Transport and Main Roads

Safety Management System Reference material

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Section 1: Introduction

1.1 Safety Management Systems

To comply with Queensland law and the National Standards for Commercial Vessels, the owner and/or the master must keep and maintain operating documents that serve as a Safety Management System (SMS) for the following registrable ships:

- commercial ship over eight metres in length operating in Queensland waters, other than a ship operating in smooth waters that does not make voyages of more than 15 minutes duration
- fishing ship operating beyond partially smooth waters
- fishing ship that is not registered.

All other ships must keep particular documents as outlined in Schedule 4 of the *Transport Operations Marine Safety Regulation 2004.*

The owner or master must ensure the required documents are:

- kept in a secure place on board ship, or if the ship is an open ship and it is impracticable to keep the records on board the ship, the documents must be kept at a 'prescribed place' that s accessible to the ship's crew
- complete, accurate and up to date
- kept with records for at least five years from the date they were made
- not defaced, entries erased or obliterated, destroyed or disposed of.

'Prescribed place' means either the owner or master of the ship having a place of business in Queensland for managing the ship's operations, or if not, then at that person's place of residence.

This document provides background and explanation about specific requirements of a Safety Management System. It should be used in conjunction with the example Safety Management System developed by Maritime Safety Queensland in hard copy and CD ROM format. The hard copy version of the example Safety Management System contains reference numbers that relate to sections of this reference document.

The documents required by Part 5, Division 11 of the *Transport Operations (Marine Safety) Regulation 2004* and by Part E of the National Standard for Commercial Vessels are:

1.2 Ship's profile and lines of responsibility

This section of the Safety Management System records basic details about the ship and outlines who is responsible for management of safety and pollution control.

1.3 Safety and emergency planning

The owner and/or master are responsible for developing emergency plans to suit their particular vessel and to ensure crew are trained and practised in emergency drills. It is mandatory to develop emergency plans for the following situations:

1. person overboard
2. fire onboard
3. severe weather
4. collision and grounding
5. personal injury
6. assembly stations (for very small ships this will be a brief statement)
7. abandon ship

Further plans must be developed for other possible emergency situations that are related to the nature of onboard operations.

All training must be recorded in the training record section of the Safety Management System and/or in the ship's log. These records must be produced for inspection by a shipping inspector.

1.4 Operational manual

This manual contains the procedures for all operations that will be conducted by the crew of the ship. It should outline roles and responsibilities and equipment to be used in a step by step guide for the master and crew.

In the example Safety Management System, Maritime Safety Queensland provided example procedures for the basic operations on a ship. The owner/master must change the examples to reflect the actual procedures used on their ship. They must also develop procedures for other activity conducted on the ship not covered by these examples.

Tailoring this document in this way enables this document to serve as a compliant Safety Management System.

1.5 Technical manual

This manual serves as a record book for your ship and should be updated as required.

The technical manual should include all the technical specifications and manufacturers' instructions for machinery and equipment on the ship.

Any item in the example Safety Management System that is not appropriate should be deleted, or if items are missing, they should be added into the document.

1.6 Maintenance and service manual

This manual is designed to assist with the planning and recording of maintenance and survey. Proper maintenance and servicing is essential to keep a ship seaworthy and in good condition (as required by the general safety obligation).

The manual is divided into the following sections:

- Maintenance schedule — this plan covers areas of a ship required to be either maintained or monitored to ensure the ship is kept safe and the servicing frequency requirements.
- Maintenance record — this section has sections to record service, maintenance and modifications.
- Survey checklist — this complements the maintenance plan and record and must only be completed by ship operator.
- Surveyors' report — these record the condition of the ship according to the type of survey performed. Surveys must be carried out by an accredited marine surveyor.
- Shipping Inspector's Record of Inspection — a copy of the report created by an inspection by a shipping inspector must be kept in this section.

Other records that make up a Safety Management System

1.7 Crew records and training

This manual contains crew member details, records of crew training, as well as explains how the operator made minimum crew and adequate crew level determinations.

1.8 Certificates

Relevant certificates and statements of compliance must be kept for each ship

1.9 Assessing and managing risk

The maintenance and safe operation of commercial and fishing ships requires the owner and/or master to assess the risks to the vessel and its operation and then manage those risks. The steps that explain how to assess and manage risk for a ship are in section 7 of this document — Assessing and managing risk.

Management of risk may require changes to operating procedures, maintenance schedule, crew training, or changes to the physical safety arrangements of the ship. An operator must review the risk management on the ship each year and record the date of the review in the Safety Management System. Actions required or risks identified in the annual review can be recorded in the record of hazardous occurrences.

A ship's operator must ensure that any feedback from crew or passengers in regard to safety concerns is recorded and acted on in a timely manner.

1.10 Relevant legislation, rules and standards

A Safety Management System can also take into account relevant industry codes, guidelines and standards recommended by class societies and industry organisations if they are relevant to the operation of that ship.

