Heersende winde. Plaaslike en streekuitwerking van verwarming en afkoeling, land- en seebriese, moesons. Katabatiese winde.

(e) Die kenmerke van, en die weer wat gepaard gaan met die vernaamste drukstelsels, bv. antisiklone, laedrukstelsels, permanente en halfpermanente hoë- en laedrukgebiede. Verhouding tussen drukverspreiding en wind. Lugmassas en hulle eienskappe. Die Wet van Buys Ballot.

(f) Gebruik van barometriese waarnemings by 'n enkele stasie saam met weertekens.

(g) Waterdamp in die atmosfeer, verdamping, kondensasie, presipitasie; betekenis van versadiging, relatiewe vogtigheid, doupunt; elementêre kennis van atmosferiese stabiliteit en vervaltempo; formasie en klassifikasie van wolke, mis, newel en dou. Dynserigheid.

(h) Kennis van die tipes weerberigte wat deur meteorologiese organisasies vir skeepvaart beskikbaar gestel word. Die kodering en dekodering van berigte deur gebruik van die Weerburo se handleiding getitel "Weerkode vir Skepe". Kennis van die algemene struktuur van weerberiggewing, bv. die keuse van skepe, weerskepe, skeepstasies.

KLAS 4—BEKWAAMHEIDSERTIFIKAAT

Mondeling

(a) (i) Hoe om 'n barometer, termometer, hidrometer en higrometer af te lees en te verstaan. Die instrumente wat deur die Weerburo verskaf word, word as standaard gebruik.

(ii) Hoe om 'n asimutspieël, pelorus en ander instrument te gebruik om peilings te neem.

(iii) Hoe om 'n sekstant te gebruik om vertikale en horisontale hoeke te meet; hoe om 'n sekstant sowel op as buite die boog af te lees.

(iv) Hoe om 'n sekstant waarin een of meer regstandigheids-, sy- of indeksfoute teweeggebring is, reg te stel.

(v) Hoe om die indeksfout van 'n sekstant te vind.

(vi) Hoe om die chronometerfout vas te stel.

(vii) Gebruik, versorging en beperkings van die magnetiese en tolkompas en verwante toerusting, met inbegrip van die stuuroutomaat.

(b) (i) Die optakeling van skepe, metodes om die sterktegraad en veilige werklas van toue te bepaal, met inbegrip van sintetieseveselen draadtoue. Daar kan ook aan kandidate vrae gestel word oor die kwalifiserende eksamenleerplan vir die uitreiking van 'n sertifikaat as Bekwame Dekseeman.

(ii) Stuwing en bevestigings van vragte. Regulasies en aanbevelings betreffende die vervoer daarvan.

(c) (i) Voorbereiding om te begin vaar. Pligte voordat skip uitvaar, 'n hawe aandoen, 'n dok binnegaan. Langs kaaie, hawehoofde of ander skepe vasmeer en aan boeie vasmaak.

(ii) Roerbevele. Stuurbevele aan stuurman. Uitwerking van skroewe op die stuur van 'n skip. Stop, tru, maneuvreer in die omgewing van loodsvaartuie en ander vaartuie. Opneem van 'n loods. Kort draai. Noodmaneuvers. Hoe om 'n skip in 'n noodgeval voor 'n enkele anker te bring. Man oorboord.

(iii) 'n Behoorlike kennis van die beginsels van navigasiewaghou ter see en anker soos neergelê deur die IMO. Pligte van die dekoffisiere in die hawe.

(iv) Driloefeninge en inspeksies. Organisasie van noodspanne.

(d) (i) Ankers, kabels, hulle gebruik en stuwing.

(ii) Elementêre kennis van skeepsmasjinerie.

Kennis van die gebruik van alle dektoestelle, met inbegrip van noodstuurgerei.

(iii) Die gebruik en versorging van vuurpyl- en lyngooiapparaat.

(iv) Die gebruik en instandhouding van logge en lodingsapparaat.

(e) (i) Die gebruik en versorging van reddingstoestelle. Die aanslaan, span en mindering van reddingsbootseile. Reddingsbootenjins van die kompressieontstekingstipe aan die gang sit. Hantering van bote wat geroei word of wat onder seil en onder krag vaar en in onstuimige weer bote ter see ophaal. 'n Boot op die strand laat loop of land. Hoe om in reddingsbote en reddingsvlotte aan die lewe te bly. Soek- en reddingsprosedures.

(ii) Die gebruik en versorging van brandblustoestelle, met inbegrip van die rookhelm en selfstandige asemhaalapparaat.

(b) The principles of the thermometer, maximum and minimum thermometers.

Sea and air temperature observations and precautions to be taken.

The principle of the hygrometer, observations to obtain relative humidity. Care and attention given to instruments.

(c) The Beaufort wind scale. Methods of estimating direction and force of wind at sea.

(d) A knowledge of the mean pressure distribution. Daily and seasonal changes in atmospheric pressure. Prevailing winds. Local and regional effects of heating and cooling, land and sea breezes, monsoons. Katabatic winds.

(e) The characteristics of, and weather associated with, the principal pressure systems, e.g. anti-cyclones, depressions, permanent and semi-permanent high and low pressure areas. Relationship between pressure distribution and wind. Air masses and their properties. Buys Ballot's law.

(f) Use of barometric observations at a single station in conjunction with weather signs.

(g) Water vapour in the atmosphere, evaporation, condensation, precipitation; meaning of saturation, relative humidity, dewpoint; elementary knowledge of atmospheric stability and lapse rate; formation and classification of clouds, fog, mist and dew. Haze.

(h) A knowledge of the types of weather messages promulgated by Meteorological Organisations for shipping. Coding and de-coding messages by the use of the hand book titled "Weather Code for Ships" as published by the Weather Bureau. A knowledge of the general structure of weather reporting, e.g. selected ships, weatherships, ship stations.

CLASS 4—CERTIFICATE OF COMPETENCY

Oral

(a) (i) To read and understand a barometer, thermometer, hydrometer and hygrometer. The instruments supplied by the Weather Bureau shall be taken as standard.

(ii) To use an azimuth mirror, pelorus or other instrument for taking bearings.

(iii) To use a sextant for taking vertical and horizontal angles; to read a sextant both on and off the arc.

(iv) To correct a sextant into which has been introduced one or more of perpendicularity, side or index errors.

(v) To find the index error of a sextant.

(vi) To ascertain the chronometer error.

(vii) Use, care and limitations of the magnetic and gyrocompass and associated equipment, including automatic pilot.

(b) (i) The rigging of ships, methods of ascertaining the proof and safe working loads of ropes including synthetic fibre and wire ropes. Candidates may also be questioned on the qualifying examination syllabus for the issue of an Efficient Deck Hand certificate.

(ii) Stowage and securing of cargoes. Regulations and recommendations affecting their carriage.

(c) (i) Preparations for getting under way. Duties prior to proceeding to sea, making harbour, entering a dock. Berthing alongside quays, jetties or other ships and securing to buoys.

(ii) Helm orders. Conning the ship. Effects of propellers on the steering of a ship. Stopping, going astern, manoeuvring in the vicinity of pilot vessels and other craft. Picking up a pilot. Turning short round. Emergency manoeuvres. Bringing a ship to single anchor in an emergency. Man overboard.

(iii) A proper knowledge of the principles of navigational watch-keeping at sea and at anchor as laid down by IMO. Duties of the deck officers in port.

(iv) Drills and musters. Organisation of emergency parties.

(d) (i) Anchors, cables; their use and stowage.

(ii) Elementary knowledge of ship machinery.

Knowledge of the use of all deck appliances including emergency steering gear.

(iii) The use and care of rocket and line-throwing apparatus.

(iv) Use and upkeep of logs and sounding appliances.

(e) (i) The use and care of life-saving appliances. Bending, setting and taking in lifeboat sails. Starting lifeboat compression-ignition engines. Management of boats under oars, sails, and power and in heavy weather; recovering boats at sea. Beaching or landing. Survival procedure in lifeboats and liferafts. Search and Rescue procedures.

(ii) The use and care of fire appliances including the smoke helmet and self-contained breathing apparatus.

(f) (i) Volledige kennis van die inhoud en toepassing van die Botsingsregulasies en van die aanhangsels wat op veilige navigasie betrekking het. (Van kandidate sal nie verwag word om 'n seilvaartuig te hanteer nie, maar van hulle sal verwag word om die ligte op sodanige vaartuig te herken en om kennis te hê van die moontlike maneuvrering volgens die rigting van die wind.)

(ii) Nood- en loodsseine; strawwe vir misbruik.

(iii) Kennis van die inhoud en gebruik van die Departement van Vervoer se "Handelskeepvaartkennisgewings", die Britse Admiraliteit "Notices to Mariners" en die "Suid-Afrikaanse" Vlootkennisgewings aan Seeliede.

(iv) IALA-boeistelsels; wrakmerkstelsel.

(g) Die eksaminator kan aan die kandidaat vrae stel wat uit die skriftelike werk voortspruit, indien dit vanweë swak prestasie deur die kandidaat nodig geag word.

KLAS 4—BEKWAAMHEIDSERTIFIKAAT

Seine

(a) Die stuur en ontvang van seine in—

(i) Morse-kode met flitslamp, tot ses woorde per minuut; en

(ii) Internasionale Seinboek.

(b) *Prakties*

Hoe om draradiotoerusting voor te berei vir gebruik in reddingsbote en reddingsvlotte, antennes op te rig en al die noodfrekwensiefasiliteite wat saam met die toerusting verskaf word, te bedien.

AANHANGSEL H

KLAS 3—BEKWAAMHEIDSERTIFIKAAT: LEERPLAN

Algemene skeepskennis

Vraestel 1 (drie uur skriftelik)

(Leerplan soos vir Klas 4, Vraestel 1)

Kaartwerk

Vraestel 2 (twee uur, uitgesonderd mondelinge vrae)

(Leerplan soos vir Klas 4, Vraestel 2)

Praktiese navigasie

Vraestel 3 (twee uur skriftelik)

(Leerplan soos vir Klas 4, Vraestel 3)

Weerkunde

Vraestel 4 (twee uur skriftelik)

(Leerplan soos vir Klas 4, Vraestel 4)

KLAS 3—BEKWAAMHEIDSERTIFIKAAT

Toegepaste wetenskap

Vraestel 5 (drie uur skriftelik)

Van kandidate sal verwag word om hulle begrip van fisiese beginsels te toon deur vrae wat berekening sonder bewys behels en deur vrae oor die praktiese toepassing van daardie beginsels, veral ten opsigte van instrumente of stelsels ter see gebruik.

Van kandidate sal verwag word om eerder begrip van en insig in fisiese beginsels te toon as om formele, gememoriseerde beskrywings of stellings van wette en reëls te verstrek.

(a) *Warmte*

(i) Meting van temperatuur; termometers, termokoppels. Oordrag van warmte; geleiding, konveksie, uitstraling.

(ii) Uitsetting van vaste stowwe en vloeistowwe, uitsettingskoëffisiënte, spesifieke warmte, latente warmte.

(iii) Eienskappe van gasse: Boyle se Wet, Charles se Wet. 'n Eenvoudige behandeling van isotermiese en adiabatiese uitsetting en kompressie van gasse; beginsels van verkoeling.

(b) *Lig*

(i) Wette van weerkaatsing; vlakspieël, draaispieël, sferiese spieël.

(ii) Wette van straalbreking; indeks van straalbreking, totale interne weerkaatsing. Prismas, dun lense; 'n grafiese behandeling van die vorming van beelde deur lense.

(c) *Golfteorie*

(i) Eenvoudige harmoniese beweging; golfbeweging, die rolbeweging van skepe; superposisie.

(ii) Radioteorie.

(iii) Getye.

(f) (i) A full knowledge of the content and application of the Collision Regulations and of those annexes concerned with safe navigation. (Candidates shall not be placed in the position of handling a sailing craft, but shall be expected to recognise the lights carried by such a carft and to have knowledge of her possible manoeuvres according to the direction of the wind).

(ii) Distress and pilot signals; penalties for misuse.

(iii) A knowledge of the contents and use of Department of Transport 'Merchant Shipping Notices', 'Admiralty Notices to Mariners' and 'South African Navy Notices to Mariners.

(iv) IALA systems of buoyage; wreck marking system.

(g) The examiner may ask the candidate questions arising out of the written work, if it is deemed necessary on account of weakness shown by the candidate.

CLASS 4—CERTIFICATE OF COMPETENCY

Signals

(a) To send and receive signals in—

(i) Morse-code by flash lamp up to six words per minute; and

(ii) International Code of Signals.

(b) *Practical.*

To prepare portable radio equipment for operation in lifeboat or liferaft, erect the aerial and operate all the distress frequency facilities on the equipment provided.

ANNEXURE H

CLASS 3—CERTIFICATE OF COMPETENCY: SYLLABUS

General ship knowledge

Paper 1 (three hours written)

(Syllabus as for Class 4, Paper 1)

Chartwork

Paper 2 (two hours excluding Oral questions)

(Syllabus as for Class 4, Paper 2)

Practical navigation

Paper 3 (two hours, written)

(Syllabus as for Class 4, Paper 3)

Meteorology

Paper 4 (two hours written)

(Syllabus as for Class 4, Paper 4)

CLASS 3—CERTIFICATE OF COMPETENCY

Applied Science

Paper 5 (three hours written)

Candidates may be asked to demonstrate their understanding of physical principles by questions involving calculation without proof and by questions on the practical application of those principles, particularly in instruments or systems in use at sea.

Candidates shall be expected to show understanding and appreciation of physical principles rather than to produce formal, memorised descriptions or statements of laws and rules.

(a) *Heat.*

(i) Measurement of temperature; thermometers, thermocouples. Transference of heat; conduction, convection, radiation.

(ii) Expansion of solids and liquids, co-efficients of expansion, specific heat, latent heat.

(iii) Properties of gases: Boyle's Law, Charles' Law. A simple treatment of isothermal and adiabatic expansion and compression of gases; principles of refrigeration.

(b) *Light.*

(i) Laws of reflection; plane mirror, rotating mirror, spherical mirror.

(ii) Laws of refraction; index of refraction, total internal reflection. Prisms, thin lenses; a graphical treatment of the formation of images by lenses.

(c) *Wave theory.*

(i) Simple harmonic motion; wave motion, rolling of ships; superposition.

(ii) Radio theory.

(iii) Tides.

(iv) Gedempte en gedwonge ossillasie.

(v) Klank: Voortbrenging, voortplanting, weerkaatsing. Uitwerking van wind.

Faktore wat snelheid beïnvloed. Doppler-effek.

(d) *Magnetisme*

(i) Teorie van magnetisme. Wette van magnetisme. Intensiteit van magnetisering, permeabiliteit, retentiwiteit, histeresekrommes vir ferromagnetiese materiaal.

(ii) Poolsterkte, veldsterkte, magnetiese moment en koppel; defleksie van 'n gemagnetiseerde naald.

(iii) Aardmagnetisme en magnetiese elemente. Variasie.

(e) *Elektrisiteit*

(i) Die aard van 'n elektriese stroom. EMK, stroom, weerstand, hul uitwerking en onderlinge verhouding, elektriese potensiaal. Isolators en isolering, elektriese en magnetiese velde geassosieer met elektriese potensiale en strome. Kapasitansie.

(ii) Die verwarmingseffek van 'n stroom; krag en die verhouding daarvan tot stroom en weerstand. Die magnetiese veld deur 'n stroom veroorsaak en die uitwerking daarvan. Die uitwerking van 'n stroomdraende geleier in 'n magnetiese veld.

Chemiese effekte; die effek van die deursending van stroom deur 'n geleioplossing.

(iii) Primêre en sekondêre selle; batterye.

(iv) Wisselspannings en -strome in breë trekke; frekwensie- en faseverwantskap, kruin-, oombliks- en w.g.k.-waardes. Reaktansie, impedansie, kragdissipasie. Resonansie. Gelykrigting.

(v) Eenvoudige WS- en GS-kringe. Sekerings en stroombreektoestelle. Die uitwerking van oop kringe, kortsluitings en lekkasie; die uitwerking van vullis en vog. Beginsels van elektriese generators en motore. Skeepsboordkragvoorsiening in breë trekke. Noodkragbronne. Veiligheidsmaatreëls wat nagekom moet word wanneer elektriese toerusting hanteer word, met inbegrip van reserwedele wat aan boord gevoer word.

(f) *Radiobeginsels*

Die begrip van elektromagnetiese straling en die nodigheid van 'n hoëfrekwensiedraergolf. Voortplanting, polarisasie en die verhouding tussen die lengte en frekwensie van 'n golf. Bodemgolwe en ruimtegolwe. Funksies van tipiese seekommunikasies, senders en ontvangers. Tipiese antennestelsels, met inbegrip van hulle vertikale en horisontale stralingspatrone.

(g) *Toegepaste chemie.*

(i) Korrosie; inwerking van ongelyksoortige metale op mekaar.

(ii) Ontbranding, geïnduseerde en spontane ontbranding. Flits- en ontstekingstemperature.

Plofmengsels, chemiese verandering toe te skryf aan oorverhitting.

(iii) Brandblussing; poeier, skuim, gasgedrewe water, trae gasse.

KLAS 3—BEKWAAMHEIDSERTIFIKAAT

Beginsels van Navigasie

Vraestel 6 (twee uur skriftelik)

(a) Die fatsoen van die aarde. Pole, ewenaar, meridiane, breedtesirkels. Posisie volgens breedte- en lengtegraad. Rigting, peilings, afstand, meeteenhede. Breedteverskil, lengteverskil, afwyking, middelbare breedte, die verskil en die verband tussen die meridiaandele. Grootsirkels, grootsirkelkoers en -afstand, kleinsirkels op 'n bol.

(b) Die hemelruim; definisies in verband met die hemelruim; skynbare beweging in die hemelsfeer. Deklinasie. Asimut. Sterre-uurhoek. Die posisie van 'n liggaam op die hemelsfeer; Asimut met hoogte of deklinasie met sterre- of plaaslike uurhoek. Die opkoms, hoogtepunt en ondergang van hemelliggame. Die gebruik van poolstertafels.

(c) Die sonnestelsel, aarde-maan-stelsel. Die beweging van die planete. Die aarde se omwenteling en beweging in sy baan, middelbare son, die sonneweg, eerste punt van die Ram. Sonsopkoms, sonsondergang, skemer tydens nagewening en sonstilstand.

(d) Tyd; Greenwich- en ander standaardtye, sonetyd, middelbare tyd, skynbare tyd, sterretyd, tydsvereffening, verband tussen lengtegraad en tyd.

(e) Plaaslike uurhoek van 'n hemelliggaam in tyd en in 'n boog. Greenwich-uurhoek van die son, maan, planete en die Ram.

(f) Korreksie van sekstanthoogtes; duiking, straalbreking, horisontale parallaks, hoogteparallaks, halwe middellyn en vergroting.

(g) Geografiese posisie van 'n hemelliggaam. 'n Posisiesirkel en die praktiese toepassing daarvan, dit wil sê standlyn. Hoogteverskil. Praktiese navigasieprosedures. [Van kandidate sal daar verwag word om te kan bepaal wat die gunstigste tyd is om 'n astronomiese waarneming te maak met betrekking tot (a) hoogteverskil en (b) rigting van die standlyn. Kandidate moet die faktore ken wat in ag geneem moet word wanneer hemelliggame gekies word vir waarneming gedurende skemer.]

(iv) Damped and forced oscillation.

(v) Sound:—Production, propagation, reflection. Effect of wind. Factors effecting velocity. Doppler effect.

(d) *Magnetism.*

(i) Theory of magnetism. Laws of magnetism. Intensity of magnetisation, permeability, retentivity, hysteresis curves for ferro-magnetic material.

(ii) Pole strength, field strength, magnetic moment and couple; deflection of a magnetised needle.

(iii) Terrestrial magnetism and magnetic elements. Variation.

(e) *Electricity.*

(i) The nature of an electric current; e.m.f., current, resistance, their effects and relationships, electrical potential. Insulators and insulation, electric and magnetic fields associated with electric potentials and currents. Capacitance.

(ii) Heating effect of a current; power and its relationship with current and resistance. The magnetic field caused by a current and the resulting effects.

The effect on a current-carrying conductor in a magnetic field.

Chemical effects; passage of current through a conducting solution.

(iii) Primary and secondary cells; batteries.

(iv) Alternating voltages and currents in outline; frequency phase relationship, peak, instantaneous and r.m.s. values. Reactance, impedance, power dissipation. Resonance. Rectification.

(v) Simple a.c. and d.c. circuits. Fuses and circuit breaker devices. The effect of open circuits, short circuits and leakage; the effects of dirt and moisture. Principles of electric generators and motors. Outline of shipboard power supplies. Emergency sources. Safety precautions to be observed when handling electrical equipment, including spares carried on board.

(f) *Principles of radio.*

Concept of electromagnetic radiation and the need for a high frequency carrier wave. Propagation, polarisation and wave length/frequency relationship. Ground and sky waves. Functions of typical marine communications, transmitters and receivers. Typical aerial systems, including their vertical and horizontal radiation patterns.

(g) *Applied Chemistry.*

(i) Corrosion; action between dissimilar metals.

(ii) Combustion, induced and spontaneous. Flash and ignition temperatures. Explosive mixtures, chemical change due to overheating.

(iii) Fire extinguishing; powder, foam, gas-powered water, inert gases.

CLASS 3—CERTIFICATE OF COMPETENCY

Principles of navigation

Paper 6 (two hours written)

(a) The shape of the earth. Poles, equator, meridians, parallels of latitude. Position by latitude and longitude. Direction, bearings, distance, units of measurement. Difference of latitude, difference of longitude, departure, mean latitude, difference of meridional parts and the relationship between them. Great circles, great circle course and distance, small circles on a sphere.

(b) The celestial sphere; definitions on the celestial sphere; apparent motion on the celestial sphere. Declination. Azimuth. Sidereal hour angle. The position of a body on the celestial sphere; azimuth with altitude or declination with sidereal or local hour angle. The rising, culmination and setting of heavenly bodies. The use of pole star tables.

(c) Solar system, earth-moon system, planetary motion. Earth's rotation and movement in orbit, mean sun, ecliptic, first point of Aries. Equinox and solstice, sunrise, sunset, twilight.

(d) Time; Greenwich and other standard time, zone time, mean time, apparent time, sidereal time, equation of time, relationship between longitude and time.

(e) Local hour angle of a heavenly body in time and arc. Greenwich hour angle of Sun, Moon, planets and Aries.

(f) Correction of sextant altitudes; dip, refraction, horizontal parallax, parallax in altitude, semi-diameter and augmentation.

(g) Geographical position of a heavenly body. A circle of position and its practical application, i.e. position line. Intercept. Practical navigational procedures. [Candidates shall be expected to be able to determine the most favourable time to make a celestial observation with regard to (a) intercept and (b) direction of the position line. Candidates shall be expected to know the factors to be taken into account when selecting heavenly bodies for observation during twilight.]

(h) Eenvoudige kenmerke van Mercator- en gnomoniese kaart. Lengte- en breedteskale; die meting van afstand, loksodrome. Grootsirkels en saamgestelde grondkoerse.

(i) Die verband tussen die getye en die maangestaltes.

(j) Die beginsel van posisiebepaling deur die afstandsverskil vanaf twee of meer vaste punte te meet. Die hiperboliese kruisnet op 'n navigasiekaart.

(k) Die eienskappe van die vrytollende giroskoop. Die verwantskap tussen toegepaste krag en presessie. Dryf en oorhelling. Die breë beginsel van die ontwikkeling van 'n noordsoekende instrument deur gravitasiebeheer.

(l) Basiese beginsels van posisiebepaling met behulp van 'n satelliet.

KLAS 3—BEKWAAMHEIDSERTIFIKAAT

Wiskunde (suiwer en toegepas)

Vraestel 7 (twee-en-'n-halfuur skriftelik)

(a) *Algebra*

Definisies en prosesse. Teorie van indekse. Eenvoudige vergelykings, probleme wat tot eenvoudige vergelykings lei. Ontwikkeling van formules, transposisie en evaluering. Breuke. Faktore. Gelyktydige vergelykings van die eerste orde waarby twee of drie onbekendes betrokke is, probleme wat tot gelyktydige vergelykings lei. Oplossing van die vierkantsvergelyking, probleme wat tot vierkantsvergelykings lei. Grafieke. Referensieasse. Reghoekige en poolkoördinate. Die konstruksie en vertolking van statistiese grafieke en diagramme. Grafieke van funksie, lineêr, algebraïes en triogonometries 0°–360°, gradiënt, veranderingstempo, maksimum en mini mum punte. Verhouding, eweredigheid en variasie; eenvoudige probleme.

(b) *Gewone logaritmes.*

Die aanwending van logaritmes tot enige grondtal. Berekenings waarby vermenigvuldiging en deling deur middel van logaritmes, magte en wortels betrokke is. Eksponensiale vergelykings.

(c) *Oppervlakte- en volumeberekening.*

Oppervlaktes en omtrekke van die reghoek, driehoek en sirkel. Volume en oppervlakte van wig, piramide silinder, sfeer keël en prismatiese blok en probleme in verband daarmee.

(d) *Meetkunde*

Die konstruksie van vlakdriehoeke. Kongruensie van driehoeke; gelykvormigheid van driehoek. Die reghoekige driehoek. Eienskappe van som van hoeke van driehoeke en poligone. Buitehoekeienskap. Ewewydige lyne en transversale. Eienskappe van sirkels, koorde en raaklyne. Hoek in 'n halfsirkel; hoeke deur enige koord van 'n sirkel onderspan. Kragte, resulterende kragte en hul komponente. Die gebruik van vektors om grootheid en rigting aan te dui; Vektoraddisie, gebruik van die vektordriehoek. Eienskappe van die ellips en hiperbool van seevaartkundige belang.

(e) *Driehoeksmeting.*

Meting van hoeke. Boogmaat. Driehoeksmetingverhoudings tot en met een omwenteling. Haversinus. Verband tussen verhoudings. Komplementêre en supplementêre hoeke en hul verhoudings. Eenvoudige identiteite en driehoeksmetingvergelykings. Oplossing van reghoekige en skeefhoekige vlakdriehoeke, met inbegrip van praktiese probleme van seevaartkundige belang.

(f) *Boldriehoeksmeting.*

Eienskappe van boldriehoeke. Oplossing van skeefhoekige, reghoekige en kwadrantboldriehoeke.

(g) *Statika.*

Samestelling en ontbinding van kragte. Beginsel van momente. Spanning, vervorming, skuifkragte en buigmomente van eenvoudiggestutte balke met en sonder laste. Eenvoudige masjiene; hefboom, skroefdomkrag, katrolstelsels; meganiese voordeel, snelheidsverhouding, doeltreffendheid. Druk in vloeistowwe; druk op 'n diepte, stukrag.

(h) *Dinamika.*

Samestelling en ontbinding van snelhede en versnellings. 'n Begrip van Newton se bewegingswette, beweging onder swaartekrag, arbeid, krag, kinetiese en potensiaalenergie, momentum, wrywing en wrywingskoëffisiënt, met inbegrip van eenvoudige illustrerende berekenings, Rotasie.

KLAS 3—BEKWAAMHEIDSERTIFIKAAT

Mondeling

(Die leerplan is dieselfde as dié vir die Klas 4 Mondelinge Eksamen)

Seine

(Die vraestel is dieselfe as dié vir die Klas 4-seineksamen)

(h) Simple properties of Mercator and gnomonic charts. Latitude and Longitude scales; measurement of distance, Rhumb lines. Great circles and composite tracks.

(i) The relationship between the tides and the phases of the moon.

(j) Principle of position fixing by measurement of difference of distance from two or more fixed points. The hyperbolic lattice on navigational charts.

(k) Properties of the free gyroscope. Relationship between applied force and precession. Drift and tilt. Outline principle of developing a North seeking instrument by gravity control.

(l) Basic principles of position fixing by satellite.

CLASS 3—CERTIFICATE OF COMPETENCY

Mathematics (pure and applied)

Paper 7 (two and a half hours written)

(a) *Algebra:*

Definitions and processes. Theory of indices. Simple equations, problems leading to simple equations. Developments of formulae, trans-position and evaluation. Fractions. Factors. Simultaneous equations of the first order involving two or three unknowns, problems leading to simultaneous equations. The solution of the quadratic equation, problems leading to quadratic equations. Graphs. Aces of reference. Rectangular and polar co-ordinates. Construction and reading of statistical graphs and diagrams. Graphs of function, linear, algebraic and trigonometric 0°–360°, gradient, rate of change, maximum and minimum points. Ratio, proportion and variation; simple problems.

(b) *Common logarithms.*

The use of logarithms to any base. Calculations involving multiplication and division by logarithms, powers and roots. Exponential equation.

(c) *Mensuration.*

Areas and perimeters of rectangle, triangle and circle, volume and surface area of wedge, pyramid, cylinder, sphere, cone and prismatic block and problems thereon.

(d) *Geometry.*

The construction of plane triangles. Congruence of triangles; similarity of triangles. The right-angled triangle. Angle-sum properties of triangles and polygons. Exterior angle property. Parallel lines and transversal. Properties of circles, chords and tangents. Angle in a semi-circle; angles subtended by any chord of a circle. Forces, resultant forces and their components. The use of vectors to indicate magnitude and direction; vector addition, use of the vector triangle. Properties of the ellipse and hyperbola of navigational importance.

(e) *Trigonometry.*

Measurement of angles. Circular measure. Trigonometrical ratios up to one revolution. Haversine. Relationship between ratios. Complementary, supplementary angles and their ratios. Simple identities and trigonometrical equations. Solution of right-angled and oblique plane triangles including practical problems of navigational significance.

(f) *Spherical trigonometry.*

Properties of spherical triangles. Solution of oblique, right-angled and quadrantal spherical triangles.

(g) *Statics.*

Composition and resolution of forces. Principle of moments. Stress, strain, shear forces and bending moments of simply supported beams with and without load.

Simple machines; lever, screwjack, pulley systems; mechanical advantage, velocity ratio, efficiency. Pressure in liquids; pressure at a depth, thrust.

(h) *Dynamics.*

Composition and resolution of velocities and accelerations. An understanding of Newton's laws of motion, motion under gravity, work, power, kinetic and potential energy, momentum, friction, and co-efficient of friction including simple illustrative calculations. Rotation.

CLASS 3—CERTIFICATE OF COMPETENCY

Oral

(The syllabus is the same as that for the Class 4 Oral examination)

Signals

(The syllabus is the same as that for the Class 4 Signals examination)

AANHANGSEL 1

KLAS 2—BEKWAAMHEIDSERTIFIKAAT: LEERPLAN

Kusnavigasie

Vraestel 1 (twee-en-'n-halfuur, uitgesonderd mondelinge vrae)

Bo en behalwe die leerplan vir Klas 4, Kaartwerk

(a) Wanneer die kus in enige omstandighede genader word.

(b) Die beplanning van 'n kusvaart of die binnegaan van 'n hawe. Bevestiging van posisie. Die uitkies van geskikte ankerplekke.

(c) Uitvoering van 'n deurvaart. Monitering van vordering. Die uitwerking van beperkings soos weer en gety, verkeer, en die toestand van die skip se toerusting.

(d) Die gebruik van vaarvoorskrifte en ander publikasies wat betrekking het op kusnavigasie, wat op Suid-Afrikaanse Handelskepe gevoer moet word, met inbegrip van die Admiraliteitsgetytafels, Volumes 1 en 2.

(e) Die gebruik van navigasiehulpmiddels, met inbegrip van radar, die eggolood en visuele hulpmiddels, by kusnavigasie en -loodsing, met inbegrip van die gebruik van radar ter voorkoming van botsings.

Opmerking:

(1) In hierdie vraestel sal vrae gestel word wat beskrywende antwoorde sowel as werk op die kaart wat voorsien word, vereis. Mondelinge vrae, wat op enige deel van die leerplan betrekking het, kan ook gevra word.

(2) Radaruitstipping kan in hierdie vraestel ingesluit word.

KLAS 2—BEKWAAMHEIDSERTIFIKAAT

Oseaan- en aflandige navigasie

Vraestel 2 (twee-en-'n-halfuur skriftelik)

(1) Astronomiese Navigasie soos in paragrawe (c) tot (g) van Praktiese Navigasie, Klas 4.

(b) Probleme van grootsirkel- en saamgestelde koersvaart.

(c) Posisiebepaling, vaste en veranderlike foute, waarskynlikheidsgebied. Hoe om 'n skip se posisie te bepaal deur twee of meer waarnemings van enige tipe, met of sonder meetvaart.

(d) Die gebruik en begrip van navigasiehulpmiddels, met inbegrip van al daardie radio- en elektroniese hulpmiddels waarmee die meerderheid handelskepe toegerus is. Die doel met die vrae is om te bepaal of die kandidate 'n behoorlike begrip het van die basiese beginsels en van die werking van hierdie hulpmiddels, en of hulle ten volle daarvan kan gebruik maak terwyl hulle die beperkings daarvan besef.

KLAS 2—BEKWAAMHEIDSERTIFIKAAT

Weerkunde

Vraestel 3 (twee-en-'n-halfuur skriftelik)

(a) Lugmassas; algemene begrippe van oorsprongstreke, klassifikasie en eienskappe. Struktuur van laagdrukgebiede, algemene verspreiding van die weer in 'n laedrukgebied. Fronte; die frontteorie van die formasie van laedrukgebiede, okklusies, geokkludeerde laedrukgebiede, sekondêre laedrukgebiede, laedrukgebiedfamilies.

(b) Adiabatiese veranderings in die atmosfeer. Droë versadigde en omgewingsvervaltempo's. Stabiliteit, onstabiliteit en voorwaardelike onstabiliteit. Die ontwikkeling van donderstorms.

(c) Volledige kennis van die ontwikkeling en afname van tropiese werwelstorms, hul lokaliteite, name, seisoene, bane en daarmee gepaardgaande weer, voorspelling van waarskynlike beweging. Navigasie in die omgewing van, en die reël vir die ontwyking van tropiese storms. Verslae wat kragtens internasionale konvensies opgestel moet word.

(d) Kennis van die inligting beskikbaar in die Suid-Afrikaanse Weerburo se handleiding getiteld "Weerkode vir Skepe". Gebruik van 'n sinoptiese kaart om die weer op bepaalde punte af te lei en om die waarskynlike veranderings oor seegebiede te voorspel. Faksimileeweerkaarte en die nut daarvan.

(e) Die vernaamste oseaanstrome; hul name en eienskappe. Oorsake van oseaanstrome, algemene oppervlaksirkulerings van die oseaan, direkte en indirekte uitwerking van heersende winde, gradiëntstrome, seisoensveranderings in die algemene sirkulasie. Opwelling en die gevolge daarvan.

(f) Die vernaamste tipes dryfys en hulle oorsprong. Algemene grense van ys in albei halfronde, seisoensontwikkeling en terugsmelting, beweging van ysberge. Navigasie in die nabyheid van ys. Verslae wat kragtens internasionale konvensies opgestel moet word.

(g) Seereisbeplanning; keuse van oseaanroetes. Algemene beginsels van weerroetebepaling, met gebruikmaking van voorspellingsoppervlakweer- en golfkaarte. Die gebruik van die jongste atlasse en ander kaarte en navigasiepublikasies wat op oseaannavigasie betrekking het.

KLAS 2—BEKWAAMHEIDSERTIFIKAAT

Operasies aan boord van 'n skip

Vraestel 4 (twee-en-'n-halfuur skriftelik)

(a) Organisering en opleiding van bemanning vir sowel roetine- as noodpligte. Skadebeheer- en brandbestrydingsplanne; Noodstasielyste.

ANNEXURE I

CLASS 2—CERTIFICATE OF COMPETENCY: SYLLABUS

Coastal navigation

Paper 1 (two and a half hours excluding oral questions)

In addition to the syllabus for Class 4, Chartwork.

(a) Approaching the coast under any circumstances.

(b) Planning a coastal passage or entry into harbour. Verification of position. Selection of suitable anchorages.

(c) Execution of a passage. Monitoring progress. Effect of constraints such as weather and tide, traffic, and state of ship's equipment.

(d) The use of sailing directions and other publications relevant to coastal navigation which are required to be carried by South African Merchant ships, including Admiralty Tide Tables, Volumes 1 and 2.

(e) The use of aids to navigation, including radar, echo sounder and visual aids, in coastal navigation and pilotage, including the use of radar in collision avoidance.

Notes:

(1) Questions shall be set in this paper requiring descriptive answers as well as work on the chart provided. Oral questions, which may relate to any part of the syllabus, may also be asked.

(2) A radar plot may be set in this paper.

CLASS 2—CERTIFICATE OF COMPETENCY

Ocean and offshore navigation

Paper 2 (two and a half hours written)

(a) Astronomical Navigation as in paragraphs (c) to (g) of Practical Navigation, Class 4.

(b) Problems on great circle and composite sailing.

(c) Position fixing, fixed and variable errors, area of probability. Obtaining a position from two or more observations of any type, with or without run.

(d) The use and understanding of aids to navigation, including all those radio and electronic aids which are installed in the majority of merchant ships. Questions shall be directed towards ensuring that candidates have a proper understanding of the essential principles and operation of these aids and can make full use of their capabilities whilst appreciating their limitations.

CLASS 2—CERTIFICATE OF COMPETENCY

Meteorology

Paper 3 (two and a half hours written)

(a) Air masses; general ideas on source regions; classification and properties. Structure of depressions, general distribution of weather in a depression. Fronts; the frontal theory of the formation of depressions, occlusions, occluded depressions, secondary depressions, families of depressions.

(b) Adiabatic changes in the atmosphere. Dry, saturated and environmental lapse rates. Stability, instability and conditional instability. The development of thunder-storms.

(c) A full knowledge of the development and decay of tropical revolving storms, their localities, names, seasons, tracks and associated weather; forecasting the probable movement. Navigation in the vicinity of and the rules for avoiding tropical storms. Reports to be made under international conventions.

(d) A knowledge of the information available in the ["Weather codes for Ships" published by the South African Weather Bureau.] use of a synoptic chart to deduce the weather at specified points and to forecast the probable changes over sea areas. Facsimile weather charts and their uses.

(e) Principal ocean currents; their names and characteristics. Causes of ocean currents, general surface circulation of the oceans, direct and indirect effect of prevailing winds, gradient currents, seasonal changes in the general circulation. Upwelling and the consequences thereof.

(f) The main types of floating ice and their origins. General limits of ice in both hemispheres, seasonal development and recessions, movement of icebergs. Navigation in the vicinity of ice. Reports to be made under international conventions.

(g) Voyage planning; the selection of ocean routes. Principles of weather routeing, use of prognostic surfaee weather and wave charts. Use of current atlases and other charts and navigational publications relevant to ocean navigation.

CLASS 2—CERTIFICATE OF COMPETENCY

Ship-board operations

Paper 4 (two and half hours written)

(a) Organisation and training of crew both for routine and emergency duties. Damage control and fire-fighting plans; Emergency Station lists.

(b) Inspeksie en onderhoud van die skip en sy toerusting, met inbegrip van die doel, gebruik en werking van 'n beplande onderhoudstelsel. Algemene herstelwerk, voorbereiding van herstelwerklyste. Droogdokroetine. Eienskappe en gebruike van verwe, harse en ander beskermende bedekkings.

(c) Algemene beginsels van die stuwing en hantering van alle tipes vrag, breedvoeriger as wat vir die laer grade vereis word, met inbegrip van voorbereidings vir die vervoer en versorging daarvan in oorvaart. Berekenings met betrekking tot stuwing (droë sowel as vloeibare vrag) en die gebruik van vraghanteergerei.

(d) Ballaslading. Die skoonmaak en ontgassing van tenks Kim- en ballaslynstelsels. Pypaanlegte in vervoerders wat onverpakte olie vervoer.

(e) Kennis van die regulasies wat betrekking het op die vervoer en hantering van vrag, met inbegrip van 'n algemene kennis van gevaarlike vragte, internasionale gebruikskodes.

(f) Kennis van die Laslynreëls soos van toepassing op die werking van die skip; die belangrikheid van die onderskeie sones en seisoensgebiede; voorbereiding vir jaarlikse opname.

Die vermoë om 'n berekening te maak van die maksimum hoeveelheid vrag wat gelaai moet word, hetsy volgens massa of volume.

(g) Voorbereiding vir veiligheidstoerusting-, veiligheidskonstuksie-, laslyn- en klassifikasieopnames; kennis van die betekenis van die uitgereikte sertifikate.

KLAS 2—BEKWAAMHEIDSERTIFIKAAT

Skeepskonstruksie en -stabiliteit

Vraestel 5 (drie uur skriftelik)

(a) 'n Volledige kennis van die beginsels van skeepsbou as wat vir Klas 4, Algemene Skeepskennis, vereis word. Midskeepse deursnee van eendek- en tussendekskepe, met inbegrip van skepe vir die vervoer van onverpakte vrag, houerskepe en vervoerders van gespesialiseerde produkte. Funksies, konstruksie en verstewiging van waterdigte skotte, met inbegrip van botsingskotte. Agterstewestruktuur. Konstruksie, verstewiging en sluitinrigtings van luikopeninge en bobou, tenkopeninge, waterdigte deure en rompdeure. Skroefaskokers.

(b) Algemene begrippe van sweisprosesse in konstruksie- en herstelwerk, soorte sweiswerk, gewone foute, sweiswerk met die oog op ondersoek. Die toets van tenks en ander waterdigte dele. Korrosiebeheermetodes.

(c) Skuifkragte en buigmomente. Spannings teweeggebring deur skuiwing en buiging. Hoe om eenvoudige vrag-, skuifkrag- en buigmomentkrommes te verkry. Moderne metodes om die uitwerking van verskillende toestande by die inlaai van vrag en ballas op die skip se struktuur te bepaal. Metodes om te kompenseer vir Sterktediskontinuïteit, lokale en spesiale versterking.

(d) Die gebruik van Simpson se reëls vir die berekening van oppervlaktes, volumes en sentroïede.

(e) Bepaling van die posisie van die swaartepunt van 'n skip vir verskillende laai- en ballastingstoestande. Die uitwerking op die posisie van die swaartepunt wanneer gewigte bygevoeg, verwyder, verskuif of gehang word. Om die virtuele styging te bereken in die posisie van die swaartepunt weens tenks wat nie vol is nie. Dwars- en langsmetasenters, metasenterhoogte. Aanvangstabiliteit en die beperking daarvan tot klein hellingshoeke. Veranderings in stabiliteit gedurende 'n seereis. Uitwerking van 'n verskuiwing van vrag of soliede ballas. Stywe en rank skepe.

(f) Veranderings van trim en diepgang weens die laai, aflaai en verskuiwing van gewigte. Die uitwerking van slagsy en trim op stabiliteit. Stabiliteit en trim by droogdokking.

(g) Die gebruik van stabiliteit-, hidrostatiese en spanningsgegewens wat aan skepe verskaf word. Begrip van die faktore wat die fatsoen van die kromme van statiese stabiliteit beïnvloed en die betekenis van die oppervlakte onder die kromme, met inbegrip van die berekening daarvan. Die gebruik van stabiliteitsgegewens. Graanverskuiwingsmomente.

