

# **Uniform Shipping Laws Code 2008**

**Section 3: Qualifications and Manning,  
Fishing Vessels  
(CTH, NSW, NT, QLD, SA, TAS, VIC & WA)**

This is not the official version of the Uniform Shipping Laws Code.  
The official version is that last published by the Australian Government Publishing Service,  
Canberra, copies of which can be obtained from the National Marine Safety Committee.

### **SECTION 3**

#### **Qualifications and Manning: Fishing Vessels**

This section is divided into Parts, as follows:

Part 1: Preliminary

Part 2: General Provisions

Part 3: Requirements for issue of Certificates

Part 4: Minimum Safety Manning of Fishing Vessels

## PART 1-PRELIMINARY

### 1. GENERAL

This Section shall be read in conjunction with Section 1-Introduction, Definitions and General Requirements.

### 2. APPLICATION

This Section applies to persons serving or intending to serve on board fishing vessels, both new and existing, engaged in seagoing or sheltered waters operations.

*(Amendment dated 15 August 1995)*

### 3. INTERPRETATION

In this Section, unless the contrary intent is apparent:-

- (a) 'approved course' means a course of study or training which achieves all of the outcomes to appropriate standard in accordance with whole or part of a syllabus for a subject and is approved by the authority as meeting those standards;
- (b) 'certificate' means a valid document, by whatever name it may be known, issued or recognised by an authority and authorising the holder to serve in a capacity appropriate to the certificate;
- (c) 'endorsement' means any record made by an authority on a certificate extending or limiting the functions authorised by the certificate;
- (d) 'holder', in relation to a certificate, means the person identified as holder by that certificate;
- (e) 'seagoing vessel' means a vessel other than a vessel which plies exclusively in inland waters or within sheltered waters;
- (f) 'service' means performance of a duty related to the functions normally permitted to the holder of a certificate for which the service qualifies;
- (g) 'watchkeeping service' means service on a vessel in charge of a watch or service as understudy to or in training by a Master, whilst holding a Certificate of Competency as required by this Section.

## PART – GENERAL PROVISIONS

### 4. MUTUAL RECOGNITION

- 4.1 A certificate issued by an authority in accordance with this Section shall for the purposes of Part 4 be recognised by each other authority as having identical validity within the recognising authority's jurisdiction.
- 4.2 A pass in an examination or otherwise satisfying an authority as to competence or completion of an approved compulsory course of training in accordance with this section, shall be recognised by any authority to the equivalent and relevant standard.

### 5. GRADES AND SUB-GRADES OF CERTIFICATES

5.1 Certificates of the following grades may be issued by an authority:-

- (a) Skipper Grade 1
- (b) Skipper Grade 2
- (c) Skipper Grade 3
- (d) Coxswain
- (e) Engineer Class 3
- (f) Marine Engine Driver Grade 1
- (g) Marine Engine Driver Grade 2
- (h) Marine Engine Driver Grade 3

5.2 Certificates of the following sub-grades may be issued by an authority:-

**GRADE REFERRED TO IN 5.1**

**SUB-GRADES**

(e) to (h)

(i) Steamship

(ii) Motorship

(iii) Steamship and Motorship

## 6. RELATIVE VALUE OF CERTIFICATES

The holder of a certificate specified in column 1 of the following table is deemed to be also the holder of a certificate or certificates identified in column 2 of that table in relation to the certificate held.

	Column 1	Column 2	
	Distinguishing Number (Certificate Held)	Distinguishing Number (Certificate Deemed Held)	
	Duties as Master	Duties as Chief Mate	Other duties
1 Skipper Grade 1	2, 3, 4	2, 3	2, 3 & 4
2 Skipper Grade 2	3, 4		3 & 4
3 Skipper Grade 3	4		
4 Coxwain			

### Certificates used in any Engineer position:

5 Engineer Class 3	6, 7 & 8
6 Marine Engine Driver Grade 1	7 & 8
7 Marine Engine Driver Grade 2	8
8 Marine Engine Driver Grade 3	

## 7. ENDORSEMENT OF CERTIFICATES

A certificate may be endorsed at any time by an authority to:

- (a) Extend or limit;
  - (b) Vary an extension or limitation of; or
  - (c) Cancel an extension or limitation of,
- the functions normally permitted to the holder.

## 8. FOREIGN QUALIFICATIONS

A Certificate of Competency issued by a country other than Australia may be recognized as equivalent in whole or in part towards the issue of a document of recognition in accordance with this part. The issue of such a document of recognition shall be in accordance with any conditions imposed by the overseas country including the period of validity of the overseas certificate.

*(Amendment dated 23 August 1996)*

## 9. CANCELLATION/SUSPENSION OF CERTIFICATES

Where an authority believes the holder of a certificate:

- (a) Is guilty of incompetence or misconduct relating to the safe navigation, management or working of a vessel;
- (b) Is unable, from any cause to fulfil properly the duties appropriate to the certificate;
- (c) Has made false representation in obtaining the certificate; or
- (d) Has forged or fraudulently altered the certificate,

the authority may cancel or, in whole or in part, suspend for a period the validity of the certificate, or withdraw recognition of that certificate when that certificate has been issued by another authority.

## 10. TRANSITIONAL ARRANGEMENTS

- (a) A certificate issued or recognised by an authority under laws preceding the adoption of the Uniform Shipping Laws Code as law by the authority, shall continue to be regarded as valid to the same extent and conditions under which it was issued or by endorsement or by the issue of an equivalent certificate be recognised as a certificate under this Section.

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- (b) A Certificate issued in accordance with a previous edition of the Uniform Shipping Laws Code, shall be deemed to be valid to the amended limits prescribed for the same qualification under this Section.

### PART 3-REQUIREMENTS FOR ISSUE OF CERTIFICATES

#### 11. EQUIVALENT

##### 11.1 Training

- (a) Where a person has satisfactorily completed a course of training or education approved or accepted by the authority as being equivalent to any requirement of this part, that person may be deemed to have met those requirements.
- (b) Notwithstanding paragraph (a) above, a person shall not be granted a remission more than 33% of the total qualifying service required by this part for the issue of a certificate.

##### 11.2 Experience

Where a person has experience, other than a course of training or education, which the authority deems to be equivalent in total or in part to any requirement of this part, the person may be deemed to have met that part of the total qualifying service as determined by the authority.

#### 12. GENERAL REQUIREMENTS

##### 12.1 Full Certificates

In order to be eligible for the issue of a full certificate an applicant shall meet all the requirements specified in this part applicable to eligibility for the certificate.

##### 12.2 Restricted Certificates

12.2.1 Having regard to the qualifications, experience and ability of an applicant unable to satisfy the requirements specified in relation to the issue of a certificate of grade:

- (a) Skipper Grade 1
- (b) Skipper Grade 2
- (c) Skipper Grade 3
- (d) Coxswain
- (e) Engineer Class 3
- (f) Marine Engine Driver Grade 1
- (g) Marine Engine Driver Grade 2
- (h) Marine Engine Driver Grade 3

an authority may issue a restricted certificate to the applicant, endorsed, if appropriate, to limit the duties, operational area or vessel or class of vessel for which the certificate is valid. In such cases the word 'RESTRICTED' should be subjacent or subjoined to the certificate description.

12.2.2 Candidates for the certificates listed in 12.2.1 with the exception of the Coxswain and Marine Engine Driver Grade 3 may attempt the written examinations for that certificate when they have obtained half the required sea service or watchkeeping experience.

##### 12.2.2A

- (a) Except as provided in sub-clause (b) a pass in an examination conducted by the Authority or a Certificate of Attainment issued on satisfactory completion of a course of training approved by the Authority shall be valid for a period of 5 years from the date of successful completion of that subject module or course.

*Note 1: This does not apply to the Australian Maritime College Applied Science (Nautical Science) Diploma Training Course which provides front end training for Australian Seafarers.*

*Note 2: For the first certificate the short courses shall also have the same 5 year validity; for higher grades of certificates the short course prerequisites do not have to be repeated unless a specific validity date is a condition of issue; eg. First Aid Certificate.*

- (b) Passes in Nautical Knowledge and Engineering Knowledge shall be valid for a period of 1 year from the date of successful completion of that subject module.
- (c) The oral examination in Nautical Knowledge and Engineering Knowledge shall not be attempted until all subject modules have been successfully completed.