The following pieces of legislation, rules and standards are relevant to this ship (add as relevant):

Transport Operations (Marine Pollution) Act 1995 (and regulation of 2008)

Transport Operations (Marine Safety) Act 1994 (and regulation of 2004)

Transport Operations (Marine Safety) Hire and Drive Ships Standard 2007

Workplace Health and Safety Act 1995 (and Regulation 2008)

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This document has been developed as a guide to assist ship owners and masters in establishing a ship management system for the vessel to assist with achieving their general safety obligation. This obligation, referred to as the general safety obligation, requires operators to meet high levels of safety by demonstrating the ship is:

- seaworthy
- appropriately equipped, crewed and adequately prepared to cope with emergency situations
- fully compliant with current workplace health and safety practices.

Failure to meet the general safety obligation may lead to penalties including one year imprisonment or a substantial fine.

Section 2: Ship profile and lines of responsibility

2.1 Ship's profile

Information must be recorded to describe the vessel particulars. This will include the hull type and lengths. It should include a photo of the vessel where possible.

2.2 Lines of responsibility

Contact details for the owner, operator (if different from the owner), and employer of crew (if different from the owner) must be recorded.

Any weather and sea condition limitations or any other operational limitations found in design/stability documents, certificates of compliance, survey certificates, or arrangements relied upon in the Safety Management System to mitigate risks must be noted on page two under the appropriate heading.

2.3 Owner or operator

The owner can be the operator of the ship and the master of the ship or they can be different people. The owner may appoint a person (might be the master) designated to act on their behalf in operating the vessel, who is the operator or designated person. The operator must have direct access to the owner and are responsible for monitoring the safety and pollution prevention of the vessel and ensure appropriate resources and shore support, are provided to the vessel.

The owner must define the relationship and lines of communication between onboard personnel and onshore staff (if any) responsible for implementing this Safety Management System. Every position onshore and onboard needs to have a brief job description so all staff and crew understand their responsibilities.

The safety management system must include job descriptions for:

- owner
- operator
- shore based manager (if different operator)
- master
- engineer
- coxswain/deckhand.

2.4 Record of hazardous occurrences

The ship's Safety Management System needs to record hazardous occurrences as well as records of situations where the ship's operating procedures are not followed. It also needs to include actions taken to prevent their reoccurrence in the operating procedures.

2.5 Record of client and crew compliments and complaints

The ship must have a way to record client (includes customers and other people dealing with the vessel) feedback and complaints about safety issues. A table that includes the headings below is an example that vessels can use to improve their operating procedures:

- location/date/time
- client name
- nature of compliment/compliant
- action taken by responsible officer
- recommended changes to vessel proceeds.

2.6 Record of annual review

The ship's safety management system needs to record hazardous occurrences as well as records of situations where the ships operating procedures are not followed. It also needs to include actions taken to prevent their reoccurrence in the operating procedures. A table including the following headers below is recommended:

- date, time and location
- hazardous occurrence, issue or review item
- person or officer responsible for investigation
- action taken to rectify
- action taken to prevent reoccurrence.

Section 3: Safety and emergency plans

3.1 Safety equipment

All ships must have appropriate life saving and fire fighting equipment. This is specified by regulation *Transport Operations (Marine Safety) Regulation 2004*. It must be inspected regularly and be ready for immediate use. The owner and/or master must ensure all crew are trained and practised in the use of emergency equipment to cope with emergencies on board. It is useful for crew training and customer safety to complete diagrams showing the location of safety equipment on board the vessel.

3.2 Frequency of drills

The frequency of emergency preparedness training shall be sufficient to maintain crew competence at a level needed to ensure the crew's rapid and effective response to emergencies at all times. The frequency of training shall take into account:

the likelihood that crew performance will deteriorate over time without periodic practising because of loss of familiarity with procedures and the location and use of equipment that new crew members may join the vessel who will need the opportunity to practise with, and learn from, other members of crew.

3.3 Special personnel

Special personnel are people who are not members of the crew or passengers. These people are required to be able-bodied and include people onboard for a particular purpose and include trainees on a sailing ship, marine pilots, dive-masters and people processing scallops on a fishing ship.

People in this category are required to be briefed in regard to emergency situations on board the vessel, but do not have full knowledge of the vessel's operations and its systems operations.

3.4 Emergency communication

In an emergency use the appropriate emergency radio channel, or call 000 on the satphone.

Extreme emergency radio traffic should commence with 'all ships, mayday, mayday, mayday' which will prompt a response from either volunteer limited coast stations or port control stations manned 24 hours a day for ships in range.

The distress signal is 'mayday'. It has absolute priority over all transmissions and indicates that the ship or person using it is threatened by grave and imminent danger and requests immediate assistance.

The urgency signal is 'pan pan'. It indicates that the station sending it has a very urgent message to transmit concerning the safety of a ship or aircraft, or the safety of a person.

The safety signal is securité. It indicates that a station is about to transmit a message concerning an important navigational or weather warning.