KLAS 2—BEKWAAMHEIDSERTIFIKAAT

Skeepsake en Wet

Vraestel 6 (twee uur skriftelik)

Hierdie vraestel dek aspekte van 'n Hoofoffisier se handelspligte wat nie elders geëksamineer word nie, en behels ook voldoende bekendstelling met die Gesagvoerder se Skeepsake en Maritieme Reg ten einde die Hoofoffisier in staat te stel om tydelik bevel oor te neem van die vaartuig in die geval van die Gesagvoerder se ongesteldheid of dood:

(a) 'n Praktiese kennis van—

(i) die stappe wat gedoen moet word by bevelsaanvaarding;

(ii) die Registrasiesertifikaat en die wetlike betekenis daarvan;

(iii) sertifikate en ander dokumente wat ingevolge Suid-Afrikaanse wetgewing of internasionale konvensies op 'n skip moet wees;

(iv) die amptelike skeepsjoernaal en inskrywings wat daarin gemaak moet word;

(b) Inspection and maintenance of the ship and her equipment, including the purpose, use and operation of a Planned Maintenance System. General repairs, preparation of repair lists. Dry-docking routine. Properties and uses of paints, resins and other protective coverings.

(c) General principles of the stowage and handling of all types of cargo, in greater depth than is required at the lower grades, including preparations for their carriage and care in transit. Calculations relating to stowage (both of dry and liquid cargoes) and to the use of cargo gear.

(d) Ballasting. Tank cleaning and gas-freeing. Bilge and ballast line systems. Piping arrangements in bulk liquid carriers.

(e) Knowledge of the regulations relating to the carriage and handling of cargo including a general knowledge of dangerous cargoes, International Codes of Practice.

(f) A knowledge of the requirements of the Load Line Rules as they affect the working of the ship; the significance of the various zones and seasonal areas; preparation for annual survey.

The ability to calculate the maximum amount of cargo to be loaded, either by mass or volume.

(g) Preparation for Safety Equipment, Safety Construction, Load Line and Classification surveys; a knowledge of the significance of the certificates issued.

CLASS 2—CERTIFICATE OF COMPETENCY

Ship construction and stability

Paper 5 (three hours written)

(a) A fuller knowledge of the fundamentals of ship construction than is required in Class 4, General Ship Knowledge. Midship sections of single deck and 'tween deck ships, including bulk carriers, container ships and specialised carriers. Functions, construction and stiffening of watertight bulkheads, including collision bulkheads. Structure at the stern. Construction, stiffening and closing arrangements of hatchways and superstructures, tank openings, watertight and hull doors. Stern tubes.

(b) General ideas on welding processes in construction and repair work, types of weld, common faults, visual examination of welded work. Testing of tanks and other watertight work. Methods of corrosion control.

(c) Shear forces and bending moments. Stresses produced by shear and bending. To produce simple curves of load, shear force and bending moments. Modern methods of determining the effect of different conditions of loading and ballasting on the ship's structure. Methods of compensating for discontinuity of strength, local and special stiffening.

(d) The use of Simpson's rules in the computation of areas, volumes and centroids.

(e) Determination of the position of the centre of gravity of a ship for different conditions of loading and ballasting. The effect on the position of the centre of gravity of adding, removing, shifting or suspending weights. To determine the virtual rise in the position of the centre of gravity due to slack tanks. Transverse and longitudinal metacentres, metacentric height. Initial stability and its limitation to small angles of inclination. Changes in stability during a voyage. Effect of a shift of cargo or solid ballast. Stiff and tender ships.

(f) Changes of trim and draught due to loading, discharging and shifting weights. Effect of list and trim on stability. Stability and trim when dry-docking.

(g) Use of stability, hydrostatic and stress data supplied to ships. An understanding of the factors affecting the shape of a curve of statical stability and the significance of the area under the curve, including its calculation. Use of stability data. Grain shift moments.

CLASS 2—CERTIFICATE OF COMPETENCY

Business and Law

Paper 6 (two hours written)

This paper covers aspects of a Chief Officer's commercial duties not examined elsewhere, and also includes sufficient introduction to shipmaster's Business and Maritime Law to enable the Chief Officer to take temporary command of the vessel in the event of the Master's incapacity or death.

(a) A working knowledge of—

(i) the action to be taken on assuming command;

(ii) the Certificate of Registry and its legal significance;

(iii) certificates and other documents required to be carried on board by South African legislation or by international conventions;

(iv) the official Log Book and entries to be made therein;

(v) huidige wetgewing betreffende die daaglikse bedryf van handelskepe, ten opsigte van die veiligheid van die bemanning, en dissipline.

(b) Dokumentasie van vrag, met inbegrip van stuurmanskwitansies, seevragbriewe, lyste van gevaarlike goedere, geleibriewe en vragplanne.

(c) Die gesagvoerder se pligte en verpligtinge ten opsigte van:

(i) stranding, botsing of ander ongevalle;

(ii) die aanmelding van gevare vir navigasie;

(iii) verkeersverdelingskemas;

(iv) navigasie in hawegebiede.

(d) Akkommodasie vir die bemanning. Skeepshigiëne en die welsyn van die bemanning. Inspeksies en verslae: Prosedures in geval van ongesteldheid of 'n ongeluk. Die aard en bron van mediese bystand ter beskikking van 'n skip ter see. Beroking en plaagbestryding. Suid-Afrikaanse en internasionale gesondheidsregulasies.

(e) Die voorkoming van besoedeling en die hou van rekords.

(f) Die vermoë om duidelike en volledige verslae te skryf aangaande—

(i) skade aan skip of vrag;

(ii) onderhoud van skip en toerusting; en

(iii) rekwisisies en rekenskap van voorrade.

KLAS 2—BEKWAAMHEIDSERTIFIKAAT

Mondeling

(a) (i) Die hantering van swaar gewigte met spesiale verwysing na die tipe en sterkte van gerei wat gebruik word.

(ii) Die gebruik en versorging van alle dek- en bodektoestelle en -toebehore, met inbegrip van wenasse, kaapstanders, windasse, davits, touleiers, noodstuurgerei en toebehore wat tussen die anker en die kettingbak gebruik word.

(b) Ankers: Verskillende tipes ankers en die voor- en nadele van elk.

Kabels en die versorging daarvan. Voorbereidsels vir ankering. Ankering met 'n enkele anker, en gebruik van 'n tweede anker. Klaring van 'n onklaar anker en kluis. Ankering in 'n stroomstreek en in beperkte vaarwater. Vasmeer. 'n Anker laat hang. Kabels wat breek en glip. Om te begin vaar. Hoe om 'n anker met bote uit te neem.

(c) (i) Uitwerking van strome, wind, watervlak en diepgang op maneuvrering. In riviere en hawens maneuvreer. Met of sonder die gebruik van sleepbote langs kaaie en olie-eindpunte aanlê of daarvandaan vertrek.

(ii) Hantering van skepe in stormweer. Metodes om 'n skip wat ontredder of buite beheer is, uit die golfdal te hou en om die lywaartse dryf te verminder. Die hantering van 'n ontredderde skip. Bykomende voorsorg wat getref moet word voordat stormweer intree.

(d) (i) Kennis van die regulasies betreffende reddings- en brandbestrydingstoestelle.

(ii) Maatreëls wat getref moet word wanneer 'n skip per ongeluk beskadig word, met inbegrip van botsings, stranding, beskadiging tydens stormweer en lekkasies. Metodes van brandbestryding aan boord van 'n skip. Die organisasie van, en die uitreik van bevele aan spanne om brande te bestry en om reddingsbote en -vlotte in gereedheid te bring.

(iii) 'n Deeglike kennis van soek-en-reddingsprosedures.

(iv) Voorbereidings vir inbring in droogdok en ontdokking. Gebruik van stutte, kimblokke en kimstutte.

(v) Maatreëls wat getref moet word om die uitstort te voorkom van olie gedurende vragwerk, die inneem van bunkerolie of die oorbring van olie.

(e) Botsingsregulasies en ander items gespesifiseer in paragraaf (f) (i) tot (v) van die mondelinge leerplan vir Klas 4.

(f) Metodes vir die laai en stuwing van vragitems wat spesiale reëlings vir hantering vereis. Die gebruik van twee laaibome, klimtolgewys. Die optakeling van swaailaaibome. Die vaswoel en bevestiging van vrag, met inbegrip van dekvrag. Die voorsiening van veilige toegang. Loopbrûe oor dekvrag. Kennis van die Handelskeepvaartregulasies in verband met die Inneem van Steenkool en die Laai en Aflaai van Skepe, met inbegrip van die periodieke toets van vraghanteringstoerusting. Die masjinerieregister.

(g) Die praktiese gebruik van die planne, tekeninge en gegewens wat aan 'n skip voorsien word, bv. die tuigplan, algemene inrigting, verplasingsplan, veiligheidsplan en hidrostatiese gegewens.

(h) Die eksaminator kan aan die kandidaat vrae stel wat uit die skriftelike werk voortspruit, indien dit nodig geag word vanweë swak prestasie deur die kandidaat.

KLAS 2—BEKWAAMHEIDSERTIFIKAAT

Seine

(a) Uitstuur en ontvang van seine in—

(i) Morse-kode met flitslamp, tot ses woorde per minuut;

(ii) Internasionale Seinboek.

(v) current legislation as it affects the day-to-day running of Merchant ships, in respect of safety of crew and discipline.

(b) Documentation of cargo, including mate's receipts, bills of lading, dangerous goods list, waybills and cargo plans.

(c) The Master's duties and obligations with respect to—

(i) stranding, collision or other casualty;

(ii) the reporting of dangers to navigation;

(iii) traffic separation schemes;

(iv) navigation in port areas.

(d) Crew accommodation. Hygiene of the ship and welfare of the crew. Inspection and reports. Procedures in cases of illness or accident. The nature and source of medical assistance available to a ship at sea. Fumigation and pest control. South African and International Health Regulations.

(e) The prevention of pollution and the keeping of records.

(f) The ability to write clear and concise reports with regard to—

(i) damage to ship or cargo;

(ii) maintenance of ship and equipment;

(iii) requisition and accounting for stores.

CLASS 2—CERTIFICATE OF COMPETENCY

Oral

(a) (i) The handling of heavy weights with special reference to type and strength of gear used.

(ii) The use and care of all deck and above-deck appliances and fittings including winches, capstans, windlasses, davits, fairleads, emergency steering gear and fittings used between anchor and cable locker.

(b) Anchors; different types of anchors and their advantages and disadvantages.

Cables and their care.

Preparation for anchoring.

Operation of anchoring with a single anchor and use of a second anchor.

Clearing a foul anchor and hawse.

Anchoring in a tideway and in confined water.

Mooring.

Hanging off an anchor.

Breaking and slipping cables.

Getting under way.

To carry out an anchor with boats.

(c) (i) Effect of current, wind, shallows and draught on manoeuvring. Manoeuvring in rivers and harbours. Berthing alongside and leaving quays and oil terminals with or without the use of tugs.

(ii) Management of ships in heavy weather. Means to employ to keep a disabled or unmanageable ship out of the trough of the see and to lessen the lee drift. Handling a disabled ship. Extra precautions to be taken before the onset of heavy weather.

(d) (i) Knowledge of the regulations concerning life-saving and fire-fighting appliances.

(ii) Measures to be taken following accidental damage including collision, grounding, heavy weather damage and leaks.

Methods of dealing with fire on board ship. The organisation and direction of fire-fighting, lifeboat and liferaft preparations parties.

(iii) A thorough knowledge of search and rescue procedures.

(iv) Preparation for drydocking and undocking. Use of shores, bilge blocks and bilge shores.

(v) Measures to be taken to prevent the spillage of oil during cargo work, bunkering or oil transfer.

(e) Collision Regulations and other items specified in paragraph (f) (i) to (v) of the oral syllabus for Class 4.

(f) Methods of loading and stowing items of cargo requiring special handling arrangements. The use of yo-yo gear. Rigging swinging derricks. Lashing and securing of cargo including deck cargo. Provision of safe access. Gangways across deck cargo. A knowledge of the Merchant Shipping Loading, Unloading and Coaling Regulations including the periodic testing of cargo handling equipment. Machinery register.

(g) The practical use of the plans, drawings and data supplied to a ship, e.g. rigging plan, General Arrangement, Displacement plan, Safety plan and hydrostatic data.

(h) The examiner may ask the candidate questions arising out of the written work, if it is deemed necessary on account of weakness shown by the candidate.

CLASS 2—CERTIFICATE OF COMPETENCY

Signals

(a) To send and receive signals in—

(i) morse code by flash lamp up to six words per minute;

(ii) International Code of Signals.

(b) Die praktiese gebruik van handbediende of outomatiese skeepsradio-rigtingsoekers, kennis van die funksies, kenmerke en metodes vir die gebruik van spesiale tipes radiobakens wat voorkom in die Admiraliteit se Radioseinlys, Vol. II, bv. draaibakens en rigbakens.

(c) Prosedures vir noodseinwerk deur middel van radiotelegrafie.

AANHANGSEL J

KLAS 1—BEKWAAMHEIDSERTIFIKAAT—BEVARE SEEKAPTEIN: LEERPLAN

Skeepsake en Wet

Vraestel 1 (drie uur skriftelik)

Die regskennis wat vereis word, word beperk tot 'n begrip van die wette en *Staatskoerante* wat op skeepvaart van toepassing is, en op die handelswette wat 'n Gesagvoerder moet ken ten einde die sake van 'n skip te behartig.

(a) Registrasie van skepe. Die registrasiesertifikaat en die wetlike betekenis daarvan.

(b) Sertifikate en ander dokumente wat op 'n skip moet wees; hul gebruik, hoe hulle verkry word en (indien van toepassing) hoe lank hulle geldig is.

(c) Indiensneming en ontslag van, en beheer oor bemannings, bemanningsvereistes en sertifikate. Indiensnemingskontrakte, lone en ander besoldiging, toewysings, poswissels, betalings in bankrekenings, pensioenfondse, werkloosheidversekering, inkomstebelasting. Gestorwe seelui, indiensneming van plaasvervangers, repatriasie.

(d) Die amptelike Skeepsjoernaal en die wet betreffende inskrywings. Oortredings met betrekking tot wangedrag waardeur die skip in gevaar gestel word en teen persone aan boord. Dissipline en optrede in die geval van dissiplinêre oortredings. Siviele aanspreeklikheid vir sekere oortredings.

(e) Doeanekantoorprosedure vir in- en uitklaring van skip. Die funksie van skeepsagente.

(f) Laslynmerke; berekenings by die gebruik daarvan. Inskrywings en verslae ten opsigte van vryboord, diepgang en toelatings.

(g) Die veiligheid van die skip, bemanning en passasiers. Hulp aan skepe in nood. Pligte in die geval van stranding, botsing of 'n ander ongeval. Sleepvaart en berging.

(h) Die wet met betrekking tot navigasie, met inbegrip van die voorkoming van botsing, die aanmeld van gevare vir navigasie, en ongevalle ter see. Verpligte en nie-verpligte loodsing. Die samestelling en magte van howe van marine-ondersoek, en van opnemingshowe.

(i) 'n Algemene kennis van skeepvaartpraktyk en -dokumente, veral huurkontrakte, seevragbriewe en geleibriewe, 'n Begrip van die hoofklousules in 'n bevragtingskontrak. Lêdae, oorlêgeld en versending (met inbegrip van berekenings). Die wet betreffende die vervoer van vrag en die skeepseienaar se aanspreeklikheid en verantwoordelikhede. Proteste, vragopnames, seewaardigheidsertifikate.

(j) 'n Oorsigtelike kennis van die uitdruklike en stilswyende voorwaardes en statutêre bepalings wat in 'n seeversekeringskontrak vervat is. Partikuliere awery, algemene awery. Prosedure by 'n vlughawe. Lloyd se agente. Beskermings- en vrywaringsklubs.

(k) Agtergrondkennis van Suid-Afrikaanse en internasionale organisasies wat met skeepvaart te doen het. Veiligheidskonvensies en nasionale wetgewing.

(l) Die skryf van sakebriewe en verslae.

KLAS 1—BEKWAAMHEIDSERTIFIKAAT: BEVARE SEEKAPTEIN

Navigasie

Vraestel 2 (twee-en-'-halfuur skriftelik)

Vrae kan gestel word oor enige aspek van navigasie wat in die laer grade behandel word, met inbegrip van aangeleenthede wat pertinent met navigasie te doen het en in ander vakke gedek word. Van kandidate word daar verwag om volle begrip te hê van die betrokke tegnieke en hulle moet in staat wees om die onderskeie aspekte met mekaar in verband te bring, en hulle vermoë te toon om ten volle gebruik te maak van al die navigasie- en meteorologiese inligting wat tot 'n skip se Gesagvoerder se beskikking is, met inbegrip van sy eie waarnemings. Die vorm van die vraestel sal van eksamen tot eksamen wissel. Dit kan byvoorbeeld uit slegs een vraag bestaan, soos gedetailleerde vaartbeplanning as 'n uitgebreide oefening, of uit een sodanige vraag, effens minder uitgebreid, en 'n korter vraag, soos 'n radaruitstipping, of 'n oefening in posisiebepaling; of uit verskeie vrae wat verskillende aspekte van navigasie en verwante onderwerpe dek. Die volgende leerplan moet in die lig van hierdie riglyne beskou word;

1. (a) Seereisbeplanning. Die keuse van oseaanroetes. Landbasisroetebepaling volgens die weer en eie roetebepaling.

(b) Beplanning en uitvoering van 'n kusvaart. Nadering van die kus. Nadering en binnevaar van 'n hawe.

(c) Navigasie in loodsvaarwaters, hetsy met of sonder 'n loods aan boord.

(b) The practical use of shipborne radio direction finders operated in the manual and automatic modes, knowledge of the functions, characteristics and methods of using special types of radio beacons which are listed in Admiralty List of Radio Signals Vol. II for example; rotating beacons and directional beacons.

(c) Procedures for emergency signalling by wireless telegraphy.

ANNEXURE J

CLASS 1—CERTIFICATE OF COMPETENCY—MASTER MARINER: SYLLABUS

Business and Law

Paper 1 (three hours written)

The legel knowledge required shall not go beyond an understanding of the Acts and *Government Gazettes* applicable to shipping and the mercantile law which a shipmaster must know in order to conduct the business of a ship.

(a) Registration of ships. The certificate of registry and its legal significance.

(b) Certificates and other documents or publications required to be carried aboard ship; their use, how they are obtained, and (if appropriate) the period of their validity.

(c) Engagement, discharge and management of crews, manning requirements and certificates. Contracts of employment, wages and other remunerations, allotments, money orders, payments into bank accounts, pension funds, unemployment insurance, income tax. Deceased seamen, engagement of substitutes, repatriation.

(d) The official Log Book and the law relating to entries. Offences relating to misconduct, to endangering ship and against persons on board. Discipline, and treatment of disciplinary offences. Civil liability for certain offences.

(e) Customs house procedure for entering and clearing ship. Function of ships' agents.

(f) Load line marks; calculations involving their use. Entries and reports in respect of freeboard, draught and allowances.

(g) The safety of the ship, crew and passengers. Assistance of vessels in distress. Duties in the case of stranding, collision or other casualty. Towage and salvage.

(h) The law relating to navigation, including the prevention of collision, the reporting of dangers to navigation, and marine casualties. Compulsory and non-compulsory pilotage. Constitution and powers of courts of marine enquiry, and of courts of survey.

(i) A general knowledge of shipping practice and documents with particular reference to charter parties, bills of lading, and waybills. An understanding of the clauses in a contract of affreightment. Lay-days, demurrage and despatch (including calculations). The law relating to the carriage of cargo, and the shipowner's liabilities and responsibilities. Protests, cargo surveys, certificates of seaworthiness.

(j) An outline knowledge of the expressed and implied conditions and statutory terms contained in a contract of marine insurance. Particular average, general average. Procedure at a port of refuge. Lloyd's agents. Protection and indemnity clubs.

(k) A background knowledge of South African and international organisations concerned with shipping. Safety conventions and national legislation.

(l) The writing of business letters and reports.

CLASS 1—CERTIFICATE OF COMPETENCY-MASTER MARINER

Navigation

Paper 2 (two and a half hours written)

Questions may be asked on any aspect of navigation covered in the lower grades, including matters pertinent to navigation covered in other subjects.

Candidates shall be required to show a full understanding of the techniques involved and must be fully able to relate the various aspects one to another, and to show their ability to make full use of all the navigational and meteorological information which is available to a ship's Master, including his own observations. The form of the paper shall vary from examination to examination. As examples, it may consist of one question only, such as a detailed and extensive exercise in passage planning; one such question, slightly less extensive, and a shorter question such as a radar plot or an exercise in position finding; several questions covering different aspects of navigation and related subjects. The following syllabus is to be read in the light of this guidance;

1. (a) Voyage planning. The selection of ocean routes. Shore-based weather routeing and self-routeing.

(b) Planning and executing a coastal passage. Approaching the coast. Approaching and entering harbour.

(c) Navigation in pilotage waters, whether with or without a pilot on board.

(d) Die nadering en deurvaar deur verkeersverdelingskemas en aangrensende gebiede.

2. (a) Die optimum koers en spoed vir twee skepe wat wil rendezvous hou.

(b) Soek-en-reddingsprosedures.

(c) Navigasieprosedures wanneer see-installasies genader word en wanneer met helikopters of klein vaartuie gewerk word.

(d) Navigasie in uiterste weerstoestande.

3. Brugprosedures ter see, in die hawe, en terwyl daar aangelê en geanker word.

4. (a) Die vertolking en gebruik van Navigasie- en Weerkundige inligting.

(b) Die vertolking en gebruik van inligting met behulp van navigasiehulpmiddels verkry, met inbegrip van die gebruik van radar ter voorkoming van botsings.

(c) Die uitwerking van stelselmatige en ewekansige foute by posisiebepaling volgens enige metode.

(d) Voordele en nadele van verskeie navigasiestelsels en -metodes; oorwegings wat die keuse van navigasiestelsels vir verskillende bedrywe en geografiese gebiede ten grondslag lê.

KLAS 1—BEKWAAMHEIDSERTIFIKAAT: BEVARE SEEKAPTEIN

Skeepskonstruksie en stabiliteit

Vraestel 3 (drie uur skriftelik)

(a) Soorte skepe. Algemene begrippe van sterkte en bou met betrekking tot die besondere doel waarvoor hulle gebruik word, met inbegrip van gespesialiseerde vervoerders. Die gebruik van spesiale soorte staal, aluminium en brandbestande materiale in skeepsbou. Beginsels van skadebeheer. Reëlings om die verspreiding van brand in die bobou te beperk.

(b) 'n Praktiese kennis van—

Klassifikasie van skepe;

Periodieke opnames vir behoud van klas;

Tonnemaatsertifikate en hulle doel;

Vereistes van die laslynreëls, tydperk en voorwaardes van geldigheid van sertifikaat, 'n begrip van daardie aspekte van die toewysingsvoorwaardes wat 'n invloed het op die stabiliteit en seewaardigheid van 'n skip. Die Regulasies in verband met die konstruksie van vragskepe, en die opnames wat kragtens hierdie regulasies vereis word.

(c) Permeabiliteit van 'n kompartement. Die uitwerking van 'n lek onderin en oorstroming (ent- of midskeepse kompartemente, op of van die middellyn af).

(d) 'n Omvattender kennis van stabiliteit as wat vir Klas 2 vereis word en daarbenewens stabiliteit by matige en groot slagsyhoeke; die bepaling van dinamiese stabiliteit met behulp van S-O-kromme; lolhoek; die verskuiwing of toevoeging van gewigte met SM nul; die uitwerking van wind en golwe.

(e) Skeepstabiliteit ter see.

Gevare vir 'n skip met 'n groot slagsy. Voorsorgmaatreëls by oprigting. Dekvragte, eensoortige vrag en vrag wat kan skuif. Inlaai van ballas met die oog op stabiliteit. Die uitwerking van rompbreedte en vryboord op stabiliteit.

(f) Die hellingsproef. Omvattende kennis van die hidrostatiese, stabiliteits- en spanningsgegewens wat aan skepe verskaf word.

(g) Vlakwatereffek. Interaksie tussen skip en skip en tussen skip en land. Draaikring. Slagsyhoek tydens die draaiproses; die uitwerking op stabiliteit.

(h) Breedvoeriger kennis as wat vir Klas 2 vereis word van buigspanning in die ballas en gelaaide toestande ter see. Wringspanning.

KLAS 1—BEKWAAMHEIDSERTIFIKAAT: BEVARE SEEKAPTEIN

Ingenieurswese en beheerstelsels

Vraestel 4 (twee-en-'n-halfuur skriftelik)

(a) (i) Die betekenis van skeepsingenieurswesetterme in algemene gebruik.

(ii) Algemene kennis van diesel- en turbinemasjinerie, skeepsketels, ontwikkelaars, pompe, kondensators en verdampers. Transmissie van hoofmasjienkrag. Stuurstelsels. Maneuvreerprosedures.

(iii) Brandstofverbruik en ekonomiese snelhede; die verband tussen krag, snelheid, verplasing en verbruik; beraamde verbruik om 'n deurvaart te voltooi. Probleme met betrekking tot heibeweging en skeepshelling. Vaste las.

(b) Begrip van die toepassing ter see van die eienskappe van gasse. Stelsels vir die vervoer van bevrore vragte en van vloeibare gasse.

(d) Approaching and passing through traffic separation schemes and adjacent areas.

2. (a) The optimum course and speed for two ships wishing to rendezvous for any purpose.

(b) Search and rescue procedures.

(c) Navigational procedures when approaching off-shore installations, and when working with helicopters or small craft.

(d) Navigation in extreme weather conditions.

3. Bridge procedures at sea, in harbour, and whilst berthing or anchoring.

4. (a) The interpretation and use of navigational and meteorological information.

(b) The interpretation and use of information from navigational aids, including the use of radar in collision avoidance.

(c) The effects of systematic and random errors in position fixing by any method.

(d) Advantages and disadvantages of various navigation systems and methods; considerations underlying the choice of navigational systems for differing trades and geographical regions.

CLASS 1—CERTIFICATE OF COMPETENCY MASTER MARINER

Ship construction and stability

Paper 3 (three hours written)

(a) Types of ships. General ideas on strenght and construction in relation to particular trades, including specialised carriers. The use of special steels, aluminium and fire resistant materials in ship construction. Principles of damage control. Arrangements for restricting the spread of fire in super-structures.

(b) A working knowledge of—

Classification of ships;
periodic surveys for retention of class;
tonnage certificates and their purpose;

requirements of the Load Line Rules, period and conditions of validity of certificate, an understanding of those aspects of the conditions of assignment which affect the stability and seaworthiness of a ship. The Cargo Ship Construction Regulations and surveys required under these regulations.

(c) Permeability of a compartment. The effect of bilging and flooding (end or midships compartment, on or off the centre-line).

(d) A more comprehensive knowledge of stability than is required for Class 2 and in addition: Stability to moderate and large angles of heel; assessment of dynamical stability from GZ curve; angle of loll; shifting or adding weights with zero GM; effect of wind and wave excitation.

(e) Ship stability at sea.

Dangers to a ship with a heavy list. Precautions when righting. Deck cargoes, homogeneous cargo and cargo liable to shift. Ballasting for stability consideration. The effect of beam and freeboard on stability.

(f) The inclining experiment. A comprehensive knowledge of the hydrostatic, stability and stress data supplied to ships.

(g) Shallow water effect. Ship to ship and ship to shore interaction. The turning circle. Angle of heel when turning; effect on stability.

(h) A more detailed knowledge than is required for Class 2 of bending stresses in the ballast and loaded conditions at sea. Torsional stress.

CLASS 1—CERTIFICATE OF COMPETENCY MASTER MARINER

Engineering and Control Systems

Paper 4 (two and a half hours written)

(a) (i) The meaning of marine engineering terms in common use.

(ii) A general knowledge of diesel and turbine machinery, marine boilers, generators, pumps, condensers and evoporators. Transmission of main engine power. Steering systems. Manoeuvring procedures.

(iii) Fuel consumption and economical speeds; relationship between power, speed, displacement and consumption; estimated consumption to complete a passage. Problems involving pitch and slip. Hotel load.

(b) An understanding of marine applications of the properties of gases. Systems for the carriage of refrigerated cargoes and of liquefied gases.

(c) Algemene beginsels van afstandbeheerstelsels. Soorte kontroles en die metodes wat by pneumatiese, elektriese en hidrouliese beheerstelsels vir die hoofmasjien, pompe en kleppe gebruik word. Inligtingstelsels en beelde; data-aantekening, bybehorende alarm- en faalveilige stelsels. Brugbeheer van hoofmasjiene. Boegstutkrageenhede en ander maneuvreerhulpmiddele nie in Vraestel 5 gedek nie. Tenk- en diepgangmeters. Stabiliseerders.

(d) Brandopsporings- en -blusstelsels en prosedures: algemene beginsels en praktiese toepassing; vermoëns en beperkings van die onderskeie stelsels.

(e) Besoedeling: die voorkoming van besoedeling, en die Gesagvoerder se pligte, verpligtinge en aanspreeklikhede, met inbegrip van die hou van rekords.

KLAS 1—BEKWAAMHEIDSERTIFIKAAT: BEVARE SEEKAPTEIN

Navigasiehulpmiddels en instrumente

Vraestel 5 (drie uur skriftelik)

(a) Die bou, plasing, versorging en instandhouding van die magnetiese kompas en verwante toerusting. Oorsake van deviasie, die opstel van 'n deviasietabel. Koëffisiënte A, B, C, D en E. Die evaluering van die benaderde koëffisiënte aan die hand van gegewe data en hulle verhouding tot die deviasie. Skatting, sonder berekening, van die uitwerking van permanente magnetisme en geïnduseerde magnetisme. Beginsels van kompasstellings en praktiese stelmetodes. Hellingsfout. Gaussfout en retentiewe fout. Die uitwerking van breedtegraadverandering op deviasie.

(b) Beginsel van die tolkompas. Foute geassosieer met die tolkompas, met inbegrip van breedte-, koers- en snelheidsfout en -korreksie; ballistiese defleksie en sy verband met verandering in snelheidsfout; rolfoute en hoe dit geminimaliseer word. Die vernaamste dele van 'n tolkompas; fundamentele verskille in die bou en werking van die bekender tolkompasse.

(c) Beginsels, werking en gebruik van die tolkompas- en magnetiese sendkompasrepeteerstelsels; stuuroutomaat; projektorkompasse; draaitempoaanwysers.

(d) Radar vir navigasie en om botsings te vermy; kenmerke, gebruik, vermoëns en beperkings. Bepaling van prestasie. Sekondêre radarstelsels. Doppler-radar.

(e) Rigtingbepaling- en satellietnavigasiestelsels; Decca, Loren, Consol, Omega; die beginsel, eienskappe, toepassings, vermoëns en beperkings van elke stelsel. Die relatiewe akkuraatheid van al die tipes posisiebepalingstelsels, met inbegrip van nie-radiostelsels en -metodes. Die foute wat met die verskillende stelsels geassosieer word. Kennis van die tersaaklike Handelskeepvaartkennisgewings.

(f) Beginsel en praktiese toepassing van eggolodingstoestelle, logge en spoedwysers.

(g) 'n Oorsigtelike kennis van onlangse ontwikkelings op die gebied van navigasiehulpmiddels.

KLAS 1—BEKWAAMHEIDSERTIFIKAAT: BEVARE SEEKAPTEIN

Mondeling

(a) (i) Uitsonderlike omstandighede.

Verlies van roer en/of skroef.

Noodstuurreëlings.

Stappe wat gedoen moet word na 'n botsing of enige skade wat opgedoen is.

Stappe wat gedoen moet word wanneer 'n skip op die grond vasloop—metodes om dit weer vlot te maak, opnames na vlotmaking.

'n Skip op die strand stuur.

(ii) Stappe wat gedoen moet word wanneer 'n skip ontredderd is en in nood verkeer.

Beveiliging van passasiers en bemanning in geval van skipbreuk.

Verlating van skip; oorlewingsprosedure.

Verlating van 'n vergane skip.

Kommunikasie met die land.

Die gebruik van vuurpyle en vuurpylapparaat.

(iii) Hulp aan 'n skip, boot of vliegtuig in nood. Die gebruik van rigtingbepaling vir aanpeiling op 'n ongeval.

Redding van die passasiers en bemanning van 'n ontredderde skip of boot, of van 'n vliegtuig wat 'n noodlanding op see gemaak het. Die tewaterlating van bote in geval van ongelukke.

(iv) Maneuvers in slegte weer. Voorsorgmaatreëls wanneer voor anker en ter see.

Gebruik van olie.

Ankering en die gebruik van ankers en kabels in alle omstandighede.

Nadering van riviere en hawens en maneuvrering daarin.

Nadering van seewaartse laaipunte in oopseetoestande.

(c) General principles of remote control systems. Types of controller and the methods used in connection with pneumatic, electrical and hydraulic control systems for main engine, pumps and valves. Information systems and displays; data logging, associated alarm and fail-safe systems. Bridge control of main engines. Bow thrust units and other manoeuvring aids not covered in Paper 5. Tank and draught gauges. Stabilizers.

(d) Fire detection and extinction systems and procedures:

general principles and practical application;

capabilities and limitations of the various systems.

(e) Pollution: the prevention of pollution and the Master's duties, obligations and liabilities, including the keeping of records.

CLASS 1—CERTIFICATE OF COMPETENCY MASTER MARINER

Navigational aids and instruments

Paper 5 (three hours written)

(a) The construction, siting, care and maintenance of the magnetic compass and associated equipment. Causes of deviation, the production of a table of deviations. Co-efficients A, B, C, D and E. The evaluation of the approximate co-efficients for given data and their relationship to the deviation. An appreciation, without calculations, of the effects of permanent magnetism and induced magnetism. Principles of compass adjustment and practical methods of adjustment. Heeling Error. Gaussin error and retentive error. The effect of change of latitude on the deviation.

(b) Principle of the gyro compass. Errors associated with the gyro compass, including latitude, course and speed error and correction; ballistic deflection and its relation to change of speed error; rolling error and how it is minimized. The principal parts of a gyro compass; fundamental differences in the construction and operation of the better known gyro compasses.

(c) Principles, operation and use of gyro and transmitting magnetic compass repeater systems; automatic pilot; projector compasses; rate of turn indicators.

(d) Navigational and collision avoidance radar; characteristics, application, capabilities and limitations. Assessment of performance. Secondary radar systems. Doppler Radar.

(e) Decca, Loren, Consol, Omega, direction-finding and satellite navigation systems; the principle characteristics, applications, capabilities and limitations of each system. The comparative accuracy of position fixing systems of all types, including non-radio systems and methods. Errors associated with the various systems. Knowledge of relevant Merchant Shipping Notices.

(f) Principle and practical application of echo sounding devices, logs and speed indicators.

(g) An outline knowledge of recent developments in navigational aids.

CLASS 1—CERTIFICATE OF COMPETENCY MASTER MARINER

Oral

(a) (i) Exceptional circumstances.

Loss of rudder and/or propeller.

Jury steering arrangement.

Action to be taken following collision or sustaining damage of any kind.

Action to be taken on grounding—methods of refloating, surveys subsequent to refloating.

Beaching a ship.

(ii) Steps to be taken when disabled and in distress.

Preservation of passengers and crew in the event of wreck.

Abandoning ship; survival procedure.

Abandoning a wrecked ship.

Communications with the shore.

The use of rockets and rocket apparatus.

(iii) Assisting a ship, boat or aircraft in distress.

The use of direction finding for homing on to a casualty.

Rescuing the passengers and crew of a disabled ship, boat or ditched aircraft. The launching of accident boats.

(iv) Bad weather manoeuvres.

Precautions at anchor and at sea.

Use of oil.

Anchoring and working anchors and cables in all circumstances.

Approaching rivers and Harbours and manoeuvring therein.

Approching off-shore loading points under open sea conditions.

(v) Die sleep en op sleeptou neem van 'n skip.

(vi) Navigasie in die omgewing van ys.

(vii) Droogdokking.

Algemene prosedure en voorsorgmaatreëls wat getref moet word.

Verspreiding van massa.

Droogdokking met volle vrag vir inspeksie van skroewe en asse.

Kimblokke.

Vlotlating van skip.

Doen 'n hawe aan met 'n beskadigde skip en/of vrag, beide vanuit 'n sake- en tegniese oogpunt.

Beveiliging van vrag.

(viii) Voorkoming van brand ter see en in die hawe.

Metodes wat gebruik word om die verspreiding van brand te voorkom.

Optrede om die verspreiding van brand te voorkom.

Uitvoerige kennis van die gebruik van brandblustoestelle en die voorsorgmaatreëls wat by die gebruik daarvan getref moet word.

(ix) Metodes van plaagbestryding en van beroking van ruime en woonruimtes; veiligheidsmaatreëls by die toepassing van verskillende metodes.

(x) Kennis van personeelbestuur, organisasie en opleiding aan boord skepe.

Verteenwoordiging van bemanning.

Prosedure in verband met klagtes.

Roetine-inspeksies van woonkwartiere en voorraadkamers.

(xi) Kompensering en instelling van kompasse; vrae kan aan kandidate gestel word oor die praktiese instelling van die magnetiese kompas deur gebruik te maak van 'n skeepskompashouer en kompas. Die deflektormetode.

(b) Botsingsregulasies en ander items in paragraaf (f) (i) tot (v) van die mondelinge leerplan vir Klas 4 gespesifiseer.

(c) Haweradio-inligtingsdienste. Kennis van die soorte diens wat beskikbaar is om vaartuie wat hawens binnekom behulpsaam te wees met die aanlê ens., soos aangedui in die Admiraliteitslys van Radioseine, "Port Radio Stations and Pilot Vessels".

(d) Die eksaminator kan die kandidaat vrae vra wat uit die skriftelike werk ontstaan, indien dit nodig geag word vanweë swak prestasie deur die kandidaat.

(xii) Kennis van die inhoud van die volgende regulasies:

(i) Regulasies betreffende reddingsuitrusting.

(ii) Veiligheidsregulasies met betrekking tot navigasie.

(iii) Handelskeepvaart-radioregulasies, 1968.

(iv) Handelskeepvaartregulasies in verband met die inneem van steenkool en die laai en aflaai van skepe, 1961.

(v) Laslynregulasies.

(xiii) Veiligheidskonvensies en die regsverpligtinge van die ondertekenaarlande. Periodieke en ander inspeksies van die romp, masjinerie en veiligheidstoerusting.

AANHANGSEL K

ENDOSSEMENT AS GESAGVOERDER (BEPERKTE HANDEL) EN ENDOSSEMENT AS GESAGVOERDER (KORTSEEHANDEL)

Skeepskonstruksie en -stabiliteit

Vraestel 1 (drie uur skriftelik)

(a) Vollediger kennis van die grondbeginsels van skeepskonstruksie as wat vir Klas 4, Algemene Skeepskennis, vereis word.

(b) Spanning en vervorming van skepe in 'n seegang as gevolg van die inlaai van vrag en ballas. Kennis van daardie dele van 'n skip wat spesiaal versterk is om sodanige spanning te weerstaan. Metodes waarvolgens vergoed word vir diskontinuïteit van sterkte. Die toets van tenks en ander waterdigte dele. Korrosiebeheermetodes.

(c) Die gebruik van stabiliteit- en hidrostatiese gegewens wat aan skepe verskaf word. Aanvangstabiliteit en die beperking daarvan tot klein slagsyhoeke.

Begrip van die faktore wat die fatsoen van die kromme van statiese stabiliteit beïnvloed en die betekenis van die oppervlakte onder die kromme.

Die berekening van oppervlaktes en volumes volgens Simpson se eerste en tweede reël.

(d) Die bepaling van die swaartepunt van 'n skip vir verskillende toestande by die inlaai van vrag en ballas. Die uitwerking op die posisie van die swaartepunt wanneer gewigte bygevoeg, verwyder, verskuif of gehang word.

(e) Dwarsmetasenter, metasenterhoogte. Die vry oppervlak van vloeistowwe (sonder bewys of berekening) en die uitwerking daarvan op stabiliteit, met spesiale aandag aan die onderverdeling van tenks.

(v) Towing and being towed.

(vi) Navigation in the vicinity of ice.

(vii) Drydocking.

General procedure and precautions to be observed.

Distribution of mass.

Drydocking with full cargo for inspection of propellors and shafting.

Bilge blocks.

Leaving a ship waterborne.

Putting into port with damage to ship and/or cargo both from business and technical points of view.

Safeguarding of cargo.

(viii) Prevention of fire at sea and in port.

Methods used to prevent the spread of fire.

Action to be taken to prevent the spread of fire.

Full knowledge of the use of fire appliances and the precautions to be taken in their use.

(ix) Methods of pest control; fumigation of holds and living spaces; safeguards in applying various methods.

(x) A knowledge of personnel management, organisation and training aboard ships.

Crew representation.

Complaints procedure.

Routine inspections of living quarters and store rooms.

(xi) Compensation and adjustment of compasses; candidates may be questioned on the practical adjustment of the magnetic compass using a ship's binnacle and compass. The deflector method.

(b) Collision Regulations and other items specified in paragraph (f) (i) to (v) of the oral syllabus for Class 4.

(c) Port Radio Information Services. Knowledge of the types of service available to aid vessels entering ports and berthing as indicated in Admiralty List of Radio Signals, "Port Radio Stations and Pilot Vessels."

(d) The examiner may ask the candidate questions arising out of the written work, if it is deemed necessary on account of weakness shown by the candidate.

(xii) Knowledge of the content of the undermentioned regulations:

(i) Life-saving Equipment Regulations.

(ii) Safety of Navigation Regulations.

(iii) The Marchant Shipping Radio Regulations, 1968.

(iv) Loading, Unloading and Coaling Regulations.

(v) Load Line Regulations.

(xiii) Safety Conventions and the legal obligations of signatory states. Periodic and other inspections of hull, machinery and safety equipment.

ANNEXURE K

MASTER (LIMITED TRADE) AND MASTER (SHORT SEA TRADE) ENDORSEMENT: SYLLABUSES

MASTER (LIMITED TRADE) ENDORSEMENT

Ship construction and stability

Paper 1 (three hours written)

(a) A fuller knowledge of the fundamentals of ship construction than is required in Class 4, General Ship Knowledge.

(b) Stresses and strains in ships in a seaway or due to loading and ballasting. A knowledge of the parts of a ship specially strengthened to withstand such stresses. Methods of compensating for discontinuity of strength. Testing of tanks and other watertight work. Methods of corrosion control.

(c) Use of stability and hydrostatic data supplied to ships. Initial stability and its limitation to small angles of heel.

An understanding of the factors affecting the shape of a curve of statical stability and the significance of the area under the curve.

Computation of areas and volumes by Simpson's first and second rules.

(d) Determination of the centre of gravity of a ship for different conditions of loading and ballasting.

The effect on the position of the centre of gravity of adding, removing, shifting or suspending weights.

(e) Transverse metacentre, metacentric height. Free surface of liquids (without proof or calculation) and its effect on stability with particular reference to the subdivision of tanks.

(f) Verandering van diepgang en trim weens die laai, aflaai en verskuiwing van gewigte (MCTC en CF gegee).