(Amendment dated 23 August 1996)

12.2.3 The Authority may, if it considers that a vessel's size and the conditions of its voyages are such as to render the full requirements for granting certificates of competency to masters and officers unreasonable or impractical; to that extent exempt the masters and officers in charge of the watch in such a vessel, or class of vessels, from part or parts of the full requirements. Where an Authority grants such exemptions the master or officer concerned shall be issued with a temporary permit to serve in a designated capacity on a particular vessel in a particular operating area. Such permits are valid only within the jurisdiction of the issuing authority.

12.3 **Conversion of Certificate from Trading to Fishing**

Where an applicant wishes to convert from a Trading to Fishing Certificate he must show evidence of meeting the appropriate service requirement for the Fishing Certificate and will be examined with due consideration of the requirements of para 11.

12.4 **Medical Standards**

Notwithstanding any of the provisions of this section in respect of medical standards, an Authority may ask an applicant to submit further proof of medical fitness if there is reason to believe that the person has a medical condition which may affect the ability to perform those duties applicable to the certificate.

12.5 **Language**

Examinations shall be conducted so as to ensure that an applicant has an adequate knowledge of the language to undertake all the duties and responsibilities required by the certificate.

12.6 **Refusal to Grant a Certificate**

Where the Authority is satisfied that an applicant for a certificate of competency is not a fit and proper person to have the responsibilities and to exercise and perform the functions and duties appropriate to the certificate, the Authority may refuse to grant the certificate or to endorse or revalidate an existing certificate for manning purposes within the limits of the Authority's jurisdiction. In such case the Authority shall advise the other Authorities within whose jurisdiction the certificate is normally accepted for manning purposes.

12.7 **Alternative Assessment**

Where an Authority deems it appropriate, an oral examination or a combination of oral and written examination may be substituted for either a prescribed written paper or prescribed short course.

**13. CERTIFICATE OF COMPETENCY AS COXSWAIN**

13.1 To be eligible for the issue of a Certificate of Competency as Coxswain an applicant must:

- (a) Have attained the age of 18 years;
- (b) Meet the eyesight standards set out in Schedule One;
- (c) have not less than 12 months qualifying service of which not less than 3 months shall be on small vessels which are less than 24 metres in length; and
- (d) pass an oral and/or written examination or by other means satisfy the Authority as to competence in the syllabus set out below.
- (e) Have satisfactorily attended a short course in or hold a valid certificate for 'Elements of Shipboard Safety' (Schedule Three).
- (f) Hold a Restricted Operators Certificate of Proficiency in Radio Telephone (Schedule Five).

(Amendment dated 15 August 1995)

13.2 **Syllabus-Coxswain**

Demonstrate a practical knowledge of the following as they apply to small vessels:

**Section 1-Vessel Handling**

- (a) Manoeuvring characteristics of small power-driven vessels (heavily laden and lightly laden); effects of: displacement and planing hulls, outboard and inboard engines, rudder and propeller;

- (b) Handling small vessels in strong tidal streams, bad weather, heavy swell and surf, crossing a bar, and use of a sea anchor;
- (c) Handling small vessel if partially disabled;
- (d) Towing and being towed; towage arrangements for towage at sea and in sheltered waters;
- (e) Berthing and unberthing, in various wind and tidal conditions;

**Section 2-Emergency & Safety**

- (a) Action to be taken in an emergency situation;
- (b) Steps to be taken after collision, grounding or other marine casualty and resulting hull damage;
- (c) Action to be taken in the event of loss of rudder; lost or fouled propeller;
- (d) Action to be taken when vessel is completely disabled;
- (e) Beaching with and without heavy surf;
- (f) Rendering assistance to others in distress; man overboard procedures for recovery;
- (g) Disposition of persons and equipment on board to ensure satisfactory stability and trim;
- (h) Obligations and duties towards all persons onboard;
- (i) Knowledge of first aid to render in case of injury, burns, sickness or apparent drowning.

**Section 3-Safety Equipment**

- (a) Knowledge of the statutory requirements pertaining to lifesaving appliances and fire fighting appliances;
- (b) Knowledge of the maintenance of lifesaving appliances and fire fighting appliances carried on small vessels;
- (c) Knowledge of the correct use of all lifesaving appliances and fire fighting appliances carried on a small vessel;
- (d) Use of distress signals; penalty for misuse.

**Section 4-Weather Reports**

- (a) Knowledge of the sources available for obtaining weather reports and warnings. Types of reports available;
- (b) Correct interpretation of weather information received;
- (c) Action to take on receiving adverse weather report, and on encountering heavy weather;
- (d) Knowledge of local weather patterns.

**Section 5-Collision Regulations and Port Operations**

- (a) An adequate knowledge of the International Regulations for the Prevention of Collisions at Sea appropriate to small vessels operating within sheltered waters and inshore limits;
- (b) Appreciation of manoeuvring difficulties of larger vessels;
- (c) Knowledge of IALA Buoyage System 'A'.

**Section 6-Practical Seamanship**

- (a) Demonstrate common knots and splices;
- (b) Knowledge of basic structural parts of a small vessel.

**Section 7-Navigation and Local Knowledge**

- (a) Knowledge of the coastline: Prominent features, isolated dangers, tidal streams and navigational aids;
- (b) Knowledge of the use of a compass and understanding of basic information contained in a navigation chart.

**Section 8-Engineering**



- (a) A working knowledge of routine checks required with the operation of propelling machinery, ancillary equipment and other mechanical equipment in small vessels. What to do in the case of malfunction and emergencies. Preparation for the use of such equipment;
- (b) Basic knowledge of the factors associated with the safe operation of propelling and ancillary equipment;
- (c) Basic knowledge of water cooling and bilge pumping arrangements in a small vessel;
- (d) Care and use of low voltage electrical systems on a small vessel including precautions necessary when charging batteries;
- (e) Fire prevention on a small vessel;
- (f) Action that should be taken in the event of fire or explosion;
- (g) Precautions necessary for the prevention of fire or explosion associated with use of petrol, LP gas and distillate and with the charging of batteries;
- (h) Knowledge of precautions to take when refuelling.

#### 14. CERTIFICATE OF COMPETENCY AS SKIPPER GRADE 3

14.1 To be eligible to be issued with a Certificate of Competency as Skipper Grade 3 an applicant must:-

- (a) Have attained the age of 19 years.
- (b) Meet the eyesight standards set out at Schedule One.
- (c) Have not less than 30 months qualifying service which shall include within the last 5 years, not less than 12 months service on commercial vessel of less than 35 metres in length and 3 months in a fishing vessel.
- (d) Have satisfactorily attended a short course in or hold a valid certificate for 'Elements of Shipboard Safety' in accordance with Schedule Three.
- (e) Hold a 'Restricted Operators Certificate of Proficiency in Radio Telephony'. (Schedule Five)
- (f) Have satisfied the authority as to competence in the syllabus set out below.

NOTE: Endorsement to 200nm may be issued on completion of examination in Navigation and Position Determination of Skipper Grade 2.

#### 14.2 Syllabus-Skipper Grade 3

##### SHIP KNOWLEDGE

(2 hours written examination-pass mark 60%)

##### Section 1-Small Vessel Construction

- (a) Know the principal parts of a small vessel and their various functions;
- (b) Practical appreciation of how the watertight integrity of a small vessel is maintained;
- (c) Practical knowledge of fuel, fresh water arrangements, including pumping, sounding and venting facilities;
- (d) Practical knowledge of bilge pumping arrangements;
- (e) Practical knowledge of deck machinery of small vessels;
- (f) Practical knowledge of the steering arrangements of a small vessel;
- (g) Practical knowledge of maintenance of small vessels;
- (h) Knowledge of methods of docking and slipping of small vessels.

##### Section 2-Stability

- (a) A general understanding without calculations of stability of a small vessel, and the use of basic stability information provided on a vessel to ensure safety in relation to :- adding and removing weights; water on deck; slack tanks; rolling period; stiff and tender vessel, additions or alterations to vessels.

- (b) The dangerous effect of external forces from fishing and other gear, e.g. foul gear or gear acting on high purchase points on the vessel.

### **COASTAL NAVIGATION**

(2 hours written examination-pass mark 70%)

An understanding and working knowledge of the following:-

- (a) Relationship between compass, magnetic, true and gyro courses and bearings. Relative bearings. The use of a deviation card without mathematical interpolation. Finding the variation from the chart. Compass error from transit bearings or by bearings taken from a known position.
- (b) Laying off a safe course on a chart.
- (c) Measuring distance on a chart.
- (d) Relating coastal features to a chart.
- (e) The effects of current and of leeway on the course and speed of the vessel (without calculations). Recognising the presence of either or both factors.
- (f) Fixing the vessel's position by simultaneous bearings, transits of coastal features, and by running fix.
- (g) Fixing the vessel's position by radar ranges and bearings.
- (h) Obtaining bearings on small vessels.
- (i) Using a single position line.
- (j) Using soundings in determining position.
- (k) Determining the times and heights of high and low water from Australian or local tide tables for any port and the relevance of chart datum.
- (l) Interpreting the set and drift of the current from information available on the chart. Australian or local tide tables and sailing directions.
- (m) The information given on a chart or plan, particularly buoyage, hazards to navigation, depth and nature of bottom, lights, tides and tidal streams. Recognition of the coast. Selection of suitable points for bearings. Selection of a suitable anchorage or shelter.
- (n) Use and limitations on the use of electronic position fixing equipment found on small vessels.

### **RADAR**

- (a) 2 hours written examination-pass mark 60%, or
- (b) Practical and/or oral examination.

Demonstrate knowledge of fundamentals of radar and ability in the operation and use of radar, and in the interpretation and analysis of information obtained from the equipment, including:

- (a) Factors affecting performance and accuracy;
- (b) Setting up and maintaining displays;
- (c) Detection of misrepresentation of information, false echoes, sea return, etc.;
- (d) Range and bearing;
- (e) Identification of critical echoes;
- (f) Application of the International Regulations for Preventing Collisions at Sea, 1972;
- (g) Basic understanding of use of radar for navigation and collision avoidance.

### **NAUTICAL KNOWLEDGE**

- (a) 2 hour written examination-pass mark 60%, and
- (b) An oral examination where the examiner may raise any subject matter pertaining to any topic within the Skipper Grade 3.

### **Section 1-Marine Legislation**

- (a) Knowledge of certificates required to be carried by small vessels;
- (b) A working knowledge of the laws relating to the following, with reference to the class of vessel: Lifesaving Appliances; Fire Appliances; Distress; Urgency and Safety signals;
- (c) Knowledge of the duties and responsibilities of the Master with respect to marine legislation;
- (d) Responsibilities with respect to the prevention of pollution of the marine environment;
- (e) A working knowledge of the content of publications and Marine Notices with respect to: Search and rescue. Navigational warnings (including firing practices). Precautions concerning submarine cables and pipelines. Other information relating to the safe navigation of a small vessel in coastal waters.
- (f) Understanding of the importance of maintaining a log book or vessel record book.

### **Section 2-Meteorology**

- (a) A knowledge of basic meteorological terms;
- (b) Practical knowledge of the sources of weather forecasts and the interpretation of that information in simple terms.
- (c) Ability to read the aneroid barometer and to interpret the information obtained.
- (d) A basic knowledge of tropical revolving storms and the weather associated with such storms.

### **Section 3-Watchkeeping**

- (a) Demonstrate a working knowledge of content, application and intent of the International Regulations for the Prevention of Collision at Sea, 1972;
- (b) Demonstrate knowledge of the recommended basic principles to be observed in keeping a navigational watch on board vessels less than 24 metres in length;
- (c) Demonstrate knowledge of the IALA buoyage system 'A';
- (d) Knowledge of duties at sea, at anchor and in port.

### **Section 4-Instruments**

Demonstrate a working knowledge of the use of wheelhouse equipment normally found in vessels less than 24 metres in length including, for example, compass, automatic pilot, echo sounder, alarm devices.

### **Section 5-Small Vessel Manoeuvring and Handling**

Demonstrate the manoeuvring and handling of a small vessel in all conditions including the following:-

- (a) Berthing, unberthing and anchor work under various conditions of wind and tide;
- (b) Manoeuvring in shallow water;
- (c) Management and handling of small vessels in heavy weather, including appropriate speed, particularly in following and quartering seas;
- (d) Means of keeping a vessel out of a trough;
- (e) Lessening drift and use of oil;
- (f) Manoeuvring the vessel during operations with special regard to factors which could adversely affect the vessel's safety during such operations;
- (g) Towing and being towed;
- (h) Precautions in manoeuvring for launching boats or liferafts in bad weather.

### **Section 6-Emergency Procedures**

A general knowledge of safe practices in the following:

- (a) Use and care of lifesaving appliances;

- (b) Use and care of fire fighting appliances;
- (c) Prevention of fire and fire fighting;
- (d) Action to be taken in the event of a fire, collision, grounding, damage to the vessel, man overboard;
- (e) Measures for the protection and safety of all persons onboard in emergencies;
- (f) Abandoning the vessel;
- (g) Rescuing persons in distress;
- (h) Survival procedures in lifeboats and liferafts;
- (i) Assisting a vessel or aircraft in distress;
- (j) The use of EPIRB's in search and rescue;
- (k) Action to be taken when gear becomes fast on an obstruction.

#### **Section 7-Practical Seamanship**

Demonstrate a practical ability in the following:-

- (a) Knots, hitches and bends in common use;
- (b) Eye splice, short splice and back splice of fibre and synthetic ropes;
- (c) Eye splice in wire rope;
- (d) Care in use of rope, wire and chains;
- (e) Rigging stages and rope ladders;
- (f) Working knowledge of gear used and an understanding of its safe use. Maintenance of gear. Rigging gear and appreciation of the maximum allowable load on this gear including power blocks;
- (g) Driving a winch and windlass, use of the windlass in anchor work;
- (h) Safe handling of moorings;
- (i) Stowage of cable and securing anchors for sea;
- (j) Securing hatches, doors, sky-lights, air pipes, etc.;
- (k) Lashing and securing of moveable equipment, especially on deck;
- (l) Understanding of breaking stress and safe working load on gear;
- (m) Knowledge of securing a vessel for rough weather.

#### **15. CERTIFICATE OF COMPETENCY AS SKIPPER GRADE 2**

15.1 To be eligible to be issued with a Certificate of Competency as Skipper Grade 2 an applicant must:

- (a) Have attained the age of 20 years.
- (b) Hold a Certificate of Competency as
  - Skipper Grade 3.
  - other acceptable qualification.
- (c) Meet the eyesight and medical standards set out in Schedule One.
- (d) Have watchkeeping service acceptable to the authority based upon the following requirements:
  - (i) For the holder of a certificate as Skipper Grade 3, 12 months watchkeeping service, on vessels 12 metres in length or over since obtaining that certificate including not less than 6 months on fishing vessels and not less than six months in the last 5 years.
  - (ii) For holder of another acceptable qualification, a period of service appropriate to the qualification, based on the above requirements.
- (e) Have satisfactorily attended the following short courses or hold valid certificates for:

- 'Elements of Shipboard Safety' (Schedule Three).
- 'Basic Radar' (Schedule Two).
- Proficiency in rendering First Aid to the injured (Schedule Four).
- Restricted Operator's Certificate of Proficiency in Radiotelephony (Schedule Five).

(f) Have satisfied an authority as to competence in the syllabus set out below.

15.2 **Syllabus-Skipper Grade 2**

**SHIP KNOWLEDGE**

(2 1/2 hours written examination—pass mark 60%)

Candidates will be required to have a more detailed and higher standard of knowledge of the subjects specified in the Ship Knowledge syllabus for Skipper Grade 2 and in addition:

**Section 1-Vessel Construction**

- (a) General knowledge of the principal structural members of a vessel up to 80 metres in length and the proper names of the various parts;
- (b) A practical knowledge of arrangements for restricting the spread of fire;
- (c) General knowledge of testing of tanks and other watertight work;
- (d) Knowledge of the significance of weathertight and watertight integrity and how this is maintained.

**Section 2-Stability**

- (a) General understanding of: Centre of gravity. Centre of buoyancy. Reserve buoyancy. Metacentric height. Righting lever. Righting moment. Range of stability. Stiff and tender vessels. Period of roll. Synchronisation. Free surface effect.
- (b) Demonstrate an understanding of the factors affecting stability by means of simple calculations concerning displacement, dead-weight, fresh water allowance, changes of draft and trim, fuel consumption. Adding and removing weight, free surface effect.
- (c) Demonstrate the ability to use a vessel's simplified stability information.
- (d) A general understanding of the effects upon stability during loading and discharging operations including heeling moments from gear and loads.
- (e) Knowledge of action to be taken when gear becomes fast to ground or an obstruction.

**NAVIGATION AND POSITION DETERMINATION**

- (a) 2½ hour written examination in coastal navigation—pass mark 70%; and
- (b) 2½ hour written examination in the remaining parts of this syllabus—pass mark 70%.

In seagoing operations which may demand a knowledge of Celestial Navigation, the Marine Authority may require an endorsement on the Certificate of Competency that the holder has passed an examination in accordance with Section 2—Navigation of the syllabus for Navigation and Position Determination for Skipper 1.