(g) Veranderinge in stabiliteit gedurende 'n seereis, met inbegrip van die uitwerking van 'n verskuiwing van vrag of soliede ballas.

(h) Laslyn; begrip van daardie aspekte van die toewysingsvoorwaardes wat die stabiliteit en seewaardigheid van 'n skip beïnvloed.

ENDOSSEMENT AS GESAGVOERDER (BEPERKTE HANDEL)

Skeepsake en Wet

Vraestel 2 (twee uur skriftelik)

(a) Die Registrasiesertifikaat en die wetlike betekenis daarvan.

(b) Sertifikate wat aan boord van Suid-Afrikaanse skepe moet wees. Prosedure vir die verkryging van sertifikate, met inbegrip van periodieke opnames en inspeksies en geldigheidstydperke.

(c) Indiensneming en ontslag van bemannings. Bemanningskale. Ooreenkoms met bemanning. Dissipline en optrede in die geval van dissiplinêre oortredings.

(d) Die amptelike skeepsjoernaal en die wet betreffende inskrywing. Verslag wat gedoen moet word in die geval van die besering of dood van bemanning of ander personeel aan boord van 'n skip.

(e) Doeanekantoorprosedure vir die in- en uitklaring van 'n Suid-Afrikaanse skip.

(f) Dokumentasie van vrag, met inbegrip van stuurmanskwitansies, seevragbriewe, lyste van gevaarlike goedere, geleibriewe en vragplanne.

(g) Die veiligheid van die skip, bemanning en passasiers.

Hulp aan skepe in nood.

Pligte in geval van stranding, botsing of 'n ander ongeval.

Berging.

(h) Die wet betreffende die aanmelding van gevare vir navigasie.

(i) Besoedeling: die Gesagvoerder se pligte, verpligtinge en aanspreeklikhede, met inbegrip van die hou van rekords.

(j) 'n Oorsigtelike kennis van die Gesagvoerder se verpligtinge ten opsigte van seeversekering en die kontrak vir die vervoer van goedere per skip. Protes, vragopnames, seewaardigheidsertifikate. Algemene awery.

(k) Kennis in breë trekke van die Gesagvoerder se verpligtinge ten opsigte van loodsing.

(l) Suid-Afrikaanse en internasionale gesondheidsregulasies. Mediese bystand ter beskikking van 'n skip ter see.

(m) Die skryf van sakebriewe en verslae.

(n) Die samestelling en magte van howe van marine-ondersoek en opnemingshowe.

ENDOSSEMENT AS GESAGVOERDER (BEPERKTE HANDEL)

Magnetisme en tolkompasse en navigasiehulpmiddels

Vraestel 3 (twee uur skriftelik)

(a) Die aarde se magneetveld, pole en ekwator. Die aarde se totale magnetiese krag, inklinasiehoek, horisontale en vertikale komponente. Variasie.

(b) Deviasie, die oorsaak en uitwerking daarvan. 'n Begrip van die uitwerking van halfpermanente en geïnduseerde magnetiese velde op die deviasie van die kompas.

Metodes wat gebruik word om vir hierdie uitwerkings te vergoed.

(c) Die plasing van magnetiese kompasse met inagneming van die nabyheid van magnetiese materiaal en elektriese toestelle. Voorsorgmaatreëls wat getref moet word met betrekking tot elektriese bedrading in die nabyheid van die kompas.

(d) Die bepaling van die magnetiese peiling van 'n voorwerp in die verte deur middel van kompaspeilings wat geneem is op afstandgelyke koerse, en om 'n deviasietabel saam te stel.

(e) Die beginsels van die vrytollende giroskoop.

Oorhelling en dryf.

Presessie. Beheer en demping. Korreksie vir breedtegraad-, koers- en snelheidsfout.

Versorging en onderhoud van verskillende tipes kompasse.

(f) Die praktiese toepassing van elektroniese en radiohulpmiddels vir navigasie.

Insig in en vertolking van data.

Posisiebepaling; vaste en veranderlike foute, waarskynlikheidsgebied.

Die gebruik van radar as 'n hulpmiddel om botsings te vermy.

(g) Die gebruik van navigasiepublikasies en -inligting wat gewoonlik aan skepe verskaf word of tot hulle beskikking is.

(f) Change of draught and trim due to loading, discharging or shifting weights (MCTC and CF given).

(g) Changes in stability during a voyage, including the effect of a shift of cargo or solid ballast.

(h) Load Line; an understanding of those aspects of the conditions of assignment which affect the stability and seaworthiness of a ship.

MASTER (LIMITED TRADE) ENDORSEMENT

Business and Law

Paper 2 (two hours written)

(a) The Certificate of Registry and its legal significance.

(b) Certificates required to be carried by South African ships. Procedure for obtaining certificates including periodical surveys and inspections and periods of validity.

(c) Engagement and discharge of crews. Manning scales. Agreement with crew. Discipline and the treatment of disciplinary offences.

(d) The official log book and the law relating to entries. Reports to be made in the event of injury to or death of crew or other personnel on board ship.

(e) Customs house procedure for entering or clearing a South African ship.

(f) Documentation of cargo, including mate's receipt, bills of lading, dangerous cargo lists, waybills, and cargo plans.

(g) The safety of the ship, crew and passengers. Assistance to vessels in distress. Duties in the case of stranding, collision or other casualty. Salvage.

(h) The law relating to the reporting of dangers to navigation.

(i) Pollution; the Master's duties, obligations and liabilities, including the keeping of records.

(j) An outline knowledge of the Master's obligations with respect to marine insurance and the contract of carriage of goods by sea. Protest, cargo surveys, certificates of seaworthiness. General average.

(k) An outline knowledge of the Master's obligations with respect to pilotage.

(l) South African and International health regulations. Medical assistance available to a ship at sea.

(m) The writing of business letters and reports.

(n) Constitution and powers of Courts of Marine Enquiry and Courts of Survey.

MASTER (LIMITED TRADE) ENDORSEMENT

Magnetic and gyro compasses and navigational aids

Paper 3 (two hours written)

(a) The earth's magnetic field, poles and equator. The earth's total magnetic force, angle of dip, horizontal and vertical components. Variation.

(b) Deviation, its cause and effect. An understanding of the effect of semi-permanent and induced magnetic fields on the deviation of the compass. The means used to compensate for these effects.

(c) Siting of magnetic compasses with reference to proximity of magnetic material and electrical appliances. Precautions to be taken with electric wiring in vicinity of the compass.

(d) To find the magnetic bearing of a distant object from compass bearings taken on equidistant headings and construct a table of deviations.

(e) The principle of the free gyroscope.

Tilt and drift.

Precession. Control and damping. Correction for latitude, course and speed error.

Care and maintenance of different types of compasses.

(f) The practical application of electronic and radio aids to navigation.

Appreciation and interpretation of data.

Position fixing; fixed and variable errors, area of probability.

The use of Radar as an aid to collision avoidance.

(g) The use of navigational publications and information commonly supplied or available to ships.

ENDOSSEMENT AS GESAGVOERDER (BEPERKTE HANDEL)

Operasies aan boord

Vraestel 4 (Twee-en-'n-halfuur skriftelik)

(Leerplan soos vir Klas 2, Vraestel 4)

ENDOSSEMENT AS GESAGVOERDER (BEPERKTE HANDEL)

Mondeling

(a) Die gebruik en versorging van alle dek- en bodektoestelle en -toebehore, met inbegrip van wenasse, kaapstanders, windasse, davits, touleiers, noodstuurgerei en toebehore wat tussen die anker en die kettingbak gebruik word.

(b) (i) Uitwerking van strome, wind, vlak water en diepgang op maneuvrering. In riviere en hawens maneuvreer. Met of sonder die gebruik van sleepbote langs kaaie en olie-eindpunte aanlê of daarvandaan vertrek.

(ii) Ankering en die gebruik van ankers en kabels in alle omstandighede.

(iii) Hantering van skepe in stormweer.

Die hantering van 'n ontredderde skip.

Ekstra voorsorg wat getref moet word voordat stormweer intree.

Die gebruik van olie.

(iv) Die sleep en op sleeptou neem van 'n skip.

(c) (i) 'n Deeglike kennis van soek-en-reddingsprosedures.

Die gebruik van rigtingbepaling vir aanpeiling op 'n ongeval.

Hulp aan 'n skip, boot of vliegtuig in nood.

Redding van die passasiers en bemanning van 'n ontredderde skip of boot of van 'n vliegtuig wat 'n noodlanding op see gemaak het.

(ii) Stappe wat gedoen moet word wanneer 'n skip ontredderd is en in nood verkeer.

Verlating van 'n skip; oorlewingsprosedure.

Kommunikasie met die land.

Die gebruik van vuurpyle en vuurpylapparaat.

Beveiliging van passasiers en bemanning in geval van skipbreuk.

(d) (i) Kennis van die regulasies betreffende reddings- en brandbestrydingstoestelle.

(ii) Maatreëls wat getref moet word wanneer 'n skip per ongeluk beskadig word, met inbegrip van botsings, stranding, beskadiging tydens stormweer en lekkasies.

'n Skip op die strand stuur.

(iii) Metodes van brandbestryding aan boord van 'n skip. Voorkoming van brand ter see en in die hawe.

Die organisasie van, en die uitreik van bevele aan spanne om brande te bestry en om reddingsbote en -vlotte in gereedheid te bring.

Stappe wat gedoen moet word om verspreiding van brand te voorkom.

(e) (i) Voorbereiding vir droogdokking en ontdokking. Die gebruik van stutte, kimblokke en kimstutte. Algemene prosedures en voorsorgmaatreëls wat nagekom moet word.

(ii) Maatreëls wat getref moet word om die uitstort te voorkom van olie gedurende vragwerk, die inneem van bunkerolie of die oorbring van olie.

(f) Roetine-inspeksie van woonkwartiere en voorraadkamers.

Kennis van personeelbestuur, organisasie en opleiding aan boord skepe. Prosedure in verband met klagtes.

(g) Botsingsregulasies en ander items in paragraaf (f) (i) tot (iv) van die mondelinge leerplan vir 'n Klas 4-sertifikaat gespesifiseer.

(h) Algemene kennis van die inhoud van die regulasies in verband met die Inneem van Steenkool en die Laai en Aflaai van Skepe, en die Veiligheidsregulasies met betrekking tot navigasie.

(i) Haweradio-inligtingsdienste. Kennis van die soorte diens wat beskikbaar is om vaartuie wat hawens binnekom behulpsaam te wees met die aanlê, ens. soos aangedui in die Admiraliteitslys van Radioseine, "Port Radio Stations and Pilot Vessels".

(j) Die eksaminator kan die kandidaat vrae vra wat uit die skriftelike werk voortspruit, indien dit nodig geag word vanweë swak prestasies deur die kandidaat.

ENDOSSEMENT AS GESAGVOERDER (KORTSEEHANDEL)

Skeepskonstruksie en -stabiliteit

Vraestel 1 (twee uur skriftelik)

Hierdie leerplan is bedoel om slegs daardie aspekte van skeepsstabiliteit te dek wat van 'n praktiese aard is en waaroor die gesagvoerder beheer het.

(a) Die gebruik van stabiliteit- en hidrostatiese gegewens wat aan skepe verskaf word, met inbegrip van stabiliteitsgegewens in vereenvoudigde vorm.

Aanvangstabiliteit en die beperking daarvan tot klein slagsyhoeke. Begrip van die faktore wat die fatsoen van 'n statiesestabiliteitskromme beïnvloed en die betekenis van die oppervlakte onder die kromme.

MASTER (LIMITED TRADE) ENDORSEMENT

Ship-board operations

Paper 4 (two and a half hours written)

(Syllabus as for Class 2, Paper 4)

MASTER (LIMITED TRADE) ENDORSEMENT

Oral

(a) The use and care of all deck and above-deck appliances and fittings including winches, capstans, windlasses, davits, fairleads, emergency steering gear and fittings used between anchor and cable locker.

(b) (i) Effect of current, wind, shallows and draught on manoeuvring. Manoeuvring in rivers and harbours. Berthing alongside and leaving quays and oil terminals with or without the use of tugs.

(ii) Anchoring and working anchors and cables in all circumstances.

(iii) Management of ships in heavy weather.

Handling a disabled ship.

Extra precautions to be taken before the onset of heavy weather.

Use of oil.

(iv) Towing and being towed.

(c) (i) A thorough knowledge of search and rescue procedures.

The use of direction finding for homing on to a casualty.

Assisting a ship, boat or aircraft in distress.

Rescuing the passengers and crew of a disabled ship, boat or ditched aircraft.

(ii) Action to be taken when disabled and in distress.

Abandoning ship; survival procedures.

Communications with the shore.

The use of rockets and rocket apparatus.

Preservation of passengers and crew in the event of wreck.

(d) (i) Knowledge of the regulations concerning life-saving and fire-fighting appliances.

(ii) Measures to be taken following accidental damage including collision, grounding, heavy weather damage and leaks. Beaching a ship.

(iii) Methods of dealing with fire on board ship.

Prevention of fire at sea and in port.

The organisation and direction of fire-fighting and lifeboat and liferaft preparation parties.

Action to be taken to prevent the spread of fire.

(e) (i) Preparation for drydocking and undocking. Use of shores, bilge blocks and bilge shores. General procedure and precautions to be observed.

(ii) Measures to be taken to prevent the spillage of oil during cargo work, bunkering or oil transfer.

(f) Routine inspection of living quarters and store-rooms.

A knowledge of personnel management, organisation and training aboard ships. Complaints procedure.

(g) Collision Regulations and other items specified in paragraph (f) (i) to (iv) of the oral syllabus for a Class 4 certificate.

(h) A General Knowledge of the content of the Loading, Unloading and Coaling Regulations and Safety of Navigation Regulations.

(i) Port Radio Information Services. Knowledge of the types of service available to aid vessels entering ports and berthing as indicated in Admiralty List of Radio Signals "Port Radio Stations and Pilot Vessels".

(j) The examiner may ask the candidate questions arising out of the written work, if it is deemed necessary on account of weakness shown by the candidate.

MASTER (SHORT SEA TRADE) ENDORSEMENT

Ship construction and stability

Paper 1 (two hours written)

This syllabus is designed to cover only those aspects of ship stability which are of a practical nature and within the control of the master.

(a) Use of stability and hydrostatic data supplied to ships, including stability data in simplified form. Initial stability and its limitation to small angles of heel. An understanding of the factors affecting the shape of a curve of statical stability and the significance of the area under the curve.

(b) Die bepaling van die swaartepunt van 'n skip vir verskillende toestande by die inlaai van vrag en ballas. Die uitwerking op die posisie van die swaartepunt wanneer gewigte bygevoeg, verwyder, verskuif of gehang word.

(c) Dwarsmetasenters, metasenterhoogte. Die vry oppervlak van vloeistowwe (sonder bewys of berekening) en die uitwerking daarvan op stabiliteit.

(d) Die verandering van diepgang en trim weens die laai, aflaai en verskuiwing van gewigte (MCTC en CF verskaf).

(e) Veranderinge in stabiliteit gedurende 'n seereis, met inbegrip van die uitwerking van 'n verskuiwing van vrag of soliede ballas.

(f) Laslyn; begrip van daardie aspekte van die toewysingsvoorwaardes wat die stabiliteit en seewaardigheid van 'n skip beïnvloed.

ENDOSSEMENT AS GESAGVOERDER (KORTSEEHANDEL)

Magnetiese kompas en navigasiehulpmiddels

Vraestel 2 (twee uur skriftelik)

(a) Die aarde se magneetveld, pole en ekwator. Die aarde se totale magnetiese krag, inklinasiehoek, horisontale en vertikale komponente. Variasie.

(b) Deviasie. Elementêre idees oor die uitwerking van harde yster, vertikale en horisontale sagte yster op die kompas. Metodes wat gebruik word om vir hierdie uitwerkings te vergoed, met besondere aandag aan kortseehandelskepe. Die plasing van magnetiese kompasse met inagneming van die nabyheid van magnetiese materiaal en elektriese toestelle. Voorsorgmaatreëls wat getref moet word met betrekking tot elektriese bedrading in die nabyheid van die kompas.

(c) Die bepaling van die magnetiese peiling van 'n voorwerp in die verte deur middel van kompaspeilings wat geneem is op afstandgelyke koerse, en om 'n deviasietabel saam te stel.

(d) Die praktiese toepassing van elektroniese en radiohulpmiddels vir navigasie. Insig in en vertolking van data. Posisiebepaling; vaste en veranderlike foute, waarskynlikheidsgebied. Die gebruik van radar as 'n hulpmiddel om botsings te vermy.

(e) Die gebruik van navigasiepublikasies en -inligting wat gewoonlik aan skepe verskaf word of tot hulle beskikking is.

GESAGVOERDER (KORTSEEHANDEL)-ENDOSSERING

Skeepsake en Wet

Mondeling

In die loop van hierdie eksamen kan die eksaminator van die kandidaat verwag om sekere vrae skriftelik te beantwoord. Sulke skriftelike antwoorde word beperk tot dié wat as noodsaaklik beskou word om die kandidaat se bekwaamheid in hierdie vak te bepaal en moenie afwyk van die wesentlike skriftelike aard van die eksamen nie.

(a) Die Registrasiesertifikaat en die wetlike betekenis daarvan.

(b) Sertifikate wat aan boord van Suid-Afrikaanse skepe moet wees. Prosedure vir die verkryging van sertifikate, met inbegrip van periodieke opnames en inspeksies en geldigheidstydperke.

(c) Indiensneming en ontslag van bemannings. Bemanningskale. Ooreenkoms met bemanning. Dissipline en optrede in die geval van dissiplinêre oortredings.

(d) Die amptelike skeepsjoernaal en die wet betreffende inskrywings. Verslag wat gedoen moet word in die geval van die besering of dood van bemanning of ander personeel aan boord van 'n skip.

(e) Doeanekantoorprosedure vir die in- en uitklaring van 'n Suid-Afrikaanse skip.

(f) Laslynmerke. Inskrywings en verslae ten opsigte van vryboord, diepgang en toelatings.

(g) Die veiligheid van die skip, bemanning en passasiers. Hulp aan skepe in nood. Pligte in die geval van stranding, botsing of 'n ander ongeval. Berging.

(h) Die wet betreffende die aanmelding van gevare vir navigasie.

(i) Besoedeling: Die Gesagvoerder se pligte, verpligtinge en aanspreeklikhede, met inbegrip van die hou van rekords.

(j) Suid-Afrikaanse gesondheidsregulasies. Mediese bystand ter beskikking van 'n skip ter see.

(k) 'n Oorsigtelike kennis van die Gesagvoerder se verpligtinge ten opsigte van seeversekering en die kontrak vir die vervoer van goedere per skip. Protes, vragopnames, seewaardigheidsertifikate.

(l) Kennis in breë trekke van die Gesagvoerder se verpligtinge ten opsigte van loodsing.

(m) Die skryf van sakebriewe en verslae.

ENDOSSEMENT AS GESAGVOERDER (KORTSEEHANDEL)

Mondeling

(a) Die gebruik en versorging van alle dek- en bodektoestelle en -toebehore, met inbegrip van wenasse, kaapstanders, windasse, davits, touleiers, noodstuurgerei en toebehore wat tussen die anker en die kettingbak gebruik word.

(b) Determination of the centre of gravity of a ship for different conditions of loading and ballasting. The effect on the position of the centre of gravity of adding, removing, shifting or suspending weights.

(c) Transverse metacentre, metacentric height. Free surface of liquids (without proof or calculation) and its effect on stability.

(d) Change of draught and trim due to loading, discharging or shifting weights (MCTC and CF given).

(e) Changes in stability during a voyage, including the effect of a shift of cargo or solid ballast.

(f) Load Line; an understanding of those aspects of the conditions of assignment which affect the stability and seaworthiness of a ship.

MASTER (SHORT SEA TRADE) ENDORSEMENT

Magetic compass and navigational aids

Paper 2 (two hours written)

(a) The earth's magnetic field, poles and equator. The earth's total magnetic force, angle of dip, horizontal and vertical components. Variation.

(b) Deviation. Elementary ideas of the effect of hard iron, vertical and horizontal soft iron on the compass. The means used to compensate for these effects with special reference to short sea trade ships. Siting of magnetic compasses with reference to proximity of magnetic material and electrical appliances. Precautions to be taken with electric wiring in vicinity of the compass.

(c) To find the magnetic bearing of a distant object from compass bearings taken on equidistant headings and construct a table of deviations.

(d) The practical application of electronic and radio aids to navigation. Appreciation and interpretation of data. Position fixing; fixed and variable errors, area of probability. The use of Radar as an aid to collision avoidance.

(e) The use of navigational publications and information commonly supplied or available to ships.

MASTER (SHORT SEA TRADE) ENDORSEMENT

Business and Law

Oral

During the course of this examination the examiner may require certain questions to be answered in writing by the candidate. Such written questions shall be restricted to those deemed necessary to establish the competence of the candidate in this subject and shall not detract from the basically oral nature of the examination.

(a) The Certificate of Registry and its legal significance.

(b) Certificates required to be carried by South African ships. Procedure for obtaining certificates including periodical surveys and inspections and periods of validity.

(c) Engagement and discharge of crews. Manning scales. Agreement with crew. Discipline and the treatment of disciplinary offences.

(d) The official log book and the law relating to entries. Reports to be made in the event of injury to or death of crew or other personnel on board ship.

(e) Custom house procedure for entering or clearing a South African ship.

(f) Load-line marks. Entries and reports in respect of freeboard, draught and allowances.

(g) The safety of the ship, crew and passengers. Assistance to vessels in distress. Duties in the case of stranding, collision or other casualty. Salvage.

(h) The law relating to the reporting of dangers to navigation.

(i) Pollution: the Master's duties, obligations and liabilities, including the keeping of records.

(j) South African health regulations. Medical assistance available to a ship at sea.

(k) An outline knowledge of the Master's obligations with respect to marine insurance and the contract of carriage of goods by sea. Protests, cargo surveys, certificates of seaworthiness.

(l) An outline knowledge of the Master's obligations with respect of pilotage.

(m) The writing of business letters and reports.

MASTER (SHORT SEA TRADE) ENDORSEMENT

Oral

(a) The use and care of all deck and above deck appliances and fittings including winches, capstans, windlasses, davits, fairleads, emergency steering gear and fittings used between anchor and cable locker.

(b) (i) Uitwerking van strome, wind, vlak water en diepgang op maneuvrering. In riviere en hawens maneuvreer. Met of sonder die gebruik van sleepbote langs kaaie of olie-eindpunte aanlê of daarvandaan vertrek.

(ii) Ankering en die gebruik van ankers en kabels in alle omstandighede.

(iii) Hantering van skepe in stormweer. Die hantering van 'n ontredderde skip. Bykomende voorsorg wat getref moet word voordat stormweer intree. Die gebruik van olie.

(iv) Die sleep en op sleeptou neem van 'n skip.

(c) 'n Deeglike kennis van soek-en-reddingsprosedures. Die gebruik van rigtingbepaling vir aanpeiling op 'n ongeval. Hulp aan 'n skip, boot of vliegtuig in nood. Redding van die passasiers en bemanning van 'n ontredderde skip of boot, of van 'n vliegtuig wat 'n noodlanding op see gemaak het.

(d) (i) Kennis in breë trekke van die regulasies betreffende reddings- en brandbestrydingstoestelle.

(ii) Maatreëls wat getref moet word wanneer 'n skip per ongeluk beskadig word, met inbegrip van botsings, stranding, beskadiging tydens stormweer en lekkasies.

'n Skip op die strand stuur.

(iii) Metodes van brandbestryding aan boord van 'n skip. Voorkoming van brand ter see en in die hawe. Die organisasie van, en die uitreik van bevele aan spanne om brande te bestry en om reddingsbote en -vlotte in gereedheid te bring.

Stappe wat gedoen moet word om verspreiding van brand te voorkom.

(e) (i) Voorbereiding vir droogdokking en ontdokking. Die gebruik van stutte, kimblokke en kimstutte. Algemene prosedures en voorsorgmaatreëls wat nagekom moet word.

(ii) Maatreëls wat getref moet word om die uitstort te voorkom van olie gedurende vragwerk, die inneem van bunkerolie, of die oorbring van olie.

(f) Roetine-inspeksie van woonkwartiere en voorraadkamers. Kennis van personeelbestuur, organisasie en opleiding aan boord skepe. Prosedure in verband met klagtes.

(g) Botsingsregulasies en ander items in paragraaf (f) (i) tot (iv) van die mondelinge leerplan vir 'n Klas 4-sertifikaat gespesifiseer.

(h) Algemene kennis van: Kode van Veilige Werkspraktyke vir die Veiligheid van Handelseelui: Reëls vir loodslere; die dele van die Falsneksregulasies wat betrekking het op skepe.

(i) Haweradio-inligtingsdienste. Kennis van die soorte diens wat beskikbaar is om vaartuie wat hawens binnekom, behulpsaam te wees met die aanlê soos aangedui in die Admiraliteitslys van Radioseine, "Port Radio Stations and Pilot Vessels".

(j) Die eksaminator kan die kandidaat vrae vra wat uit die skriftelike werk voortspruit, indien dit nodig geag word vanweë swak prestasie deur die kandidaat.

AANHANGSEL L

VOORGESKREWE PUNTETOEKENNING

KLAS 5—BEKWAAMHEIDSERTIFIKAAT

	Tyd	Puntetotaal		Slaagpunt
1. Kaartwerk en praktiese navigasie	3 uur	200		140
2. Algemene skeepskennis	2 uur	150		90
		350	Aggregaat	230

KLAS 4—BEKWAAMHEIDSERTIFIKAAT

	Tyd	Puntetotaal		Slaagpunt
Eerste dag				
1. Algemene skeepskennis	3 uur	200		120
2. Kaartwerk	2 uur	150		105
Tweede dag				
3. Praktiese navigasie	2 uur	150		105
4. Weerkunde	2 uur	150		75
		650	Aggregaat	405

Mondelinge eksamens: Soos gereël deur die eksaminator.

(b) (i) Effect of current, wind, shallows and draught on manoeuvring. Manoeuvring in rivers and harbours. Berthing alongside and leaving quays and oil terminals with or without the use of tugs.

(ii) Anchoring and working anchors and cables in all circumstances.

(iii) Management of ships in heavy weather. handling a disabled ship. Extra precautions to be taken before the onset of heavy weather. Use of oil.

(iv) Towing and being towed.

(c) A thorough knowledge of search and resque procedures. The use of direction finding for homing on to a casualty. Assisting a ship, boat or aricraft in distress. Rescuing the passengers and crew of a disabled ship, boat or ditched aircraft.

(d) (i) An outline knowledge of the regulations concerning life-saving and fire-fighting appliances.

(ii) Measures to be taken following accidental damage including collision, grounding, heavy weather damage and leaks.

Beaching a ship.

(iii) Methods of dealing with fire on board ship. Prevention of fire at sea and in port. The organisation and direction of fire-fighting, lifeboat and liferaft preparation parties. Action to be taken to prevent the spread of fire.

(e) (i) Preparation for drydocking and undocking. Use of shores, bilge blocks and bilge shores. General procedures and precautions to be observed.

(ii) Measures to be taken to prevent the spillage of oil during cargo work, bunkering or oil transfer.

(f) Routine inspection of living quarters and store rooms. A knowledge of personnel management, organisation and training aboard ship. Complaints procedure.

(g) Collision Regulations and other items specified in sections (f) (i) to (iv) of the oral syllabus for a Class 4 certificate.

(h) A general knowledge of: Code of Safe Working Practices for the Safety of Merchant Seamen: Pilot ladder rules; the parts of the Factory Regulations relevant to ships.

(i) Port Radio Information Services. Knowledge of the types of service available to aid vessels entering ports and berthing as indicated in Admiralty List of Radio Signals Port Radio Stations and Pilot Vessels.

(j) The examiner may ask the candidate questions arising out of the written work, if it is deemed necessary on account of weakness shown by the candidate.

ANNEXURE L

PRESCRIBED MARKING

CLASS 5—CERTIFICATE OF COMPETENCY

	Time	Total Marks		Pass Mark
1. Chartwork and practical navigation	3 hrs	200		140
2. General ship knowledge	2 hrs	150		90
		350	Aggregate	230

CLASS 4 CERTIFICATE OF COMPETENCY

	Time	Total Marks		Pass Mark
First day				
1. General ship knowledge	3 hrs	200		120
2. Chartwork	2 hrs	150		105
Second day				
3. Practical navigation	2 hrs	150		105
4. Meteorology	2 hrs	150		75
		650	Aggregate	405

Orals: As arranged by examiner.

KLAS 3—BEKWAAMHEIDSERTIFIKAAT

	Tyd	Puntetotaal		Slaagpunt
Eerste dag				
1. Algemene skeepskennis	3 uur	200		130
2. Kaartwerk	2 uur	150		105
Tweede dag				
3. Praktiese navigasie	2 uur	150		105
4. Weerkunde	2 uur	150		75
Derde dag				
5. Toegepaste wetenskap	3 uur	200		100
6. Navigasiebeginsels	2 uur	150		100
Vierdie dag				
7. Wiskunde	2½ uur	150		75
		1 150	Aggregaat	690

Mondelinge eksamens: Soos gereël deur die eksaminator.

KLAS 2—BEKWAAMHEIDSERTIFIKAAT

	Tyd	Puntetotaal		Slaagpunt
Eerste dag				
1. Kusnavigasie	2½ uur	200		140
2. Oseaan- en kusnavigasie	2½ uur	150		105
Tweede dag				
3. Weerkunde	2½ uur	150		75
4. Operasies aan boord van 'n skip	2½ uur	150		90
Derde dag				
5. Skeepskonstruksie en -stabiliteit	3 uur	200		120
6. Skeepsake en Wet	2 uur	150		75
		1 000	Aggregaat	605

Mondelinge eksamens: Soos gereël deur die eksaminator.

KLAS 1—BEKWAAMHEIDSERTIFIKAAT: BEVARE SKEEPSKAPTEIN

	Tyd	Puntetotaal		Slaagpunt
Eerste dag				
1. Skeepsake en Wet	3 uur	200		130
2. Navigasie	2½ uur	200		140
Tweede dag				
3. Skeepskonstruksie en stabiliteit	3 uur	200		120
4. Ingenieurswese en beheerstelsels	2½ uur	200		100
Derde dag				
5. Navigasiehulpmiddels en instrumente	3 uur	200		120
		1 000	Aggregaat	610

Mondelinge eksamens: Soos gereël deur die eksaminator.

ENDOSSEMENT AS GESAGVOERDER (BEPERKTE HANDEL)

	Tyd	Puntetotaal		Slaagpunt
Eerste dag				
1. Skeepskonstruksie en stabiliteit	3 uur	200		120
2. Skeepsake en Wet	2 uur	150		100
Tweede dag				
3. Magnetiese en tolkompas en navigasiehulpmiddels	2 uur	150		90
4. Operasies aan boord van 'n skip	2½ uur	150		90
		650	Aggregaat	400

Mondelinge eksamens: Soos gereël deur die eksaminator.

CLASS 3—CERTIFICATE OF COMPETENCY

	Time	Total marks		Pass mark
First day				
1. General ship knowledge	3 hrs	200		130
2. Chartwork	2 hrs	150		105
Second day				
3. Practical navigation	2 hrs	150		105
4. Meteorology	2 hrs	150		75
Third day				
5. Applied Science	3 hrs	200		100
6. Principels of navigation	2 hrs	150		100
Fourth day				
7. Mathematics	2½ hrs	150		75
		1 150	Aggregate	690

Orals: As arranged by examiner.

CLASS 2—CERTIFICATE OF COMPETENCY

	Time	Total marks		Pass mark
First day				
1. Coastal navigation	2½ hrs	200		140
2. Ocean and off-shore navigation	2½ hrs	150		105
Second day				
3. Meteorology	2½ hrs	150		75
4. Ship-board operations	2½ hrs	150		90
Third day				
5. Ship construction and stability	3 hrs	200		120
6. Business and Law	2 hrs	150		75
		1 000	Aggregate	605

Orals: As arranged by examiner.

CLASS 1—CERTIFICATE OF COMPETENCY MASTER MARINER

	Time	Total marks		Pass mark
First day				
1. Business and Law	3 hrs	200		130
2. Navigation	2½ hrs	200		140
Second day				
3. Ship construction and stability	3 hrs	200		120
4. Engineering and control systems	2½ hrs	200		100
Third day				
5. Navigation aids and instruments	3 hrs	200		120
		1 000	Aggregate	610

Orals: As arranged by examiner.

MASTER (LIMITED TRADE) ENDORSEMENT

	Time	Total marks		Pass mark
First day				
1. Ship construction and stability	3 hrs	200		120
2. Business and Law	2 hrs	150		100
Second day				
3. Magnetic and gyro compass and navigational aids	2 hrs	150		90
4. Ship-board operations	2½ hrs	150		90
		650	Aggregate	400

Orals: As arranged by examiner.

ENDOSSEMENT AS GESAGVOERDER (KORTSEEHANDEL)

	Tyd	*Punte-totaal*		*Slaag-punt*
1. Skeepskonstruksie en stabiliteit	2 uur	150		90
2. Magnetiese kompas en navigasiehulpmiddels	2 uur	150		90
		300	Aggregaat	180

Mondelinge eksamens: Soos gereël deur die eksaminator.

AANHANGSEL M

SIMBOLE EN AFKORTINGS

1. Die simbole, afkortings en konvensies wat in die eksamens gebruik word, volg die SI.

2. Die volgende afkortings word ook gebruik:

(a) *Navigasie en kaartwerk.*

(i) CP: Die gekose posisie is die posisie naaste aan die waarnemer, só gekies dat die hoogte 'n integraalgraad is en die lengtegraad sodanig is dat die plaaslike uurhoek van die liggaam ten tyde van die waarneming ook 'n integraalgraad is.

DR: Die gisbestek is dié wat verkry word deur slegs voorsiening te maak vir gestuurde koerse en afgelegde afstande.

EP: Die berekende posisie is dié wat verkry word deur voorsiening te maak vir koerse en afstande en vir drif en seestroom, as daar is.

Sekstanthoogte: Die sekstanthoogte is dié wat van 'n sekstant afgelees word.

(ii) AZ: asimut
C: kompas
Co: koers
Chron: chronometer
Cpa: naaste saamlooppunt
HE: ooghoogte
IE: indeksfout
LL: onderrand
M: magneties
P/L: standlyn
T: ware
UL: borand

(b) *Stabiliteit en algemene skeepskennis.*

ap: agterstandlyn
Bp: tussenstandlyn
fp: voorstandlyn
cg: swaartepunt (item op skip)
fwa: varswatertoelating
kb: hoogte van drukkingspunt bo die kiel
Kb: hoogte van drukkingspunt van 'n hulptoestel bo die kiel
KN: regbringhefboom om die kiel
MCTC: moment om trim 1 cm te verander
GZ: regbringhefboom om swaartepunt
GM: metasenterhoogte
KM: metasenterhoogte bokant kiel
KG: hoogte van swaartepunt (vaartuig) bokant die kiel.

(c) *Magnetisme en kompas.*

Hf: Horisontale komponent van die aarde se magneetveld
Z: Vertikale komponent van die aarde se magneetveld

AANHANGSEL N

BEKWAAMHEIDSERTIFIKAAT AS GESAGVOERDER (SPESIALE GRAAD): OOGMERKE EN LEERPLAN

Oogmerke

Die eksamen wat lei tot die uitreiking van 'n sertifikaat as Gesagvoerder (Spesiale Graad) word vrywillig afgelê en is bedoel vir daardie offisiere wat streef na senior poste in die skeepvaartbedryf en regeringsdiens, en in skeepvaartonderrig waar 'n grondige kennis van professionele vakke op 'n hoër vlak as vir Klas 1: Bevare Seekaptein in baie gevalle 'n vereiste is. Om te verseker dat kandidate behoorlik voorberei is vir sowel die eksamen as vir die poste wat hulle uiteindelik sal beklee as houers van 'n sertifikaat as Gesagvoerder (Spesiale Graad) is bywoning van 'n goedgekeurde Gesagvoerder(Spesiale Graad)-kursus 'n vereiste. Metgesel- of veldwerk in sekere vakke en werklike of hipotetiese gevallewerk in ander is 'n kenmerk van die kursus, ter aanvulling van die finale eksamen deur insig te

MASTER (SHORT SEA TRADE) ENDORSEMENT

	Time	*Total marks*		*Pass mark*
1. Ship construction and stability	2 hrs	150		90
2. Magnetic compass and navigational aids	2 hrs	150		90
		300	Aggregate	180

Orals: As arranged by examiner.

ANNEXURE M

SYMBOLS AND ABREVIATIONS

1. The symbols, abbreviations and conventions used in the examinations shall follow the SI system.

2. The following abbreviations shall also be used:

(a) *Navigation and chartwork.*

(i) CP: The chosen position is that position nearest to the observer chosen so that the altitude is an integral degree and the longitude is such that the local hour angle of the body at the time of observation is also an integral degree.

DR: The dead reckoning position is that obtained by allowing for courses steered and distances run only.

EP: The estimated position is that obtained by allowing for courses and distances and for leeway and current if any.

Sext alt: The sextant altitude is that read off a sextant.

(ii) az: azimuth
C: compass
Co: course
Chron: chronometer
cpa: closest point of approach
HE: height of eye
IE: index error
LL: lower limb
M: magnetic
P/L: position line
T: true
UL: upper limb

(b) *Stability and general ship knowledge.*

ap: after perpendicular
BP: between perpendiculars
fp: forward perpendicular
cg: centre of gravity (item on ship)
fwa: fresh water allowance
kb: height of centre of buoyancy above the keel
Kb: height of the centre of buoyancy of an appendage above the keel
KN: righting lever about keel
MCTC: moment to change trim 1 cm
GZ: righting lever about centre of gravity
GM: metacentric height
KM: height of metacentre above keel
KG: height of centre of gravity (vessel) above the keel

(c) *Magnetism and compass.*

Hf: Horizontal component of Earth's magnetic field
Z: Vertical component of Earth's magnetic field

ANNEXURE N

CERTIFICATE OF COMPETENCY AS MASTER SPECIAL GRADE: OBJECTIVES AND SYLLABUS

Objectives

The examination leading to the issue of a Master Special Grade certificate is voluntary and is intended for those officers who aspire to senior positions in the shipping industry, in Government service, and in nautical education where a sound knowledge of professional subjects, taken to a greater depth than for Class 1: Master Mariner, is in many cases an essential requirement. To ensure that candidates are adequately prepared not only to present themselves for examination but also for the positions they will eventually reach as holders of Master Special Grade certificates, their attendance at an approved Master Special Grade course shall be a requirement. Companion or field work in certain subjects and actual or hypothetical casework in others shall be a feature of the course, to complement the

gee in die praktiese toepassing van die studies wat onderneem is. Vrystelling van die bywoning van 'n kursus kan algemeen en individueel in sekere gevalle toegestaan word aan diegene wat reeds 'n gedeelte van 'n Gesagvoerder(Spesiale Graad)-eksamen voltooi het of hulle daarvoor ingeskryf het voor die datum van publikasie van hierdie regulasies.

Eksamentoelatingsvereistes

Alle kandidate moet die houers wees van 'n Gesagvoerder(Klas 1)-bekwaamheidsertifikaat wat geldig is kragtens die Suid-Afrikaanse Handelskeepvaartwet. Voor kwalifisering vir toelating tot Deel B van die Gesagvoerder(Spesiale Graad)-eksamen word van alle kandidate verwag om 'n bevredigende standaard in wiskunde en fisika te bereik ten einde hulle in staat te stel om die tegniese vakke wat in daardie Deel behandel word deeglik te begryp.

Wiskunde- en Fisikaleerplan verskyn hieronder tesame met besonderhede van die interne beoordelingseksamen in hierdie vakke, eksterngemodereer deur die Departement van Vervoer, wat gehou word nadat hulle die goedgekeurde kursus ses maande lank bygewoon het. Kandidate wat die houers is van kwalifikasies wat aanvaarbaar is vir die Departement van Vervoer en wat bevestig dat die vereiste standaard bereik is in enige van die vakke wat deur die interne eksamen gedek word, sal oorweeg word vir vrystelling van die betrokke vraestelle.

Eksamen

Die finale eksamen, wat in elke geval deur die Departement van Vervoer afgeneem word, behels vyf skriftelike vraestelle, waarvan twee Deel A en drie Deel B vorm; kandidate kan enigeen van die dele eerste aflê of beide dele saam aflê. Deel A van die eksamen is gerig op private studie ten einde die voornemende studente in staat te stel om voorbereidende leeswerk vir hierdie Deel ter see te onderneem voordat hulle met die kursus begin.

'n Slaagpunt in 'n deel van die eksamen bly vir 'n onbeperkte tyd geldig en word aangeteken deur middel van 'n endossement te dien effekte op die kandidaat se Klas 1-sertifikaat.

Vraestelle word so opgestel dat dit binne drie uur beantwoord kan word, maar kandidate kan 'n bykomende uur toegestaan word voordat hulle gevra word om hul werk af te sluit.

Die gebruik van 'n elektroniese rekenaar met vier funksies en 'n enkelgeheue mag in die eksamen gebruik word.

Van kandidate sal daar verwag word om minstens 50 % van die punte wat vir elke vraestel toegeken word en 'n aggregaat van 60 % van die totale punte wat afsonderlik aan elke deel van die eksamen toegeken word te behaal ten einde in daardie Deel te slaag.

Geen naslaanwerk mag tydens enige deel van die eksamen gedoen word nie. Kandidate sal nie mondeling getoets word nie en daar sal ook nie van hulle vereis word om die gesigtoets te slaag nie.

Kursusse

Kursusse moet aangebied word by die Seevaartkolleges soos van tyd tot tyd deur die Direkteur-generaal goedgekeur.

Algemeen

Voltydse voorbereidingskursusse by 'n goedgekeurde kollege duur ongeveer 36 weke en omvat 'n studieprogram wat die gepubliseerde leerplanne dek. Vakke vir Deel A en Deel B moet saam bestudeer word ter voorbereiding vir albei dele van die eksamen aan die einde van die kursus.

Praktiese en eksperimentele werk moet ingesluit word; die presiese aard van hierdie werk hang af van die beskikbaarheid van fasiliteite en toerusting, maar daar word verwag dat die volgende gedek moet word:

Die gebruik van modelle ten einde die verskuiwing van gewigte te demonstreer, hanggewigte, inklinasie-eksperiment, die effek van 'n vry oppervlak, bepaling van die kromme van statiese stabiliteit, rol-eksperimente, vertrimmingsdemonstrasie. Demonstrasie en gebruik van toepaslike navigasie-toerusting en ontleding van observasiefoute. Oefeninge in praktiese hidrografiese opnames. Praktiese kompasstellings.

GESAGVOERDER (SPESIALE GRAAD): LEERPLAN VIR WISKUNDE EN FISIKA

Wiskunde

Teorie van indekse en logaritmes. Breuk- en negatiewe indekse. Ongelykhede. Vergelykings waarin die onbekende as 'n indeks voorkom.

Funksie as 'n afbeelding van versamelings. Saamgestelde en inverse funksies. Grafieke van funksies in die cartesiese vlak. Grafiese oplossing van vergelykings. Perke van funksies. Lineêre en kwadratiese funksies. Teorie van kwadratiese vergelykings. Parsiële breuke. Res- en faktorstellings. Vasstelling van wette deur redusering tot lineêre vorm. Binomiaalontwikkeling vir positiewe integraalindekse. Gebruik, sonder bewys, van breuk- en negatiewe indekse. Rye en reekse. Elementêre behandeling van konvergensie. Rekenkundige, meetkundige, eksponensiale en logaritmiese reekse. Gebruik van reekse om benaderings en perke te vind. Die algemene hoek. Graad- en radiaalmaat. Goniometriese funksies.

Trigonometriese identiteite. Algemene oplossing van trigonometriese vergelykings.

Probleme wat saamgestelde, veelvoud- en subveelvoudhoeke behels.

Inverse goniometriese funksies.

final examination by providing an appreciation of the practical application of studies undertaken. Exemption from course attendance may be granted generally and individually in certain cases to those who have already completed/enrolled for a Part of a Master Special Grade examination before the date of publication of these regulations.

Examination entry requirements

All candidates shall hold a Master (Class I) certificate of competency valid under the South African Merchant Shipping Act. Before qualifying for admission to Part B of the Master Special Grade examination all candidates shall be required to reach a satisfactory standard in mathematics and physics to enable them to have a thorough understanding of the technical subjects dealt with in that Part.

The mathematics and physics syllabus appears hereunder, together with details of the internal assessment examination in these subjects, externally moderated by the Department of Transport, that shall be held after six months attendance at the approved courses. Candidates holding qualifications which are acceptable to the Department of Transport as evidence that the required standard has been reached in any of the subjects covered by the internal examination, shall be considered for exemption from the appropriate papers.

Examination

The final examination, which shall in every case be conducted by the Department of Transport, comprises five written papers; two of which form Part A and three Part B; candidates shall have the option of taking either Part first or both Parts together. Part A of the examination shall be designed for private study in order that prospective students might undertake preparatory reading for this Part at sea before embarking on the course.

A pass in a Part of the examination shall be valid for all time and shall be recorded by an endorsement to that affect on the candidate's Class I certificate.

Question papers shall be designed and set for completion in three hours, but candidates may be allowed one additional hour before being asked to conclude their work. The use of four-function single memory electronic calculators may be permitted in the examination.

Candidates shall be required to attain at least 50 % of the marks allotted to each paper, and an aggregate of 60 % of the total marks allotted to each part of the examination separately, to achieve a pass in that Part. There shall be no facility for referral in either part of the examination. Candidates shall not be examined orally, nor shall they be required to pass the sight test.

Courses

Courses shall be conducted at Nautical Colleges as approved by the Director-General from time to time.

General

Full time courses for preparation at an approved college shall be of about 36 weeks duration, comprising a programme of study to cover the published syllabuses. Part A and Part B subjects shall be studied in parallel to prepare for both parts of the examination at the end of the course.

Some practical and experimental work shall be included; the exact nature of this work shall depend upon the availability of facilities and equipment but it is envisaged that it shall take place in such areas as:

Use of models to demonstrate shift of weights, suspended weights, inclining experiment, free surface effect, determination of the curve of statical stability, rolling experiments, squat demonstration. Demonstration and use of appropriate navigational equipment and analysis of observational errors. Practical Hydrographic surveying exercises. Practical compass adjustment.

MASTER SPECIAL GRADE MATHEMATICS AND PHYSICS SYLLABUS

Mathematics

Theory of indices and logarithms. Fractional and negative indices. Inequilities. Equations in which the unknown occurs as an index.

Function as a mapping of sets. Composite and inverse functions. Graphs of functions in the cartesian plane.

Graphical solution of equations. Limits of functions.

Linear and quadratic functions. Theory of quadratics.

Partial fractions. Remainder and factor theorems.

Determination of laws by reduction to linear form.

Binomial expansion for positive integral indices. Use, without proof, of fractional and negative indices. Sequences and series. Elementary treatment of convergence.

Arithmetic, geometric, exponential and logarithmic series. Use of series in finding approximations and limits. The general angle. Degree and radian measure.

Circular functions.

Trigonometrical indentities. General solution of trigonometrical equations.

Problems involving compound, multiple and sub-multiple angles.

Inverse circular functions.

Boldriehoeke. Napier se analogieë. Sinus- en kosinusreëls vir boldriehoeke.

Oppervlakte van die boldriehoek. Pooldriehoeke. Afgeleide formules, met inbegrip van die haversinus-formule en vierdeelreël. Differensiasie van algebraïse, sirkel-, eksponensiale, logaritmiese en inverse goniometriese funksies.

Produk, kwosiënt en kettingreëls. Toepassing van differensiasie op klein foute, ekstrema en veranderingstempo. Herhaalde differensiasie. Integrasie as omgekeerde van differensiasie.

Integrasie deur verandering van die veranderlike, deur parsiële breuke en deur dele. Die toepassing van integrasie op die evaluering van vlakoppervlaktes, volumes, eerste en tweede momente van oppervlaktes en volumes.

Middelwaardes. Numeriese integrasie; trapesium- en Simpsonreëls, en die bewys daarvan.

Oplossing van eenvoudige differensiaalvergelykings van die eerste orde met skeibare veranderlikes; homogene vergelykings. Integrasiefaktore. Numeriese oplossing van vergelykings in een onbekende; die metode van Newton-Ralphson.

Meganika en statistiek

Optel en aftrek van vektore. Vermenigvuldiging van skalaar en vektor. Krag as 'n vektorgrootheid. Ontbinding van saamvlakkige kragte. Resultant van 'n stelsel van saamvlakkige kragte wat op 'n punt inwerk. Ewewig. Driekragprobleme, Lami se theorema.

Spanning, vervorming, die wet van Hooke, Young se elastisiteitsmodulus. Ewewydige kragte, momente, kragtepare. Herleiding van 'n stelsel van saamvlakkige kragte wat op 'n stewige liggaam inwerk. Ewewigtoestande. Wrywing. Swaartepunt. Belaste raamwerke.

Verplasing, snelheid en versnelling as vektore. Reglynige beweging van 'n deeltjie met gelykmatige versnelling. Beweging van 'n deeltjie onder swaartekrag. Verbonde deeltjies. Projektiele assa, momentum, krag. Newton se bewegingswette. Impuls, arbeid, energie, krag. Beginsels van die behoud van lineêre momentum en energie. Direkte en skuinsslag, met inbegrip van die gebruik van Newton se eksperimentele wet.

Skuifkrag- en buigmomentdiagramme vir puntlaste en eenvormig verspreide laste. Reglynige beweging van 'n deeltjie met veranderlike versnelling waar die versnelling 'n funksie is van tyd of verplasing. Eenvoudige harmoniese beweging.

Beweging in 'n sirkel (horisontaal en vertikaal). Eenvoudige slinger. Keëlslinger.

Traagheidsmoment, teoremas van parallelle en loodregte asse. Hoekmomentum en kinetiese energie van draaiende liggame. Newton se wet vir draaiende liggame.

Voorstelling van numeriese data. Verspreiding van frekwensie. Gemiddelde en standaardafwyking van diskrete en gegroepeerde verspreidings.

Elementêre waarskynlikheidsteorie, met inbegrip van voorwaardelike waarskynlikheid.

Waarskynligheidsverdeling van 'n variant. Binomiese, Poisson-, reghoekige en normale verdelings. Wiskundig; verwagting, veral gemiddeld en variansie.

Streekproefverdeling van die gemiddelde; standaardfout. Vertroubaarheidsperke. Hipotesetoetsing. Die toets van gemiddeldes en verskil tussen gemiddeldes.

Fisika

S.I.-eenhede word deurgaans gebruik maar vrae kan ander praktiese eenhede soos die minuut, uur en graad Celsius insluit.

Warmte

Gedrag van 'n ideale gas met veranderinge in druk, volume en temperatuur. Eenvoudige kinetiese teorie van 'n ideale gas, met inbegrip van die afleiding van die formule $p = \frac{1}{3} c^2$ en van die gebruik van die Avogadrogetal.

Die verhouding tussen temperatuur en molekulêre kinetiese energie.

Interne energie van 'n gas. Eerste termodinamikawet. Bestendigevloeienergievergelyking. Entalpie.

Verskille tussen die vernaamste spesifieke warmtekapasiteite van 'n ideale gas. Bewys van $Cp-Cv=R$.

Verhouding van spesifieke warmte en die afhanklikheid daarvan van atomisiteit. Omkeerbare isotermiese en adiabatiese omskakelings. Arbeid verrig in isobariese, isotermiese en adiabatiese uitsettings.

Versadigde en onversadigde dampe. Kook by versadigde dampdruk, doupunt en relatiewe humiditeit. Spesifieke humiditeit (humiditeitmengverhouding). Gedrag van reële gasse.

Spherical triangles. Napier's analogies. Sine and consine.

Rules for spherical triangles.

Area of spherical triangle. Polar triangles. Derived formulae including Haversine Formula and Four Part Rule. Differentiation of algebraic, circular, exponential, logarithmic and inverse circular functions.

Product, quotient and chain rules. Applications of differentiation to small errors, extrema and rates of change.

Successive differentiation. Integration as inverse of differentiation.

Integration by change of variable, by partial fractions and by parts. Applications of integration to the evaluation of plane areas, volumes, first and second moments of areas and volumes.

Mean values. Numerical integration; trapezoidal and Simpson's Rules, and proof thereof.

Solution of simple differential equations of the first order with variables separable, Homogeneous equations. Integrating factors. Numerical solution of equations is one unknown; Newton-Ralphson method.

Mechanics and statistics

Addition and subtractions of vectors. Multiplication of scalar and vector. Force as a vector quantity. Resolution of coplanar forces. Resultant of system of coplanar forces acting at a point. Equilibrium. Three Force problems, Lami's Theorem.

Stress, strain, Hooke's Law and Young's Modulus of Elasticity.

Parallel forces, moments, couples. Reduction of a system of coplanar forces acting on a rigid body. Equilibrium conditions. Friction. Centre of gravity. Loaded frameworks.

Displacement, velocity and acceleration as vectors.

Relative velocity and acceleration. Rectilinear motion of a particle with uniform acceleration. Motion of a particle under gravity. Connected particles. Projectiles.

Mass, momentum, force. Newton's Laws of Motion.

Impulse, work, energy, power. Principles of conservation of linear momentum and energy. Direct and oblique impact, including use of Newton's Experimental Law.

Shearing force and bending moment diagrams for point and uniformly distributed loads. Rectilinear motion of a particle with variable acceleration where the acceleration is a function of time or displacement. Simple harmonic motion.

Motion in a circle (Horizontal and vertical).

Simple pendulum. Conical pendulum.

Moment of inertia, parallel and perpendicular axes theorems.

Angular Momentum and kinetic energy of rotating bodies.

Newton's Law for rotating bodies.

Representation of numerical data. Frequency distributions.

Mean and standard deviation of discrete and grouped distributions.

Elementary probability theory, including conditional probability.

Probability distribution of a random variable.

Binomial, Poisson, rectangular and normal distributions.

Mathematical; expectation, especially mean and variance.

Sampling distribution of the mean; standard error.

Confidence Limits. Hypothesis testing. Testing means and difference between means.

Physics

S.I. Units shall be used throughout but questions may contain other practical units such as the minute, hour, degree Celsius.

Heat

Behaviour of an ideal gas with changes in pressure, volume and temperature. Simple kinetic theory of an ideal gas including derivation of the formula $p = \frac{1}{3} c^2$ and use of Avogadro's number.

The relationship between temperature and molecular kinetic energy.

Internal energy of a gas. First law of thermodynamics.

Steady flow energy equation, enthalpy.

Differences between the principal specific heat capacities of an ideal gas. Proof of $Cp-Cv = R$.

Ratio of specific heats and its dependance on atomicity.

Reversible isothermal and adiabatic changes. Work done in isobaric, isothermal and adiabatic expansions.

Saturated and unsaturated vapours. S.V.P. boiling, dew point and relative humidity. Specific humidity (humidity mixing ratio). Behaviour of real gases.

Critical temperatures. Thermal conductivity, calculation of linear steady-flow conditions.

Newton's law of cooling, derivation of formula from statement of law.

Thermal radiation. Electromagnetic spectrum.

Kritieke temperature. Warmtegeleivermoë, berekening van lineêre bestendigevloeitoestande.

Newton se verkoelingswet, afleiding van formule van die stelling van die wet.

Warmtestraling. Elektromagnetiese spektrum. Opsporingsmetodes. Prevost se teorie van uitwisseling. Swartstraling en verdeling van energie.

Variasie van golflengte van maksimum energie met temperatuur. Uitstraal- en absorpsievermoë. Kirchoff se stralingswet. Stefan se wet. Sonkonstante en straling van die son ontvang.

Omskakeling van hitte in arbeid. Termodinamiese siklusse. Carnot-siklus. Termiese rendement. Omkeerbaarheid. Tweede termodinamikawet. Entropie. Omgekeerde siklusse, omgekeerde carnot-siklus en dampkompressiesiklus. Prestasiekoëffisiënte vir vries- en hittepomp.

Golwe

Beskrywende behandeling van vrye en gedwonge vibrasies, demping en resonansie. Eenvoudige matematiese behandeling van dwars- en langsgolwe, eenvoudige harmoniese golwe, loopgolwe, die verhouding tussen snelheid, frekwensie en golflengte. Superposisie van kollineêre golwe, die vorming van staande golwe. Swewings.

Lig

Kennis van en gebruik van formules vir die vorming van beelde deur weerkaatsing op plat- en bolvlakke. Refraksie op plat- en bolvlakke. Kritieke hoek en totale interne weerkaatsing. Kennis van en gebruik van dunlensformules. Dun lense in kontak. Eenvoudige behandeling van saamgestelde mikroskoop, refraktor en reflektor astronomiese teleskope. Landteleskoop en -verkyker. Vergrotings en uitgang pupil. (Besonderhede van oogstukke nie vereis nie.) Breking en verstrooiing deur prismas. Verstrooiingsvermoë. Voorwaarde vir minimum afwyking in die formule wat brekingsindeks verbind. Dun prismas.

Beskrywende hantering van sferiese aberrasie, koma, astigmatisme, veldkromming en verwringing. Chromatiese aberrasie en achromatiese lenspaar, sonder berekenings.

Spektra en kleur. Ligintensiteit, ligvloed, verligting. Fotometers, fotovoltaïese sel. Huygens-beginsel, afleiding van wette van refraksie en refleksie op 'n plat oppervlak. Interferensie, Young se dubbelgleufeksperiment. Dun films, slegs normale inval. Nie-weerkaatsende films, neerslag. Buiging, enkelgleuf. Beskrywende behandeling van buiging deur 'n sirkelvormige opening en die skeivermoë van 'n teleskoop. Natuurverskynsels, lugspieëlings, opdoemings, ligkrans, reënboog, korona. Ligspoed, Römer en Michelson se metode.

Klank

Snelheid en klank in gasse, vloeistowwe en stawe. Faktore wat die snelheid beïnvloed. Die meting van snelheid in gasse en stawe. Weerkaatsing en buiging. Die uitwerking van wind, snelheidsgradiënt op voortplanting. Die Dopplereffek. Klankintensiteit. Desibelskaal. Luidheid, die telefoon en dBA. Beskrywende behandeling van geraas, luggeraas en struktuurgeraas. Faktore wat transmissie en demping beïnvloed.

INTERNE BEOORDELINGSEKSAMEN

1. Eksamens word kort na die halfjaarlikse vakansie afgelê.

Kandidate skryf 'n vraestel van drie uur oor Wiskunde, 'n vraestel van drie uur oor Meganika en Statistiek en 'n vraestel van drie uur oor Fisika.

2. Die Wiskundevraestel bestaan uit nege vrae waaruit die kandidaat ses moet kies ten einde volpunte te behaal.

Die Meganikavraestel bestaan uit nege vrae—sewe oor Meganika en twee oor Statistiek. Kandidate moet minstens een vraag oor Statistiek beantwoord. Die Fisikavraestel bestaan uit drie afdelings:

(i) Warmte: Vier vrae.

(ii) Lig: Drie vrae.

(iii) Klank: Twee vrae.

Kandidate moet een vraag uit elke afdeling doen en enige ander drie uit die oorblywende afdelings.

3. Die totale slaagpunt is 55 persent. Die minimum slaagpunt in elke vraestel is 45 %.

Methods of detection. Prevost's theory of exchanges.

Black-body radiation and distribution of energy.

Variation of wavelength of maximum energy with temparature.

Emissive and absorptive power. Kirchoff's Law of radiation. Stefan's Law. Solar constant and radiation received from the sun.

Conversion of heat to work. Thermodynamic cycles.

Carnot cycle. Thermal efficiency. Reversibility. Second Law of Thermodynamics. Entropy. Reversed cycles, reversed Carnot cycle and vapour compression cycle. Coefficients of performance for refrigerator and heat pump.

Waves

Descriptive treatment of free and forced vibrations, damping, resonance. Simple mathematical treatment of transverse and longitudinal waves, simple harmonic waves, progressive waves, relation between velocity, frequency and wavelength. Superposition of collinear waves, formation of standing waves. Beats.

Light

Knowledge of and use of formulae for formation of images by reflexion at plane and spherical surfaces. Refraction at plane and spherical surfaces. Critical angle and total internal reflexion. Knowledge of and use of thin lens formulae. Thin lenses in contact. Simple treatment of compound microscope, refracting and reflecting astronomical telescopes. Terrestrial telescope and binoculars. Magnification and exit pupil. (Details of eyepieces not required). Refraction and dispersion by prisms. Dispersive power. Condition for minimum deviation and the formula connecting refractive index. Thin prisms.

Descriptive treatment of spherical aberration, coma, astigmatism, curvature of field and distortion.

Chromatic aberration and achromatic doublet without calculations.

Spectra and colour.

Luminous intensity, luminous flux, illumination.

Photometers, photovoltaic cell.

Huygen's principle, derivation of laws of refraction and reflextion at a plane surface.

Interference, Young's double slit experiment.

Thin films, normal incidence only.

Non-reflecting films, blooming.

Diffraction, single slit. Descriptive treatment of diffraction by circular aperture and resolving power of a telescope.

Natural phenomena; mirages, looming, halo, rainbow, corona.

Speed of light, Römer's and Michelson's methods.

Sound

Velocity and sound in gases, liquids and rods.

Factors affecting the velocity.

Measurement of velocity in gases and rods.

Reflexion and refraction.

Effect of wind, velocity gradient on propagation.

Doppler effect.

Intensity of sound. The decibel scale. Loudness, the phone and dBA.

Descriptive treatment of noise, air-borne and structureborne. Factors affecting transmission and damping.

INTERNAL ASSESSMENT EXAMINATION

1. Examinations shall be held shortly after the mid-year vacation.

Candidates shall write one three-hour paper in mathematics, one three-hour paper in Mechanics and Statistics, and one three-hour paper in Physics.

2. The Mathematics paper shall consist of nine questions from which the candidate shall be required to select six questions for full marks.

The Mechanics paper shall consists of nine questions—seven in Mechanics and two on Statistics. Candidates shall attempt at least one question on Statistics. The Physics paper shall consist of three sections:

(i) Heat: Four questions.

(ii) Light: Three questions.

(iii) Sound: Two questions.

Candidates shall attempt one question from each section and any other three from the remainder.

3. The pass mark shall be 55 % overall. The minimum pass mark in each paper shall be 45 %.

GESAGVOERDER (SPESIALE GRAAD): EKSAMENLEERPLAN

DEEL A

VRAESTEL 1—INTERNASIONALE MARITIEME OOREENKOMSTE EN REGSKENNIS

Afdeling A

1. IMO-konvensies.

(a) Toepassing:

(i) Die funksies van IMO en die implementering van Konvensies.

(ii) Uitgesonderde en vrygestelde skepe.

(iii) Nie-konvensieskepe.

(b) Sertifikate—die sertifikate wat op internasionale vaarte aan boord van vaartuie moet wees.

(c) Navigasieveiligheid:

(i) Reëlings vir die monitering van gevare en die pligte van Gesagvoerders.

(ii) Verkeerverdeling en beheer.

(iii) Soek-en-redding.

(d) Vragte:

(i) Kode vir die veilige hantering van massavragte.

(ii) Kode vir gevaarlike goedere.

(iii) Graan.

(iv) Ander kodes wat betrekking het op skepe wat gespesialiseerde vragte aan boord het.

(Gedetailleerde tegniese kennis word nie vereis nie.)

(e) (i) Die aanmeld van ongevalle en die bevindings van ondersoeke.

(ii) Die aanmeld van substandaardskepe.

(f) Besoedeling—ooreenkomste oor besoedeling.

2. Gesondheid.

(a) Internasionale ooreenkomste en maatreëls om die verspreiding van siektes deur skeepvaart te vermy.

(b) Internasionale organisasie vir mediese advies ter see.

(c) Internasionale ooreenkomste vir mediese bystand ter see.

3. Ander internasionale ooreenkomste en konvensies rakende skeepvaart.

4. Handelsaangeleenthede.

(a) (i) Wet op Seeversekering—begrip van die inhoud en betekenis.

(ii) York-Antwerp-reëls—kennis van die reëls.

(iii) Haagse Visby-reëls—kennis van die reëls.

(b) Haagse reëls—algemene kennis van die reëls wat op die vervoer van goedere ter see betrekking het.

Afdeling B

1. Suid-Afrikaanse wetgewing wat uit die internasionale ooreenkomste in Afdeling A voortspruit.

2. Handelskeepvaartwet en verwante wetgewing soos van toepassing op:

(a) Bemanning;

(i) Die indiensneming en ontslag van seemanne;

(ii) die bepalings en voorwaardes van hul indiensneming;

(iii) oortredings en dissipline;

(iv) toewysings en bevorderings;

(v) klagteprosedure;

(vi) bemanning en diplomering.

(b) Algemeen:

(i) Ondersoeke, navrae en howe;

(ii) vervolging na oortredings;

(iii) aanhouding van onseewaardige skepe;

(iv) skipbreuk en berging.

3. Suid-Afrikaanse wetgewing betreffende:

(a) Besoedeling van die atmosfeer;

(b) veilige werkstoestande aan boord skepe.

VRAESTEL 2—SEE-OMGEWINGSTUDIES

Afdeling A

1. Weerkunde:

Die meteorologiese elemente, weerstelsels, weervoorspelling, soos aangedui in staatspublikasies. Hierbenewens sal die volgende taamlik diepgaande geëksamineer word:

(i) Adiabatiese prosesse, afnametempo's en stabiliteit.

MASTER SPECIAL GRADE EXAMINATION SYLLABUS

PART A

PAPER 1—INTERNATIONAL MARITIME AGREEMENTS AND LEGAL KNOWLEDGE

Section A

1. IMO Conventions.

(a) Application:

(i) The functions of IMO and the implementation of Conventions.

(ii) Excepted and exempted ships.

(iii) Non-Convention ships.

(b) Certificates—the certificates required to be carried by vessels on international voyages.

(c) Safety of navigation:

(i) Arrangements for monitoring hazards and the duties of Masters.

(ii) Traffic separation and control.

(iii) Search and rescue.

(d) Cargoes:

(i) Code and Safe Practice for Bulk Cargoes.

(ii) Dangerous Goods Code.

(iii) Grain.

(iv) Other Codes relating to ships carrying specialised cargoes.

(A detailed technical knowledge is not required).

(e) (i) Reporting casualties and the findings of inquiries.

(ii) Reporting of sub-standard ships.

(f) Pollution—agreements on pollution.

2. Health.

(a) International agreements and measures to prevent the spread of disease by shipping.

(b) International organisation for medical advice at sea.

(c) International arrangements for medical assistance at sea.

3. Other international agreements and conventions affecting shipping.

4. Commercial.

(a) (i) Marine Insurance Act—an understanding of the content and meaning.

(ii) York-Antwerp Rules—a knowledge of the rules.

(iii) Hague—Visby Rules—a knowledge of the rules.

(b) Hague Rules—a general knowledge of the rules relating to the carriage of goods by sea.

Section B

1. South African legislation resulting from the international agreements in Section A.

2. Merchant Shipping Act and related legislation as applied to:

(a) Crew:

(i) The engagement and discharge of seamen;

(ii) the terms and conditions of their employment;

(iii) offences and discipline;

(iv) allotments and advances;

(v) complaints procedure;

(vi) manning and certification.

(b) General:

(i) Investigations, inquiries and courts;

(ii) prosecution of offences;

(iii) detention of unseaworthy ships;

(iv) wreck and salvage.

3. South African legislation relating to—

(a) pollution of the atmosphere;

(b) safe working conditions aboard ships.

PAPER 2—MARINE ENVIRONMENTAL STUDIES

Section A

1. Meteorology:

The meteorological elements, weather systems, weather forecasting, as outlined in Government publications. In addition the following will be examined in some depth:

(i) Adiabatic processes, lapse rates and stability.

(ii) Coriolis- en middelpuntvliedende effekte; geostrofiese windvergelyking; vortisiteit; straalstrome; atmosferiese sirkulasie.

(iii) Frontogenese en frontolise.

2. Oseanografie:

(i) Algemene kenmerke van die oseane. Bodemtopografie.

Aard van die seebedding. Kuslyne en strande.

(ii) Fisiese eienskappe van seewater. Ligbinnedringing en kleur van die see.

3. See-opname:

Die opnametegnieke betrokke by die onderwerpe wat in Afdeling 1 beskryf is.

(i) Beheer.

(ii) Posisiebepaling.

(iii) Seismiese en sonarprofilering.

(iv) Seebeddingmonsterneming.

3. Getyteorie:

Algemene kennis van—

(a) kragte wat die gety laat styg—die ewewigsgety, moderne getyteorie;

(b) die aarde se getye—

(i) Hul klassifikasie en hul belangrikste harmoniese komponente; Ontledings- en voorspellingsmetodes;

(ii) Die bepaling van die gemiddelde seevlak;

(iii) Die vasstelling van verwysingspunte langs kuslyne;

(iv) Die keuse van plekke vir getymetings;

(v) Die gebruik van newegetykaarte;

(vi) Getystrome en hulle meting;

(c) seismiese en meteorologiese stuwings, wiegings, vloedgolwe en verwante verskynsels, seisoens- en langtermynveranderinge in gemiddelde seevlak.

4. Seebesoedeling deur skepe.

Algemene kennis van die uitwerking op die omgewing en die internasionale beheermetodes met betrekking tot die volgende besoedelingsbronne:

(a) Olie.

(b) Skadelike stowwe.

(c) Rioolwater.

(d) Afval.

(e) Hittebalans van die oseane. Verspreiding van soutgehalte, temperatuur en digtheid. Watermassas.

(f) Oorsake van seestrome. Oppervlak- en onderoppervlaksirkulasies.

(g) Ysvorming en -verwering. Verspreiding en beweging van ys.

Afdeling B

1. Bronne van die see.

(a) Visvangs:

(i) Tipes vis, geografiese ligging van visgronde; bewaring van bronne.

(ii) Moderne bodem- en diepseevisvangmetodes.

(iii) Fabrieksvaartuie.

(iv) Seevisboerdery.

(b) Minerale:

(i) Metodes om minerale uit seewater te ekstraheer.

(ii) Ontsoutingsprosesse.

(iii) Sand- en gruisbaggering.

(iv) Ekstrahering van minerale uit die seebedding, en ondersese mynbou.

(c) Olie en gas:

(i) Tipes boortorings; boorskepe; boorplatforms; produksieplatforms; bergingsfasiliteite en tipes skeepstasies.

(ii) Algemene idees oor boorwerk.

(iii) Pyplêwerk en die gebruik van duikbote.

(d) Krag:

Algemene idees oor die benutting van energie uit die see; getykragsentrales.

DEEL B

VRAESTEL 3—VLOOTARGITEKTUUR

Afdeling A

1. Die toepassing van Simpson se reëls by die bepaling van oppervlakte middelpunt, transversale en longitudinale tweede oppervlaktemoment, volumes en drukkingspunt. Benaderde posisie van die drukkingspunt, byvoorbeeld die Morrish-Formule. Die Bonjean-krommes. Vloeistofdruk op plat- en geboë oppervlakke.

(ii) Coriolis and centrifugal effects; geostrophic wind equation; vorticity; jet streams; atmospheric circulation.

(iii) Frontogenesis and frontolysis.

2. Oceanography:

(i) General characteristics of the seas. Bottom topography. Nature of the sea bed. Coastlines and beaches.

(ii) Physical properties of sea water. Light penetration and colour of the sea.

2. Sea Surveying:

The techniques of surveying involved in the appreciation of the topics outlined in Section 1.

(i) Control.

(ii) Position fixing.

(iii) Seismic and sonar profiling.

(iv) Sea-bed sampling.

3. Tidal Theory:

A general knowledge of—

(a) tide raising forces—the equilibrium tide, modern tidal theory;

(b) the earth's tides—

(i) their classification and principal harmonic components; methods of analysis and prediction;

(ii) determination of mean sea level;

(iii) establishment of datums along coasts;

(iv) selection of sites for tide gauges;

(v) the use of co-tidal charts;

(vi) tidal streams and currents and their measurement;

(c) seismic and meteorological surges, seiches, bores and related phenomena, seasonal and long term changes in mean sea level.

4. Pollution of the sea by ships.

A general knowledge of the effects on the environment and the methods of international control for the following sources of pollution:

(a) Oil.

(b) Noxious substances.

(c) Sewage.

(d) Garbage.

(e) Heat budget of the oceans. Distribution of salinity, temperature and density. Water masses.

(f) Causes of ocean currents. Surface and sub-surface circulations.

(g) Ice formation and decay. Distribution and movement of ice.

Section B

1. Marine resources.

(a) Fishing:

(i) Types of fish, geographical location of fishing grounds; conservation of resources.

(ii) Modern demersal and pelagic fishing methods.

(iii) Factory vessels.

(iv) Marine fish-farming.

(b) Minerals:

(i) Methods of extracting minerals from sea water.

(ii) Desalination processes.

(iii) Sand and gravel dredging.

(iv) Extraction of minerals from the sea-bed and sub-sea mining.

(c) Oil and gas:

(i) Types of drilling rigs; drill ships; wellheads; production platforms; storage facilities and types of sea terminal.

(ii) General ideas on drilling.

(iii) Pipe-laying and the use of submersibles.

(d) Power:

General ideas on harnessing energy from the sea, tidal power stations.

PART B

PAPER 3—NAVAL ARCHITECTURE

Section A

1. The application of Simpson's Rules to the determination of area, centre of area, transverse and longitudinal second moment of areas, volumes and centre of buoyency. Approximate position of the centre of buoyancy, e.g. Morrish's formula. Bonjean curves. Fluid thrust on plane and curved surfaces.

Drukmiddelpunt.

2. Transversale stabiliteit. Stabiliteit teen smal slagsyhoeke. Die afdeling $BM_T = I/V$. Die uitwerking van die verskuiwing van gewigte hanggewigte; die uitwerking van vry oppervlak, met inbegrip van onderverdeling van tenks en kruisverbinde tenks. Stabiliteit teen groot slagsyhoeke. Die begrip regbringmoment. Die beperking van GM as stabiliteitsmaatstaf. Die uitwerking van die verskuiwing van gewigte en vry oppervlak op die statiesestabiliteitkromme. Die bepaling van regbringmomente, kruisstabiliteitskrommes, die gebruik van die rekenaar. Die formule vir loodregte sye en sy beperkings. Teorie van selfregbringreddingsbote. Dinamiese stabiliteit, definisie en bepalingsmetode. Oorblywende dinamiese stabiliteit en die gebruik daarvan by die bepaling van die vermoë van 'n skip om gevaarlike situasies die hoof te bied, byvoorbeeld 'n swaargewig oor die kant van die skip. Windvlae, die uitwerking van golwe en die samedromming van passasiers. Die uitwerking van vry trim op die dinamiese stabiliteit.

3. Oorlangse stabiliteit. Die afleiding $BM_L = I/V$. Trim. Ware gemiddelde diepgang. Verandering in diepgang weens 'n verandering in digtheid. Laaiprobleme.

4. Oorstroming van skepe. Die uitwerking van statiese en dinamiese stabiliteit. Slagsy- en trimhoeke as gevolg van onsimmetriese oorstroming. Die toepassing op kasvormige en skeepsvormige vaartuie.

5. Droogdokking van skepe. Algemene voorsorgmaatreëls en probleme betreffende blokdrukke, die uitskop van blokke, gelaaide skepe, trim en verandering van stabiliteit. Stranding. Kennis in breë trekke van die vloedvereistes en berekenings met betrekking tot drywende droogdokke.

6. Tewaterlating. Probleme van tewaterlating vanaf 'n sleephelling, afloopglyspoor, slee, sleestutte; die tot stilstand bring van 'n skip, byvoorbeeld sleepkettings. Die tewaterlatingsdiagram.

7. Spanning en vervorming. Eenvoudige buigteorie, profielmodulus, toepassing op eenvoudige balke en op skepe. Spanning en vervorming op 'n skip wanneer dit in stil water en in 'n seegang is. Murray se metode. Die gebruik van las-, skuifkrag- en buigmomentkrommes. Berekenings in verband met kasvormige vaartuie. Spanningsaanwysers.

8. 'n Omvattende kennis van die gebruik van alle soorte hidrostatiese, stabiliteits- en spanningsdata wat aan alle tipes skepe, met inbegrip van behoueringskepe, verskaf word; LNG/LPG, vissersvaartuie en baggerskepe.

9. maneuvrering en skeepsbewegings. Skeepsmaneuvrering- en afgemetemylproefvaarte. Evaluering van stuurkenmerke en die toepassing daarvan op die ontwerp van die romp en roer. Slagsyhoek wanneer die skip draai. Die uitwerking van vlakwater op maneuvrering. Interaksie. Skeepsbewegings algemene begrip van golwe en die begrip van die seegang. Die ses vryheidsgrade van 'n skip, die definisie en oorsaak van elke skeepsbeweging.

Die uitwerking van skeepsbewegings op die stabiliteit en veiligheid van die vaartuig, die omslaan van skepe as gevolg van 'n dwarssee, 'n meesee en 'n see vanuit die windveer. Metodes om 'n skip se bewegings te verminder.

10. Vibrering van 'n skip. Algemene kennis van 'n skip se struktuurvibrasies. Die voorkoming en vermindering van vibrasie.

Afdeling B

Ontwerpveiligheid

Algemene begrip van die ontwerpkenmerke wat bydra tot die veiligheid van die volgende tipes vaartuie:

(a) Passasiers- en motorveerbote.

(b) A- en B-tipe skepe.

(c) Tenkskepe.

(d) Chemikalieë tenkskepe.

(e) VSG- en VPG-skepe.

(f) Behoueringskepe.

(g) Baggerskepe.

(h) Skeertuie.

(i) Kussingtuie.

(j) Duikbote.

(k) Kernskepe.

(dit wil sê onderverdeling, brandbeskerming, vryboord, isolering, tenkbestryking, behoueringstelsels en gespesialiseerde vraghanteringstelsels waar van toepassing.)

VRAESTEL 4—NAVIGASIEHULPMIDDELS

Kennis van elektroniese kringe word nie vereis nie

1. Standlyne. Die teorie van standlyne. Die uitwerking van waarnemingsfoute met betrekking tot standlyne en posisiebepalings. Die statistiese behandeling van foute. Die wiskundige teorie van hiperbole en die hiperboliese kruisnet.

2. Hiperboliese stelsels. 'n Volledige begrip van die beginsels, kenmerke, akkuraatheid en foute wat met hiperboliese stelsels vir skeepvaart gepaard gaan. Decca, Loran en Omega. Kortafstandhoënoukeurigheidstelsels. Karteer- en registreertoerusting.

Centre of pressure.

2. Transverse Stability. Stability at small angles of heel. The derivation of $BM = I/V$. The effect of shift of weights, suspended weights, free surface effects, including subdivision of tanks and cross connected tanks. Stability at large angles of heel. Concept of righting moment and excitation moment. Limitation of GM as stability criterion. Effect of shift of weights and free surface on the curve of statical stability. Determination of righting moments, cross curves of stability, computer applications. The wallsided formula and its limitations. Theory of self righting lifeboats. Dynamical stability, definition and method of determination. Residual dynamical stability and its use in determining the ability of the ship to survive given dangerous situations, e.g. heavy lift over the side, wind gusts, wave effects and passenger crowding. The effect of free trim on dynamical stability.

3. Longitudinal Stability. Derivation of $BM_L = I/V$. Trim. True mean draught. Change in draught due to change in density. Loading problems.

4. Flooding of Ships. Its effect on statical and dynamical stability. Resulting heel and trim angles to unsymmetrical flooding. Application to box-shaped and ship-shaped vessels.

5. Drydocking of Ships. General precautions and problems concerning block pressures, tripping of blocks, loaded ships, trim and change of stability. Grounding. An outline knowledge of the flooding requirements and calculations relating to floating docks.

6. Launching. Problems of launching from a slipway, launchways, cradle, poppets, stopping of the ship, e.g. drag chains. The launching diagram.

7. Stress and Strain. Simple bending theory, section modulus, application to simple beams and to ships. Stresses and strains on a ship when in still water and in a seaway.

Murray's method.

The use of load, shearing force and bending moment curves.

Calculations relating to box-shaped vessels. Stress indicators.

8. A comprehensive knowledge of the use of all kinds of hydrostatic stability and stress data supplied to all types of vessels including container ships, LNG/LPG, fishing vessels and dredgers.

9. Manoeuvring and ship motions. Ship's measured mile and manoeuvring trials. Evaluation of steering characteristics and application to the design of hull and rudder. Angle of heel when turning. Shallow water effects on manoeuvring. Interaction. Ship motions. A general appreciation of waves and the concept of the seaway. The six degrees of freedom of a ship, the definition and cause of each ship motion.

The effect of ship motions on the stability and safety of the vessel, capsizing of ships due to beam seas and following and quartering seas. Methods of reducing ship motions.

10. Ship vibration. A general knowledge of ship structural vibration. The prevention and reduction of vibration.

Section B

Safety in design

A general understanding of the design features contributing to the safety of the following types of vessel:

(a) Passenger and car ferries.

(b) Type A and B ships.

(c) Tankers.

(d) Chemical carriers.

(e) LNG/LPG ships.

(f) Container ships.

(g) Dredgers.

(h) Hydrofoils.

(i) Hovercraft.

(j) Submersibles.

(k) Nuclear ships.

(i.e. subdivision, fire protection, freeboard, insulation, tank coatings, containment systems and specialised cargo handling systems where applicable.)

PAPER 4—NAVIGATIONAL AIDS

A knowledge of electronic circuits shall not be required

1. Position lines. Theory of position lines. Effects of observational errors in position lines and fixes. Statistical treatment of errors. Mathematical theory of hyperbolae and the hyperbolic lattice.

2. Hyperbolic systems. A full understanding of the principles, characteristics, accuracy and errors associated with marine hyperbolic systems. Decca, Loran and Omega. Short range high accuracy systems. Plotting and recording equipment.

3. Radiorigtingbepaling. Beginsels en kenmerke. KSB- en digitale presentasie. Radiobakens en bakens met draaiende patrone.

4. Snelheids-, afstands- en dieptemeetinstrumente. Eggololoders Skeepsjoernale. Aanlêhulpmiddels. Toepassing van die doppler-beginsel.

5. Skeepsradar. Basiese beginsels en die praktiese gebruik daarvan. Kenmerke van moderne radarstelsels. Sekondêre radar, met inbegrip van Racon en Ramark. Botsingvoorkomingstelsels uitstipmetodes. Die gevolge van uitsitpfoute. 'n Ontleding van ongevalle waarby radar 'n rol gespeel het.

6. Satellietnavigasie. Basiese teorie en praktiese gebruik.

7. Geïntegreerde navigasiestelsels. Basiese beginsels en praktiese gebruik.

8. Navorsing en ontwikkeling. Kennis in breë trekke van ander stelsels wat nog in 'n stadium van ontwikkeling is, byvoorbeeld:

(a) Laserstrale.

(b) Infrarooitegnieke.

(c) Akoestiese-antwoordsenders vir duikbote.

(d) Splitstraalkanaalnavigasiestelsels.

(e) Skeepsidentifikasie.

(f) Dinamiese standstelsels.

(g) Leikabels.

9. Tolkompas. 'n Volledige teoretiese en praktiese begrip van kommersiële tolkompasse in algemene gebruik. Die basiese teorie en praktiese gebruik van inerte navigasiestelsels.

VRAESTEL 5—NAVIGASIE

Afdeling A

1. (a) Dieper insig in die beginsels van navigasie word vereis as vir die laer grade.

(b) Die eienskappe van boldriehoeke.

(c) Foute in astronomiese aardwaarnemings en standlyne en posisiebepalings.

(d) Kepler se wette.

(e) Die helderheid van sterre.

(f) Gekoördineerde universele tyd.

(g) Die inhoud van die verkorte seemansalmanak.

(h) Die teorie van die sekstant, korreksies en foute in sekstante.

(i) Geosentriese en geografiese breedtegraad.

(2) Die berekening en toepassing van die formules wat gebruik word vir—

(a) meridiaanherleidingstafels;

(b) poolstertafels;

(c) A-, B- en C-tafels;

(d) veranderingstempo's van asimut en hoogte;

(e) maksimum en meridiaanhoogtes;

(f) vergroting van die maan se halwe middellyn;

(g) parallaks;

(h) aardrefraksie;

(i) duiking en afstand van see- en kushorisonte.

3. Die teorie en 'n algemene begrip van die eienskappe van die volgende:

(a) Merkatorprojeksie.

(b) Transversale merkatorprojeksie.

(c) Gnomoniese projeksie.

(d) Ortomorfiese keëlprojeksie van Lamberts.

(e) Stereografiese projeksie.

4. Voorkoming van botsings:

(a) Botsingvoorkomings- en maneuvreerstelsels.

(b) Roetebepalingstelsels.

(c) Verkeersbeheerorganisasie.

5. Soek- en- reddingswerk.

(a) Prosedures.

(b) Patrone.

(c) Stipwerk.

Afdeling B

1. 'n Volledige teoretiese en praktiese begrip van die oorsake van deviasie van die magnetiese kompas, met inbegrip van toestande van geen deviasie en praktiese regstellingsmetodes.

2. Die statutêre voorskrifte en inhoud van skeepvaartkennisgewings betreffende die voorsiening, plasing en onderhoud van skeepskompasse, en die plasing van ander toerusting in die omgewing.

3. Radio direction finding. Principles and characteristics. CRT and digital presentation. Radio beacons and rotating pattern beacons.

4. Velocity, distance and depth measuring instruments. Echo sounders. Logs. Berthing aids. Applications of Doppler principle.

5. Marine radar. Basic principles and practical use. Characteristics of modern radars. Secondary radar including Racon and Ramark. Collision avoidance systems. Plotting methods. Effects of errors in plotting. Analysis of casualties involving radar.

6. Satellite navigation. Basic theory and practical use.

7. Integrated navigation systems. Basic principles and practical use.

8. Research and development. An outline knowledge of other systems under development for example:

(a) Laser beams.

(b) Infra-red techniques.

(c) Submarine acoustic transponders.

(d) Split beam channel guidance systems.

(e) Ship indentification.

(f) Dynamic positioning systems.