Candidates will be required to have a more detailed and higher standard of knowledge including calculations of the subjects specified in the Coastal Navigation syllabus for Skipper 3 and, in addition;

**Section 1—Voyage planning**

Knowledge of and a practical understanding of the following:

- (a) Using rhumb line navigation:
  - (i) voyage planning between departure and arrival position by plane sailing;
  - (ii) determining a dead reckoning position or estimated position;
  - (iii) allowances to be made in waters affected by tidal streams, currents, restricted visibility, restricted waters;
- (b) Differences between rhumb line and great circle sailings;

- (c) Determining the times and heights of tides at standard and secondary ports for any state of the tide.

### **Section 2—Position Determination**

Knowledge and practical understanding of the following:

- (a) Using terrestrial observations determine a vessel's position using individually or in combination with other methods
- rising and dipping distances of lights
  - ranges and/or bearings from radar;
- (b) Using modern electronic navigational aids to determine a vessel's position including:
- use of typical modern equipment using satellite technology
  - use of hyperbolic systems
  - use of differential GPS
  - coverage areas
  - use of plotters
  - use of electronic charts
  - sources and causes of errors
  - determination of accuracy of a fix
  - use and care of equipment;
- (c) Error of a compass using amplitudes or azimuths of the Sun.

### **Section 3—Wheelhouse equipment**

Practical ability to safely and efficiently use and care for instruments including but not limited to:

- Alarm devices including off-course and watch alarms
- Bottom Logs
- Automatic Pilot
- Echo Sounder
- Magnetic and gyro compasses
- Azimuth mirror.

*(Amendment dated 15 March 1996)*

## **NAUTICAL KNOWLEDGE**

- (a) 2 hour written examination-pass mark 60%, and
- (b) An oral examination where the examiner may raise any subject matter pertaining to any topic within the Skipper Grade 2 syllabus.

### **Syllabus:**

Candidates will be required to have a more detailed and higher standard of knowledge of the subjects specified in the Nautical Knowledge syllabus for Skipper Grade 2, and in addition:

#### **Section 1-Watchkeeping**

- (a) Demonstrate thorough knowledge of content, application and intent of the International Regulations for the Prevention of Collision at Sea, 1972, including those Annexes concerned with safe navigation;
- (b) Demonstrate knowledge of recommended basic principles to be observed in keeping a navigational watch onboard vessels.

#### **Section 2-Vessel Manoeuvring and Handling**

Demonstrate a working knowledge of the manoeuvring and handling of a vessel up to 80 metres in length in all conditions including the following:

- (a) Berthing, unberthing and anchor work under various conditions of wind and tide;
- (b) Manoeuvring in shallow water;
- (c) Management and handling of vessels in heavy weather, including appropriate speed, particularly in following and quartering seas, assisting a vessel or aircraft in distress, means of keeping a vessel out of a trough, lessening drift and use of oil;
- (d) Manoeuvring the vessel during operations with special regard to factors which could adversely affect the vessel's safety during such operations;
- (e) Precautions in manoeuvring for launching boats or liferafts in bad weather;
- (f) Methods of taking on board survivors from lifeboats or liferafts.
- (g) Transferring of catch at sea to other vessels.

**Section 3-Maritime Law**

- (a) Knowledge of the State Acts, Regulations, Notices, Determinations or other legislation applicable to the operation of trading vessels for which the certificate will be valid.
- (b) Knowledge of Commonwealth legislation concerning safety of life at sea.
- (c) General knowledge of the Uniform Shipping Laws Code and in particular Section 15, Emergency Procedures and Safety of Navigation.
- (d) General knowledge of State and Commonwealth legislation reflecting the provisions of international conventions for the prevention of pollution from ships.

**Section 4-Vessel Administration**

- (a) Working knowledge of the Master's duties and responsibilities with respect to: Log book, musters and drills, marine casualties, urgency signals, search and rescue and pilotage;
- (b) General understanding of salvage and towing agreements.

**Section 5-Meteorology & Oceanography**

- (a) Knowledge of meteorological instruments and their use;
- (b) Demonstrate the ability to use meteorological information available;
- (c) Knowledge of characteristics of various weather systems affecting the Australian coast;
- (d) Knowledge of weather conditions affecting the Australian coast and liable to endanger the vessels.

**Section 6-Emergency Equipment**

- (a) General knowledge of the requirements for provision of and survey of equipment provided in accordance with the Uniform Shipping Laws Code including fire appliances, lifesaving appliances, radio equipment and miscellaneous equipment;
- (b) Demonstrate the ability to organise and conduct emergency drills.

**Section 7-Emergency Procedures**

Demonstrate a working knowledge of emergency procedures on a vessel of up to 80 metres in length in:

- (a) Precautions when beaching a vessel;
- (b) Action to be taken in the event of grounding;
- (c) Floating a grounded vessel, with and without assistance;
- (d) Action to be taken in the event of a collision;
- (e) Action to be taken in the event of minor hull leaks;
- (f) Measures for the protection and safety of persons onboard in emergencies;
- (g) Limiting damage and salvaging the vessel following a fire or explosion;
- (h) Emergency steering, rigging and use of jury steering and the means of rigging a jury rudder, where practicable;

- (i) Rescuing persons from a vessel in distress or from a wreck;
- (j) Abandoning ship;
- (k) Man-overboard procedures;
- (l) Towing and being towed;
- (m) Search and rescue procedures.

**Section 8-Practical Seamanship**

- (a) Knowledge of rigging purchases and the power gained by their use;
- (b) Knowledge of the stresses and loads on gear;
- (c) Ability to determine the safe working load on a rope or wire;
- (d) Ability to recognise defective or unsound gear.

**Section 9-Communications**

- (a) Recognise the individual morse letters;
- (b) Recognise the individual flags of the International Code;
- (c) Knowledge of the use of the International Code of Signals in particular the important single flag signals;
- (d) Knowledge of the use of 'SEAPHONE', GMDSS or other systems for search and rescue.

**16. CERTIFICATE OF COMPETENCY AS SKIPPER GRADE 1**

16.1 To be eligible to be issued with a Certificate of Competency as Skipper Grade 1 an applicant must:

- (a) Hold a Certificate of Competency as:
  - Skipper Grade 3
  - Other acceptable qualification
- (b) Meet the eyesight and medical standards set out in Schedule One;
- (c) Have:
  - (i) not less than 36 months qualifying service since obtaining the Certificate of Competency as Skipper Grade 3 of which 24 months shall be watchkeeping service and of which at least 12 months shall be watchkeeping service on fishing vessels of 24 metres or more in length;
  - (ii) for the holder of another acceptable qualification, a period of service appropriate to the qualification, based upon the above requirements.
- (d) Where the certificate:
  - (i) is restricted for use within State jurisdiction, have satisfactorily attended the following short courses or hold valid certificates for:
    - 'Elements of Shipboard Safety' (Schedule Three)
    - Basic Radar (Schedule Two)
    - Proficiency in Rendering First Aid to the injured (Schedule Four)
    - Restricted Operator's Certificate of Proficiency in Radio Telephony (Schedule Five).
  - (ii) is for unrestricted operations and designated "without restriction", have satisfactorily completed the following courses and/or hold a valid certificate for:
    - Certificate of Proficiency in Survival Craft (Schedule Six)
    - Prevention and Control of Fires Onboard Ship (Schedule Seven)
    - First Aid at Sea (Schedule Eight)
    - Restricted Operator's Certificate of Proficiency in Radiotelephony (Schedule Five)
    - Radar Simulator (Schedule Nine)
- (e) Have satisfied an authority as to competence in the syllabus set out below.



16.2 **Syllabus-Skipper Grade 1**

**SHIP KNOWLEDGE**

(2 1/2 hours written examination-pass mark 60%)

Candidates will be required to have a more detailed and higher standard of knowledge of the subjects specified in the Ship Knowledge syllabus for Skipper Grade 2 and in addition:

**Section 1-SHIP STRUCTURES**

- (a) General knowledge of the principal structural members of a vessel and the proper names of the various parts
- (b) An understanding of the fundamentals of construction and interpretation of the plans available on board a vessel
- (c) An understanding effect of welding and burning on a vessel's structure. Appreciation of the precautions to be taken when such processes are carried out on board a vessel
- (d) A general knowledge of:
  - (i) Longitudinal, transverse and local stresses within a vessel;
  - (ii) The effects of panting and pounding;
  - (iii) Stresses imposed by loading of fish and ballast;
  - (iv) Stabilizing devices.
- (e) An outline knowledge of the layout of different types of vessels including special purpose vessels
- (f) Knowledge of dry docking procedures and repair and maintenance of commonly used materials
- (g) Knowledge of the corrosion in a ship's structure and its causes, effects and control
- (h) Practical acquaintance with surveys including the purpose and extent of hull, equipment, machinery and Classification Society surveys.