(g) Leader cables.

9. Gyro compass. A full theoretical and practical understanding of commercial gyro compasses in common use. The basic theory and practical use of inertial navigation systems.

PAPER 5—NAVIGATION

Section A

1. (a) A deeper understanding of the principles of navigation shall be required than for the lower grades.

(b) The properties of spherical triangles.

(c) Errors in astronomical terrestrial observations and position lines and fixes.

(d) Kepler's laws.

(e) Stellar magnitudes.

(f) Co-ordinated universal time.

(g) The content of the abridged nautical almanac.

(h) The theory of the sextant, corrections and errors in sextants.

(i) Geocentric and geographic latitude.

2. Derivation and application of the formulae used for—

(a) ex-meridian tables;

(b) pole star tables;

(c) A, B and C tables;

(d) rates of changes of azimuth and altitude;

(e) maximum and minimum altitudes;

(f) augmentation of the moon's semi-diameter;

(g) parallax;

(h) terrestrial refraction;

(i) dip and distance of the sea and shore horizons.

3. The theory and a general appreciation of the properties of the following projections:

(a) Mercator.

(b) Transverso Mercator.

(c) Gnomonic.

(d) Lamberts—conical orthomorphic.

(e) Stereographic.

4. Collision avoidance:

(a) Collision avoidance and manoeuvring systems.

(b) Routeing systems.

(c) Traffic control organisation.

5. Search and rescue:

(a) Procedures.

(b) Patterns.

(c) Plotting.

Section B

1. A full theoretical and practical understanding of the causes of deviation at the magnetic compass including conditions of no deviation and methods of practical correction.

2. The statutory requirements and contents of M notices concerning the provision, siting, and maintenance of ship's compasses, and the siting of other equipment in the vicinity.

3. Magnetiese sendkompas en magnetiese tolkompas.

4. Die teorie van degaussering in skepe.

AANHANGSEL O

(SIEN REGULASIE 3.7)

KURSUS IN ELEKTRONIESE NAVIGASIESTELSELS

OPLEIDING IN DIE GEBRUIK VAN RADAR- EN ANDER ELEKTRONIESE NAVIGASIETOERUSTING

ALGEMEEN

Hierdie aanhangsel dek die vereistes vir opleiding in die operasionele gebruik van radar- en elektroniese navigasietoerusting, en die vereistes vir die toekenning van sertifikate.

1. Die kursus in elektroniese navigasiestelsels en die gepaardgaande eksamen vervang die kursusse vir radarwaarnemer met ingang van 1 Junie 1984.

2. Die navigasiebeheerkursus vervang die radarsimulatorkursus met ingang van 1 Junie 1984.

KURSUS IN ELEKTRONIESE NAVIGASIESTELSELS

Mikpunt

Die mikpunt van die kursus is om die leerlingoffisier toe te rus met die basiese kennis en vaardighede wat nodig is om die elektroniese navigasiestelsels waarmee S.A. skepe gewoonlik toegerus is te bedien en om gebruik te maak van die inligting wat voorsien word om die pligte van 'n brugwagoffisier by ontvangs van 'n eerste Bekwaamheidsertifikaat te onderneem.

Einddoel

Aan die einde van die opleiding moet die opleideling in staat wees om sy pligte, soos in die spesifikasie aangedui as Aanhangsel A, doeltreffend te verrig en om die inligting wat van elektroniese navigasietoerusting verkry word aan te wend vir die veilige navigasie van die skip.

Opleidingsplan

Die hele opleidingskursus bestaan uit die progressiewe stadiums wat voltooi word gedurende die twee vernaamste kollege-opleidingstydperke en die tussentydperk seediens, in die goedgekeurde opleidingskema volgens die opleidingspesifikasies aangeheg by Aanhangsel B.

Die leerplan van die ENS-kursus is geïntegreer met en aanvullend by die verwante navigasiestudies in die hoofopleidingskursus. Minstens 120 uur word gedurende die kollege-opleidingstydperke aan die ENS-kursus gewy. So nie kan die kursus in die geval van persone wat Bekwaamheidsertifikate buite die goedgekeurde beplande opleidingskemas wil verwerf, aangebied word as 'n voltydse blok wat 150 uur duur.

Leerplan

Die leerplan vir die kursus is aangeheg by Aanhangsel C.

Aanbieding van die kursus

Die onderlinge verwantskap tussen en die veilige gebruik van alle navigasiemetodes is die grondbeginsel van die kursus.

Praktiese opleiding is noodsaaklik omdat dit die student in sy rol as waghou-offisier bedrewe maak in die hantering van spesifieke toerustingitems.

In die laaste stadiums van die kursus word daar van simulasie gebruik gemaak by oefeninge wat die studente ondervinding laat opdoen van werklike radarstipwerk en die gebruik van radar vir deurlopende posisiemonitering. Sulke oefenige moet egter verband hou met die basiese begrippe van botsingvoorkomings- en navigasietegnieke, en nie met ingewikkelde oefeninge wat meer onder die navigasiebeheerkursus tuishoort nie.

Toerusting

Die toerustingspesifikasie vir die kursus is by Aanhangsel D aangeheg.

Eksamens en beoordeling

Die vordering van studente moet in elke stadium van die kursus beoordeel word en in aanmerking geneem word as deel van die finale eksamen. Die eksamen wat aan die einde van die kursus afgelê word, bestaan uit die konstruksie en vertolking van radarstippings gevolg deur 'n mondelinge/praktiese toets waarin gebruik gemaak word van toerusting wat by die kollege geïnstalleer is.

Vereistes vir die beoordeling van en toelating tot die afneem van eksamens is by Aanhangsel E aangeheg.

Sertifikate

'n Sertifikaat in Elektroniese Navigasiestelsels, uitgereik deur die Departement van Vervoer, word deur die kollege toegeken aan opleidelinge wat die volle kursus bevredigend gevolg het en in die eindeksamen geslaag het.

3. Transmitting magnetic and gyro-magnetic compasses.

4. The theory of degaussing in ships.

ANNEXURE O

(SEE REGULATION 3.7)

ELECTRONIC NAVIGATION SYSTEMS COURSE

TRAINING IN THE USE OF RADAR AND OTHER ELECTRONIC NAVIGATION EQUIPMENT

GENERAL

This annexure covers requirements for training and certification in the operational use of radar and electronic navigation equipment.

1. The Electronic Navigation Systems course and its related examination shall replace the Radar Observer courses as from 1 June 1984.

2. The Navigation Control course shall replace the Radar Simulator course as from 1 June 1984.

ELECTRONIC NAVIGATION SYSTEMS COURSE

Aim

The aim of the course shall be to equip the trainee officer with the fundamental knowledge and skills needed to operate electronic navigational systems commonly fitted in S.A. ships and to use the information presented to undertake the duties of a bridge watch-keeping officer on receipt of a first Certificate of Competency.

Objective

At the end of the training, the trainee should be able to perform competently the duties shown in the specification as Annex 'A' and use the information obtained from electronic navigation equipment for the safe navigation of the ship.

Training plan

The complete course of training has been designed in three progressive stages for completion during the two main college based phases and the intervening period of sea service in the approved training scheme in accordance with the training specification attached at Annex B.

The ENS course syllabus shall be integral with and complementary to the related navigational sudies in the main course of training. At least 120 hours shall be devoted to the ENS course during the college based phases. Alternatively, for persons seeking Certificates of Competency outside the approved schemes of planned training, the course may be run as a full time block of 150 hours duration.

Syllabus

The syllabus for the course is attached at Annex C.

Conduct of the course

The inter-relationship and safe use of all methods of navigation shall be the keynote throughout the course.

Practical training shall be an essential feature to enable the student to acquire and demonstrate proficiency in the operation of specific items of equipment in relation to his role as a watch-keeping officer.

In the latter stages of the course simulation shall be used for exercises which give students experience of real-time radar plotting and the use of radar for continuous position monitoring. Such exercises shall, however, be related to the basic concepts of collision avoidance and navigational techniques, and not to complex exercises more appropriate to the Navigation Control Course.

Equipment

The equipment specification for conduct of the course is attached at Annex D.

Examination and assessments

The progress of students shall be assessed at each stage of the course and be taken into account as part of the final examination. The examination held at the end of the course shall consist of the construction and interpretation of radar plots followed by an oral/practical test using equipment installed at the college.

Requirements for assessment and for entry to and conduct of the examination are attached at Annex E.

Certificates

A Department of Transport Electronic Navigation Systems Certificate shall be awarded by the college to trainees who satisfactorily attend the complete course and who are successful in the terminal examination.

Goedkeuring

Die kursus word aangebied ooreenkomstig die bepalings van hierdie Aanhangsel. Die personeel wat met onderrig gemoeid is, moet deur die Direkteur-generaal goedgekeur word. Die kursus en eksamen is oop vir inspeksie deur beamptes van die Departement van Vervoer ten einde te verseker dat algemene standaarde gehandhaaf word.

Approval

The course shall be conducted in accordance with the provisions of this Annexure. Staff involved in teaching shall be approved by the Director-General. The course and examination shall be open to inspection by officers of the Department of Transport to ensure that common standards are maintained.

SUBAANHANGSEL A VAN DIE ENS-LEERPLAN

Vaardigheid-/Kennisspesifikasie vir die opleiding in elektroniese navigasietoerusting

Werkvereiste	*Vaardigheid*	*Kennis*
	Die volgende paragrawe moet almal ingelui word deur die woorde: "Die offisier moet in staat wees....."	
1. Om rigtingpeilings en standlyne te verkry en aan te teken	1. om geskikte radiobakens te kies en te identifiseer; om die D/F (rigtingsoeker) op te stel en in die hand- of outomatiese modus op 'n geselekteerde radiobaken of op 'n noodfrekwensie in te skakel; om 'n peiling van 'n sendstasie te verkry en om gepaste regstellings te maak; om peilings en standlyne op 'n navigasiekaart uit te stip	1. Die basiese beginsels van radiopeilers (RDF). Beskrywing van radiopeilontvangers in gebruik ter see. Die oorsake en uitwerking van ionosfeergolwe, die halfsirkelfout, kwadrantfout en kuseffek. Kalibrering. Toepassing van halfkonvergensie. Akkuraatheid, afstand en ander beperkings van RDF. Gebruik daarvan vir aanpeiling op 'n ongeval. Doel van die Admiraliteit se lys van radioseine, Volume II.
2. om eggoloders te gebruik	2. om tipiese eggolodingstoerusting te bedien en die inligting op die vertoonterminaal korrek te vertolk	2. Die basiese beginsels van Skeepseggoloders. Tipes in gebruik ter see. Die vernaamse komponente van veeldoelnavigasie-eggolodingstoerusting. Voorsorgmaatreëls wat getref moet word by die gebruik daarvan en die akkuraatheid wat verlang word.
3. om die skip se posisie vas te stel deur van hiperboliese navigasiestelsels gebruik te maak:		3. Die basiese beginsels van hiperboliese navigasie. Die verskil tussen stelsels wat gebruik maak van die meting van tydsverskil en van faseverskil.
(a) Decca-navigator.....	(a) om die toepaslike Decca-navigatorketting te kies; om die toerusting te bedien; om die inligting op die vertoonterminaal korrek te vertolk; om regstellings en toelatings vir vaste en veranderlike foute aan te bring; om Decca-koördinate op 'n Decca-kaart uit te stip ten einde die skip se posisie te bepaal; om die verwagte akkuraatheid te bepaal	(a) Beskrywing van die Decca-navigatorstelsel en -ontvangers in gebruik aan boord skepe. Dekkingsgebiede en Decca-kaarte. Vertolking van instruksies in die Decca-handboek. Oorsprong en oorsake van foute. Die gebruik van Decca-datavelle.
(b) Loran C.....	(b) om die toepaslike Loran-ketting te kies; om die Loran-ontvanger te bedien; om die inligting op die vertoonterminaal korrek te vertolk; om foutregstellings toe te pas; om Loran-koördinate uit te stip ten einde posisie te bepaal; om verwagte akkuraatheid vas te stel	(b) Beskrywing van die Loran-stelsel en tipiese ontvanger in gebruik aan boord skepe; oorsprong en oorsake van foute; regstellings en verwagte akkuraatheid. Dekkingsgebied en Loran-kaarte.
(c) Omega.....	(c) om die toepaslike Omega-stasies te kies; om 'n Omega-ontvanger te bedien; om die inligting op die vertoonterminaal korrek te vertolk; om foutregstellings toe te pas; om Omega-data uit te stip ten einde posisie te bepaal; om die verwagte akkuraatheid te bepaal	(c) Beskrywing van die basiese Omega-stelsel en ontvangers in gebruik aan boord skepe. Oorsprong en oorsake van foute. Die gebruik van voortplantingskorreksietafels. Posisionele akkuraathede. Dekkingsgebied en Omega-kaarte.
4. om die skip se posisie te bepaal deur van satellietnavigasietoerusting gebruik te maak	4. om die ontvanger te bedien; om die posisie uit te stip; om die verwagte akkuraatheid te bepaal	4. Basiese beskrywing en beginsels van die satellietnavigasiestelsels. Tipiese ontvangers in gebruik aan boord skepe. Oorsprong en oorsake van foute. Regstellings en verwagte akkuraatheid. Dekkingsgebied.
5. om basiese radartoerusting te bedien.....	5. om kontroles aan te skakel en in te stel vir 'n optimale beeld; om die werkverrigting van toerusting na te gaan; om die kontroles te verstel ten einde 'n optimale beeld te behou; om waninstelling van die kontroles te kan raaksien; om die afstande en peilings van teikens te meet	5. Beskrywing van basiese seeradarinstallasie. Identifikasie van kontroles en die basiese beginsels van radar.
6. om die radarstel as 'n navigasiehulpmiddel te gebruik.....	6. om peilings en/of afstande te verkry en die posisie van die skip te bepaal; om parallelindekstegnieke vir deurlopende posisiemoniterings te gebruik	6. Opsporing en herkenning van teikens. Oorsprong van foute in verkreë posisies. Die gebruik van radar vir navigasie in beperkte vaarwater of kuswaters, met inbegrip van paralleleindekstegnieke.
7. om radar te gebruik om botsings te vermy	7. om 'n radarwaghoudiens in stand te hou deur inligting van die vertoonterminaal te verkry of deur van radaruitstiphulpmiddels gebruik te maak; om potensieel gevaarlike teikens te identifiseer; om 'n botsingrisiko te takseer en om die uitwerking te beoordeel van veranderings in eie en/of ander vaartuie se koers en spoed in voorgenome botsingvoorkomingsmaneuvers; om inligting te rapporteer	7. Beginsels en konstruksie van 'n radarstipping. Die gebruik van uitstiphulpmiddels. Die gebruik van 'n stipping om inligting oor teikens te verkry. Die beoordeling van 'n botsingrisiko. Die uitwerking van die verandering van koers en spoed met betrekking tot die voorkoming van 'n botsing. Radarrapporteringsprosedures. Die toepassing van die Botsingsregulasies in beperkte sig.
8. om outomatiese radaruitstiphulpmiddels te gebruik.....	8. om toerusting aan te skakel en op te stel; om die kontroles te verstel ten einde 'n optimale beeld te behou; om 'n stipping te behou deur teikens outomaties of met die hand te verkry; om inligting wat vertoon word te vertolk en reg te beoordeel; om inligting te rapporteer	8. Die beskrywing en beginsels van die werking van ARPA-toerusting. Die werkverrigting en akkuraatheid van die stelsel. Vertoonpersentasie. Kontroles, vermoëns van die stelsel en inligtingsfasiliteite.

SUB-ANNEXURE A TO ENS SYLL

Skill/Knowledge Specification for electronic navigational equipment training

Job requirement	*Skill*	*Knowledge*
	The following paragraphs should all be prefaced by the words "The officer should have the ability to....."	
1. Obtain and plot D/F bearings and position lines	1. Select and identify suitable radio beacons. Set up and tune, in manual or automatic mode, the D/F to a selected radio beacon or to a distress frequency. Obtain a bearing of a transmitting station and apply appropriate corrections. Plot bearings and position lines on a navigational chart	1. Basic principles of radio direction finders (FDF). Description of D/F receivers in use at sea. The causes and effects of sky waves, semi-circular error, quadrantal error and coast effect. Calibration. Application of half convergency. Accuracy, range and other limitations of RDF. Use for "homing on" to casualty. Purpose of the Admiralty list of radio signals Volume II.
2. Use echo sounders	2. Operate typical echo sounding equipment. Correctly interpret the information on the display	2. Basic principles of ship-born echo sounders. Types in use at sea. The principal components of general purpose navigational echo sounding equipment. Precautions to be observed in use and accuracy to be expected.
3. Obtain the ship's position using hyperbolic navigation systems:		3. Basic principles of hyperbolic navigation. The difference between systems which utilise the measurement of time difference and of phase difference.
(a) Decca navigator	(a) Select the appropriate Decca navigator chain. Operate the equipment. Interpret information shown on the display. Apply corrections and allowances for fixed and variable errors. Plot Decca co-ordinates on a Decca Chart to obtain the ship's position. Determine expected accuracy	(a) Description of the Decca navigator system and receivers in use aboard ships. Coverage areas and Decca charts. Interpretation of instruction notes in the Decca Manual. Sources and causes of errors. Use of Decca data sheets.
(b) Loran C.....	(b) Select the appropriate Loran chain. Operate Loran receiver. Interpret correctly the information on the display. Apply error corrections. Plot Loran co-ordinates to fix position. Determine expected accuracy.	(b) Description of the Loran system and typical receiver in use aboard ships; sources and causes of errors; corrections and expected accuracy. Coverage area and Loran charts.
(c) Omega.....	(c) Select the appropriate Omega stations. Operate an Omega receiver. Interpret correctly the information on the display. Apply error corrections. Plot Omega data to fix position. Determine expected accuracy	(c) Description of the basic Omega system and receivers in use aboard ships. Sources and causes of errors. Use of propagation correction tables. Positional accuracies. Coverage area and Omega charts.
4. Obtain the ship's position using satellite nagivational equipment	4. Operate the receiver. Plot the position. Determine expected accuracy	4. Basic description and principles of the satellite navigation systems. Typical receivers in use aboard ships. Sources and causes of errors. Corrections and expected accuracy. Coverage areas.
5. Operate basic radar equipment	5. Switch on and set controls for optimum display. Check performance of equipment. Adjust operational control to maintain optimum display. Recognise maladjustment. Measure ranges and bearings of targets	5. Description of basic marine radar installation. Identification of controls and basic principles of radar.
6. Use the radar set as an aid to navigation	6. Obtain bearings and/or ranges and fix position of the ship. Use parallel index techniques for continuous position monitoring	6. Detection and recognition of targets. Sources of errors in positions obtained. Use of radar for navigation in confined or coastal water including parallel index techniques.
7. Use radar for collision avoidance	7. Maintain a radar watch by obtaining information from the display or by using radar plotting devices; identify potentially dangerous targets; appraise collision risk and assess effects of alterations in own and/or other vessel's course and speed in proposed collision avoidance manoeuvres; report information	7. Principles and contruction of a radar plot. Use of plotting aids. Use of plot to obtain information about targets. Assessment of collision risk. Effect of alteration of course and speed in relation to collision avoidance. Radar reporting procedures. Application of collision regulations in restricted visibility.
8. Use automatic radar plotting aids	8. Switch on and set up equipment; adjust operational controls to maintain optimum display; maintain plot using automatic and manual acquisition of targets; interpret and appreciate information displayed; report information	8. Description and principles of operation of ARPA equipment. System performance and accuracy. Display presentation. Controls, system capabilities and information facilities.

SUBAANHANGSEL B BY ENS-KURSUSSPESIFIKASIE

Opleidingspesifikasie

Stadium A—Eerste kollegefase.

Stadium B—Tweede seefase.

Stadium C—Finale kollegefase.

Vaardigheid/Kennis Verwysing (Aanhangsel 'A')	*Stadium van opleileiding*	*Metode*
1.2.3 (a), 3 (b)	A	Prakties en teorie.
	B	Prakties ter see.
	C	Hersiening.
3 (c), 4	B	Prakties ter see.
	C	Prakties en teorie.
5	A	Teorie.
	B	Prakties ter see.
	C	Prakties en teorie.
6	B	Observasie ter see.
	Ca	Prakties en teorie.
	b	Radarsimulator oefeninge.

SUB-ANNEXURE B to ENS course specification

Training specification.

State A—First college phase.

Stage B—Second sea phase.

Stage C—Final college phase.

Skill/Knowledge Reference (Annex 'A')	*Stage of training*	*Method*
1.2.3 (a), 3 (b)	A	Practical and theory.
	B	Practice at sea.
	C	Revision.
3 (c), 4	B	Practical at sea.
	C	Practical and theory.
5	A	Theory.
	B	Practice at sea.
	C	Practical and theory.
6	B	Observation at sea.
	Ca	Practical and theory.
	b	Radar simulator exercises.

Vaardigheid/Kennis Verwysing (Aanhangsel 'A')	*Stadium van opleileiding*	*Metode*
7	B	Observasie ter see.
	C	Prakties en teorie, met inbegrip van simulator oefeninge wat betrekking het op basiese radarstipwerk en posisiemonitering.
8	B	Observasie ter see.
	C	Prakties en teorie.

SUBAANHANGSEL

C by ENS-kursusspesifikasie

KURSUS EN ELEKTRONIESE NAVIGASIESTELSELS

ALGEMENE RIGLYNE EN LEERPLAN

Opsomming

Stadium A

Die doel van hierdie stadium van die opleiding is om die leerlingoffisier bewus te maak van die basiese werkbeginsels van die elektroniese navigasietoerusting en om hom te leer hoe om hierdie toerusting te bedien sodat hy noukeurige inligting aan die brugwaghouspan kan verstrek gedurende die daaropvolgende seefase van die beplande opleidingskemas.

Stadium B

Gedurende die tydperk seediens tussen die kollegefases behoort die leerlingoffisier hom toe te spits op die konsolidering van die vaardighede en kennis wat gedurende Stadium A verwerf is, deur onder toesig gebruik te maak van al die radar- en navigasiehulptoerusting aan boord van die skip (skepe) waarop die seediens verrig word.

Stadium C

Die doel van hierdie stadium is om 'n wyer begrip van navigasiestelsels, sowel as insig in die akkuraatheid, beskikbaarheid, beperkings en die gebruik van navigasie-instrumente teen die agtergrond van algemene vereistes vir navigasie te ontwikkel.

Verwante studies

In die geval van opleidelinge wat opleidingskemas in fases volg, word die ENS-kursusleerplan gedek tesame met die verwante praktiese navigasieafdeling van die hoofstroom van die opleiding.

Let ook op dat die Afdeling Toegepaste Wetenskap van die Klas 3-leerplan, wat oor WS-teorie en die beginsels van radio handel as nuttige agtergrondmateriaal vir die studie van radiopeiling en hiperboliese stelsels dien, en dat wanneer hulle voltooi is, die twee studievelde 'n geïntegreerde geheel behoort te vorm.

Amptelike publikasies

Van opleidelinge word verwag om kennis te dra van die huidige amptelike publikasies wat betrekking het op die gebruik van radar- en ander navigasietoerusting, met inbegrip van die volgende.

(i) Die Botsingsregulasies tans van krag.

(ii) handelskeepvaartkennisgewings.

(iii) Handelskeepvaart (Navigasietoerusting)—regulasies.

(iv) Die Seeradarprestasiespesifikasie.

(v) Die ARPA-prestasiespesifikasie.

(vi) Verslae van Seehowe van Ondersoek, wat betrekking het op veilige navigasie.

Gevallestudies

Inligting oor die gebruik of misbruik van toerusting na aanleiding van werklike voorvalle verkry, dien as 'n waardevolle bron wat dwarsdeur die kursus gebruik word.

Die aandag word in hierdie verband gevestig op die *Marine Navigation Casualty Reports* wat deur die International Chamber of Shipping, 30/32 St Mary Axe, London EC 3A 8ET gepubliseer word.

Praktiese oefeninge

Praktiese oefeninge is 'n basiese kenmerk van die kursus. Hulle word so ontwerp dat die student in staat gestel word om sy vermoë te toon om die toerusting te bedien en die inligting wat verkry is korrek te gebruik soos in die spesifikasie van subaanhangsel A aangedui. In die laaste stadiums van die kursus word simulasie gebruik om studente oefening te gee in radaruitstipwerk en die gebruik van radar vir deurlopende posisiemonitering. Die leerplan van ARPA-toerusting dek, word in hierdie stadium, sover dit waghou-offisiere betref, indringend genoeg behandel en neem die student se betreklik beperkte praktiese ondervinding ter see in aanmerking.

Leerplan

Gaan van die veronderstelling uit dat al die doelwitte wat hierna volg, voorafgegaan word deur die woorde "Die verwagte resultaat van die studies is dat die student in staat moet wees tot die volgende: .....".

Skill/Knowledge Reference (Annex 'A')	*Stage of training*	*Method*
7	B	Observation at sea.
	C	Practical and theory including simulator exercises relating to basic radar plotting and position monitoring.
8	B	Observation at sea.
	C	Practical and theory.

SUB-ANNEXURE

C to ENS course specification

ELECTRONIC NAVIGATION SYSTEMS COURSE

GENERAL GUIDELINES AND SYLLABUS

Summary

Stage A

The objective of this stage of the training is to enable the trainee officer to be aware of the basic principles of operating of the various electronic navigational equipments and to operate these equipments so that he can provide accurate information to the bridge watch-keeping team during the succeeding sea phase of the planned scheme of training.

Stage B

During the period of sea service between the college-based phases the trainee officer should aim to consolidate the skills and knowledge acquired during Stage A by using, under supervision, all the radar and navigational aid equipment fitted aboard the ship(s) in which the sea service is performed.

Stage C

The objective of this stage is to develop a wider appreciation of navigational systems, together with an understanding of the accuracy, availability, limitations and use of navigational instruments in the context of overall requirements for navigation.

Related studies

For trainees following phased training schemes, the ENS course syllabus shall be covered in conjunction with the related practical navigation section of the main stream of training.

It should also be noted that the Applied Science Section of the Class 3 syllabus, concerned with AC Theory and Principles of Radio forms useful background material to the study of Radio Direction Finding and Hyperbolic Systems and when completed, the two areas of study should form an integrated whole.

Official publications

Trainees shall be expected to have a knowledge of current official publications which are related to the use of radar and other navigational equipment including the following:

(i) The Collision Regulations currently in force.

(ii) Merchant Shipping Notices.

(iii) Merchant Shipping (Navigational Equipment) Regulations.

(iv) Marine Radar Performance Specification.

(v) Automatic Radar Plotting Aids Performance Specification.

(vi) Reports of Courts of Marine Enquiry relevant to safe navigation.

Case studies

Information about the use or misuse of equipment derived from actual incidents in the form of case studies provides a valuable resource which shall be used throughout the course.

In this connection, attention is drawn to the Marine Navigation Casualty Reports published by the International Chamber of Shipping, 30/32 St Mary Axe, London EC 3A BET.

Practical exercises

Practical exercises are an essential feature of the course. They shall be designed to enable the student to demonstrate ability to operate equipment and correctly use the information obtained as indicated in the specification at Sub Annexure 'A'. In the latter stages of the course, simulation shall be used for exercises which give students experience of real-time radar plotting and the use of radar for continuous position monitoring. The depth of treatment of the syllabus covering ARPA equipment shall, at this stage, be appropriate to the role of watch-keeping officer and take account of the students relatively limited practical experience at sea.

Syllabus

It should be assumed that each of the objectives hereunder is prefaced by the words "The expected learning outcome is that the student .....".

SUB-AANHANGSEL C

Stadium A—Kollegefase

A.1 Beskryf rig-, spoed- en afstandinstrumente soos volg:

1.1 Beskryf hoe die hooftolkompas in staat is om 'n vaste rigting aan tewys.

1.2 Beskryf die tolkompas antwoordbaken en beskryf die aanvanklike instellings- en noukeurigheidstoetse.

1.3 Beskryf hoe om 'n peiling te maak om vir tolkompasfout te toets en hoe om 'n fout te benoem en toe te pas.

1.4 Beskryf hoe antwoordbakens koersinligting herlei na bruginstrumente-, radar, radiorigtingsoeker, outomatiese roerganger, rigtingaantekenaar, ensovoorts.

1.5 Beskryf uitkoersalarms.

1.6 Beskryf hoe die magnetiese kompas gestel kan word om voortdurend 'n vaste rigting aan te wys.

1.7 Beskryf hoe om 'n peiling te maak om die magnetiese kompas te toets, en hoe om die fout te benoem en toe te pas.

1.8 Beskryf 'n magnetiese sendkompas en verduidelik hoe koersinligting na bruginstrumente herlei word.

1.9 Bespreek metodes om die afstand wat gevaar is asook die snelheid deur die water te bepaal.

1.10 Beskryf die tipes sleepspoed- en onderwaterspoed- en onderwaterafstandinstrumente, met inbegrip van Doppler-tipes.

Posisiebepalingstelsel

A.2 *Lewer bewys van kennis van die basiese beginsels van hiperboliese navigasies, soos volg:*

2.1 Gee die definisie van 'n hiperbool.

2.2 Trek 'n hiperboolpatroon rondom twee fokuspunte met die basislyn verdeel in 'n eksakte getal gelyke verdelings.

2.3 Verstaan die begrippe van bane.

2.4 Toon hoe dubbelsinnigheid ontstaan wanneer die twee fokuspunte radiostasies is wat gelyktydig seine uitsend.

2.5 Verwyder dubbelsinnigheid deur die toepassing van 'n tydsvertraging.

2.6 Omskryf 'n grondlynuitbreidingsgebied.

2.7 Verklaar waarom die hiperbool/hiperbole se akkuraatheid in die grondlynuitbreidingsgebied verminder.

2.8 Kombineer twee hiperboolpatrone om die metode van posisievasstelling te illustreer.

2.9 Beskryf hoe 'n hiperboolpatroon (-bane) geproduseer kan word tussen twee stasies wat op dieselfde frekwensie uitsaai en 'n eksakte getal golflengtes uit mekaar is met die seine wat in fase begin.

2.10 Beskryf hoe faseverskille gebruik kan word om hiperboliese standlyne tussen twee volle bane vas te stel en te trek.

2.11 Beskryf hoe tydverskil gebruik kan word om intermediêre hiperboliese standlyne tussen twee volle bane vas te stel en te trek.

A.3 Lewer bewys van die vermoë om die Decca-navigator te bedien, soos volg:

3.1 Beskryf die basiese Decca-navigatorstelsel.

3.2 Meld die radiusse van dekkingsbediede.

3.3 Identifiseer die "Decca"-kaart en die bykomende inligting wat in druk daarop verskyn.

3.4 Vertolk die instruksies in die Decca-handboek.

3.5 Stel 'n Decca-ontvanger op vir 'n bekende posisie.

3.6 Stel 'n Decca-ontvanger op deur middel van baanidentifikasieseine.

3.7 Beskryf ander tipes Decca-ontvangers as dié in A.3.5 in gebruik op skepe.

3.8 Verkry Decca-koördinate van die Decca-ontvanger.

3.9 Gebruik datavelle om vastefoutkorreksies en toelating vir veranderlike foute te vind en toe te pas.

3.10 Stel die posisie vas deur data wat van die Decca-ontvanger verkry is, te stip.

3.11 Demonstreer interkettingposisiebepalingstegnieke.

3.12 Gee 'n opsomming van die inhoud van die handelskeepvaartkennisgewings wat betrekking het op die gebruik van die Decca-navigator.

A.4 Lewer bewys van die vermoë om posisiebepalings te doen deur gebruik te maak van Loran-koördinate

4.1 Beskryf die tipes Loran C-ontvangers in gebruik ter see.

4.2 Identifiseer die Loran-kaart en die bykomende inligting wat daarop verskyn.

4.3 Stel die posisie vas deur die uitstip van Lorankoördinate, met inagneming van moontlike foute soos op die Loran-kaart aangedui.

SUB-ANNEXURE C

Stage A—College Phase

A.1 *Describes heading, speed and distance instruments as follows:*

1.1 Describes how the master gyro is able to point in a fixed direction.

1.2 Describes the gyro repeater and discusses the initial setting and accuracy checks.

1.3 Describes how to take a bearing to check for gyro error and how to name and apply the error.

1.4 Describes how repeaters relay heading information to bridge instruments—radar, radio direction finder, automatic helmsmen, course recorder, etc.

1.5 Describes off-course alarms.

1.6 Describes how the magnetic compass is enabled to point constantly in a fixed direction.

1.7 Describes how to take a bearing to check the magnetic compass, and how to name and apply the error.

1.8 Describes a transmitting magnetic compass and how heading information is relayed to bridge instruments.

1.9 Discusses methods of calculating distance steamed and speed through the water.

1.10 Describes types of towed and submerged speed and distance instruments, including Doppler types.

Position fixing systems

A.2 *Demonstrates a knowledge of the basic principles of hyperbolic navigation as follows:*

2.1 States the definition of a hyperbola.

2.2 Draws a hyperbolic pattern around two foci with the base line divided into an exact number of equal divisions.

2.3 Understands the concepts of lanes.

2.4 Shows how ambiguity occurs when the two foci are radio stations transmitting simultaneous signals.

2.5 Removes ambiguity by application of a time delay.

2.6 Defines base-line extension area.

2.7 Explains why the hyperbolae/s have reduced accuracy in the base line extension area.

2.8 Combines two hyperbolic patterns to illustrate the method of ascertaining position.

2.9 Describes how a hyperbolic pattern (lanes) can be produced between two stations transmitting on the same frequency and an exact number of wave-lengths apart with the signals starting in phase.

2.10 Describes how phase difference can be used to ascertain and draw intermediate hyperbolic position lines between two whole lanes.

2.11 Describes how time difference can be used to ascertain and draw intermediate hyperbolic position lines between two whole lanes.

A.3 *Demonstrates the ability to operate the Decca Navigator as follows:*

3.1 Describes the basic Decca Navigator system.

3.2 States the radii of coverage areas.

3.3 Identifies the "Decca" chart and the additional information printed thereon.

3.4 Interprets the instructional notes in the Decca Manual.

3.5 Sets up a Decca receiver for a known position.

3.6 Sets up a Decca receiver by lane identification signals.

3.7 Describes types of Decca receivers, other than that in A.3.5 in use on ships.

3.8 Obtains Decca co-ordinates from the Decca receiver.

2.9 Uses data sheets to find and apply fixed-error corrections and allowances for variable errors.

3.10 Fixes position by plotting data obtained from the Decca receiver.

3.11 Demonstrates inter-chain fixing techniques.

3.12 Summarises the contents of the Merchant Shipping Notices relating to the use of the Decca Navigator.

A.4 *Demonstrates the ability to fix positions using Loran co-ordinates:*

4.1 Describes types of Loran C receiver in use at sea.

4.2 Identifies the "Loran" chart and the additional information presented thereon.

4.3 Fixes position by plotting Loran co-ordinates taking account of possible errors as indicated on the Loran chart.

A.5 *Toon begrip van die basiese beginsels van rigtingbepaling en toon die vermoë om radiorigtingsoekers te bedien, soos volg:*

5.1 Beskryf die basiese beginsels van radiorigtingsoekers.

5.2 Noem die voordele van 'n radiorigtingsoeker aan boord.

5.3 Beskryf die voorsiening van radiobakens oor die hele wêreld.

5.4 Beskryf hoe 'n radiorigtingsoeker gebruik word om op 'n ongeval aan te peil.

5.5 Gee die pooldiagram van die spanning wat onwikkel word in die lusantenne wanneer dit in die kragveld van 'n sender geroteer word.

5.6 Verduidelik dat die minimum sein voorkom wanneer 'n lusantenne reghoekig met die voortplantingsrigting is.

5.7 Maak 'n waarneming van die peiling van 'n sein wat deur 'n ossillator in die rigtingsoeker ingevoer word.

5.8 Gee die pooldiagram van die spannings wat in die oordantenne in die sendveld ontwikkel word.

5.9 Kombineer die pooldiagramme van die spannings wat gelyktydig in die lusantenne en die oordantenne ontwikkel word en so 'n hartvormige diagram gee.

5.10 Verduidelik hoe die minimum sein die voortplantingsrigting aandui wanneer die oordantenne in werking is.

5.11 Beskryf die Bellini-Tosi-stelsel en die werking van die soekspoel.

5.12 Maak radiopeilings (deur 'n oordantenne) van 'n nabygeleë sender of nabootssein.

5.13 Beskryf hoe foute veroorsaak word deur interaksie tussen die voortgeplante golf en heruitstraling van die skip se struktuur af.

5.14 Verduidelik hoe residu foute van 13 uitgestip word om 'n ykkromme te produseer.

5.15 Beskryf foute in die rigting van die voortgeplante sein deur oorsake buite die skip, die uitwerking van ionosfeergolf en kuseffek- en bespreek metodes om die uitwerkings van hierdie foute tot die minimum te beperk.

5.16 Beskryf die metode om die koersinligting wat deur die tolkompas aan die rigtingsoeker voorsien word in te voer en te toets.

5.17 Begryp inligting betreffende radiobakens, wat in die Admiraliteit se lys van radioseine, Volume II, voorkom.

5.18 Ontvang seine van eksterne of nagebootste radiobakens.

5.19 Maak waarnemings van die peile van spesifieke radiobakens, ekstern of nageboots.

5.20 Pas die korreksie van die ykkromme verkry toe op die relatiewe peiling.

5.21 Sit verbeterde relatiewe peiling om 'n grootsirkelpeiling.

5.22 Bespreek halfkonvergensieverbetering en pas dit toe.

5.23 Verkry mercatorpeiling.

5.24 Stip mercatorpeiling uit op die kaart.

A.6 Toon begrip van die basiese beginsels van eggoloding en toon die vermoë om 'n eggolood soos volg te bedien.

6.1 Beskryf die basiese beginsels van 'n ultrasoniese see-eggoloder.

6.2 Noem die aanvaarde waarde van die snelheid van klank in seewater en die grense waar binne die werklike waarde mag lê.

6.3 Noem die fisiese faktore wat die snelheid van klank in seewater beïnvloed.

6.4 Vergelyk die frekwensies wat in ultrasoniese eggolode gebruik word met dié van hoorbare klank.

6.5 Teken 'n blokdiagram van 'n eggolood en noem die funksies van die onderskeie komponente.

6.6 Bedien 'n tipiese eggolood, en toon die vermoë om gebruikersonderhoud uit te voer, byvoorbeeld vervang papier, verstel of vervang die stilus, ensoorts.

6.7 Onderskei tussen "afstand" en "fase" en toon bewustheid van die gevare van die gebruik van die verkeerde fase.

6.8 Onderskei tussen onnoukeurighede veroorsaak deur instrument- en skaalfout en dié wat deur "vals eggo's" veroorsaak word.

6.9 Verduidelik die oorsake van onnoukeurighede as gevolg van instrument- of skaalfout, sê hoe groot hulle moontlik kan wees en meld watter maatreëls getref kan word om hulle uit te skakel.

6.10 Herken die verskillende tipes "vals eggo's" wat aangetref word, beskryf hulle vorming en noem die moontlike optrede om hulle van die spoor af te verwyder.

Radar

A.7 *Beskryf die metode waarvolgens 'n radarinstallasie inligting versamel en dit op 'n visuele skerm vertoon, soos volg:*

7.1 Verduidelik die eggobeginsel en die toepassing daarvan op radarpulse.

7.2 Identifiseer die komponente van 'n eenvoudige blokdiagram van 'n radarinstallasie.

A.5 *Demonstrates an understanding of the basic principles of direction finding and the ability to operate Radio Direction Finders as follows:*

5.1 Describes the basic principles of radio direction finders.

5.2 States the advantages of having a radio direction finder on board.

5.3 Describes the provision of radio beacons throughout the world.

5.4 Describes the use of a radio direction finder for homing on to a casualty.

5.5 Produces the polar diagram of the voltage set up in a loop aerial when it is rotated in the force field of a transmitter.

5.6 Explains that the minimum signal occurs when a loop aerial is at right angles to the direction of propagation.

5.7 Observes the bearing of a signal fed into the direction finder by an oscillator.

5.8 Produces the polar diagram of the voltages set up in the sense aerial in the transmitter field.

5.9 Combines the polar diagrams of the voltages set up simultaneously in the loop and sense aerials to produce a cardioid diagram.

5.10 Explains how the minimum signal indicates the direction of propagation when the sense aerial is in operation.

5.11 Describes the Bellini-Tosi system and operation of the search coil.

5.12 Takes radio bearings (using sense) of an adjacent transmitter or simulated signal.

5.13 Describes how errors are caused by interaction between the propagated waves and re-radiation from the ship's structure.

5.14 Explains how residual errors from 13 are plotted to produce a calibration curve.

5.15 Describes errors produced in the direction of the propagated signal by causes external to the ship—sky wave and coastal refraction effects—and discusses methods of minimising the effects of these errors.

5.16 Describes the method of setting and checking the heading information supplied to the direction finder from the gyro compass.

5.17 Understands information regarding Radio Beacons supplied in Admiralty List of Radio Signals Volume II.

5.18 Receives signals from external or simulated radio beacons.

5.19 Observes the bearings of specific radio beacons, external or simulated.

5.20 Applies correction from calibration curve to relative bearing.

5.21 Converts corrected relative bearing to great circle bearing.

5.22 Discusses and applies half-convergency correction.

5.23 Obtains mercatorial bearing.

5.24 Plots mercatorial bearing on chart.

A.6 *Demonstrates an understanding of the basic principles of echo sounding and the ability to operate an echo sounder as follows:*

6.1 Describes the basic principles of a marine ultrasonic echo-sounder.

6.2 States the accepted value of the velocity of sound in sea water and the limits within which the true value may lie.

6.3 States the physical factors which affect the velocity of sound in sea water.

6.4 Compares the frequencies used in ultrasonic echo-sounders with the frequency of audible sound.

6.5 Draws a block diagram of an echo sounder and states the function of the various components.

6.6 Operates a typical echo-sounder, and demonstrates an ability to carry out user maintenance e.g. change paper, adjust or change stylus, etc.

6.7 Distinguishes between "range" and "phase" and demonstrates an awareness of the dangers of using the wrong phase.

6.8 Distinguishes between inaccuracies caused by instrument and scale error and those caused by "false echoes".

6.9 Explains the causes of inaccuracies due to instrument or scale error, states their likely magnitude and such measures that may be taken to eliminate them.

6.10 Recognises the various types of "false echo" that may be found, describes their formation and states the possible action to remove them from the trace.

Radar

A.7 *Describes the method by which a radar installation gathers information and presents it on a visual display as follows:*

7.1. Explains the echo principle and its application to radar pulses.

7.2 Identifies the components on a simple block diagram of a radar installation.

7.3 Beskryf die baan wat deur 'n enkele radarpuls vanaf die sender na die teiken gevolg word.

7.4 Beskryf die baan van 'n terugkerende eggo deur die ontvanger tot by die toepassing daarvan in die CRT.

7.5 Beskryf die metode waarvolgens 'n CRT 'n eggo op die korrekte afstand en peiling vertoon.

7.6 Identifiseer die radarhorison en die faktore wat die afstand van die waarnemer af beïnvloed.

7.7 Begryp die veiligheidsmaatreëls wat nodig is in die nabyheid van oop toerusting en die bestralingsgevaar naby antennes en oop golfleiers.