**Section 2-Stability**

- (a) Knowledge of the theories and factors affecting trim and stability and measures necessary to preserve safe trim and stability
- (b) Determine the initial metacentric height for different conditions of loading and ballasting, allowing for the effects of 'free surface', from stability data
- (c) Knowledge of the presence and dangers of negative GM and angle of loll
- (d) Ability to construct of a curve of statical stability and full appreciation of information available from it, including significance of the area under the curve
- (e) Ability to undertake simple calculations of change in trim due to loading and discharging
- (f) Demonstrate calculations of fuel capacities and fresh water capacities with reference to fuel and water consumption. Ability to use tank calibration tables
- (g) Knowledge of treatment of suspended weights and weights free to move
- (h) An understanding of the fundamental action to be taken in the event of partial loss of intact buoyancy. An appreciation of the reduction in stability of the vessel when in the listed condition
- (i) Knowledge of securing of catch onboard a fishing vessel including gear
- (j) Demonstrate the ability to use full stability data as supplied to a fishing vessel in accordance with the provisions of the USL Code.

**NAVIGATION AND POSITION DETERMINATION**

- (a) 3 hour written examination in coastal navigation-pass mark 70%; and
- (b) 3 hour written examination in the remaining parts of the syllabus-pass mark 70%.

Candidates will be required to have a more detailed and higher standard of knowledge of the subjects specified in the Navigation and Position Determination syllabus for Master Class 4 and, in addition:

**Section 1-Voyage Planning**

- (a) A general knowledge of the geometry of the earth, great and small circles
- (b) An ability to determine ocean tracks by means of nautical tables
- (c) Knowledge of the use of meteorological or oceanographic information to the best advantage for an ocean passage

**Section 2-Navigation**

- (a) To determine and plot a position line from an observation of the sun and stars by calculation and to determine the ship's position by the use of position lines To determine the times of sunrise, sunset, twilight, meridional passage
- (b) To assess the accuracy of a position
- (c) General knowledge of the operating principles of radio and electronic aids to navigation.

**SHIP ADMINISTRATION**

(2 1/2 hours written examination-pass mark 60%)

Candidates will be required to have a more detailed and higher standard of knowledge of the subjects specified in the operational knowledge syllabus for Master Class 4 and in addition.

**Section 1-Maritime Law**

- (a) Knowledge of maritime declarations of health and requirements of the international health regulations;
- (b) Knowledge of a Master's obligations under international maritime conventions on the Safety of Fishing Vessels.

**Section 2-Vessel Administration**

A general knowledge of:

- (i) Certificates and other documents required to be carried onboard vessels by international conventions, how they may be obtained and the period of their legal validity;
- (ii) Registration of vessels; use of vessel's register;
- (iii) Customs procedures including entry and clearance immigration requirements;
- (iv) Master's duties with respect to: official log book, musters and drills, marine casualties, urgency signals, search and rescue and pilotage;
- (v) Vessel hygiene.

**METEOROLOGY**

(2 1/2 hour examination-pass mark 50%)

- (a) Knowledge of meteorological instruments and their application;
- (b) Ability to use meteorological information available;
- (c) Knowledge of characteristics of various weather systems, including tropical revolving storms and avoidance of storm centres and dangerous quadrants;
- (d) Knowledge of weather conditions liable to endanger the vessel including, fog, icebergs, ice accretion.

**NAUTICAL KNOWLEDGE**

- (a) 2 1/2 hour written examination-pass mark 60%; and
- (b) An oral examination in which the examiner may raise any subject matter pertaining to any other topic within the Skipper Grade 1 syllabus.

Candidates will be required to have a thorough knowledge of the subjects specified in the Nautical Knowledge syllabus for Skipper Grade 2 and in addition:

**Section 1-Catch Handling and Stowage**

- (a) The stowage and securing of catch onboard vessels including gear;
- (b) Loading and discharge operations, with special regard to heeling moments from gear and catch.

**Section 2-Emergency Procedures**

A knowledge of

- The duties of the on scene coordinator in a search and rescue operations. Use of MARSAR
- Australian ship reporting scheme
- Global Marine Distress and Safety Systems

**Section 3-Communications**

- (a) Ability to transmit and receive messages by morse lamp at 6 words per minute;
- (b) Ability to use the International Code of Signals;
- (c) Knowledge of procedures for obtaining medical advice by radio;
- (d) Ability to use IMO Standard Navigational Vocabulary.

**Section 4-General Engineering**

A general knowledge of operating principles of marine power plants in vessels including:

- (i) Vessel auxiliary machinery;
- (ii) Marine engineering terms;
- (iii) Control systems.

**Section 5-Vessel Manoeuvring St Handling**

A knowledge of:

- (i) Interaction in a narrow channel
- (ii) Use of tugs
- (iii) Anchoring using one and two anchors
- (iv) Dry docking
- (v) Manoeuvring and engine characteristics including stopping distances.

**17. CERTIFICATE OF COMPETENCY AS MARINE ENGINE DRIVER GRADE 3**

17.1 To be eligible for the issue of a Certificate of Competency as Marine Engine Driver

Grade 3 an applicant must:

- (a) Have attained the age of 18 years.
- (b) Have approved service on vessels of not less than 75kW propulsion power as detailed hereunder:

No previous training	6 months
or	
Marine Fitter	
Diesel or Motor Mechanic	
Refrigeration Mechanic	
Electrical Fitter Mechanic	3 months

The Authority may consider a reduction in approved service of not more than 3 months for a period of other training or experience considered appropriate.

- (c) Have satisfactorily attended a short course in Elements of Shipboard Safety (Schedule Three).

- (d) Pass written and oral examinations to satisfy the Authority as to competence in the syllabus set out hereunder. The duration of the written examination shall be one hour and the pass mark 60%.

17.2 **SYLLABUS-MARINE ENGINE DRIVER (MOTOR) GRADE**

- (a) Marine internal combustion engines and their fittings, shafting and propellers, preparing for use;
- (b) Precautions necessary for the prevention of fire or explosion associated with the use of petrol, LP gas and distillate, and with the charging of batteries;
- (c) The action that should be taken in the event of fire or explosion, including the use of fire fighting appliances;
- (d) Cooling water and fuel systems, bilge pumping arrangements, including precautions against back flooding;
- (e) Care of electrical systems including batteries. Safety procedures when working on low and medium voltage a.c. and d.c. systems. Fuses and circuit breakers;
- (f) Steering gear and deck machinery;
- (g) Fuel consumption; estimation and calculation.

17.3 **CERTIFICATE OF COMPETENCY AS MARINE ENGINE DRIVER (STEAM) GRADE 3**

For any applicant requiring a Steam Certificate the Authority shall determine the approved service and the examination syllabus as is appropriate.

18. **CERTIFICATE OF COMPETENCY AS MARINE ENGINE DRIVER GRADE 2**

18.1 To be eligible for the issue of a Certificate of Competency as a Marine Engine Driver Grade 2 an applicant must:

- (a) Have attained the age of 18 years;
- (b) Have approved service on vessels of not less than 150kW propulsion power as detailed hereunder:

No previous training 12 months

or

Marine Fitter

Diesel or Motor Mechanic

Refrigeration Mechanic

Electrical Fitter Mechanic 3 months

or

Marine Engine Driver Grade 3

(service to be while holding certificate) 6 months

The Authority may consider a reduction in approved service of not more than 6 months for a period of other training or experience considered appropriate.

- (c) Have satisfactorily attended a short course in Elements of Shipboard Safety (Schedule Three);
- (d) Pass a written and oral examination to satisfy the Authority as to competence in the syllabus set out hereunder. The duration of the written examination shall be 3 hours and the pass mark 60%.

18.2 **SYLLABUS-MARINE ENGINE DRIVER (MOTOR) GRADE 2**

- (a) Operation and maintenance of marine internal combustion engines;
- (b) Care and operation of lubricating oil and cooling systems;
- (c) Pumps and arrangements of bilge and seawater piping systems. Dangers associated with back flooding;

- (d) Attention to steering gears, in particular hydraulic systems and associated pipelines. Emergency steering;
- (e) Arrangements of fuel-oil piping systems and filters. Fuel tank ventilation, filling and draining. Tank gauging; knowledge of effect of slack tanks on stability;
- (f) Oil and grease lubrication;
- (g) Care of electrical systems and batteries. Series and parallel operation. Safety procedures when working on low and medium voltage a.c. and d.c. systems; protection devices;
- (h) Dangers of LP gas and liquid fuels; refrigeration safety;
- (i) Precautions against fire and explosion. Methods of dealing with fires; extinguishers, fire pumps, fire mains and hoses, nozzles and sprays, fixed installations, closing appliances, remote shut-offs;
- (j) Items for inspection on slipway or in drydock;
- (k) Maintenance and recognition of deterioration of various items;
- (l) Preparing for sea. Securing vessel after voyage;
- (m) Methods of propulsion reversal;
- (n) Calculations dealing with consumption of fuel. Speed and range of vessels.

18.3 **CERTIFICATE OF COMPETENCY AS MARINE ENGINE DRIVER (STEAM) GRADE 2**

For any applicant requiring a Steam Certificate the Authority shall determine the approved service and the examination syllabus as is appropriate.

19. **CERTIFICATE OF COMPETENCY AS MARINE ENGINE DRIVER GRADE 1**

19.1 To be eligible for the issue of a Certificate of Competency as Marine Engine Driver Grade 1 an applicant must:

- (a) Have attained the age of 19 years;
- (b) Have approved service on vessels of not less than 200kW propulsion power as detailed hereunder:
 

No previous training	24 months
or	
Marine Fitter	
Diesel or Motor Mechanic	
Refrigeration Mechanic	
Electrical Fitter Mechanic	6 months
or	
Marine Engine Driver Grade 3	15 months
Marine Engine Driver Grade 2	9 months

(service to be while holding the Marine Engine Driver Certificate)

The Authority may consider a reduction in approved service of not more than 12 months for a period of other training or experience considered appropriate.

- (c) Have satisfactorily attended a short course in Elements of Shipboard Safety (Schedule Three);
- (d) Pass a written examination in each of:
  - Practical Mathematics
  - Engineering Knowledge

and an oral examination to satisfy the Authority as to competence in the syllabus set out hereunder.

19.2 **SYLLABUS-MARINE ENGINE DRIVER (MOTOR) GRADE 1**

**Practical Mathematics**

(3 hour written examination-pass mark 60%)

- (a) Consumption of oil and fuel;
- (b) Area and circumference of a circle;
- (c) Volumes of rectangular and circular cross-section tanks;
- (d) Capacity and pumping out of tanks and bunkers;
- (e) Speed and range of vessels;
- (f) Weights and measures;
- (g) Simple levers;
- (h) Load, stress on bolts, factor of safety.

**Engineering Knowledge**

(3 hour written examination-pass mark 60%)

- (a) Operation and maintenance of marine internal combustion engines;
- (b) Operation and maintenance of auxiliary machinery systems, including steering gear, and refrigeration systems;
- (c) Operation, testing and maintenance of electrical and control equipment;
- (d) Maintenance of deck equipment and machinery;
- (e) Detection of machinery malfunction, location of faults and action to prevent damage;
- (f) Organisation of safe maintenance and repair procedures;
- (g) Methods of, and aids for, fire prevention, detection and extinction;
- (h) Regulations to be observed regarding operational or accidental pollution of the marine environment and methods and aids to prevent such pollution;
- (i) Function and use of lifesaving appliances;
- (j) Methods of damage control with specific reference to action to be taken in the event of flooding;
- (k) Safe working practices.

**19.3 CERTIFICATE OF COMPETENCY AS MARINE ENGINE DRIVER (STEAM) GRADE 1**

For any applicant requiring a Steam Certificate the Authority shall determine the approved service as is appropriate.

The candidate must pass examinations in Practical Mathematics and Engineering Knowledge.

The Practical Mathematics shall be as for Motor Certificate but the Authority shall determine the examination syllabus for engineering knowledge as is appropriate.

**20. CERTIFICATE OF COMPETENCY AS A ENGINEER CLASS 3**

20.1 To be eligible for the issue of a Certificate of Competency as an Engineer Class 3 an applicant must:

- (a) Have attained the age of 20 years;
- (b) Satisfy the medical and eyesight standards set out in Schedule One;
- (c) Have approved service on vessels of not less than 400kW propulsion power as detailed hereunder:

Marine Engine Driver Grade 1	18 months
(service to be while acting in a capacity normally requiring possession of the certificates)	
Marine Fitter	
Diesel Mechanic	12 months

The Authority may consider other forms of work and/or training which may be considered suitable for the training of a Marine Engineer and accept that in conjunction with not less than the specified approved service.

NOTE: Approved service shall be counted as follows:

On vessels engaged in Inshore Operations-two thirds rate.

On vessels engaged in Harbour Operations-half rate.

Not less than 6 months qualifying service must be performed on vessels propelled by machinery of the type for which the certificate is valid.

- (d) Have satisfactorily attended the following short courses:
- Elements of Shipboard Safety (Schedule Three).
  - Proficiency in rendering First Aid to the injured.
  - Prevention and Control of Fires Onboard Ship. Until this course has been attended Certificates of Competency shall be endorsed  
'RESTRICTED TO VESSELS OF LESS THAN 3000kW';
- (e) Pass written and oral examinations to satisfy the Authority as to competence in the following subjects:
- Practical Mathematics (written only)
  - Engineering Knowledge (Motor or Steam)
  - Electrical Knowledge.

NOTE 1: The written and oral examination for an additional endorsement (motor or steam) of a valid Marine Engineer Class 3 Certificate of Competency shall be limited to –

Engineering Knowledge (motor or steam as appropriate)

NOTE 2: The holder of a valid Marine Engineer Watchkeeper Certificate of Competency need only pass the Engineering Knowledge (oral) as appropriate.

20.2

### **SYLLABUS-MARINE ENGINEER CLASS 3**

#### **Practical Mathematics**

(3 hour written paper-pass mark 60%).

The candidate may be required to perform calculations relating to the following:

- (a) Application of areas and volumes to problems such as the weight of engine parts;
- (b) Force as a vector, triangle of forces;
- (c) Coefficient of friction, friction losses in simple slides;
- (d) Velocity ratio, mechanical advantage and efficiency of simple machines, levers, rope blocks, screw and hydraulic jacks;
- (e) Direct stress, shear stress, elasticity, working stress, factor of safety;
- (f) Circumferential and longitudinal stress in thin cylinders and spherical shells;
- (g) Equilibrium of floating bodies;
- (h) Linear expansion;
- (i) Heat units, specific heat capacity;
- (j) Engine power and torque;
- (k) Heat value of fuel, fuel consumption and engine power;
- (l) Relationship between vessel's speed and fuel consumption, assuming resistance varies as speed squared.

#### **Engineering Knowledge**

(3 hour written paper-pass mark 60%).

- (a) Properties of common marine engineering materials and methods of joining. Manufacture of simple components. Simple heat treatment;
- (b) Properties of liquids and gases commonly used aboard vessels;
- (c) Precautions against fire or explosion. Dangers of oil or gas leakage into bilge or enclosed spaces. Action of wire gauze diaphragms;
- (d) Methods of dealing with fire aboard vessels. Construction, testing, and use of the various portable and fixed fire extinguishers and installations. Remote shut-offs and closing appliances;
- (e) Precautions before entering tanks or enclosed spaces;
- (f) Common shipbuilding terms. Simple details of rudders, propellers, stem tubes, underwater fittings, tank management and effect on ship stability;
- (g) Elementary principles and care and management of auxiliary power sources steam and motor, including boilers and their fittings. Proper use of gauge glasses and blowdown valves. Dangers of water hammer;
- (h) Elementary principles and care and management of the various types of auxiliary pumps and pumping and piping systems, refrigerators and other shipboard auxiliaries;
- (i) Alignment of machinery and machinery parts;
- (j) Construction and use of the various types of gauges and meters;
- (k) Administrative responsibilities. Oil pollution;
- (l) Use of lifesaving appliances;
- (m) (Motor Only) Simple constructional details and the care and management of two stroke and four stroke cycle main propulsion internal combustion engines, with particular reference to safety devices. Preparing for sea. Starting and reversing. Detection of defects;
- (n) (Motor Only) Engine cooling, fuel, and lubricating systems;
- (o) (Motor Only) Care and attention required in the use of air compressors;
- (p) (Steam Only) Simple constructional details and the care and management of main propulsion steam engines and boilers, their fittings and mountings, with particular reference to safety devices. Preparing for sea. Detection of defects;
- (q) (Steam Only) Causes and effects of boiler water contamination. Detection and remedial action;
- (r) (Steam Only) Care and management of boiler fuel, air and feed water systems;
- (s) Refrigeration including
  - Principles of refrigeration;
  - Properties of common refrigerants. Dangers associated with leakage;
  - Operating temperatures and pressures. Methods of temperature control;
  - Care and management of refrigeration equipment, recognition of defects.