A.8 *Toon die vermoë om kontroles so te stel dat 'n optimale vertoning van teikens verkry word, soos volg:*

8.1 Noem die korrekte aanskakelveiligheidsmaatreëls en -prosedures.

8.2 Identifiseer 'n skip se boeg bo-, noord bo- en warebewegingvoorstelling en bring die vertoning in lyn met 'n spesifieke metode.

8.3 Toon die korrekte stelling vir helderheid, versterking en instemkontrole. Herken waninstelling.

8.4 Onderskei tussen die funksies van die seesteuringseggo- en neerslagkontroles en toon hulle korrekte instelling.

8.5 Beskryf 'n prestasiemoniteringsprosedure in breë trekke en toon hoe dit gebruik word.

8.6 Begryp die funksies van die oorblywende kontroles en demonstreer die gebruik van afstand- en peilingmetingskontroles en -rapporteringsprosedures.

8.7 Herken radareggo's en toon begrip van die faktore wat die vertolking van 'n beeld affekteer, bv. skadusektore, radar-tot-radarsteuring en ander indruiseggo's.

A.9 *Beskryf die navigasie-inligting wat deur radar verskaf word en die praktiese toepassing daarvan, soos volg:*

9.1 Identifiseer die oorsprong van foute in die akkuraatheid van radarafstande.

9.2 Identifiseer die oorsake van foute in die akkuraatheid van radarpeilings.

9.3 Toon die vermoë om die skip se posisie te bepaal deur die uitstip van afstande en/of peilings.

9.4 Vergelyk die kaart en PPI vir opvallende radarteikens.

9.5 Beskryf die voorkoms van radarbakens en radarpeilbakens op radarskerms.

9.6 Toon begrip van navigasie-parallelindekstegnieke en van die praktiese gebruik daarvan.

A.10 *Beskryf die gebruik van radar as 'n hulpmiddel om botsings te voorkom, soos volg:*

10.1 Beskryf die beginsels van relatiewe en ware radaruitstippings.

10.2 Stip 'n opeenvolging van posisiebepalings uit as 'n relatiewe stipping, lei die werklike koers en spoed van 'n teiken af en voorspel die CPA en TCPA.

10.3 Beoordeel die belangrikheid van die kennis van die voorkoms van 'n teiken.

10.4 Beskryf die voordele van die gebruik van 'n radarreflektoruitstipper.

10.5 Herken die faktore wat by doeltreffende radarwaghouding betrokke is.

Stadium B—Tweede seefase

Gedurende die seediens tussen die kollegefases, ontvang die leerlingoffisier praktiese ondervinding in die volgende toerusting waar dit geïnstalleer is:

Decca-navigator.

Loran C.

Omega.

Satellietnavigator.

Rigtingsoeker.

Eggolood.

Radar.

Outomatiese radaruitstiphulpmiddels (ARPA).

Die volgende oefeninge word uitgevoer onder toesig van een van die skip se navigasie-offisiere.

1. Die uitstip van radardata om die volgende te verkry:

(a) Die skip se posisie op die kaart;

(b) die koers, spoed, voorkoms, CPA en TCPA van 'n skip se teikens.

2. Die bediening van die skip se eggoloodtoerusting om lodings te verkry, en die vergelyking daarvan met die gekarteerde diepte van die water.

7.3 Describes the path followed by a single radar pulse from transmitter to target.

7.4 Describes the path followed by a returning echo through the receiver to its application to the CRT.

7.5 Describes the method by which a CRT displays an echo at the correct range and bearing.

7.6 Identifies the radar horizon and the factors affecting the distance from the observer.

7.7. Understands the safety precautions necessary when in the vicinity of open equipment and the radiation hazards near antennae and open waveguides.

A.8 *Demonstrates an ability to set controls to obtain an optimum display of targets as follows:*

8.1 States the correct switching-on safe-guards and procedures.

8.2 Identifies ship's Head Up, North Up and true motion presentation and aligns the display to a specific mode.

8.3 Demonstrates the correct adjustment of brilliance, gain and tuning controls. Recognises maladjustment.

8.4 Distinguishes the functions of the sea clutter and precipitation controls and demonstrates their correct adjustment.

8.5 Outlines a performance monitoring procedure and demonstrates its use.

8.6 Understands the functions of the remaining controls and demonstrates the use of range and bearing measurement controls and reporting procedures.

8.7 Recognises radar echoes and appreciates factors affecting the interpretation of a display e.g. shadow sectors, radar-to-radar interference and other spurious echoes.

A.9 *Describes the navigational information provided by radar and its practical application as follows:*

9.1 Identifies the sources of error in the accuracy of radar ranges.

9.2 Identifies the causes of error in the accuracy of radar bearings.

9.3 Demonstrates the ability to fix the ship's position by plotting ranges and/or bearings.

9.4 Compares the chart and PPI for radar conspicious targets.

9.5 Describes the appearance of Racons and Ramarks on radar screens.

9.6 Demonstrates an understanding of and the practical use of navigational parallel index techniques.

A.10 *Describes the use of radar as an aid to collision avoidance as follows:*

10.1 Describes the principles of relative and true radar plots.

10.2 Plots a succession of fixes as a relative plot, derives the true course and speed of target and predicts the CPA and TCPA.

10.3 Appreciates the value of the knowledge of aspect of a target.

10.4 Describes the benefits of the use of a radar reflection plotter.

10.5 Recognises the factors involved in efficient radar watch-keeping.

Stage B—Second sea phase

During the sea service between the college based phases, the trainee officer shall obtain practice on the following equipment where fitted:

Decca navigator.

Loran C.

Omega.

Satellite navigator.

D/F.

Echo sounder.

Radar.

Automatic Radar Plotting Aids (ARPA)

The following exercises shall be conducted under the supervision of one of the ship's navigation officers:

1. Plotting of radar data to obtain—

(a) the ship's position on the chart;

(b) the course, speed, aspect, CPA and TCPA of ship's targets.

2. Operation of the ship's echo-sounder equipment to obtain soundings and their comparison with the charted depth of water.

3. Dit uitstip van koördinate verkry van minstens een van die hiperboliese navigasietoerustingitems wat hierbo gelys is.

4. Die aanteken van D/F-peilings tesame met berekenings ten einde die relevante ware peilings te verkry.

5. Bediening van die toerusting om die inligting wat in 1 tot 3 vereis word, te verkry.

Die leerling se rekordboek moet geëndosseer word in die betrokke afdeling wanneer die oefeninge tot tevredenheid van die betrooke offisier(e) voltooi is.

By die bepaling van die hoeveelheid praktiese opleiding wat vereis word, moet rekening gehou word met die beoordeling wat aan die einde van Stadium A van die kursus deur die kollege gemaak is.

Die oefeninge word waar moontlik in samehang met verwante oefeninge in navigasieprosedures onderneem.

Dit is met die oog op die bevordering van die leerlingoffisier se navigasievaardighede van die uiterste belang dat data van elektroniese navigasietoerusting verkry is waar moontlik altyd volgens ander metodes nagegaan moet word.

Die gevare van navigasie wanneer daar staat gemaak word op karige of onbevestigde inligting moet beklemtoon word. In hierdie verband moet die leerlingoffisier waar moontlik 'n junior posisie in die brugwaghouspan inneem.

Stadium C—Kollegefase

Posiesiebepalingstelsels

C.1 *Hersiening en uitbreiding van stelsels waarin daar van hiperboliese navigasietegnieke gebruik gemaak word.*

1.1 Hersien die basiese beginsels van verkrygingstelsels waarin gebruik gemaak word van die meting van die faseverskil- en tydverskiltegniek.

1.2 Noem die belangrike navigasiestelsels waarin daar gebruik gemaak word van die meting van die faseverskil- en tydverskiltegniek.

C.2 *Die Decca-stelsel.*

2.1 Hersien "How the Decca System Works" (Appendix 4, Decca Operating Instruction, of soortgelyk).

2.2 Beskryf die periodieke verbreding van die patroon om baanidentifikasieseine asook die seinvolgorde vir die multipulsketting te voorsien.

2.3 Beskryf die gebruik van baanidentifikasieseine om diskrimineerders op te stel wanneer die dekking binnegegaan word of by aanskakeling binne die dekkingsgebied.

2.4 Beskryf die uitwerking van ionosfeergolfsteuring.

2.5 Beskryf werking by toestande van 'n swak sein en/of hoë geraas.

2.6 Bespreek die moontlik oorsake van foutiewe baanaanwysing.

2.7 Beskryf die gevare van die gebruik van Decca-gange as bane.

2.8 Hersien die akkuraatheid en foute van die stelsel en inligting deur die seedatakaarte voorsien.

2.9 Verduidelik die belangrikheid van foute en die waarskunlikheidsfaktor van die akkuraatheid van die posisie wat verkry is.

2.10 Meld die waarskuwings wat vir kettingwanfunksionering voorsien word.

2.11 Demonstreer metodes vir die opstel en bediening van Decca-ontvangers.

2.12 Verkry Decca-koördinate en bepaal posisie deur middel van datauitstipwerk.

2.13 Verkry Decca-koördinate deur interkettingvasstelling en stip data uit om posisie te bepaal.

C.3 *Die Loran-stelsel.*

3.1 Hersien die produksie van 'n hiperboliese patroon voortspruitend uit verspringende pulse tussen hoof- en slaafstasies.

3.2 Definieer pulsherhaalfrekwensie, herhalingsinterval en tydsdeling.

3.3 Beskryf die koersmeting van tydsverskil en prestasie deur 'n Loran-ontvanger.

3.4 Beskryf die siklusvergelykingsomhulling deur die Loran C-ontvanger geproduseer.

3.5 Beskryf die ontvangs van grond- en ionosfeergolwe deur die Loran-ontvanger en die voordele van laefrekwensietransmissies.

3.6 Dui gebiede aan waar gemengde ionosfeer- grondseine of beide ionosfeerseine ontvang sal word en beskryf die uitstipprosedure.

3.7 Beskryf die akkuraatheid van die stelsel en moontlike foute.

3.8 Beskryf die funksies van die kontroles van 'n half outomatiese Loran-ontvanger.

3.9 Beskryf 'n ten volle outomatiese Loran-ontvanger.

3.10 Verkry Loran-koödinate en stel die posisie vas op die Loran-kaart terwyl moontlike foute in aanmerking geneem word.

3. The plotting of co-ordinates obtained from at least one of the hyperbolic navigation equipments listed above.

4. A record of D/F bearings together with calculations to obtain the relevant true bearings.

5. Operation of the equipment to obtain the information required in 1 to 3.

The trainee's record book shall be endorsed in the relevant section when the exercises have been completed to the satisfaction of the officer(s) concerned.

The amount of practical training required shall take into account the assessment recorded by the college at the end of Stage A of the course.

The exercises shall be undertaken whenever possible in conjunction with related practice in navigational procedures. It is vitally important in promoting the trainee officer's navigational skills that data obtained from electronic navigational equipment shall, wherever possible, be checked by other methods. The hazards of navigating by reliance on scanty or unverified information shall be stressed. In this respect the trainee officer shall occupy a junior position in the bridge watch-keeping team wherever possible.

Stage C—College phase

Position fixing systems

C.1 *Revision and extension of systems employing hyperbolic navigation techniques.*

1.1 Revises the basic principles of obtaining systems which utilise the measurement of phase-difference and time-difference techniques.

1.2 States the important navigational systems which utilise the measurement of phase-difference and time-difference techniques.

C.2 *The Decca system.*

2.1 Revises "How the Decca System Works" (Appendix 4 Decca Operating Instruction or similar).

2.2 Discusses the periodic broadening of the pattern to provide lane identification signals and the signalling sequence for the multi-pulse chain.

2.3 Describes the use of lane identification signals to set up the decometers on entering coverage or on first setting up within coverage.

2.4 Describes the effect of sky wave inteference.

2.5 Discusses operation under conditions of low signal and/or high noise.

2.6 Discusses possible causes of lane slip.

2.7 Describes dangers of using Decca lanes as tracks.

2.8 Revises accuracy and errors of system and information provided by the marine data charts.

2.9 Explains the significance of errors and the probability factor of the accuracy of the position obtained.

2.10 States the warnings provided for chain malfunction.

2.11 Demonstrates methods of setting up and operating Decca receivers.

2.12 Obtains Decca co-ordinates and fixes position by plotting data.

2.13 Obtains Decca co-ordinates by inter-chain fixing and plots data to fix position.

C.3 *The Loran system.*

3.1 Revises the production of a hyperbolic pattern resulting from staggered pulses between master and slave stations.

3.2 Defines pulse repetition frequency, recurrence interval and time sharing.

3.3 Describes the course measurement of time difference and performance by a Loran receiver.

3.4 Describes the cycle matching envelope produced by the Loran C receiver.

3.5 Describes the reception of ground and sky waves by the Loran receiver and the advantages of low frequency transmissions.

3.6 Indicates areas where mixed sky/ground signals or both sky waves signals would be received and describes procedure for plotting.

3.7 Describes the accuracy of the system and possible errors.

3.8 Describes the functions of the controls on a semi-automatic Loran receiver.

3.9 Describes a fully automatic Loran receiver.

3.10 Obtains Loran co-ordinates and fixes position on the Loran chart taking account of possible errors.

C.4 Die Omega-stelsel.

4.1 Beskryf Omega as 'n wêreldwye faseverskilstelsel en dui die posisie van senders aan.

4.2 Begryp die voordele van die voortplanting van baielaefrekwensieradiogolwe.

4.3 Begryp die voordele van 'n lang basislyn.

4.4 Beskryf die produksie van die hiperboliese kruisnet tussen 'n stasiepaar.

4.5 Beskryf tydsdeling en die Omega-stasies se seinformaat.

4.6 Begryp die uitwerking van die lae laag geïoniseerde BLF-radiogolwe en die daelikse en seisoensvariasies wat daaruit voortspruit.

4.7 Toon die vermoë om korreksietabelle te gebruik.

4.8 Bespreek die akkuraatheid van Omega-seine.

4.9 Bespreek voortplantingsanomalieë en die uitwerking van die sein-tot-geraasverhouding.

4.10 Identifiseer die Omega-kaart en die bykomende inligting wat daarop vertoon word.

4.11 Toon die vermoë om die gepaste stasiepare te selekteer en om 'n Omega-ontvanger voor vertrek op te stel.

4.12 Toon die vermoë om Omega-aflesings wat onderweg geneem is te korrigeer.

4.13 Beskryf metodes om die ontvanger onderweg op te stel.

4.14 Verduidelik waarom dit nodig mag wees om die Synch-stasie onderweg te verander en meld die prosedure wat gevolg moet word.

4.15 Verduidelik waarom dit nodig mag wees om die LOP-stasie onderweg te verander en meld die prosedure wat gevolg moet word.

4.16 Beskryf die gebruik en werking van 'n LOP-opnemer.

4.17 Beskryf die opsporing van foutiewe baanaanwysing en die korreksie daarvan.

4.18 Beskryf voorsorgmaatreëls naby een sender.

4.19 Beskryf differensiaal-Omega.

4.20 Beskryf outomatiese posisie-aanduitoestelle gebaseer op die ontvangs van Omega-seine.

4.21 Toon kennis van navigasiewaarskuwings wat op Omega betrekking het.

4.22 Gee 'n opsomming van die inhoud van die handelskeepvaartkennisgewings wat verband hou met Omega.

C.5 Toon begrip van posisiebepaling deur navigasiesatelliete.

5.1 Beskryf die algemene kenmerke van 'n navigasiesatelliet.

5.2 Beskryf die bane van satelliete.

5.3 Beskryf die rol van opspoor- en invoerstasies.

5.4 Beskryf die inligting wat deur 'n Transit-satelliet uitgesend word.

5.5 Beskryf hoe die geïntegreerde Doppler-differensiefrekwensies wat van 'n Transit-satelliet ontvang is tesame met kennis van twee satellietposisies, 'n hiperboloïed of revolusie kan afbaken.

5.6 Beskryf hoe twee of meer sulke hiperboloïede gekombineer kan word om 'n waarnemersposisie aan te gee.

5.7 Beskryf foute as gevolg van enkelfrekwensie-uitsending, spoed oor land, antennehoogte, gesigshoek en geodetiese verskille.

5.8 Beskryf 'n tipiese ontvanger en aanvangswaarnemingsvolgorde.

5.9 Beskryf die roetine-werking van Satnav-toerusting.

5.10 Beskryf die Navstar-satellietstelsel.

5.11 Beskryf die inligting wat deur die Navstar-satelliete uitgesend word.

5.12 Verduidelik hoe pseudoafstand gemeet word.

5.13 Verduidelik hoe ekwiwalente gebruikerklokfout gemeet word vir die beraming van waarnemerposisie.

5.14 Verduidelik hoe onafhanklike afstandfoute bereken word om 'n ware gebruikerklokfout en derhalwe die ware posisie van die waarnemer te verkry.

5.15 Beskryf 'n tipiese Navstar-ontvanger en aanvangswaarnemingsvolgorde.

5.16 Beskryf die roetinewerking van Navstar-toerusting.

Radar

C.6 Beskryf die basiese beginsels van radar.

6.1 Verduidelik hoe afstand bepaal word.

6.2 Verduidelik hoe peiling bepaal word.

C.7 Beskryf die toepassing van die basiese beginsels in die praktyk.

7.1 Beskryf hoe inligting vertoon word.

7.2 Verduidelik waarom uitgangsenergie "gepulseer" moet word.

7.3 Beskryf die uitwerking van die puls duur op die beeld.

C.4 The Omega system.

4.1 Describes Omega as a world-wide phase-difference system indicating position of transmitters.

4.2 Understands the advantages of the propagation of very low frequency radio waves.

4.3 Understands the advantages of a long base line.

4.4 Describes the production of the hyperbolic lattice between a station pair.

4.5 Describes time sharing and the Omega stations signal format.

4.6 Understands the effect of the low altitude ionized layer of VLF radio waves and the diurnal and seasonal variations resulting therefrom.

4.7 Demonstrates ability to use correction tables.

4.8 Discusses the accuracy of Omega signals.

4.9 Discusses propagation anomalies and the effect of signal to noise ratio.

4.10 Identifies the Omega chart and the additional information displayed thereon.

4.11 Demonstrates ability to select appropriate station pairs and set up Omega receiver prior to departure.

4.12 Demonstrates his ability to apply corrections to Omega readings taken en route.

4.13 Describes methods of setting up receiver en route.

4.14 Explains why it may be necessary to change Synch Station en route and procedure to follow.

4.15 Explains why it may be necassary to changs LOP station en route and procedure to follow.

4.16 Describes use and operation of LOP recorder.

4.17 Describes Lane slip detection and correction.

4.18 Describes precautions near to one transmitter.

4.19 Describes differential Omega.

4.20 Describes automatic position indicating devices based on reception of Omega signals.

4.21 Demonstrates knowledge of navigational warnings pertaining to Omega.

4.22 Summarises the contents of merchant shipping Notices related to Omega.

C.5 Damonstrates an understanding of position fixing by navigational satellites.

5.1 Describes the general features of a navigational satellite.

5.2 Describes the orbits of satellites.

5.3 Describes the role of tracking and injection stations.

5.4 Describes the information transmitted by a transit satellite.

5.5 Describes how the integrated Doppler difference frequencies received from a transit satellite together with a knowledge of two satellite positions can define a hyperboloid or revolution.

5.6 Describes how two or more such hyperboloids can by combined to give an observer's position.

5.7 Describes errors, due to single frequency transmission, speed over ground, aerial height, angle of sight and geodetic differences.

5.8 Describes a typical receiver and sequence for initiating observations.

5.9 Describes routine operation of Satnav equipment.

5.10 Describes the Navstar satellite system.

5.11 Describes the information transmitted by Navstar satellites.

5.12 Explains how pseudo-range is measured.

5.13 Explains how equivalent user clock error is measured to produce an estimate of observer position.

5.14 Explains how independent range errors are calculated to give true user clock error and hence the true position of the observer.

5.15 Describes a typical Navstar receiver and sequence for initiating observations.

5.16 Describes routine operation of Navstar equipment.

Radar

C.6 Describes the basic principles of radar.

6.1 Explains how range is determined.

6.2 Explains how bearing is determined..

C.7 Describes the application of the basic principles in practice.

7.1 Describes how information is displayed.

7.2 Explains why output energy needs to be 'pulsed'.

7.3 Describes the effect of pulse duration on the display.

7.4 Verduidelik die uitwerking van die pulsduur op afstandonderskeidingsvermoë en minimum afstand.

7.5 Verduidelik ander faktore wat die minimum afstand beïnvloed.

7.6 Noem die spesifikasievereiste ten opsigte van afstandsonderskeidingsvermoë en minimum afstand.

7.7 Verduidelik waarom en wanneer verskillende pulsdure gebruik word.

7.8 Verduidelik die noodsaaklikheid van 'n smal horisontale bundelbreedte (HBW) maar 'n breë vertikale bundelbreedte (VBW).

7.9 Beskryf die uitwerking van HBW op die beeld.

7.10 Noem die spesifikasievereiste ten opsigte van HBW en VBW.

7.11 Illustreer uitgangsvermoë deur pooldiagramme.

7.12 Definieer halfkragpunte.

7.13 Noem die spesifikasievereiste ten opsigte van peilingdiskriminering.

C.8 Toon 'n nie-tegniese kennis van 'n radarstel.

8.1 Illustreer die funksionele eenhede van 'n radarstel deur 'n blokdiagram.

8.2 Beskryf die funksies van die blokdiagrameenhede.

8.3 Beskryf hoe die koersflits geproduseer word.

8.4 Verduidelik moontlike peiling onakkuraathede voortspruitend uit item 3.

8.5 Noem die spesifikasievereistes ten opsigte van koersflitsakkuraatheid.

8.6 Verduidelik die onderlinge verband tussen funksies.

8.7 Beskryf en illustreer verskillende tipes antennes tans in gebruik.

8.8 Verduidelik hoe antenne-ontwerp aan die spesifikasie vir HBW en VBW voldoen.

8.9 Beskryf die metodes van afstandmeting met radartoerusting, byvoorbeeld vaste en veranderlike afstandmerkers, interaftasmerkers.

8.10 Identifiseer moontlike oorsprong van 'n fout in item 9, en die relatiewe akkuraatheid van die verskillende metodes.

8.11 Meld die spesifikasievereistes ten opsigte van afstandakkuraatheid.

8.12 Besef die behoefte aan gereelde kontrolering van afstandakkuraatheid en korreksie van of toelating vir onakkuraathede.

8.13 Beskryf die metodes waarvolgens peilings op radartoerusting gemeet word, byvoorbeeld 'n draaibare loper op 'n skyf, EBV en ander metodes.

8.14 Identifiseer peilingonakkuraathede as gevolg van parallaks, koersflitsverskuiwing en wanstelling van die middelpunt.

8.15 Noem die spesifikasievereistes vir peilingakkuraatheid.

8.16 Besef die behoefte aan gereelde kontrolering van peilingakkuraatheid en korreksie van of toelating vir onakkuraathede.

C.9 Gebruik kontroles om 'n radarbeeld te verkry.

9.1 Verduidelik die behoefte aan kontrolestelling voordat daar aangeskakel word.

9.2 Meld die spesifikasievereistes ten opsigte van tydsverloop tussen die aanskakeling en die aktivering.

9.3 Manipuleer kontroles in die korrekte volgorde om 'n optimale beeld op die verlangde wyse te verkry.

9.4 Beskryf die uitwerking van ontvangergeraas op die beeld.

9.5 Regverdig die kriteria vir optimale kontrolestellings.

9.6 Noem die gevare van wangestelde kontroles.

9.7 Spoor kontrolewanstellings op en bring die nodige regstellings aan stellings.

9.8 Besef die uitwerking van die plasing van radareenhede en die berging van onderdele naby magnetiese kompasse.

9.9 Definieer magnetiesveilige afstand en erkende veilige afstand.

C.10 Vertolk die beeld.

10.1 Identifiseer indruiseggo's, byvoorbeeld indirek, veelvuldig, bylob, sekondêre spoor en steuring.

10.2 Verduidelik die oorsprong van indruiseggo's.

10.3 Verduidelik die uitwerking van antenneplasing op die beeld, met betrekking tot die tregter, maste, bobou, ensovoorts.

10.4 Definieer blinde en skaduweesektore.

10.5 Beskryf aanbevole meetmetodes vir blinde en skaduweesektore.

10.6 Verduidelik die voorkoms van seesteureggo's.

10.7 Meld die gevaar van seesteureggo's.

10.8 Onderneem 'n soektog in seesteureggo's.

10.9 Verduidelik die voorkoms van neerslag op 'n beeld.

10.10 Meld die gevare van neerslagsteureggo's.

7.4 Explains the effects of pulse duration on range discrimination and minimum range.

7.5 Explains other factors affecting minimum range.

7.6 States the specification requirement on range discrimination and minimum range.

7.7 Explains why and when different pulse durations are used.

7.8 Explains the need for narrow horizontal beam width (HBW) but wide vertical beam width (VBW).

7.9 Describes the effect of HBW on the display.

7.10 States the specification requirement on HBW and VBW.

7.11 Illustrates output by polar diagrams.

7.12 Defines half power points.

7.13 States specification requirement on bearing discrimination.

C.8 Demonstrates a non-technical knowledge of a radar set.

8.1 Illustrates the functional units of a radar set by block diagram.

8.2 Describes functions of the block diagram units.

8.3 Describes how the heading marker is produced.

8.4 Explains possible bearing inaccuracies arising from item 3.

8.5 States the specification requirement on heading marker accuracy.

8.6 Explains how functions inter-relate.

8.7 Describes and illustrates different types of antennas in current use.

8.8 Explains how antennae design achieves the specification for HBW and VBW.

8.9 Describes the methods of measuring ranges on radar equipment, e.g. fixed and variable range markers, interscan markers.

8.10 Identifies possible sources of error in item 9 and the relative accuracy of the different methods.

8.11 States the specification requirements for range accuracy.

8.12 Appreciates the need for regular checking of range accuracy and correction of or allowances for inaccuracies.

8.13 Describes the methods of measuring bearings on radar equipment, e.g. rotatable cursor on disc, EBV and other methods.

8.14 Identifies bearing in accuracies due to parallax, heading marker displacement and centre maladjustment.

8.15 States the specification requirements for bearing accuracy.

8.16 Appreciates the need for regular checking of bearing accuracy and correction of or allowances for inaccuracies.

C.9 Uses controls to set up a radar display.

9.1 Explains the need for control setting before switching on.

9.2 States the specification requirements on time lapse between switching on and activation.

9.3 Manipulates controls in a correct sequence to obtain an optimum picture in the desired mode.

9.4 Describes the effects of receiver noise on the display.

9.5 Justifies criteria for optimum control settings.

9.6 States dangers of maladjusted controls.

9.7 Detects maladjustment of control settings and corrects these maladjustments.

9.8 Appreciates the effects of siting radar units and storing spares near magnetic compasses.

9.9 Defines magnetic safe distance and conceded safe distance.

C.10 Interprets the display.

10.1 Identifies spurious echoes, e.g. indirect, multiple, side lobe, second trace and interference.

10.2 Explains sources of spurious echoes.

10.3 Explains effect of antennae siting on display, in relation to funnel, masts, superstructure, etc.

10.4 Defines blind shadow sectors.

10.5 Describes recommended methods of measuring blind and shadow sectors.

10.6 Explains the appearance of sea clutter.

10.7 States the danger of sea clutter.

10.8 Performs a search in sea clutter.

10.9 Explains the appearance of precipitation on a display.

10.10 States the dangers of precipitation clutter.

10.11 Onderneem 'n soektog binne en buite neerslag.

10.12 Onderskei tussen die uitwerking van see- en neerslagsteureggo's.

10.13 Verduidelik hoe 'n beeld beïnvloed kan word deur nabygeleë spantorings, groot strukture, kraglyne wat riviere kruis, riviermondings en vervorming van die kuslyn as gevolg van ys.

10.14 Vergelyk die uitwerking van verskille tussen afstandskale.

C.11 *Identifiseer faktore wat teikenopsporing beïnvloed.*

11.1 Maak gebruik van 'n totale prestasiemonitor om die prestasiestandaard te bepaal en besef die behoefte aan die gereelde nagaan van prestasie.

11.2 Meld die uitwerking van prestasieverlies.

11.3 Definieer radarhorison.

11.4 Bereken die maksimumopspoorafstande in standaard meteorologiese toestande.

11.5 Meld die spesifikasievereistes vir afstandsprestasie.

11.6 Evalueer die uitwering van nie-standaardtoestande op opspoorafstande.

11.7 Noem die toestande wat waarskynlik tot bo-standaardbreking en substandaardbreking sal lei.

11.8 Verduidelik die uitwerking van teikenkenmerke op eggosterkte, bv. die grootte, fatsoen, voorkoms en samestelling van teikens.

11.9 Verduidelik die vertoonde uitwerking van pulsduur en bundelbreedte op topografiese teikens.

11.10 Verduidelik watter uitwerking die beweging van 'n skip op vaart op teikenopsporing het.

C. 12 *Gebruik 'n radarstel vir navigasie.*

12.1 Bepaal posisie deur peilings en/of afstande.

12.2 Noem die oorsprong van 'n posisiefout.

12.3 Vergelyk die akkuraatheid van radarposisiebepalings volgens verskillende metodes verkry.

12.4 Vergelyk die akkuraatheid van radarposisiebepalings met ander metodes.

12.5 Begryp die belangrikheid van dubbelkontrole van die akkuraatheid van radarposisiebepalings volgens ander metodes verkry.

12.6 Begryp die waarde van die gebruikmaking van alle beskikbare inligtingsbronne om posisies te bepaal.

12.7 Beskryf die werkbeginsels van en die verskyning van opspoorhulpmiddels in beelde, bv. hoekreflektors, radarbakens, radarpeilbakens.

12.8 Maak gebruik van radar in helder weer—

(i) om met visuele waarnemings te vergelyk;

(ii) om die relatiewe akkuraatheid van radarinligting te bepaal;

(iii) om die vermoëns en beperkings van radar te bepaal;

(iv) om gekarteerde eienskappe te vergelyk met eienskappe wat deur radar vertoon word.

12.9 Maak gebruik van parallelindekstegnieke vir deurlopende posisiemonitering.

C.13 *Gebruik 'n radarstel vir botsingvoorkoming.*

13.1 Bepaal op 'n relatiewebewegingsbeeld—

(i) die uitwerking van eie skeepsbewegings;

(ii) die uitwerking van 'n teiken se bewegings op sy eie relatiewe baan;

(iii) die voordele van kompasstabilisasie.

13.2 Bepaal die uitwerking van beweging op eie en ander skepe in 'n warebewegingsbeeld.

13.3 Beskryf die uitwerking van onakkuraathede in kompasstabilisasiedata op 'n relatiewebewegingsbeeld.

13.4 Beskryf die uitwerking van onakkuraathede in spoed en kompasstabilisasiedata op 'n warebewegingsbeeld.

13.5 Begryp die akkuraatheidperke van inligting verkrygbaar van nagloeispore op beelde.

13.6 Begryp die ontwikkeling van situasies op handgemeenafstand.

13.7 Identifiseer gevaarlike teikens.

13.8 Gebruik uitstiptegnieke om inligting af te lei omtrent teikens, bv. CPA, TCPA, koers, spoed, voorkoms, tempo en rigting van gety.

13.9 Verkry die inligting in 8 deur—

(i) 'n ongestabiliseerde relatiewe uitstipping;

(ii) 'n gestabiliseerde relatiewe uitstipping;

(iii) 'n ware uitstipping.

13.10 Vergelyk die voordele van die verskillende uitstipmetodes.

13.11 Gebruik die korrekte rapporteerprosedure.

10.11 Performs a search in and beyond precipitation.

10.12 Distinguishes between the effects of sea and precipitation clutter.

10.13 Explains the effects on a display of nearby pylons, large structures, power lines crossing rivers, estuaries and distortions of coastlines due to ice.

10.14 Compares the effects of differences between range scales.

C. 11 *Identifies factors affecting target detection.*

11.1 Employees overall performance monitor to determine performance standard, and appreciates the need for regular checks on performance.

11.2 States the effects of loss of performance.

11.3 Defines radar horizon.

11.4 Calculates maximum detection ranges in standard meteorological conditions.

11.5 States the specification requirement for range performance.

11.6 Evaluates the effect of non-standard conditions on detection ranges.

11.7 States the conditions likely to cause super and sub-refraction.

11.8 Explains the effects of target characteristics on echo strength, e.g. size, shape, aspect and composition of targets.

11.9 Explains the displayed effects of pulse duration and beam width on topographical targets.

11.10 Explains the effects on target detection of the motion of the ship in seaway.

C. 12 *Uses a radar set for navigation.*

12.1 Fixes position by bearings and/or ranges.

12.2 States sources of error in positions.

12.3 Compares the accuracy of radar fixes obtained by different methods.

12.4 Compares the accuracy of radar fixes with other methods.

12.5 Appreciates the importance of cross-checking the accuracy of radar fixes obtained by other methods.

12.6 Appreciates the value of using information from all available sources to obtain positions.

12.7 Describes the principle of operation and the appearance on displays of aids to detection, e.g. corner reflectors, racons, remarks.

12.8 Employs radar in clear weather—

(i) to compare with visual observations;

(ii) to assess the relative accuracy of radar information;

(iii) to appreciate the capabilities and limitations of radar;

(iv) to compare charted features with features displayed by radar.

12.9 Uses parallel index techniques for continuous position monitoring.

C. 13 *Uses a radar set for collision avoidance.*

13.1 Appreciates on a relative motion display—

(i) the effect of own ship's movements;

(ii) the effects of a target's movements on its relative track;

(iii) the advantages of compass stabilisation.

13.2 Appreciates the effect of movement of own and other ships on a true motion display.

13.3 Describes the effects of inaccuracies in compass stabilisation data on a relative motion display.

13.4 Describes the effects of inaccuracies in speed and compass stabilisation data on a true motion display.

13.5 Appreciates the limits of accuracy of information obtainable from afterglow trials on displays.

13.6 Appreciates the development of close-quarters situation.

13.7 Identifies dangerous targets.

13.8 Uses plotting techniques to extract information about targets, e.g. CPA, TCPA, course, speed, aspect, rate and direction of tide.

13.9 Obtains the information in 8 by—

(i) unstabilised relative plot;

(ii) stabilised relative plot:

(iii) true plot.

13.10 Compares the advantages of the different methods of plotting.

13.11 Uses correct report procedure.

13.12 Begryp die belangrikheid daarvan dat radarobservasieverslae goed uiteengesit moet wees.

13.13 Bring 'n stippouse in verband met die teikennaderingspoed en -afstand.

13.14 Voorspel die baan van teikens op die beeld.

13.15 Bereken die uitwerking van verandering van eie skip se koers en spoed.

13.16 Identifiseer veranderings in die teiken se koers en spoed.

13.17 Bepaal die vereiste verandering van eie skip se koers en spoed om die verlangde uitwerking te verkry.

13.18 Bring eie en die teiken se verwagte aksie in verband met die botsingsregulasies.

13.19 Begryp die belangrikheid van gereelde waarnemings wat dikwels geskied.

13.20 Identifiseer die vertraging tussen 'n koersverandering en spoed van 'n teiken en die opsporing van daardie verandering.

13.21 Identifiseer die uitwerking van klein en ingrypende veranderinge van koers en spoed op die snelheid en akkuraatheid van die opsporing van verandering.

13.22 Begryp die gevare van veronderstellings wat op grond van onvoldoende inligting gemaak word.

13.23 Begryp die gevare van klein veranderings van koers of spoed.

13.24 Begryp die voordele van matige spoed wanneer radar gebruik word om botsing te voorkom.

13.25 Bring spoed in verband met CPA en TCPA en met die maneuvreerkenmerke van 'n vaartuig.

13.26 Begryp die behoefte aan die vroeë gebruik van radar in helder weer in die nag wanneer daar aanduidings is dat sigbaarheid mag verswak.

13.27 Beskryf meganiese hulpmiddele om inligting te verkry, bv. RAS-uitstipper.

13.28 Verduidelik die beginsel van en beskryf die voordele van die refleksiestipper.

Outomatiese radaruitstiphulpmiddels (ARPA)

C.14 *Begryp die beginsel van outomatiese radaruitstiphulpmiddels.*

14.1 Verduidelik in breë trekke watter inligting deur ARPA-toerusting vir navigasie en botsingsvoorkoming voorsien word.

14.2 Bespreek die onderskeie metodes waarvolgens teikendata vertoon word.

14.3 Bespreek die moontlike gevare daaraan verbonde om te veel op ARPA te steun.

C.15 *Ondersoek die faktore wat 'n uitwerking het op die ARPA-stelsel.*

15.1 Beskryf die inset van die onverwerkte radarbeeld.

15.2 Meld die uitwerking van beperking op—

(a) radarafstand en radarpeilingsakkuraatheid;

(b) radarafstand- en radarpeilingsdiskriminasie.

15.3 Beskryf die insette van koers- en spoedinstrumente.

15.4 Meld die uitwerking van waninstellings of onakkuraathede in die koers- en spoed insette op die ARPA-data wat vertoon word.

15.5 Meld die beperkinge op hand- sowel as outomatiese verkrygingsfasiliteite deur multi-teikensituasies, teikenvervaging en teikenruiling meegebring.

C.16 *Begryp die volgvermoëns en beperkings van ARPA.*

16.1 Beskryf die metodes wat gebruik word om teikens vir volging te verkry.

16.2 Bespreek die kriteria wat gebruik word vir—

(a) outomatiese; en

(b) handverkryging.

16.3 Beskryf die uitwerking wat verlore teikens, teikenvervaging en teikenruiling op die volger het.

16.4 Beskryf die vertraging wat veroorsaak word deur die verwerking van ARPA-data.

16.5 Beskryf die roetine wat gebruik word vir die toets van wanfunksionering van die ARPA-beeld en die nodige voorsorgmaatreëls (nadat wanfunksionering voorgekom het).

16.6 Begryp die gebruike en beperkings van ARPA-alarms, skutringe en sektorwaarskuwingstelsels en beskryf die korrekte instelling van hierdie alarms.

16.7 Interpreteer ARPA-data wat vertoon word en vergelyk hierdie data met handuitstipmetodes veral ten opsigte van bedreigingbepaling en die gebruik van grafiese voorstelling van gevaargebiede.

16.8 Beskryf die proefmaneuvreerfasiliteit en verduidelik sy verband met die handuitstipvoorspellingsmetodes.

16.9 Weet wanneer en hoe om die *uitstipgeheuefasiliteit te gebruik.*

13.12 Appreciates the importance of radar observations, reports being well defined.

13.13 Relates plotting interval to target approach speed and range.

13.14 Predicts track of targets on display.

13.15 Calculates effect of alteration of own ship's course and speed.

13.16 Identifies alterations in target's course and speed.

13.17 Determines required alteration of own ship course and speed to have desired effect.

13.18 Relates own and target's expected action to the collision regulations.

13.19 Appreciates the importance of frequent regular observations.

13.20 Identifies the delay between a change of course and speed of a target and the detection of that change.

13.21 Identifies the effect of small as compared with substantial changes of course and speed on the rate and accuracy of detection of change.

13.22 Appreciates the dangers of assumptions made on inadequate information.

13.23 Appreciates the hazards of small alterations of course or speed.

13.24 Appreciates the advantages of moderate speed when using radar to avoid collision.

13.25 Relates speed to CPA and TCPA and to the manoeuvring characteristics of vessel.

13.26 Appreciates the need for the early use of radar in clear weather at night when there are indications that visibility may deteriorate.

13.27 Describes mechanical aids to obtaining information, e.g. RAS plotter.

13.28 Explains the principle of and describes the advantages of the reflection plotter.

Automatic Radar Plotting Aids (ARPA)

C.14 *Understands the principle of Automatic Radar Plotting Aids.*

14.1 Outlines the information provided by ARPA equipment for navigation and collision avoidance.

14.2 Discusses the various methods of displaying targets data.

14.3 Discusses the possible risks of over-reliance on ARPA.

C. 15 *Examines factors affecting ARPA system.*

15.1 Decribes the input from the raw radar display.

15.2 States the effects of limitationsin—

(a) radar range and bearing accuracy; and

(b) radar range and bearing discrimination.

15.3 Describes the inputs from course and speed instruments.

15.4 States the effects of maladjustments or inaccuracies in the course and speed inputs on the displayed ARPA data.

15.5 States the limits imposed on both manual and automatic acquisition facilities by multi-target situations, target fading and target swop.

C.16 *Appreciates tracking capabilities and limitations of ARPA.*

16.1 Describes the methods employed for the acquisition of targets for tracking.

16.2 Discusses the criteria uses for—

(a) automatic; and

(b) manual aquisition.

16.3 Describes the effects on the tracker of lost targets, target fading and target swop.

16.4 Describes the delay caused by the processing of ARPA data.

16.5 Describes routine used testing for malfunctions of the ARPA display and necessary precautions (after a malfunction occurs).

16.6 Appreciates the uses and limitations of ARPA alarms, guard rings and sector warning systems and describes the correct setting of these alarms.

16.7 Interprets displayed ARPA data and compares this data with manuel plotting methods particularly with regard to threat assessment and the use of graphic representation of danger areas.

16.8 Describes the trial manoeuvre facility and explains its relationship to the forecast manuel plotting.

16.9 Appreciates when and how to use the past history facilities.

C.17 *Gebruike en ARPA vir botsingvoorkoming.*

17.1 Beskryf die gebruik van die werkkontroles en die datavertoonmetodes.

17.2 Demonstreer die korrekte opstelling van 'n ARPA-beeld.

17.3 Beskryf die operasionele waarskuwings en bykomende alarms wat geïnstalleer kan word.

17.4 Beskryf die gebruik van selfdiagnostiese roetines by die nagaan van wanfunksionering.

17.5 Vergelyk inligting van ARPA verkry met dié wat van 'n basiese radaruitstipping verkry word.

17.6 Identifiseer kritieke eggo's.

17.7 Gebruik inligting wat deur ARPA voorsien is om 'n botsingrisiko te bepaal.

17.8 Ontleed die risiko van botsing.

17.9 Bedien die proefmaneuvreerfasiliteit.

17.10 Hanteer die uitstipgeheuefasiliteit.

17.11 Bepaal watter optrede nodig is om handgemeenafstandsituasies te voorkom terwyl daar verseker word dat sodanige aksie nie interaksie met enige ander teiken veroorsaak nie.

Gebruik van elektroniese navigasietoerusting

C.18 *Kategoriseer en bepaal die akkuraatheid van elektroniese navigasie-instrumente en -tegnieke volgens spesifieke gebiedsvereistes.*

18.1 Gee 'n lys van instrumente en tegnieke in algemene gebruik.

18.2 Noem die akkuraatheid, beskikbaarheid en beperkings van instrumente en tegnieke in algemene gebruik.

18.3 Kategoriseer die bruikbaarheid van die stelsels volgens die volgende gebiede: oseaan-, landnaderings-, kus- en riviermondingsgebiede.