### **Electrical Knowledge**

(1 hour written paper-pass mark 60%).

- (a) S.I. Units Amperes, Volts, Ohms;
- (b) Electrical circuit, Ohms law, resistance in series and parallel, batteries in series and parallel;
- (c) Heating effect of electric current;
- (d) Calculation of electrical power given a network of resistance and applied voltage;
- (e) Electrical safety;
- (f) Colour coding;
- (g) Motor starters, overload and under voltage protection;



- (h) ac and dc generators, voltage control and load sharing;
- (i) Accumulators, care and maintenance;
- (j) Power and lighting distribution systems, 3 phase and single phase. Use of fuses and circuit breakers; use of earth lamps;

20.3 **SYLLABUS-ENDORSEMENT OF MARINE ENGINEER CLASS 3**

**Engineering Knowledge**

(for the steam endorsement of a certificate limited to motor only)

(1 1/2 hour written paper-pass mark 60%).

- (a) Simple constructional details and the care and management of main propulsion steam engines and boilers, their fittings and mountings, with particular reference to safety devices. Preparing for sea. Detection of defects;
- (b) Causes and effects of boiler water contamination. Detection and remedial action;
- (c) Care and management of boiler fuel, air and feed water systems.

**Engineering Knowledge**

(for the motor endorsement of a certificate limited to steam only)

(1 1/2 hour written paper-pass mark 60%).

- (a) Simple constructional details and the care and management of two stroke and four stroke cycle main propulsion internal combustion engines, with particular reference to safety devices. Preparing for sea. Starting and reversing. Detection of defect;
- (b) Engine cooling, fuel, and lubricating systems;
- (c) Care and attention required in the use of air compressors.

**PART 4 MINIMUM SAFETY MANNING OF FISHING VESSELS**

**21. Interpretation**

In this Part, unless expressly provided otherwise;

- (a) Certificate means a certificate issued or recognised in accordance with Part 2;
- (b) Master means the person having command of the vessel;
- (c) Chief Mate means the person next in rank to the master and upon whom the command of the vessel will fall in the event of the incapacity of the master;
- (d) Deck Watchkeeper means the person in charge of the navigational watch;
- (e) Chief Engineer means the person responsible for the mechanical propulsion of the vessel;
- (f) Engineroom Watchkeeper means the person in charge of the engineroom watch;
- (g) Propulsion power:
  - (i) In the case of a multiscrew vessel of less than 35 metres in length for use in sheltered waters, inshore, restricted offshore or offshore operations, propulsion power means the maximum continuous rated power in kilowatts of the larger engine provided for the propulsion of the vessel by one screw; and
  - (ii) In the case of a vessel not included in (i) above, means the total maximum continuous rated power in kilowatts of all the machinery provided for propulsion of the vessel.

**22. Requirements**

The Authority having jurisdiction over a vessel shall determine the minimum safety manning of a vessel and in so doing:

- (a) Shall require that it be under the command of a master, being the holder of a certificate of an appropriate grade;
- (b) May require that it be manned by additional personnel, both certificated and uncertificated, having regard to the type and size of the vessel and the intended area of operation. In so requiring, the Authority shall have regard to 24 below when determining the minimum safety manning, and the certificated personnel required.

**23. Dispensation**

An Authority may provide for the issue of a dispensation from its prescribed manning permitting an adequately qualified and experienced person to serve in a specified vessel for a specific period. For service in vessels engaged in seagoing operations a dispensation for a master or chief engineer shall be for the shortest possible period and only for circumstances of force majeure, and for any other person shall not exceed six months.

**24-PARTICULAR PROVISIONS****FISHING VESSELS-MINIMUM SAFETY MANNING**

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COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4	COLUMN 5	COLUMN 6
Vessel Size	Operational Area	TOTAL COMPLEMENT	MASTER	CHIEF MATE	OTHER
80 metres & over	Unlimited	As determined by the Authority			
	Australian Coastal & Middle Waters Offshore	As determined by the Authority			
35 metres and over, but less than 80 metres	Unlimited	As determined by the Authority			
	Australian Coastal & Middle Waters Offshore (200nm)	6	S1	S2	4
	Offshore (100nm)	5	S2	S3	3
	Inshore	5	S2	S3	3
24 metres and over, but less than 35 metres	Unlimited	As determined by the Authority			
	Australian Coastal & Middle Waters Offshore (200nm)	4	S2	S3	3
	Offshore (100nm)	4	S2	-	3
	Restricted Offshore (30nm)	3	S2	-	2
	Unlimited	As determined by the Authority			
12 metered and over, but less than 24 metres	Australian Coastal & Middle Waters (See Note 2)	¾	S2	S3	1/2
	Offshore (200nm) (See Note 2)	¾	S3 endorsed (note 3)	S3	½
	Offshore (100nm) (See Note 2)	2/3	S3	-	½
	Restricted Offshore (20nm)	2	S3	-	1
Less than 12 metres	Unlimited	As determined by the Authority			
	Australian Coastal & Middle Waters Offshore (200nm)	As determined by the Authority			
	Offshore (100nm) (See Note 1)	2/3	S3 endorsed (note 3)	S3	1
	Inshore	½	S3	-	½
	Inshore	1	Coxswain	-	-

Note 1: An additional person is required when length of voyage exceeds 12 hours.

Note 2 Engineer table over page indicates the number of and minimum engineer qualifications required, indicated by propulsion power of a vessel and operational area. These are included in this table in the minimum complement (Column 3).

Note 3: Endorsement to 200nm issued on completion of examination in Navigation and Position Determination of Skipper Grade 2.

**24-PARTICULAR PROVISIONS**

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**FISHING VESSELS-MINIMUM SAFETY MANNING**

COLUMN 1 Propulsion Power	COLUMN 2 Operational Area	COLUMN 3 Chief Engineer	COLUMN 4 Other Engineers
Vessels of 1500kW and over	Unlimited	As determined by the Authority	
	Australian Coastal & Middle Waters	As determined by the Authority	
	Offshore (200nm)	As determined by the Authority	
Vessels of 750 kW and over but less than 1500kW	Inshore	As determined by the Authority	
	Unlimited	As determined by the Authority	
	Australian Coastal & Middle Waters	Class 3	MED 1
	Offshore (200nm)	Class 3	MED 2
Vessels of 500kW and over, but less than 750kW	Restricted Offshore (30nm)	MED 1	-
	Unlimited	As determined by the Authority	
	Australian Coastal & Middle Waters	MED 1	MED 2
	Offshore (200nm)	MED 1	-
Vessels of 250kW and over, but less than 500kW	Inshore (15nm)	MED 2	-
	Unlimited	As determined by the Authority	
	Australian Coastal & Middle Waters	MED 1	-
	Offshore (200nm)	MED 2	-
Vessels less than 250 kW	Inshore (15nm)	MED 3	-
	Unlimited	As determined by the Authority	
	Australian Coastal & Middle Waters	MED 2	-
	Offshore (100nm)	MED 3	-
	Inshore (15nm)	COXSWAIN	-

**INDEX OF SCHEDULES-FISHING**

SCHEDULE ONE	Medical Fitness Standards
SCHEDULE TWO	Basic Radar Course
SCHEDULE THREE	Elements of Shipboard Safety
SCHEDULE FOUR	Courses leading to the award of a Certificate of Proficiency in Rendering First Aid to the Injured
SCHEDULE FIVE	Restricted Operator's Certificate of Proficiency in Radiotelephony
SCHEDULE SIX	Certificate of Proficiency in Survival Craft
SCHEDULE SEVEN	Prevention and Control of Fires Onboard Ship
SCHEDULE EIGHT	First Aid at Sea
SCHEDULE NINE	Radar Simulator Course

## SCHEDULE ONE

### MEDICAL FITNESS STANDARDS

The following medical fitness guidelines are for the purposes of certification under this Section.

Medical fitness examinations should be based on normal criteria taking due account of the nature of employment for which certification is intended, as well as the medical and employment history of the person.

Particular account should be taken of the standards set out below

#### 1. EYESIGHT

##### 1.1 DECK DEPARTMENT

- (a) with or without aids to vision
  - 6/6 in the better eye, 6/9 in the other eye (note (ii));
- (b) without aids to vision
  - 6/30 in each eye (note (ii));
- (c) with or without aids to vision
  - read N5 chart; and
- (d) with or without aids to vision
  - lantern test, large and small apertures.