18.4 Begryp die behoefte daaraan om te alle tye aan die basiese beginsels en operasionele leiding vir offisiere wat in bevel van 'n navigasiewag is, te voldoen, veral met betrekking tot die gebruik van radar en ARPAs.

SUBAANHANGSEL D van ENS-kursusspesifikasie

Elektroniesenavigasiestelsel (ENS)-kursus

Toerustingspesifikasie

A. Die volgende is die minimum toerusting wat vereis word vir die ENS-kursus (data-uitsette hoef nie gekoördineer te word nie):

Decca-navigatorontvanger gekontroleer deur 'n statiese simulator;

'n goedgekeurde D/F-ontvanger—lewendig, tesame met 'n rug-teen-rug-goniometer en seingenerator;

'n goedgekeurde eggoloder gekontroleer deur 'n simulator, of gebruik in die lug;

'n volledige stel basiese radaruitrusting van 'n soort waaraan 'n Tipetoetssertifikaat volgens die prestasiespesifikasie van 1968 (of later) deur die Departement van Handel toegeken is;

toegang tot 'n radarsimulator van 'n soort wat goedgekeur is deur die Departement van Handel; of die gebruik van VCR-toerusting wat basiese uitstipoefeninge voorsien soos goedgekeur deur die Departement van Handel;

toegang tot toerusting wat goedgekeur is deur die Departement van Handel en wat in staat is om ARPA-kenmerke te vertoon.

B. Die volgende toerusting word as wenslik beskou en moet, indien reeds geïnstalleer, gebruik word; 'n besluit om nuwe toerusting te installeer of bestaande stelle te vervang moet egter eers geneem word na oorlegpleging met die Departement van Vervoer, met inagneming van die mate waarin die toerusting te alle tye ter see in algemene gebruik is, in welke geval doeltreffende visuele hulpmiddels, modelle en ander fasiliteite, wat die werkprosedure van die toerusting duidelik toon, as alternatief aanvaar kan word:

'n Loran 'C'-ontvanger wat deur 'n statiese simulator gekontroleer word;

'n Omega-ontvanger—lewendig;

'n satellietnavigasie-ontvanger—lewendig.

Algemene vereistes

C. Ten einde voorsiening te maak vir 'n omgewing wat in hoë mate ooreenstem met dié aan boord van handelskepe, moet die praktiese werk van die kursus uitgevoer word deur gebruik te maak van toerusting van 'n tipe wat algemeen in Suid-Afrikaanse handelskepe gebruik word.

Radaropleiding moet geskied op 'n ten volle werkende siviele seeradartipe wat deur die Departement van Vervoer goedgekeur is. Die vertoning van eggo's moet net so realisties soos 'n situasie aan boord van 'n skip wees en demonstrasietoerusting moet derhalwe geïnstalleer word ooreenkomstig een van die volgende vereistes:

C. 17 *Uses and ARPA for collision avoidance.*

17.1 Describes the use of the operational controls and the methods of displaying data.

17.2 Demonstrates the correct setting up of an ARPA display.

17.3 Describes the operational warnings and additional alarms which may be fitted.

17.4 Describes the use of self-diagnostic routines when checking for malfunctions.

17.5 Compares information obtained from ARPA with that obtained from a basic radar plot.

17.6 Identifies critical echoes.

17.7 Uses information provided by ARPA to assess risk of collision.

17.8 Analyses the risk of collision.

17.9 Operates the trial manoeuvre facility.

17.10 Operates the past history facility.

17.11 Determines the action to be taken to avoid close quarters situations while ensuring that such action does not cause interaction with any other target.

Use of electronic navigation equipment

C.18 *Categorises and assesses accuracy of electronic navigational instruments and techniques in terms of specific area requirements.*

18.1 Lists instruments and techniques in general use.

18.2 States accuracy, availability and limitations of instruments and techniques in general use.

18.3 Categorises the usefulness of the systems in terms of the following areas: oceanic, landfall, coastal and estuarine.

18.4 Appreciates the need at all times to comply with the basic principles and operational guidance for officers in charge of a navigational watch, particularly in relation to the use of radar and ARPA's.

SUB-ANNEXURE D TO ENS course specification

Electronic navigation system (ens) course

Equipment specification

A. The following shall be the minimum equipment required for conduct of the ENS course (data outputs need not be co-ordinated):

A Decca Navigator receiver controlled by a static simulator;

an approved D/F receiver—live, together with back-to-back goniometer and signal generator;

an approved echo-sounder controlled by a simulator or used in air;

a complete basic Radar outfit of a type which has been awarded a Department of Trade Certificate of Type Testing to the 1968 (or later) Performance Specification;

access to a radar simulator of a type approved by the Department of Trade; or the use of VCR equipment which provides basic plotting exercises approved by the Department of Trade;

access to equipment approved by the Department of Trade and capable of displaying ARPA features.

B. The following equipment is considered desirable and if already fitted, shall be used; however a decision on whether to fit new equipment or replace existing sets shall be taken after consultations with the Department of Transport, having regard to the extent to which the equipment is in general use at sea at any time, in which event effective visual aids, models and other facilities which clearly illustrate the procedures for operation of the equipment may then be accepted as an alternative:

A Loran 'C' receiver controlled by a static simulator;

an Omega receiver—live;

a Satellite Navigation receiver—live.

General requirements

C. In order to provide an environment which closely resembles that found on board merchant ships, practical work on the course shall be carried out using equipment of a type in general use aboard a S.A. merchant ship.

Radar instruction shall be carried out on a fully operational civil marine radar type approved by the Department of Transport. The display of echoes shall be realistic of a shipboard situation and demonstration equipment shall therefore be installed in accordance with one of the following requirements:

1. Dit moet naby 'n skeepskanaal by die kus geleë wees. Die volgende faktore moet in aanmerking geneem word by die bepaling van 'n geskikte terrein:

(a) Met die oog op die demonstrering van, en die eksaminering van studente in waarnemingstegnieke van bewegende teikens in die omgewing van die eie skip, veral wanneer sulke teikens moontlik deur seesteureggo's verdof mag word, is dit noodsaaklik dat die terrein naby aan skeepvaart in 'n hoofskeepskanaal en/of die ingang van 'n hawe moet wees en 'n onbelemmerde uitsig daarop moet bied. Die maksimum afstand vanaf die kus is 200 meter maar hierdie afstand is slegs toelaatbaar wanneer daar ten volle aan die ander vereistes van hierdie Subaanhangsel voldoen is;

(b) die onbelemmerde gesigsveld oor die see moenie minder as 160° wees nie;

(c) die hoogte van die antenne moet sodanig wees dat 'n duidelike uitsig seewaarts verkry word;

(d) die radaruitsig seewaarts moet sodanige wees dat langafstandteikens, d.w.s. minstens vyf myl, vertoon kan word;

(e) die radaruitsig moet skadusektore kan toon, bv. van nabygeleë geboue;

(f) visuele observasie van die radaruitsiggebied moet geredelik beskikbaar wees sodat die radar- en visuele observasie van teikens maklik vergelyk kan word.

2. Dit moet aan boord van 'n opleidingsvaartuig geïnstalleer wees, mits sodanige vaartuig nie tot 'n dok of smal water beperk is nie.

3. Dit moet op 'n kollegeterrein geïnstalleer wees waar daar dan van 'n videokassetopnemerstelsel gebruik gemaak word, mits—

(i) een van die radarterminale wat tydens hierdie kursus gebruik word, toegerus is met 'n videokassetopnemerstelsel wat deur die Departement van Vervoer goedgekeur is;

(ii) 'n bandbiblioteek goedgekeur deur die Departement van Vervoer beskikbaar is vir gebruik met die videokassetopnemerstelsel;

(iii) minstens een ten volle werkende marineradarstel geïnstalleer word op 'n plek wat deur die Departement van Vervoer goedgekeur is.

SUBAANHANGSEL E van ENS-kursusspesifikasie

Sertifikaat in elektroniese-navigasiestelsels

Beoordelings- en eksamenreëlings

1. *Inleiding*

1.1 Die Sertifikaat in Elektroniese Navigasiestelsels word uitgereik aan studente wat die eksamen soos voorgeskryf in paragraaf 3 na voltooiing van die kursus slaag en wat die beoordelings tydens die kursus, waarna in paragraaf 2 verwys word, bevredigend voltooi. Die resultate van hierdie beoordelings word in aanmerking geneem gedurende die finale eksamen.

1.2 Die eksamen- en beoordelingsreëlings word uitgevoer deur die lektor wat betrokke is by die onderrig van elke individuele instrument.

2. *Beoordeling van vordering.*

2.1 *Stadium A en Stadium C* (Kollegefases).

2.1.1 Die kollege beoordeel 'n student se praktiese vermoë om die individuele instrumente te bedien nadat die studie van elke besondere instrument voltooi is.

2.1.2 'n Soortgelyke beoordeling word gemaak van die standaard van die kaartwerk wat uitgevoer is terwyl posisies verkry is van koördinate wat van die onderskeie instrumente afgelei is.

2.1.3 Die beoordeling van praktiese werk word in elke stadium op die volgende wyse aangeteken:

Kursus in Elektroniese navigasiestelsels						*Stadium A/C					
	Praktiese Hantering					Stipwerk					
Instrument	A	B	C	D	E	A	B	C	D	E	Opmerkings

SLEUTEL

A— Ten volle in staat om werk op hierdie vlak te hanteer.

B— Goed in staat om werk op hierdie vlak te hanteer.

C— In staat om werk op hierdie vlak te hanteer.

D— Nouliks in staat om die werk in hierdie stadium te hanteer.

E— Nie in staat om die werk in hierdie stadium te hanteer nie.

* Skrap soos toepaslik om 'n aanduiding te gee van die stadium van opleiding waarna die beoordeling verwys.

2.1.4 Die prosedures vir praktiese beoordeling moet ter aanvulling dien van die inkursusbeoordeling van die teoretiese kennis wat vir 'n kollegetoekenning vereis word. Vir studente wat ander goedgekeurde faseopleidingskemas volg, word as vereiste gestel 'n ekwivalente beoordeling van teoretiese kennis, wat gedurende die loop van die kursus volgehou word op 'n wyse wat vir die Departement van Vervoer aanvaarbaar is.

1. At a site close to a shipping channel at the coast. The following factors shall be taken into account in determining a suitable site:

(a) In order to demonstrate to students and for students to be examined in the techniques of observing moving targets in the vicinity of own ship, particularly when such targets may be obscured by sea clutter, it is essential that the site shall be close to and afford an unobstructed view of shipping in a main shipping channel and/or the entrance to a port. The maximum distance from the shore shall be 200 metres but this distance shall only be allowable when the other requirements of this Sub-Annexure can be fully complied with;

(b) the field of view shall be not less than 160°, uninterrupted, over the sea;

(c) the height of the aerial shall be consistent with that necessary to obtain a clear view to seaward;

(d) the radar view to seaward shall be such that targets at longer range, i.e. not less than five miles, can be displayed;

(e) the radar view shall be capable of demonstrating shadow sectors e.g. from nearby buildings;

(f) visual observation of the area viewed by the radar shall be readily available so that comparison between radar and visual observation of targets can be easily made.

2. Aboard a training vessel provided it is not confined to a dock or narrow water.

3. At a college site using a Video Cassette Recorder (VCR) system provided—

(i) one of the radar displays used on this course is fited with a video cassette recorder (VCR) system which has been approved by the Department of Transport;

(ii) a library of tapes approved by the Department of Transport is available for use with the VCR system;

(iii) at least one fully operational marine radar set is installed in a location approved by the Department of Transport.

SUB-ANNEXURE E to ENS course specification

Electronic navigation systems certificate

Assessment and examination arrangements

1. *Introduction.*

1.1 The Electronic Navigation Systems Certificate shall be issued to students who pass the examination described in paragraph 3 on completion of the course and who satisfactorily complete the in-course assessments referred to in paragraph 2. The results of these assessments shall be taken into account during the final examination.

1.2 The examination and assessment arrangements shall be carried out by the lecturer involved in teaching each individual instrument.

2. *Progress assessment.*

2.1 *Stage A and Stage C* (College phases).

2.1.1 The college shall assess a student's practical ability to operate the individual instruments at the time that study of each particular instrument is completed.

2.1.2 A similar assessment shall be made of the standard of chartwork performed when obtaining positions from co-ordinates derived from the various instruments.

2.1.3 In each stage, assessment of practical work shall be recorded in the following format:

Electronic Navigational Systems Course						*Stage A/C					
	Practical operation					Plotting					
Instrument	A	B	C	D	E	A	B	C	D	E	Remarks

KEY

A—Fully able to cope with this level of work.
B—Well able to cope with this level of work.
C—Able to cope with this level of work.
D—Barely able to cope with the work at this stage.
E—Unable to cope with the work at this stage.

* Delete as appropriate to indicate the stage of training to which the assessment refers.

2.1.4 The practical assessment procedures shall complement the in-course assessment of theoretical knowledge required for a college award. For studens following other approved phased training schemes, an equivalent assessment of theoretical knowledge shall be required to be maintained during the progress of the course in a way acceptable to the Department of Transport.

2.1.5 Studente behoort te poog om enige ongunstige beoordelings gedurende Stadium A reg te stel. (Gedurende Stadium B behoort studente te poog om, terwyl hulle ter see is, hul praktiese prestasie en begrip van die gebruik van die toerusting te verbeter. 'n Aantekening oor hul vordering moet deur die skip se offisier op die beoordelingsvel gemaak word.) As daar nie bevredigende vordering is nie, moet 'n verdere poging gedurende Stadium C aangewend word om beter te vaar.

2.1.6 'n Formele eksamen word nie aan die einde van Stadium A vereis nie.

2.2 *Stadium B* (Tweede seefase van die opleidingskema).

2.2.1 Toepaslike inskrywings moet in die rekordboek vir praktiese opleiding gemaak word as bewys dat die opleideling oefeninge voltooi het in die gebruik van elektroniese navigasietoerusting, met inbegrip van posisiebepaling, radar, eggoloding en rigtingpeiling, tesame met verwante praktyk en navigasieprosedures.

2.2.2 Hierdie inskrywings moet deur die betrokke lektor nagegaan word wanneer die student terugkeer vir Stadium C.

2.3 *By voltooiing van Stadium C.*

2.3.1 By voltooiing van Stadium C moet daar 'n formele eksamen afgelê word in radar, die rigtingpeiler en minstens een ander elektroniese navigasie-instrument. (Sien par. 3.) In sommige gevalle mag dit egter nodig wees om die eksamen af te neem oor die volle reeks toerusting waarop die kursus gebaseer is; wanneer besluit word oor watter toerusting daar eksamen afgeneem moet word, moet die eksaminator elke kandidaat se beoordelingsvel nagaan om vas te stel of daar enige swakhede bestaan met betrekking tot die bediening van toerusting, of ten opsigte van die basiese kennis wat vereis word om die toerusting aan boord van 'n skip doeltreffend te gebruik.

2.4 *Modulêre kursusse.*

2.4.1 Progressiewe beoordeling van die praktiese en teoretiese kennis moet gedurende die loop van modulêre kursusse volgehou word op 'n wyse wat aanvaarbaar is vir die Departement van Vervoer.

2.4.2 By voltooiing van 'n modulêre kursus moet die eksamenprosedure dieselfde wees as dié wat aan die einde van Stadium C vereis word vir studente wat gefaseerde opleidingskemas volg.

3. *Finale eksamen en beoordeling.*

3.1 *Toelating.*

3.1.1 Daar word van alle kandidate vereis om die ENS-kursus en die vier-en-twintig maande kwalifiserende diens ter see bevredigend te voltooi het.

3.1.2 Opleidelinge wat 'n gefaseerde skema van opleiding deurloop, word geag die kursus te voltooi het waar dit geïntegreer is met verwante studies, mits minstens 120 uur gewy is aan die ENS-materiaal en die beoordeling in paragraaf 2 beskryf bevredigend voltooi is. In die geval van ander kandidate sal bevredigende bywoning van die kursus deur die kollege beoordeel word maar dit sal minstens 150 uur wees en die beoordelings in paragraaf 2 beskryf, moet dan bevredigend voltooi wees.

3.1.3 Kandidate wat nie aan die vereiste voldoen nie, mag in buitengewone omstandighede tot die eksamen toegelaat word, mits toestemming van die Departement van Vervoer in elke geval verkry is.

3.2 *Samestelling.*

3.2.1 Die eksamen bestaan uit twee dele:

Deel 1: 'n eksamen van een uur in die konstruksie en vertolking van radaruitstippings;

Deel 2: 'n praktiese/mondelike eksamen.

3.2.2 Deel 1—Konstruksie en vertolking van radaruitstippings.

Deel 1 bestaan uit oefeninge in die konstruksie en vertolking van radaruitstippings van gegewe inligting en hoogstens een uur word toegelaat vir die voltooiing daarvan. Die inligting wat die kandidaat uit die stippings moet verkry, word gekies uit die volgende:

3.2.2.1 'n Aanduiding van vaste en bewegende teikens, asook die naaste naderingspunt van teikens;

3.2.2.2 koers en spoed van bewegende teikens;

3.2.2.3 voorkoms van teikens;

3.2.2.4 snelheid en rigting van getystroom;

3.2.2.5 koersverandering wat nodig is om te vergoed vir getyrigting; en

3.2.2.6 uitwerking van koersverandering en/of waarnemingsnelheid van skip en/of teikens op CPA en TCPA.

3.2.3 Kandidate sal toegelaat word om die tipe stipwerk van hulle keuse te konstrueer. Vrae sal nie op so 'n wyse gestel word dat dit kandidate beperk tot 'n bepaalde tipe of tipes stipwerk nie.

3.3 *Praktiese eksamen.*

Die praktiese toets moet 'n kandidaat se bekwaamheid in die gebruik van toerusting ooreenkomstig die volgende riglyne bepaal:

2.1.5 Endeavour should be made by students to correct any low assessments during Stage A. (During Stage B students should make every effort to improve their practical performance and understanding of the use of the equipment while at sea. A note of their progress shall be made on the assessment sheet by the ship's officer). Failing satisfactory improvement, a further effort to upgrade assessment should be made during Stage C.

2.1.6 A formal examination at the end of Stage A shall not be required.

2.2 *Stage B* (Second sea phase of training scheme).

2.2.1 Appropriate entries shall be made in the practical training record book as evidence that the trainee has completed exercises in the use of electronic navigational equipment, including position finding, radar, echo sounding and D/F, in conjunction with related practice in navigational procedures.

2.2.2 These entries shall be scrutinised by the lecturer concerned when the student returns for Stage C.

2.3 *On completion of Stage C.*

2.3.1 On completion of Stage C there shall be a formal examination in radar, D/F and at least one other electronic navigational instrument. (See para. 3.) In some cases, however, it may be necessary to conduct the examination on the full range of equipment on which the course is based; in deciding on which equipment the examination shall be conducted, the examiner shall study each candidate's assessment sheet to determine any areas of weakness in the operation of equipment or the fundamentals of knowledge required for their competent use aboard ship.

2.4 *Modular courses.*

2.4.1 A progressive assessment of practical and theoretical knowledge shall be maintained during the progress of modular courses in a way acceptable to the Department of Transport.

2.4.2 On completion of a modular course, the procedure for examination shall be the same as that required at the end of Stage C for students following phased training schemes.

3. *Final examination and assessment.*

3.1 *Entry.*

3.1.1 All candidates shall be required to have satisfactorily completed the ENS course and 24 months of qualifying service at sea.

3.1.2 Trainees undergoing a phased scheme of training shall be deemed to have completed the course where it is integrated with related studies provided a minimum of 120 hours has been devoted to the ENS material and the assessments described in paragraph 2 have been satisfactorily completed. For other candidates satisfactory attendance of the course shall be judged by the college but it shall be for not less than 150 hours and the assessments described in paragraph 2 shall have been satisfactorily completed.

3.1.3 Candidates who do not meet the requirements may in exceptional circumstances enter the examination provided approval of the Department of Transport is obtained in each case.

3.2 *Format.*

3.2.1 The examination shall be in two parts:

Part 1: A one-houer examination in the construction and interpretation of radar plots.

Part 2: A practical/oral examination.

3.2.2 Part 1—Construction and interpretation of radar plots. Part 1 shall consist of exercises in the construction and interpretation of radar plots from given information and a maximum of one hour shall be allowed for their completion. The information which the candidate shall be required to obtain from the plots shall be chosen from the following:

3.2.2.1 An indication of fixed and moving targets, also closest point of approach of targets;

3.2.2.2 course and speed of moving targets;

3.2.2.3 aspects of targets;

3.2.2.4 rate and direction of tidal stream;

3.2.2.5 alternation of course needed to compensate for tidal set; and

3.2.2.6 effects of alteration of course and/or speed of observing ship and/or targets on CPA and TCPA.

3.2.3 Candidates shall be allowed to construct the type of plot of their choice. Questions shall not be framed in a way that restricts candidates to a particular type or types of plot.

3.3 *Practical examination.*

The practical test shall be conducted so as to determine a candidate's competence to use equipment in accordance with the following guide-lines:

3.3.1 Radar.

Die aanskakel en afskakel van toerusting volgens die korrekte prosedure; die instel van die vertoonkontroles van die radarstel in die korrekte volgorde met verwysing na die aanduidings van punte van optimale stelling, herkenning van waninstelling van stelknoppe:

— helderheids-/versterkings-/videoprosesseerkontroles;
— fokuskontroles;
— seesleurwerende kontroles;
— middelkontroles;
— reënwerende of korttydkonstantekontroles;
— handinstemkontrole;
— optimale keuse van afstandskale met inagneming van die wisselende toestande of omstandighede van verkeer, weer of nabyheid van die land;
— gebruik van vaste of veranderlike afstandsmerkers;
— akkuraatheid en nagaan vir onnoukeurighede;
— gebruik van elektroniese peilingaanduiders;
— meting van afstande en peilings vir posisiebepaling;
— perke van akkuraatheid van vasstellings;
— waarnemings om inligting te verkry om botsings te help voorkom;
— die aanstuur van inligting in 'n verstaanbare vorm;
— radarrapporteringsprosedures;
— nagaan van die prestasie van radartoerusting;
— gebruik van 'n prestasiemonitor en die behoefte aan gereelde kontrolering; en beeldinstellingskontrole;
— mondelinge vrae oor die gebruik van warebewegingsradar;
— mondelinge vrae oor die beginsels, vermoëns en beperkings van ARPA.

3.3.2 Rigtingsoekers.

Verkry 'n rigtingsoekerpeiling en pas enige nodige korreksie toe ten einde dit moontlik te maak om die peiling op 'n navigasiekaart aan te bring; sodanige peiling moet van 'n eksterne bron van radiotransmissie wees, bv. 'n nabygeleë radiobaken.

3.3.3 Elektroniese posisiebepalingstelsel.

Neem lesings van die verskillende toerustingitems nadat seker gemaak is dat die toerusting opgestel is in ooreenstemming met die instruksies wat in die toepaslike bedieningshandleidings aangegee word; stip sodanige lesings uit op 'n navigasiekaart terwyl die nodige voorsiening gemaak word vir enige regstellings wat deur die eksaminator aangedui mag word (die eksaminator kan die regstellings in hipotetiese vorm gee).

3.3.4 Eggoloders.

Bedien die toerusting volgens die instruksies aangedui in die bedieningshandleiding.

3.4 *Mondelinge eksamen.*

Die kandidaat moet vrae mondeling beantwoord oor die gebruik van enige van bogenoemde toerusting, die uitwerking van foute en waninstellings en oor enige ander onderwerpe in die leerplan, wat die eksaminator kan help om 'n oordeel te vel oor 'n kandidaat se vermoë om data op 'n bekwame wyse uit navigasietoerusting te verkry, te vertolk en te gebruik.

3.5 *Uitreiking van sertifikate.*

3.5.1 'n Kandidaat moet in albei dele van die finale eksamen slaag en die standaarde bereik wat deur die Departement van Vervoer vereis word in die inkursusbeoordelings van teoretiese kennis om vir die uitreiking van 'n Sertifikaat in Elektroniese Navigasiestelsels te kwalifiseer.

3.5.2 Sewentig persent van die beskikbare punte moet behaal word ten einde in Deel 1 te slaag. Ten einde in Deel 2 te slaag, moet 'n kandidaat die eksaminator oortuig van sy bekwaamheid om die toerusting met inagneming van die doelwitte van die kursus te gebruik. 'n Kandidaat wat druip, sal die volledige kursus moet herhaal voordat hy die eksamen weer kan aflê, tensy die hereksamen aangepak word binne 12 maande na die eerste poging.

3.5.3 Met betrekking tot vakke wat gedeeltelik geslaag word, kan eksaminators na goeddunke uitstel verleen ten opsigte van Deel 1 of Deel 2. Die uitgestelde deel moet egter binne ses maande na die eerste poging aangepak word. Uitstel kan slegs vir een deel toegelaat word en indien die kandidaat hierin druip, moet hy albei dele herhaal wanneer hy die eksamen weer aflê.

3.6 *Departement van Vervoer se goedkeuring en moderering.*

3.6.1 Progressiewe beoordeling van teoretiese kennis. In alle gevalle, d.i. vir studente wat òf kollegeskemas òf modulêre kursusse volg, moet kolleges hulle beoordelingsplan vir elke onderwerp in die leerplan gelys aan die Department van Vervoer voorlê vir goedkeuring. Die plan kan dié volg wat kragtens die kollegebeoordelingskemas aanvaar word, of in die geval van modulêre kursusse kan 'n metode gevolg word waarvolgens kort skriftelike eksamens van tyd tot tyd gedurende die kursus afgeneem word. Elke eksamen dek die onderwerpmateriaal wat gedurende die kursus tot met die aanbreek van die eksamen behandel is.

3.3.1 Radar.

Starting and stopping equipment by the correct procedure; adjustment of the display controls of the radar set in the correct sequence with reference to the indications of points of optimum setting; recognition of maladjustment of operational controls:

— brilliance/gain/video processor controls;
— focus controls;
— anti-sea clutter control;
— centre controls;
— anti-rain or fast-time constant controls;
— manual tuning control;
— optimum choice of range scales bearing in mind the varying conditions or circumstances of traffic, weather or proximity to land;
— use of fixed and variable range markers;
— accuracy and checking for inaccuracies;
— use of electronic bearing indicators;
— measurement of ranges and bearing for position fixing;
— limits of accuracy of fixes;
— observations to obtain information for aiding collision avoidance;
— passing information in an understandable form;
— radar reporting procedures;
— checking performance of radar equipment;
— use of performance monitor and need for frequent checks; and display tuning control;
— oral questions on the use of true motion radar;
— oral questions on the principles, capabilities and limitations of ARPA.

3.3.2 Direction finders.

Obtain a D/F bearing and apply any necessary corrections to enable the bearing to be laid off on a navigational chart; such bearing to be of an external source of radio transmission e.g. a nearby radio beacon.

3.3.3 Electronic position fixing systems.

Take readings from the various equipment after ensuring that the equipment has been set up according to the instructions laid down in the appropriate operating manuals; plot such readings on a navigational chart making due allowance for any corrections which may be indicated by the examiner (the corrections may be given by the examiner in hypothetical form).

3.3.4 Echo sounders.

Operate the equipment according to the instructions laid down in the operational manual.

3.4 *Oral examination.*

The candidate shall be questioned orally on the use of any of the equipment mentioned above, the effects of errors and misalignments and on any other subjects in the syllabus which may assist the examiner in judging a candidate's ability to obtain, interpret and use data from navigational equipment in a competent manner.

3.5 *Issue of certificates.*

3.5.1 A candidate must obtain a pass in both parts of the final examination and achieve the standards required by the Department of Transport in the in-course assessments of theorectical knowledge to qualify for the issue of an Electronic Navigation Systems Certificate.

3.5.2 Seventy percent of the marks available must be obtained to pass Part 1. To pass Part 2, a candidate must satisfy the examiner as to his competence to use the equipment, bearing in mind the objectives of the course. A candidate who fails shall be required to retake the complete course before again sitting for the examination unless the re-examination is attempted within twelve months of the first attempt.

3.5.3 With regard to partial passes, examiners may, at their discretion, allow a deferment in either Part 1 or Part 2. The deferred part must, however, be attempted within six months of the first attempt. Only one deferment shall be allowed and failure in this deferment shall oblige the candidate to re-take both parts of the examination at the next attempt.

3.6 Department of Transport approval and moderation.

3.6.1 Progressive assessment of theoretical knowledge. In all cases i.e. for students following either college schemes or modular courses, colleges shall submit for approval by the Department of Transport their assessment plan for each topic listed in the syllabus. The plan may follow those accepted under the college assessment schemes or in the case of modular courses, adopt a method of short written examination set at intervals during the course, each examination covering the subject matter dealt with during the course up to the point of examination.

3.6.2 Beoordeling van uitstipvaardighede.

Kolleges moet aan die Departement van Vervoer vir goedkeuring afskrifte voorlê van vraestelle wat in Deel 1 van die finale eksamen gestel gaan word (hierdie vraestelle moet wat inhoud en standaard betref, ooreenstem met dié wat goedgekeur is vir die Radarwaarnemereksamen).

3.6.3 Afneem van eksamen.

Die eksamen moet namens die Departement van Vervoer afgeneem word deur 'n eksaminator aangewys deur die kollege en goedgekeur deur die Direkteur-generaal: Met dien verstande dat die Direkteur-generaal hom die reg van sy beamptes voorbehou om te eniger tyd 'n eksamen, hetsy in sy geheel of gedeeltelik, te laat afneem.

AANHANGSEL P

NAVIGASIEBEHEERKURSUS (SIEN REGULASIE 3.7)

Doel

Om bevelsbesluitneming gebaseer op data deur navigasie-instrumente verskaf, volledige begrip van stelselfoute, deeglike begrip van die operasionele aspekte van moderne navigasiestelsels en effektiewe brugspanwerkprosedures te bevorder.

Kandidate

Offisiere met minstens 18 maande diens as gediplomeerde waghou-offisiere. Besit van 'n NB-sertifikaat is 'n voorvereiste vir die uitreiking van die Klas 2-bekwaamheidsertifikaat en 'n Bevelvoeringsendossementsertifikaat.

Mikpunt

Aan die einde van die opleiding moet die offisier in staat wees om navigasieinligting wat van alle bronne verkry is te evalueer ten einde bevelsbesluite te neem en te implementeer met die oog op botsingvoorkoming en die veilige navigasie van die skip.

Om hierdie mikpunt te bereik, brei hierdie kursus die aanwending van navigasie- en botsingvoorkomingstegnieke wat alreeds bestudeer en in die praktyk beoefen is uit, en die kursus toon die belangrikheid van hul onderlinge verband en die optimale gebruik van die navigasiedata wat normaalweg beskikbaar is vir die veilige navigasie van die skip.

Opleidingsplan

Die opleidingsplan is opgestel met die veronderstelling dat studente bekwaam is in basiese parallelindeksering, radarstipwerk en deurvaartbeplanningsprosedures.

Wanneer die NB-kursus gevolg word as deel van die kollegegebaseerde kursus ter voorbereiding van die Klas 2-bekwaamheidsertifikaat moet dit, waar moontlik, aanvullend wees tot en die kulminering wees van verwante studies in die Klas 2-leerplan wat betrekking het op praktiese navigasie en deurvaartbeplanningsprosedures.

Daar word derhalwe nie vereis dat die kursus as 'n diskrete module buite die hoofstroom van studie behandel moet word nie, maar minstens 36 uur moet gewy word aan die simulatoroefeninge wat deel van die kursus vorm.

Studente wat nie die NB-kursus as deel van die Studiekursus vir 'n volle Klas 2-sertifikaat volg nie, kan voordat met die oefeninge begin word bykomende tyd nodig hê vir die hersiening van die basiese prosedures waarna hierbo verwys is en vir sodanige studente kan die kursus aangebied word as 'n voltydse blok wat 60 uur duur.

Kursusprogram

Die kursus en oefeninge wat aangebied word, word in Subaanhangsel 'A' getoon.

Toerusting

Die lys van toerusting wat vir die kursus vereis word, word in Subaanhangsel 'B' gegee. Kolleges kan waar moontlik ander geskikte toerusting, byvoorbeeld skeepsimulators en opleidingsvaartuie, gebruik vir die aanbied van oefeninge bykomend by die voorgeskrewe simulatoroefeninge. Sulke bykomende oefeninge kan sekere aspekte van die opleiding en die bereiking van die doelstellings van die kursus verder bevorder, veral met betrekking tot instrumentloodsing- en brugspanwerkprosedures.

Toelating tot kursus

'n Student moet vir toelating tot hierdie kursus minstens 18 maande diens gelewer het as 'n gediplomeerde waghou-offisier en moet die houer wees van 'n Sertifikaat in Elektroniese Navigasiestelsels [of van sowel 'n Radarwaarnemersertifikaat as 'n Sertifikaat in Elektroniese Navigasiestelsels (Operasie)].

'n Student wat nie aan bogenoemde vereistes voldoen nie, kan tot hierdie kursus toegelaat word en 'n sertifikaat van bywoning in die goedgekeurde vorm kan na goeddunke van die Departement van Vervoer aan hom uitgereik word.

Aanbieding van kursus

Opleidingsinrigtings kan oor hulle eie gedetailleerde beplanning van kursusse en tydtafelreëlings besluit: Met dien verstande dat by die implementering van die oefeninge om gemelde mikpunte te bereik die volgende riglyne in aanmerking geneem moet word:

(i) Die oefeninge moet intensief wees en dit moet pas by die gevorderdheid en graad van die studente;

(ii) die omgewing waarin die oefeninge aangebied word, moet bevorderlik wees vir die opdoen van kennis deur deelname eerder as deur formele klaskameronderrig of lesings;

3.6.2 Assessment of plotting skills.

Colleges shall submit for approval by the Department of Transport copies of question papers to be set under Part 1 of the final examination (these papers shall be similar in contents and standards to those approved under the Radar Observer examination).

3.6.3 Conduct of examination.

The examination shall be conducted on behalf of the Department of Transport by an examiner appointed by the college and approved by the Director-General provided that the Director-General reserves the right of his officers to conduct an examination, either in whole or part, at any time.

ANNEXURE P

NAVIGATION CONTROL COURSE (SEE REGULATION 3.7)

Aim

To promote command decision-making based on data supplied by navigational instruments, a full appreciation of system errors, a thorough understanding of operational aspects of modern navigation systems and effective bridge teamwork procedures.

Candidates

Officers with a minimum of 18 months' service as certificated watchkeeping officers. Possession of a NC certificate shall be a prerequisite for issue of the Class 2 Certificate of Competency and Command Endorsement certificates.

Objective

At the end of the training, the officer should be able to evaluate navigational information derived from all sources in order to make and implement command decisions for collision avoidance and for directing the safe navigation of the ship.

To achieve this objective the course shall extend the application of navigational and collision ayoidence techniques already studied and practised; and demonstrate the importance of their inter-relationship and the optimum use of the navigational data normally available for conducting the safe navigation of the ship.

Training plan

The training plan has been drawn up on the assumption that students are proficient in basic parallel indexing, radar plotting and passage planning procedures.

When the NC course is taken as part of the college-based course of preparation for the Class 2 Certificate of Competency, it should where practicable, be complementary to and form the culmination of related studies in the Class 2 syllabus dealing with practical navigation and passage planning procedures. The course shall not therefore be required to be treated as a discrete module outside the main-stream of studies but a minimum of 36 hours shall be devoted to the simulator exercises which form part of the course.

Students who are not taking the NC course as part of a full Class 2 certificate study course may need additional time for revision of the basic procedures referred to above before commencing the exercises, and for such students the course may be run as a full-time block of 60 hours duration.

Course programme

The course and exercises to be conducted are shown at Sub-Annexure A.

Equipment

The list of equipment required for conduct of the course is given at Sub-Annexure B.

Colleges may utilise other suitable equipment where available, such as ship simulators and training vessels, for conducting exercises additional to the prescribed simulator exercises which additional exercises may further enhance certain aspects and achievement of the overall aims of the course, particularly in relation to blind pilotage and bridge teamwork procedures.

Entry to course

Students entering this course shall have a minimum of 18 months' service as a certificated watch-keeping officer and shall be in possession of an Electronic Navigation Systems Certificate [or both a Radar Observer's Certificate and an Electronic Navigational Aids (Operation) Certificate].

Students who do not comply with the above requirements may be allowed entry to this course and, at the discretion of the Department of Transport, may be issued with a Certificate of Attendance in the approved form.

Conduct of course

Training establishments may decide on their own detailed planning of courses and timetable arrangements: Provided that in implementing the exercises to meet the stated objectives, the following guide-lines shall be taken into account:

(i) The exercises shall be intensive and appropriate to the maturity and grade of the students;

(ii) the environment in which the exercises are conducted shall be conducive to learning through participation rather than formal classroom teaching or lectures;

(iii) die rol wat die studente speel, moet verteenwoordigend wees van die werklike situasie ten einde dit moontlik te maak om brugspanwerkprosedures te volg;

(iv) na elke oefening moet al die offisiere 'n algemene samespreking voer waartydens die oefening ontleed en die aksies gekritiseer moet word.

Beoordeling

Studente se prestasie en hulle begrip van die beginsels waarop die oefeninge gebaseer is, moet as 'n vorm van deurlopende beoordeling gedurende die kursus deeglik deur die instrukteurs nagegaan word, maar daar is geen formele eksamen aan die einde van die navigasiebeheerkursus nie.

Die basiese beginsels moet soos tevore formeel beoordeel word as deel van die Departement van Vervoer se skriftelike en mondelinge eksamens en die NB-kursus moet eerder as aanvullend tot die oorhoofse opleidings- en ondervindingsvereistes, as 'n doel op sigself beskou word.

Sertifikaat

'n Bywoningsertifikaat in 'n vorm wat deur die Direkteur-generaal goedgekeur is, word slegs aan offisiere uitgereik wat die kursus bygewoon en bevredigend daaraan deelgeneem het.

Goedkeuring

Die program van elke kursus moet deur die Direkteur-generaal goedgekeur word.

SUBAANHANGSEL A van die Navigasiebeheerkursusspesifikasie

KURSUSPROGRAM EN OEFENINGE WAT AANGEBIED MOET WORD

1. *Inleiding*

1.1 Die kursus sluit die program van simulatoroefeninge wat in hierdie Subaanhangsel beskryf is in, maar opleidingsinrigtings kan, ooreenkomstig die volgende riglyne, die besonderhede van hulle eie oefeninge ontwerp ten einde die doelstellings wat vir elke stadium gelys is te bereik en oor die geskikte "afspeelgebiede" en die duur van elke oefening te besluit.

2. *Ontwerp en oefeninge.*

2.1 By die ontwerp en aanbieding van oefeninge moet daar in gedagte gehou word dat—

2.1.1 die gebruik en werking van die volledige reeks navigasietoerusting, met inbegrip van radar en ARPA, reeds gedurende die ENS-kursus bestudeer is en dat sommige similatoroefeninge reeds in daardie stadium onderneem is;

2.1.2 die beginsels van die hou van 'n veilige navigasiewag, kaartwerk, deurvaartbeplanning en brugspanwerkprosedures dan reeds bestudeer sal wees as deel van die verwante vorm vir die bekwaamheidsertifikaatleerplanne. Waar 'n student die navigasiebeheerkursus volg as deel van 'n studiekursus wat tot die Klas 2-eksamen lei, moet opleiding in basiese tegnieke van, byvoorbeeld, deurvaartbeplanning en hersiening van radarstipwerk, deel vorm van daardie studiekursus. Weens die uiters praktiese en realistiese aard van die oefeninge bevorder die navigasiebeheerkursus die toepassing van die betrokke beginsels;

2.1.3 offisiere wat die navigasiebeheerkursus volg, maar nie as 'n deel van 'n studiekursus vir 'n Klas 2-sertifikaat nie, kan bykomende tyd nodig hê vir hersiening van die basiese tegnieke voordat daar met die navigasiebeheeroefeninge begin word;

2.1.4 offisiere wat nie 'n kursus in elektroniese navigasiestelsels gevolg het nie, maar wat die radarwaarnemerkursus en die kursus in elektroniese navigasiehulpmiddels (operasie) gevolg het, mag dit voor hul toetrede nodig vind om Stadium 1 van die navigasiebeheerkursus te verleng met die oog op volle dekking van paragrawe C14.17 van die ENS-kursusleerplan, wat opleiding in die gebruik van ARPAs insluit;

2.1.5 die student moet minstens agtien maande ondervinding as 'n gediplomeerde waghou-offisier ter see opgedoen het voordat hy met die kursus begin.

2.2 Ten einde genoemde doelwit van die kursus te bereik, behoort die nodige aandag geskenk te word aan—

2.2.1 die beplanning en uitvoering van vaarte in beperkte en oop waters;

2.2.2 die gebruik van radar en ARPA vir botsingvoorkoming, navigasie en instrumentloodsing;

2.2.3 die keuring en gebruik van ander navigasietoerusting en data ooreenkomstig die heersende toestande;

2.2.4 ander dienste en inligting soos weerverslae en die gebruik van radiotelefoonkommunikasie.

2.3 Doeltreffende brugspanwerkprosedures moet deurgaans in die kursus beklemtoon word.

3. *Organisasie.*

3.1 Die kursus kan nie in sy doel slaag met minder as vier studente in twee spanne van twee elk, of meer as drie studente by elke skip nie.

(iii) the roles played by the students shall be representative of the real situation to enable bridge teamwork procedures to be followed;

(iv) following every exercise there shall be a general discussion amongst all the officers, when the exercise shall be analysed and actions criticised.

Assessment

Students' performance and understanding of the basic principles on which the exercises are based shall be closely monitored by the instructors as a form of continuous assessment throughout the course, but there shall be no formal examination at the conclusion of the NC course. The basic principles shall continue to be formally assessed as part of the Department of Transport's written and oral examinations and the NC course may be seen as contributory to the overall training and experience requirements rather than an end in itself.

Certificate

A Certificate of Attendance, in a form approved by the Director-General be issued only to officers who attend and satisfactorily participate in the course.

Approval

Each course programme shall be approved by the Director-General.

SUB-ANNEXURE A to Navigation Control Course Specification

COURSE PROGRAMME AND EXERCISES TO BE CONDUCTED

1. *Introduction.*

1.1 The course shall include the programme of simulator exercises described in this Sub-Annexure but training establishments may, within the following guidelines, design the details of their own exercises to meet the objectives listed for each stage and to decide appropriate "playing areas" and duration for each exercise.

2. *Design and exercises.*

2.1 The design and conduct of exercises shall take into account that—

2.1.1 the use and operation of the full range of navigation equipment, including radar and ARPA, shall have been studied during the ENS course and some simulator exercises shall have been undertaken at that stage;

2.1.2 principles of keeping a safe navigation watch, chartwork, passage planning and bridge team work procedures shall have been studied as part of the related form for the certificate of competency syllabuses. Where a student is taking the Navigation Control (NC) Course as part of a course of study leading to the Class 2 examination, instruction in basic techniques of, for instance, passage planning and revision of radar plotting, shall form part of that course of study. The Navigation Control (NC) Course shall reinforce the application of the principles involved through the extremely practical and realistic nature of the exercises;

2.1.3. officers taking the Navigation Control (NC) Course other than as part of a Class 2 Certificate study course may need additional time for revision of the basic techniques before commencing the NC exercises;

2.1.4 officers who have not attended an Electronic Navigation Systems (ENS) Course, but who have taken the Radar Observer and Electronic Navigational Aids (Operation) Course, prior to entry may need to extend Stage 1 of the NC course to provide a full coverage of paragraphs C14.17 of the ENS course syllabus, which includes instruction in the use of ARPA's;

2.1.5 the student shall have gained at least eighteen months experience at sea as a certificated watch-keeping officer prior to entering the course.

2.2 In meeting the stated objective of the course, due regard shall be paid to—

2.2.1 planning and execution of passages in confined and open waters;

2.2.2 the use of radar and ARPA for anti-collision, navigation and blind pilotage;

2.2.3 the selection and use of other navigation equipment and data as appropriate to prevailing circumstances;

2.2.4 other services and information such as weather reports and the use of Radio Telephone Communications.

2.3 Effective bridge team-work procedures shall be emphasised throughout the course.

3. *Organisation.*

3.1 The objective of the course cannot be achieved with less than four students in two teams of two each, or more than three students at any ownship.

4. *Spanrolle.*

4.1 Die rolle moet verteenwoordigend wees van die werklike situasie ten einde dit moontlik te maak om brugspanwerkprosedures te volg. Die Gesagvoerder moet byvoorbeeld as die ontvanger/koördineerder van inligting optree en moet met die oog op die veilige verloop van die oefening oorhoofse besluite neem ooreenkomstig die pligte van 'n offisier in bevel van 'n navigasiewag, waar moontlik bygestaan deur die derde spanlid. Die spanne moet hulle eie plan vir die deurvaart wat gevolg moet word, in ooreenstemming met erkende prosedures opstel.

Geskikte publikasies, bv. Loodsboeke en Getytafels van die Admiraliteit is vir hierdie doel beskikbaar.

4.2 Gedurende die kursus moet rolle soos toepaslik omgeruil word om elke student voldoende geleentheid te bied om as bevelvoerder van die skip op te tree en om die toerusting by elke erkende posisie van die skip te bedien.

5. *Oefeninge*

5.1 By voltooiing van die eerste stadium van die kursus moet die offisier-in-bevel van die skip toegelaat word om die tegnieke wat hy verkies te gebruik by die beplanning van die voorgenome deurvaart, by die verkryging van radar- en navigasie-inligting en by die maneuvrering van sy skip.

5.2 Na afloop van elke oefening moet al die studente samesprekings voer om die handelinge wat plaasgevind het te analiseer en te kritiseer, en rekords van die oefening moet vir hierdie doel beskikbaar wees.

Besprekings kan gevolg word deur demonstrasies van die uitwerking van enige moontlike alternatiewe optrede, of optrede wat in die bespreking voorgestel is. Dit kan by geleentheid ook voordelig wees om alternatiewe tipes beeldvoorstellings te demonstreer en te vergelyk.

6. *Soort oefeninge.*

Stadium 1—Botsingvoorkomingsoefeninge

Tema: Oopwateroefeninge wat ontmoetings met een of twee teikenskepe behels en later op veelskipontmoetings uitloop.

Die aanvanklike oefening(e) moet die student bekendstel met die toerusting en hom weer eens vertroud maak met die gebruik van 'n radarstel vir botsingvoorkoming deur radar- en ARPA-tegnieke.

Doelstellings:

1. Om die opleideling se uitstip- en vertolkingsvermoëns te verfris, en om sy begrip van uitstipbeperkings en -foute te verbeter (met inbegrip van dié wat met die gebruik van ARPA-stelsels in verband staan).

2. Om, waar optrede nodig is, die nodigheid van die groot koers- en/of spoedveranderings in 'n vroeë stadium van die ontmoeting in te sien.

3. Om die moontlikheid in te sien dat stappe wat reeds gedoen word, gekanselleer moet word, veral as peilings aanvanklik stadig verander.

Omvang van oefeninge:

Die oefeninge moet voorbeelde insluit van alle kategorieë van realistiese ontmoetings wat veranderings in die skip se koers en/of spoed mag vereis. Dit is in hierdie stadium belangrik dat oefeninge en demonstrasies gerig moet wees op daardie situasies wat in gevalle van werklike botsings voorgekom het.

Stadium 2—Navigasie en botsingvoorkoming

Tema:

Oefeninge wat veelskipontmoetings insluit wanneer 'n kuslyn of ander navigasiegevaar uit oop water genader word.

Doelstellings:

Om voort te gaan met die oefen van botsingvoorkomingsmaneuvers waarby enkel- en veelskipontmoetings betrokke is, en terselfdertyd—

(i) die student se vermoë te verbeter om as deel van 'n span te werk wanneer die land genader word en in kuswater genavigeer word;

(ii) die nodigheid te illustreer om die eie skip se posisie vas te stel en sy voortgang in kuswaters te moniteer;

(iii) elke span se vermoë te toets om die skip se baan in kuswaters te moniteer en 'n doeltreffende radarwag in stand te hou.

Omvang van oefeninge:

Die oefeninge moet die volgende aspekte dek:

Posisiebepaling deur gebruik te maak van elektroniese hulpmiddels vir navigasie.

Die opstel en uitvoering van 'n navigasieplan vir die nadering van die land.

Monitering van die skip se baan in kuswaters, met inbegrip van die gebruik van parallelindekstegnieke.

Die uitwerking van getystrome, seestrome en wind op die behoud van baan.

Die probleme om grondgestabiliseerde warebewegingsradarbeelde te vertolk.

Botsingvoorkomingsmaneuvers.

Die toevallige wanfunksionering van toerusting wat in navigasie en botsingvoorkoming gebruik word.

Beperkings van ARPA in navigasierol.

4. *Team roles.*

4.1 The roles played should be representative of the real situation to enable bridge team-work procedures to be followed. For example, the Master shall act as the receiver/co-ordinator of information and shall make overall decisions for the safe conduct of the exercise appropriate to the duties of an officer in charge of a navigational watch, assisted by the third team member where available. The teams should devise their own plan for the passage to be followed, in accordance with recognised procedures.

Suitable publications e.g. Admiralty Pilot Books and Tide Tables shall be available for this purpose.

4.2 Roles should be changed as appropriate during the course to give each student ample opportunity in command of own ship and to operate equipment at each own ship position.

5. *Conduct of exercises.*

5.1 On completion of the first stage of the course, the officer in command of own ship shall be allowed to use the techniques he desires in planning the intended passage, in obtaining radar and navigational information and in manoeuvring his ship.

5.2 Discussions should be held amongst all the students following every exercise to analyse and criticise actions taken and records of the exercise shall be available for this purpose. Discussions may be followed by demonstrations of the effects of any alternative action which could have been taken or which was suggested in discussion. On occasion it may also be beneficial to demonstrate and compare alternative types of display presentation.

6. *Exercises.*

Stage 1—Collision avoidance exercises

Theme:

Open water exercises involving encounters with one or two target ships and progressing to multi-ship encounters.

The initial exercise(s) should introduce the student to the equipment and update his knowledge of the use of a radar set for collision avoidance employing radar and ARPA techniques.

Objectives:

1. To refresh the trainee's plotting and interpretation abilities, and to increase his appreciation of plotting limitations and errors (including those associated with the use of ARPA systems).

2. To recognise, where action is necessary, the need for generally making substantial alterations of course and/or speed at an early stage in the encounter.

3. To recognise the possibility of cancelling actions being taken, particularly when bearings are initially changing slowly.

Outline of excercises:

The exercises should include examples of all categories of realistic encounters which may call for alterations in own ship course and/or speed. It is important during this stage that exercises and demonstrations shall highlight those situations which have occurred in actual collision cases.

Stage 2—Navigation and collision avoidance

Theme:

Exercises involving multi-ship encounters when approaching a coastline or other navigational hazard from open waters.

Objectives:

To continue practice of collision avoidance manoeuvres involving single and multi-ship encounters and, at the same time—

(i) enhance the student's ability to work as part of a team when making landfall and navigating in coastal waters;

(ii) illustrate the need to ascertain position of own ship and to monitor its progress into coastal waters;

(iii) test each team's ability to monitor the ship's track in coastal waters and maintain an efficient radar watch.

Outline of exercises:

The exercises should cover the following points:

Position fixing using electronic aids to navigation.

The production and execution of a navigation plan for landfall.

Monitoring of the ship's track in coastal waters, including use of parallel index techniques.

The effects on track keeping of tidal streams, currents and wind.

The problems of interpreting ground stabilised true motion radar displays.

Collision avoidance manoeuvres.

The occasional malfunction of equipment used in navigation and collision avoidance.

Limitations of ARPA in the navigational role.

Stadium 3—Soek-en-reddingswerk

Tema:

Oefening(e), hetsy in oop of kuswaters, met besondere aandag aan die noodsaaklikheid om 'n soek-en-reddingsoperasie uit te voer terwyl voortgegaan word met die oefen van botsingvoorkoming en navigasietegnieke en -prosedures.

Doelwitte:

1. Die oefen, sowel in die skip as tussenskeeps, van soek-en-reddingsprosedures en -tegnieke, met besondere klem op die koördinering en beplanning van die soektog ten einde die redding in die kortste moontlike tyd af te handel terwyl die beskikbare hulpmiddels met die grootste mate van doeltreffendheid gebruik word.

2. Om die beginsel van effektiewe brugspanwerkprosedures in te skerp.

Omvang van oefening(e):

Die ongeval moet realisties beheer word deur die instrukteur en kan byvoorbeeld sink voordat reddingskepe opdaag. Elke skip, tesame met instrukteursbeheerde teikens (met inbegrip van helikopter(s)), moet betrokke wees by die reaksie op die noodoefening(e) wat die volgende insluit:

Navigasie- en botsingweringsoorwegings.

Die noodsaaklikheid daarvan dat die ongeval dit vir ander maklik moet maak om hom op te spoor.

Gebruik van D/F vir aanpeiling op 'n ongeval (wanneer dit in 'n simulator voorsien word, moet hierdie fasiliteit gebruik word om die realisme van die oefeninge te verhoog).

Koördinering en beplanning van die soektog-en-redding.

Stadium 4—Navigasie en botsingvoorkoming

Tema:

Intensiewe oefeninge wat die nadering van en deurvaart deur gebiede met swaar verkeer en navigasiebeperkings behels.

Doelstellings:

Om korrekte deurvaartbeplanning en waghouprosedures wat vir doeltreffende navigasiebeheer in beperkte waters met swaar verkeer vereis word, te konsolideer.

Omvang van oefeninge:

Die oefeninge moet die vermoë van individue en spanne tot die realistiese maksimum verhoog. Hulle moet soveel aspekte moontlik van navigasie en botsingvoorkoming insluit.

Die punte in Stadiums 1 en 2 genoem, moet waar toepaslik gebruik word en die oefening(e) moet ook die volgende insluit:

Die opstel en uitvoer van 'n deurvaartplan deur 'n gebied wat fokuspunte vir verkeer- en verkeersverdelingsones bevat.

Landbasis verkeersinligting moet ingesluit word. Nadering van loodsstasie en die aan boord neem van 'n loods.

Minstens een oefening moet lank genoeg wees om realistiese oorhandigings tussen lede van die span soos toepaslik op heersende omstandighede, moontlik te maak, bv. die aanvang van beperkte sigbaarheid.

Subaanhangsel B van Navigasiebeheerkursusspesifikasie

TOERUSTINGVEREISTES

Die volgende minimum toerusting word vir die kursus vereis:

1. 'n Seenavigasietoerustingsimulator waaraan 'n Tipetoetssertifikaat deur die Departement van Handel toegeken is en wat geïnstalleer is in akkommodasie deur die Direkteur-generaal goedgekeur.

2. Die simulator moet minstens drie skeepsposisies in werklike tyd aandryf. Elke skeepsposisie word voorsien van—

(a) 'n basiese radarterminaal met opleidelingbeheer van skeepsmaneuvrering;

(b) data van 'n Decca-navigator (Merk XXI of Merk XXX), MF/DF, en 'n eggoloder wat deur werklike, verteenwoordigende of grafiese beelde, of in alfa-numeriese vorme voorsien word;

(c) toepaslike kaarte, handstiphulpmiddels, 'n stiptafel, 'n konvooitydhouer, en kompas- en skeepsnelheidsaflesings. Daarby moet 'n gesimuleerde radiotelefoonkommunikasiestelsel van skip-tot-skip en skip-tot-land (instrukteur se posisie) voorsien word.

3. Benewens die vereistes van paragrawe 1 en 2, moet minstens een skeepsposisie voorsien word van 'n ARPA-beeld wat òf 'n integrerende deel van die radarbeeld wat in paragraaf 2 (a) vereis word, òf 'n alleenstaande fasiliteit kan wees. In albei gevalle moet die beeld met ARPA-kenmerke in verband gebring word met die simulering van die skip se posisie.

4. Die navigasiebeelde en data-uitsette in paragrawe 2 en 3 hierbo vereis, moet deur die simulatorrekenaar beheer word en in verband gebring word met die betrokke skeepsposisie, terwyl tipiese foute van hierdie beelde deur die instrukteur nagegaan moet word. Die toepaslike bedieningsaanwysings en foutkorreksiedata moet waar nodig aan die opleidelinge beskikbaar gestel word.

Stage 3—Search and rescue

Theme:

Exercise(s) in either open or coastal waters involving the need to conduct a search and rescue operation while continuing practice in collision avoidance and navigational techniques and procedures.

Objectives:

1. To practice, both in-ship and inter-ship, search and rescue procedures and techniques, emphasising the need for the search to be co-ordinated and planned to carry out a rescue in the minimum time using to maximum effect the resources available.

2. To enhance the concept of effective bridge team-work procedures.

Outline of exercise(s):

The casualty should be realistically controlled by the instructor and may, for instance, sink before rescue ships arrive on the scene. Each own ship, together with instructor-controlled targets [including helicopter(s)], should be involved in the response to the distress exercise(s) which should include—

navigation and anti-collision considerations;

the need for the casualty to assist location by others;

use of D/F for homing on (when provided on a simulator, this facility should be used to enhance the realism of the exercises);

co-ordination and planning of the search and rescue.

Stage 4—Navigation and collision avoidance

Theme:

Intensive exercises involving the approaches to and passage through areas of heavy traffic with navigational restrictions.

Objectives:

To consolidate correct passage planning and watch-keeping procedures required for effective navigation control in confined waters with heavy traffic.

Outline of exercises:

The exercises should stretch the ability of individuals and teams to the realistic maximum. They should include as many aspects as possible of navigation and collision avoidance.

Points covered in Stages 1 and 2 should be introduced as appropriate and the exercise(s) should also include the following:

The production and execution of a passage plan through an area containing focal points for traffic and traffic separation zones. Shore-based traffic information should be included.

Approach to pilot station and pilot embarkation.

At least one exercise should be of sufficient duration to enable realistic handovers to be effected between members of the team as appropriate to prevailing circumstances, e.g. the onset of restricted visibility.

Sub-Annexure B to Navigation Control Course Specification

EQUIPMENT REQUIREMENTS

The following minimum equipment shall be required for the conduct of the course:

1. A marine navigational equipment simulator which has been awarded a Certification of Type-Testing by the Department of Trade and which is installed in accommodation approved by the Director-General.

2. The simulator shall drive, in real time, at least three own ship positions. Each own ship position shall be provided with—

(a) a basic radar display with trainee control of own ship manoeuvring;

(b) data from a Decca Navigator (Mark XXI or Mark XXX), and MF/DF, and an echo sounder provided through real, representative or graphic displays, or in alphanumeric forms;

(c) appropriate charts, manual plotting aids, a plotting table, a time clock, and compass and ship's speed read-outs. Additionally a simulated radiotelephone communications system shall be provided ship-to-ship and ship-to-shore (instructor's position).

3. In addition to the requirements of paragraphs 1 and 2, at least one own ship position shall be provided with an ARPA display which may be either an integral part of the radar display required in paragraph 2 (a) above or a stand-alone facility. In either case, the display of ARPA features shall be related to the simulation of the own ship's position.

4. The navigational displays and data outputs required in paragraphs 2 and 3 above shall be controlled by the simulator computer and be related to the respective own ship position with typical errors of these displays being controlled by the instructor. Where appropriate, the relevant operating instructions and error correction data shall be made available to the trainees.

5. Elke skeepsposisie moet geakkommodeer word in 'n hokkie of kamer geskei van die ander skepe, en die hoofsimulatorrekenaar en die instrukteur se posisie moet voldoende klankdig wees.

6. Plek moet beskikbaar wees vir voorligting en ondervraging.

7. Tot tyd en wyl bestaande simulators wat nie aan bogenoemde vereistes voldoen nie, verbeter of vervang kan word, mag bestaande toerusting steeds gebruik word, mits die goedkeuring van die Direkteur-generaal in elke geval verkry is.

Opmerkings:

Simulators wat na 1 September 1981 vervaardig is, moet aan die werkverrigtingspesifikasie (1980) vir sodanige simulators, soos gepubliseer deur die Departement van Handel, voldoen.

Daar kan vereis word dat minstens twee skeepsposisies met ARPA toegerus moet wees, maar 'n besluit oor hierdie aangeleentheid word uitgestel totdat ondervinding in die aanbieding van die kursus opgedoen is. Hierdie bykomende vereiste moet in gedagte gehou word wanneer nuwe toerusting bestel word.

KURSUS IN OUTOMATIESE RADARUITSTIPHULPMIDDELS

Doelstelling:

Om opleiding te verskaf in die grondbeginsels en bediening van ARPA-toerusting en in die vertolking en ontleding van inligting met behulp van hierdie toerusting verkry.

Bedoel vir:

Gesagvoerders en Offisiere in bevel van 'n navigasiewaghoudiens, wat op skepe wat met ARPA-toerusting toegerus is, dien, of voornemens is om daarop te dien. (Opmerking: Die opleidingsprogram wat in hierdie dokument beskryf word, vorm 'n essensiële deel van die kursus in elektroniese navigasiestelsels (ENS-kursus); die besit van 'n ENS-sertifikaat moet derhalwe voldoen aan die vereistes vir offisiere wat in bevel is van 'n wag van enige skip wat oor ARPA-toerusting beskik).

Mikpunt:

Aan die einde van die kursus moet die offisier in staat wees om ARPA-toerusting doeltreffend te gebruik as 'n veilige hulpmiddel vir navigasie en botsingvoorkoming deur die vermoë om—

(1) prosedures vir die bediening van die toerusting en die behoud van die beeld te volg;

(2) die data wat voorsien word te verkry en te ontleed;

(3) op te tree soos vereis vir veilige navigasie gebaseer op korrekte vertolking en ontleding van ARPA-data.

Leerplan:

Die leerplan vir hierdie kursus is by Subaanhangsel A aangeheg.

Toerusting:

Die minimum toerusting vir hierdie kursus moet uit 'n goedgekeurde ARPA-stel bestaan wat aan die IMO-spesifikasie vir sodanige toerusting voldoen [IMO-Resolusie A422 (XI) het betrekking]. Die ARPA-insette moet voorsien word deur 'n simulator met 'n wisselwerkingsvermoë soos goedgekeur deur die Departement van Vervoer.

Toelating tot kursus:

Studente wat tot hierdie kursus toegelaat word, moet in besit wees van 'n radarwaarnemersertifikaat. Hulle moet verkieslik ook in besit wees van 'n Bywoningsertifikaat van bywoning van 'n goedgekeurde radarsimulator-kursus en moet minstens 18 maande seediens verrig het.

Van offisiere wat hierdie kursus moet volg en wat nie voorheen 'n radarsimulatorkursus bygewoon het nie, sal verwag word om 'n preliminêre intensiewe tydperk van hersiening van basiese radarstipwerk op 'n radarsimulator te volg. Die opleidingsinriging kan besluit oor die mate waarin enige sodanige preliminêre opleiding nodig is vir die bereiking van die doelstellings van die ARPA-opleiding, en of groepe studente met uiteenlopende radarondervinding tot dieselfde ARPA-kursus toegelaat moet word.

Duur en aanbieding van kursus:

Die tyd wat nodig is om die doelstellings te bereik, hang in hoë mate af van vorige ondervinding en opleiding en van die toerusting wat beskikbaar is vir die aanbieding van die kursus. In die reël moet die kursus gebaseer wees op die vereiste dat daar nie meer as vier studente, verdeel in pare, per ARPA-terminaal moet wees nie; dat elke paar minstens 9 uur moet bestee aan die gebruik van ARPA-toerusting, en dat al die studente ewe veel geleentheid moet kry om die beskikbare toerusting te bedien.

Die leerplanonderwerpe moet, waar toepaslik, gedek word deur onderrig en demonstrasies en deur intensiewe simulatoroefeninge in verband met die gebruik van ARPA. Aandag word gevestig op die nodigheid daarvan dat die opleidelinge 'n reeks werklikheidsoefeninge moet voltooi, gevolg deur 'n ondervraging en bespreking van die handelinge wat gedurende die oefeninge plaasgevind het. Aandag moet geskenk word aan—

(1) die noodsaaklikheid daarvan om te alle tye in ooreenstemming met die bepalings van die Botsingsregulasies en die Basiese Beginsels en Operasionele Gids vir die Hou van 'n Veilige Navigasiewag op te tree;

5. Each own ship position shall be accommodated in a cubicle or room separated from the other own ships, the main simulator computer and the instructor's position by adequate sound proofing.

6. A space for briefing and de-briefing shall be made available.

7. Until such time as existing simulators which do not meet the above requirements can either be updated or replaced, existing equipment may continue to be used provided the approval of the Director-General is obtained in each case.

Notes:

Simulators manufactured after 1 September 1981 shall comply with the (1980) Performance Specification for such simulators published by the Department of Trade.

There may be a requirement for at least two own ship positions to be equipped with ARPA but a decision on this matter shall be deferred until experience of operating the course has been acquired. This additional requirement shall be borne in mind when ordering new equipment.

AUTOMATIC RADAR PLOTTING AIDS COURSE

Aim:

To provide training in the fundamentals and operation of ARPA equipment and in the interpretation and analysis of information obtained from this equipment.

Intended for:

Masters and Officers in charge of a navigational watch serving or intending to serve on ships fitted with ARPA equipment. [*Note:* The training programme described in this paper forms an essential part of the Electronic Navigation Systems (ENS) Course; possession of a ENS Certificate shall, therefore, meet the requirements for officers in charge of a watch of any ship fitted with ARPA equipment].

Objective:

At the end of the course the officer should be capable of effectively using ARPA equipment as a safe aid to navigation and collision avoidance through an ability to—

(1) follow procedures for operating the equipment and maintaining the display;

(2) obtain and analyse the data provided;

(3) take action as required for the safe conduct of navigation based on correct interpretation and analysis of ARPA data.

Syllabus:

The syllabus for this course is attached at Sub-Annexure A.

Equipment:

The minimum equipment for conduct of this course shall consist of an approved ARPA set which meets the IMO specification for such equipment (IMO Resolution A422 (xi) refers). The inputs to the ARPA shall be provided by a simulator with an inter-active capability approved by the Department of Transport.

Entry to Course:

Students entering this course shall hold a Radar Observer's Certificate. They should ideally also be in possession of a Certificate of Attendance at an approved Radar Simulator Course and have a minimum of 18 months sea service.

Officers required to undertake this course who have not previously attended a Radar Simulator Course shall be required to follow a preliminary intensive period of revision of basic radar plotting on a radar simulator. The training establishment may decide on the extent of any such preliminary training needed to enable the objectives of the ARPA training to be achieved and whether to allow groups of students having a varied background of radar experience entry to the same ARPA course.

Duration and conduct of course:

The time needed to achieve the objectives shall depend to a large extent upon previous experience and training and the equipment available for the conduct of the course. As a rule, the course should be based on a requirement that there shall be no more than four students, divided into pairs, per ARPA display; that each pair shall spend a minimum of 9 hours using the ARPA equipment, and that each student shall be given equal opportunity to operate the equipment available.

The syllabus topics should be covered, as appropriate, by instruction, demonstrations, and intensive simulator exercises on the use of ARPA. Attention is drawn to the need for the trainees to undergo a series of real-time exercises followed by a de-briefing and discussion of actions taken during the exercises. Due attention must be given to—

(1) the need to act at all times in accordance with the provisions of the Collision Regulations and the Basic Principles and Operational Guidance for Keeping a Safe Navigational Watch;

(2) die gevare daaraan verbonde om te veel op ARPA-data te vertrou;

(3) die vermoëns en beperkings van die stelsel, en daardie faktore wat die stelsel se prestasie en akkuraatheid kan beïnvloed.

Sertifikate:

'n Bywoningsertifikaat in 'n vorm soos goedgekeur deur die Direkteur-generaal mag slegs uitgereik word aan offisiere wat die kursus bywoon en op 'n bevredigende wyse daaraan deelneem.

Goedkeuring van kursus:

Die fasiliteite en kursusprogram moet deur die Direkteur-generaal goedgekeur word.

SUBAANHANGSEL A van ARPA-kursusspesifikasie

OPLEIDING IN DIE OPERASIONELE GEBRUIK VAN OUTOMATIESE RADARUITSTIPHULPMIDDELS

1. *Algemeen.*

1.1 Die kursus handel oor die grondbeginsels en bediening van ARPA-toerusting en die vertolking en ontleding van inligting wat verkry is.

1.2 Benewens die formele opleiding en demonstrasies moet studente 'n reeks werklikheidsoefeninge voltooi waarin die vertoonde radarinligting òf in ARPA-formaat, òf in basiese radarformaat is. Sodanige buigsaamheid van aanbieding maak dit moontlik om realistiese oefeninge te onderneem wat aan elke groep studente die wydste verskeidenheid beeldinligting moontlik beskikbaar stel en sodoende hulle vermoë verbeter om òf basiese radarstelsels, òf ARPA-stelsels effektief te gebruik.

1.3 Die aandag word gevestig op die vereistes soos in die afdeling Duur en Aanbieding van die Kursus in die kursusspesifikasie uiteengesit, en daar word verder gewys op die behoefte aan preliminêre bykomende opleiding vir studente wat nie voorheen 'n radarsimulatorkursus gevolg het nie.

1.4 Die besonderhede van die doelwitte wat gedurende hierdie kursus bereik moet word, word in paragraaf 2 hieronder beskryf, terwyl 'n meer omvattende leerplan van vakke wat deur opleiding/demonstrasie en praktiese oefeninge gedek moet word onderskeidelik in paragrawe 3 en 4 gegee word.

2. *Doelwitte.*

By voltooiing van hierdie kursus moet studente oor die volgende beskik:

2.1 Kennis van—

2.1.1 die moontlike gevare daaraan verbonde om te veel op ARPA te vertrou.

2.1.2 die vernaamste tipes ARPA-stelsels en hulle beeldkenmerke;

2.1.3 die IMO-prestasiestandaarde vir ARPA;

2.1.4 faktore wat die prestasie en akkuraatheid van die stelsel beïnvloed;

2.1.5. volgvermoëns en beperkings van ARPA;

2.1.6 Prosesseervertragings.

2.2 Die kennis en vermoë om met behulp van goedgekeurde toerusting te demonstreer—

2.2.1 die opstel en behoud van ARPA-beelde;

2.2.2 wanneer en hoe om die operasionele waarskuwings te gebruik; hul voordele en beperkings;

2.2.3 operasionele toetse van die stelsel;

2.2.4 wanneer en hoe om inligting te verkry in sowel relatiewe as warebewegingbeeldmodusse, met inbegrip van:

— die identifikasie van kritieke eggo's;

— die gebruik van uitsluitingsgebiede in outomatiese modus;

— die spoed en rigting van teikens se relatiewe beweging;

— die tyd na en voorspelde afstand tot by die teiken se naaste naderingspunt;

— die koers en spoed van teikens;

— die opspoor van koers- en spoedveranderings van teikens, en die beperkings van sodanige inligting;

— die uitwerking van verandering in skip se koers of spoed of albei;

— die werking van die toetsmaneuver;

2.2.5 hand- en outomatiese verkryging van teikens, en hulle onderskeie beperkings;

2.2.6 wanneer en hoe om ware en relatiewe vektore en tipiese grafiese voorstelling van teikeninligting en gevaargebiede te gebruik;

2.2.7 wanneer en hoe om inligting oor verbygegane posisies van teikens wat gevolg word, te gebruik;

2.2.8 toepassing van die Internasionale Regulasies vir die Voorkoming van Botsings ter See.

3. *Leerplan—Teorie en demonstrasie.*

3.1 Die moontlike gevare daaraan verbonde om te veel op ARPA te vertrou.

(2) the dangers inherent in over-reliance on ARPA data;

(3) the capabilities and limitations of the system and those factors which can affect the system's performance and accuracy.

Certificates:

A Certificate of Attendance, in a form approved by the Director-General shall be issued only to officers who attend and satisfactorily participate in the course.

Approval of courses:

The facilities and course programme shall be approved by the Director-General.

SUB-ANNEXURE A to ARPA Course specification

TRAINING IN THE OPERATIONAL USE OF AUTOMATIC RADAR PLOTTING AIDS (ARPA)

1. *General.*

1.1 The course shall cover the fundamentals and operation of ARPA equipment and the interpretation and analysis of information obtained.

1.2 In addition to formal instruction and demonstrations, students should complete a series of real-time exercises where the displayed radar information is either in the ARPA format or in the basic radar format. Such flexibility of presentation will enable realistic exercises to be undertaken, providing for each group of students the widest range of displayed information available to the user and thus consolidating their ability to use effectively either basic radar or ARPA systems.

1.3 Attention is drawn to the requirements under the section Duration and Conduct of the Course in the course specification, and to the need for preliminary additional training for students who have not previously undertaken a Radar simulator course.

1.4 The detailed objectives to be achieved during the course are described in paragraph 2 below, while a more comprehensive syllabus of subjects to be covered by instruction/demonstration and practical exercises is given in paragraphs 3 and 4 respectively.

2. *Objectives*

On completion of the course, students should have—

2.1 knowledge of—

2.1.1 the possible risks of over-reliance on ARPA;

2.1.2 the principal types of ARPA systems and their display characteristics;

2.1.3 the IMO performance standards for ARPA;

2.1.4 factors affecting system performance and accuracy;

2.1.5 tracking capabilities and limitations of ARPA;

2.1.6 processing delays.

2.2 Knowledge and ability to demonstrate in conjunction with the use of approved equipment—

2.2.1 setting up and maintaining ARPA displays;

2.2.2 when and how to use the operational warnings, their benefits and limitations;

2.2.3 system operational tests;

2.2.4 when and how to obtain information in both relative and true motion modes of displays, including—

— identification of critical echoes;

— use of exclusion areas in automatic mode;

— speed and direction of target's relative movement;

— time to and predicted range at target's closest point of approach;

— course and speed of targets;

— detecting course and speed changes of targets and limitations of such information;

— effect of change in own ship's course or speed or both;

— operation of the trial manoeuvre;

2.2.5 manual and automatic acquisition of targets and their respective limitations;

2.2.6 when and how to use true and relative vectors and typical graphic representation of target information and danger areas;

2.2.7 when and how to use information on past positions of targets being tracked;

2.2.8 application of the International Regulations for Preventing Collisions at Sea.

3. *Syllabus—Theory and demonstration.*

3.1 The possible risks of over-reliance on ARPA.

3.1.1 Die besef dat ARPA slegs 'n navigasiehulpmiddel is en dat sy beperkings, met inbegrip van dié van sy sensors, dit gevaarlik maak om, veral wat die hou van 'n uitkykpos betref, te veel op ARPA te vertrou. Die noodsaaklikheid daarvan om te alle tye te voldoen aan die basiese beginsels en die operasionele leiding vir offisiere in bevel van 'n navigasiewag.

3.2 Die belangrikste tipes ARPA-stelsels en hulle beeldkenmerke.

3.2.1 Kennis van die belangrikste tipes ARPA-stelsels in gebruik; hul onderskeie beeldkenmerke en 'n begrip van wanneer om gebruik te maak van grond of seegestabiliseerde modusse en noord bo-, koers bo- of boeg bo- voorstellings.

3.3 IMO-prestasiestandaarde vir ARPA.

3.3.1 Begrip van die IMO-prestasiestandaarde vir ARPA, in die besonder die standaarde wat op akkuraatheid betrekking het.

3.4 Faktore wat die stelsel se prestasie en akkuraatheid beïnvloed.

3.4.1 Kennis van ARPA-sensorinsetprestasieparameters-, radar-, kompas- en spoedinsette; die uitwerking van sensorwanfunksionering op die akkuraatheid van ARPA-data.

3.4.2 Uitwerking van die beperkings van radarafstand en peilingdiskriminasie en -akkuraatheid; die beperkings van kompas- en spoedinset op die ARPA-data.

3.4.3 Kennis van faktore wat vektorakkuraatheid beïnvloed.

3.5 Volgvermoëns en -beperkings.

3.5.1 Faktore wat tot die korrekte keuse van teikens vir handverkryging aanleiding gee.

3.5.2 Uitwerking van verlore teikens en teikenvervaging op volging.

3.5.3 Omstandighede wat aanleiding gee tot teikenruiling en die uitwerking daarvan op die data wat vertoon word.

3.6 Oponthoud met prosessering.

3.6.1 Die vertragings wat inherent is aan die vertoning van geprosesseerde ARPA-inligting, veral by verkryging en herverkryging of wanneer 'n opgespoorde teiken maneuvreer.

3.7 Wanneer en hoe om die operasionele waarskuwings te gebruik, hul voordele en beperkings.

3.7.1 Begrip van die gebruike, voordele en beperkings van operasionele waarskuwings deur ARPA; korrekte instelling; om, waar moontlik, oorbodige steurings te vermy.

3.8 Operasionele toetse vir die stelsel.

3.8.1 Toetsmetodes vir die wanfunksionering van ARPA-stelsels, met inbegrip van funksionele selftoetsing.

3.8.2 Voorsorgmaatreëls wat getref moet word nadat wanfunksionering voorgekom het.

3.9 Hand- en outomatiese verkryging van teikens, en hulle onderskeie beperkings.

3.9.1 Kennis van die beperkings op beide tipes verkryging in meerteikenscenario's; uitwerking op die verkryging van teikenvervaging en teikenruiling.

3.10 Wanneer en hoe om gebruik te maak van ware en relatiewe vektore en tipiese grafiese voorstelling van teikeninligting en gevaargebiede.

3.10.1 Deeglike kennis van ware en relatiewe vektore; afleiding van die ware koerse en spoed van teikens.

3.10.2 Beoordeling van 'n bedreiging; afleiding van voorspelde naaste naderingspunt en voorspelde tyd tot by die naaste naderingspunt vanaf die voorwaartse ekstrapolering van vektore; die gebruik van die grafiese voorstelling van gevaargebiede.

3.10.3 Die uitwerking van veranderings in koers en/of spoed van die skip en/of teikens op voorspelde naaste naderingspunt en voorspelde tyd tot by die naaste naderingspunt en gevaargebiede.

3.10.4 Die uitwerking van onjuiste vektore en gevaargebiede.

3.10.5 Die voordeel van die oorskakeling van ware na relatiewe vektore.

3.11 Wanneer en hoe om die inligting oor die vorige posisie van teikens wat gevolg word, te gebruik.

3.11.1 Kennis van die afleiding van vorige posisies van teikens wat gevolg word, die erkenning van historiese data as 'n wyse om onlangse maneuvrering van teikens aan te dui en as 'n metode om die geldigheid van die ARPA se volgstelsel na te gaan.

4. *Leerplan—praktiese oefeninge.*

4.1 Die opstel en behoud van beelde.

4.1.1 Die korrekte aanvangsprosedure om die optimale beeld uit ARPA-inligting te verkry.

4.1.2 Keuse van beeldaanbieding; gestabiliseerde relatiewebewegingsbeelde en warebewegingsbeelde.

4.1.3 Korrekte instelling van alle veranderlike radarbeeldkontroles vir optimale databeelde.

3.1.1 Appreciation that ARPA is only a navigational aid and that its limitations, including those of its sensors, make over-reliance on ARPA dangerous, in particular relating to keeping a look-out.

Need to comply at all times with the basic principals and operational guidance for officers in charge of a navigational watch.

3.2 The principal types of ARPA systems and their display characteristics.

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

3.3 IMO performance standards for ARPA.

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

3.4 Factors affecting system performance and accuracy.

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

3.4.2 Effects of the limitations of radar range and bearing discrimination and accuracy; the limitations of compass and speed input on the ARPA data.

3.4.3 Knowledge of factors which influence vector accuracy.

3.5 Tracking capabilities and limitations.

3.5.1 Factors leading to the correct choice of targets for manual acquisition.

3.5.2 Effects on tracking of lost targets and target fading.

3.5.3 Circumstances causing target swop and its effects on displayed data.

3.6 Processing delays.

3.6.1 The delays inherent in the displays of processed ARPA information, particularly on acquisition and re-acquisition or when a tracked target manoeuvres.

3.7 When and how to use the operational warnings, their benefits and limitations.

3.7.1 Appreciation of the uses, benefits and limitations of ARPA operational warnings; correct setting; where applicable, to avoid superfluous interference.

3.8 System operational tests.

3.8.1 Methods of testing for malfunctions of ARPA systems including functional self-testing.

3.8.2 Precautions to be taken after a malfunction occurs.

3.9 Manual and automatic acquisition of targets and their respective limitations.

3.9.1 Knowledge of the limits imposed on both types or acquisition in multi-target scenarios, effects on acquisition of target fading and target swop.

3.10 When and how to use true and relative vectors and typical graphic representation of target information and danger areas.

3.10.1 Thorough knowledge of true and relative vectors; derivation of targets' true courses and speeds.

3.10.2 Threat assessment; derivation of predicted closest point of approach and predicted time to closest point of approach from forward extrapolation of vectors, the use of graphic representation of danger areas.

3.10.3 Effects of alterations of courses and/or speeds of own ship and/or targets on predicted closest point of approach and predicted time to closest point of approach and danger areas.

3.10.4 Effects of incorrect vectors and danger areas.

3.10.5 Benefit of switching between true and relative vectors.

3.11 When and how to use information on past position of targets being tracked.

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

4. *Syllabus—Practical exercises.*

4.1 Setting up and maintaining displays.

4.1.1 The correct starting procedure to obtain the optimum display of ARPA information.

4.1.2 Choice of display presentation; stabilised relative motion displays and true motion displays.

4.1.3 Correct adjustment of all variable radar display controls for optimum display of data.

4.1.4 Selektering, soos toepaslik, van vereiste spoedinset vir ARPA.

4.1.5 Selektering van ARPA-uitstipkontroles, hand-/outomatiese verkryging, vektor-/grafiese beeld van data.

4.1.6 Selektering van die tydskaal van vektore/grafiese voorstellings.

4.1.7 Die gebruik van uitsluitingsgebiede wanneer outomatiese verkryging deur ARPA gebruik word.

4.1.8 Prestasiekontrolering van radar, kompas, spoedinsetsensors en ARPA.

4.2 Operasionele toetse vir die stelsel.

4.2.1 Kontrolering van stelsel en die bepaling van die data-akkuraatheid van ARPA, met inbegrip van die toetsmaneuver fasiliteit, deur dit met basiese radaruitstippings te vergelyk.

4.3 Wanneer en hoe om inligting uit 'n ARPA-beeld te verkry.

4.3.1 Toon die vermoë om inligting te verkry in sowel relatiewe- as warebewegingsbeeldmodusse, met inbegrip van—

— die identifikasie van kritieke eggo's;
— spoed en rigting van 'n teiken se relatiewe beweging;
— die tyd na 'n teiken en die voorspelde afstand tot by 'n teiken se naaste naderingspunt;
— die rigting en spoed van teikens;
— die opspoor van koers- en spoedveranderings van teikens, en die beperkings van sodanige inligting;
— die uitwerking van verandering van 'n skip se koers of spoed of albei;
— die werking van die toetsmaneuver.

4.4 Die toepassing van die Internasionale Regulasies vir die Voorkoming van Botsings ter See, 1972.

4.4.1 Die ontleding van 'n potensiële botsing aan die hand van vertone inligting en optrede in situasies op handgemeenafstand in ooreenstemming met die Internasionale Regulasies vir die Voorkoming van Botsings ter See, 1972.

4.1.4 Selection, as appropriate, of required speed input to ARPA.

4.1.5 Selection of ARPA plotting controls, manual/automatic acquisition, vector/graphic display of data.

4.1.6 Selection of the time scale of vectors/graphics.

4.1.7 Use of exclusion areas when automatic acquisition is employed by ARPA.

4.1.8 Performance checks of radar, compass, speed input sensors and ARPA.

4.2 System operational tests.

4.2.1 System checks and determining data accuracy of ARPA including the trial manoeuvre facility by checking against basic radar plot.

4.3 When and how to obtain information from ARPA display.

4.3.1 Demonstrate ability to obtain information in both relative and true motion modes of display, including—

— identification of critical echoes;
— speed and direction of target's relative movement;
— time to and predicted range of target's closest point of approach;
— course and speed of targets;
— detecting course and speed changes of targets and the limitations of such information;
— effect of changes in own ship's course or speed or both;
— operation of the trial manoeuvre.

4.4 Application of the International Regulations for Preventing Collisions at Sea, 1972.

4.4.1 Analysis of potential collision from displayed information and execution of action to a close quarter situation in accordance with International Regulations for Preventing Collisions at Sea, 1972.

DIE BLOMPLANTE VAN AFRIKA

Hierdie publikasie word uitgegee as 'n geïllustreerde reeks, baie na die aard van Curtis se "Botanical Magazine". Die doel van die werk is om die skoonheid en variasie van vorm van die flora van Afrika aan die leser bekend te stel, om belangstelling in die studie en kweek van die inheemse plante op te wek, en om plantkunde in die algemeen te bevorder.

Die meeste van die illustrasies word deur kunstenaars van die Navorsingsinstituut vir Plantkunde gemaak, dog die redakteur verwelkom geskikte bydraes van 'n wetenskaplike en kunsstandaard afkomstig van verwante inrigtings.

Onder huidige omstandighede word twee dele van die werk in een omslag gepubliseer, maar met onreëlmatige tussenpose; elke deel bevat 10 kleurplate. Intekengeld bedra R10 per uitgawe van twee dele (buitelands R10,60 per uitgawe): Vier dele per band. Vanaf band 27 is die prys per band in linne gebind R30; in moroccoleer gebind R35. (Buitelands, linne gebind R31; moroccoleer R36).

Verkrygbaar van die Direkteur, Afdeling Landbouinligting, Privaatsak X144, Pretoria.

Verkoopbelasting moet by binnelandse bestellings ingesluit word.

THE FLOWERING PLANTS OF AFRICA

This publication is issued as an illustrated serial, much on the same lines as Curtis's Botanical Magazine, and for imitating which no apology need be tendered.

The desire and object of the promoters of the publication will be achieved if it stimulates further interest in the study and cultivation of our indigenous plants.

The illustrations are prepared mainly by the artists at the Botanical Research Institute, but the Editor welcomes contributions of suitable artistic and scientific merit from kindred institutions.

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Gedruk deur en verkrygbaar by die Staatsdrukker, Bosmanstraat, Privaatsak X85, Pretoria, 0001

Printed by and obtainable from the Government Printer, Bosman Street, Private Bag X85, Pretoria, 0001