#### NOTES:

- (i) In every case for issue of the first Certificate of Competency, the lantern test shall be used provided that for Skipper 3 and below the Authority may accept a statement from a qualified ophthalmologist that the applicant suffers no abnormality in colour vision. The Ishihara test may be used as a screening test in outports for certificates up to and including the Skipper 3 Certificate.
- (ii) Persons with one eye or poor vision in one eye may be permitted to demonstrate their ability to keep a navigation watch.

##### 1.2 ENGINE ROOM DEPARTMENT (other than Marine Engine-driver Grades 1, 2 and 3).

##### 1.2.1 For initial and further certification

- (a) with or without aids to vision
  - 6/9 in one eye;
- (b) without aids to vision
  - 6/60 in one eye;
- (c) with or without aids to vision
  - read N5 chart; and
- (d) distinguish basic colours.

#### 2. GENERAL (applies to Skipper 2, Engineer Class 3 and higher grades of Certificates)

2.1 In addition to normal fitness standards, the following conditions are specified to ensure the person can perform the relevant duties without creating an unacceptable risk to him/ herself, other members of the crew or the safe operation of a vessel.

##### 2.2 Hernia

No condition of hernia unless satisfactorily corrected by a curative operation.

##### 2.3 Speech

Deck department's speech should be clear and without hesitation.

##### 2.4 Hearing

Hearing ability should be tested by the whispered voice, watch or other proved tests. However, where an appeal is made the test should be conducted by means of an audiogram to the standard of:

Hearing loss in each ear must not be greater than 20 decibels (AMA standard) for the frequencies of 500 Hz, 1000 Hz and 2000 Hz.

Where hearing level is less than the above standards, hearing aids may be accepted, providing the above standards may be reached when using the aid and watchkeeping duties can be adequately performed.

2.5 **Artificial limbs**

Each case considered on its merits.

2.6 **Cardiac pacemaker**

A person with a cardiac pacemaker is not fit to serve on a vessel unless a doctor is satisfied that taking into account the nature of the disease and the reliability of the pacemaker, the person is considered fit.

**SCHEDULE TWO**  
**BASIC RADAR COURSE**

- NOTE:** Candidate must have 12 months qualifying sea service before undertaking the course.
- AIM:** To ensure that candidates receive adequate formal training in the correct use of radar equipment and the interpretation of information obtained from it; and that they are capable of making safe use of the equipment as an aid to navigation and collision avoidance.
- SCOPE:** Demonstrate knowledge of fundamentals of radar and ability in the operation and use of radar, and in the interpretation and analysis of information obtained from the equipment, including:
- (a) Factors affecting performance and accuracy;
  - (b) Setting up and maintaining displays;
  - (c) Detection of misrepresentation of information; false echoes, sea return, etc;
  - (d) Range and bearing;
  - (e) Identification of critical echoes;
  - (f) Course and speed of other vessels;
  - (g) Time and distance of closest approach of crossing, meeting or overtaking vessels;
  - (h) Detecting course and speed changes of other vessels;
  - (i) Effect of changes in own vessel's course or speed or both;
  - (j) Application of the International Regulations for Preventing Collisions at sea.



**SCHEDULE THREE**

**ELEMENTS OF SHIPBOARD SAFETY**

**AIM:** To ensure that candidates receive practical training in matters which effect their personal safety and the safety of the vessel and crew as a whole.

**SCOPE:** The course shall cover:

Elements of fire prevention on board the vessel.

Theory of combustion and methods of extinguishing fire.

Practical training in the use of portable fire fighting appliances.

Knowledge of the lifesaving appliances carried on board a vessel, their use and operation.

Practical training in launching, boarding and survival in an inflatable liferaft.

Elements of accident prevention as they apply to the ship-board workplace, particularly as they apply to falls, burns and scalds, electric shock and working in close proximity to machinery and moving objects.

Practical instruction in resuscitation methods and treatment of the injured.

**SCHEDULE FOUR**  
**COURSES LEADING TO THE AWARDS OF AN**  
**APPROVED CERTIFICATE INDICATING**  
**PROFICIENCY IN RENDERING FIRST AID TO THE INJURED**

Certificates issued by the St. John Ambulance Association and the Australian Red Cross Society are approved for this purpose.

**AIM:** To ensure that candidates can render first aid to the injured.

**SCOPE:** The scope of the courses leading to the abovementioned certificate is contained in the authorised manual of the St. John Ambulance Association and Australian Red Cross Society.

**SCHEDULE FIVE**  
**RESTRICTED OPERATOR'S CERTIFICATE OF**  
**PROFICIENCY IN RADIOTELEPHONY**

The certificate is issued to a candidate who successfully passes an examination conducted by the Department of Transport and Communications, Australia.

**AIM:** To ensure that candidates are competent in the operation of the radiotelephone, in particular its use with respect to distress urgency, safety and navigational messages.

**SCOPE:** A general knowledge of the contents of the 'Handbook for Radiotelephone Ship Station Operators' leading to the issue of a 'Restricted Operator's Certificate of Proficiency in Radiotelephony' issued by the Australian Department of Transport and Communications.

**SCHEDULE SIX**

**CERTIFICATE OF PROFICIENCY IN SURVIVAL CRAFT**

- AIM:** To ensure that candidates are able to instruct and lead all crew members in the use of the lifesaving appliances carried on vessels so as to maximise the possibility of rescue and survival in the event of marine disaster.
- SCOPE:** The course shall cover the requirements for the issue of a Certificate of Proficiency in Survival Craft as contained in Regulation VI/I of the International Convention of Standards of Training, Certification and Watchkeeping for Seafarers, 1978.

**SCHEDULE SEVEN**

**PREVENTION AND CONTROL OF FIRES ONBOARD SHIP**

**AIM:** To ensure that candidates receive formal training in fire prevention and fire fighting, including practical exercises in the fighting of fires and the maintenance and use of the appliances required to be carried onboard a vessel.

**SCOPE:** The course shall cover:

An understanding of:

- the sources of ignition of fires onboard a vessel.
- the measure that must be taken to minimise the risk of fires on vessels.
- the appliances fitted on vessels for the detection of fires.
- Knowledge of the theory of combustion and the means by which fires may be extinguished.
- Knowledge of the extent of fixed fire fighting appliances onboard a vessel and their mode of operation.
- Thorough knowledge of the portable fire fighting appliances carried onboard a vessel, their maintenance and method of operation.

Practical exercises in:

- methods of resuscitation.
- use of portable breathing apparatus.
- use of portable extinguishers in the extinguishing of class A, B and C fires.
- use of hoses in the extinguishing of class A and B fires.

An appreciation of the dangers from fumes and the risks involved with fires involving dangerous goods.

**SCHEDULE EIGHT**

**FIRST AID AT SEA**

**AIM:** To ensure that candidates receive formal training in rendering first aid to the injured and in handling injured persons with particular emphasis on those situations which may arise onboard a vessel.

**SCOPE:** The course shall cover:

Outline of body structure and functions.

Treatment of the injured person; shock, bleeding, coma etc.

General treatment of fractures and dislocations.

Head injuries and spinal injuries, treatment of the unconscious and paralysed patient.

Treatment of wounds and burns.

General treatment of persons affected by poisonous and toxic substances.

Poisoning by alcohol, drugs etc.

General nursing techniques, hygiene.

Drowning and asphyxia, resuscitation techniques. Practical Instruction in;

- control of bleeding.

- bandaging.

- application of splints.

- use of the Neil Robertson stretcher, evacuation of injured person from holds and tanks.

- resuscitation (mouth to mouth). - external cardiac massage.

Practical application of medical guides, including the guide for use in accidents involving dangerous goods, and advice by radio, including the ability to take effective action based on such knowledge in the case of accidents or illnesses that are likely to occur onboard ship.

**SCHEDULE NINE**

**RADAR SIMULATOR COURSE**

**NOTE:** Candidate must have completed the Basic Radar Course and twelve months qualifying watchkeeping service before undertaking the course. The Authority may accept other experience and qualifications deemed to be equivalent.

**AIM:** To ensure that candidates are able to derive maximum benefits from radar for safe and efficient navigation through practical exercises in collision avoidance and navigation.

**SCOPE:** The course shall cover:

- an understanding of the limitations of information obtained from radar and the hazards of failing to recognise these limitations.
- the practical application of the rules and recommendations of the Regulations for the Prevention of Collisions at Sea.
- exercises involving vessels of different manoeuvring characteristics in close quarter situations.
- demonstrations of how the misuse of radar has led to accidents in the past, case studies.
- the use of ARPA's.