3.5 Communications equipment

A vessel must be provided with communications equipment of type and quantity appropriate to control to acceptable levels the risks associated with the operation of the vessel. This needs to take into account the area of operation as well as other risk factors that might be relevant.

Risks concerning communications equipment may be associated with design and failure to perform when initiating distress assistance. Consequences arising from these risks may include increased risk to operating the vessel in a safe manner, delay or failure to rescue, personal injury, poor response to environmental damage and so on.

Communication equipment must be designed, constructed and arranged to enable communication that reduces navigation risks associated with operating the vessel.

The equipment must be installed and located so as to be readily available in the event of an incident and designed and constructed to be able to function reliably when required.

Arrangements must be provided to maintain the effectiveness of communications equipment over the life of the vessel and to ensure that its reliability does not reduce over time.

Crew must be provided with sufficient information to effectively use all available communications equipment at time of need.

There are three types of marine radios — 27MHz, VHF and MF/HF.

Crew should be trained in the appropriate use of the radio or radios on board. Information is provided in the *Marine Radio Operator's Handbook*.

Crew should also be trained how to use a satphone, which might be more appropriate than radio communication in the event of a medical emergency.

Ships in B, C and D class (operating in partially smooth waters and beyond) are required to be equipped with an approved, properly installed radiotelephone installation with a source of power capable of keeping the radios operable for at least six hours in an emergency.

For ships operating within range of a coastal station or limited coastal station, the required radio is a marine VHF radio capable of transmitting and receiving on channels 16 and 67 and on such other frequencies as are appropriate.

For ships operating beyond a limited coastal station, a marine MF/HF radio or satphone is required capable of transmitting and receiving on assigned distress/calling frequencies and other appropriate frequencies. The distress and calling frequencies are 4125, 6215 and 8291 kHz 24 hours a day.

3.6 Danger messages or securité

Any vessel that encounters any of the hazards listed below shall issue a danger message or securité to all vessels in the vicinity and to the nearest rescue coordination centre.

Dangers that shall be reported are:

- a dangerous derelict, hazardous floating object, or any other direct danger to navigation
- a tropical storm, or winds of force 10 or above on the Beaufort scale for which no storm warning has been received
- dangerous ice
- sub-freezing air temperature associated with gale force winds causing severe ice accretion on superstructure
- any other situation that could pose a danger to other vessels in the vicinity.

3.7 Communicating distress

A minimum of two methods must be provided for vessel to shore communication of a distress message or request for assistance and to provide the vessel's location in order to initiate and facilitate rapid assistance for rescue.

A minimum of one method must be provided to communicate safety information to other vessels and to the shore.

A person must not use or display a prescribed signal of distress other than under a regulation.

Distress signals shall only be used in emergency situations to:

- transmit or display a signal for distress
- transmit a prescribed urgency signal
- send out a danger message.

Other than in an emergency, a person shall not use any flare, rocket or shell that could be mistaken for a distress signal from a vessel, unless advance permission has been provided by Maritime Safety Queensland.

When a distress signal has been accidently transmitted from a vessel, the master shall immediately advise the nearest rescue coordination centre of the accidental transmission, and that the vessel is not in danger. Transmission includes signalling distress by radio, satellite, sound, visual or any other means.

EPIRBs must not be activated for trial or test. If a person removes an EPIRB from a vessel for the purpose other than test or repair, that person shall ensure that the EPIRB is effectively disabled by the immediate removal of each battery. The nature of the disablement shall be noted on the unit.

3.8 Emergency plans

Emergency planning is carried out to ensure that appropriate measures are put in place before an emergency to limit the consequences of an emergency should one occur. An emergency plan needs to:

- outline emergency procedures to be followed
- list people and positions to implement procedures within emergency plan.

It is the responsibility of the owner and/or master of the ship to develop emergency plans for all vessels, and to ensure that all crew are adequately trained to cope with emergency situations.

Emergency plans must be developed for the following situations:

1. person overboard
2. fire onboard
3. severe weather
4. collision and grounding
5. personal injury
6. assembly stations (for very small ships this will be a brief statement)
7. abandon ship.

Further plans must be developed for other possible emergency situations that are related to the nature of onboard operations.

Information on how to determine which other situations should be covered by emergency plans is contained in the chapter on Assessing and managing risk. This chapter explains how to assess the risks to a vessel and how to manage those risks by implementing controls that reduce, remove or transfer risk. The controls the owner and/or master devises to manage risks to the vessel will affect the emergency plans and operating procedures for the vessel. New or changed emergency plans and operating procedures need to be outlined in this document.

The master should enact the emergency plans. In the event that the master is incapacitated, the crew member that is next in command assumes the master's duties. This crew member may not necessarily have the required qualification.

Class 1A and 2A vessels have the option of satisfying the emergency planning requirements by complying Marine Orders Part 21, 28 and 58.

3.9 Verbal emergency plans

All registrable commercial and fishing ships need to prepare emergency plans. A ship may have emergency plans in an alternative form (can be verbal) if it is less than eight metres and:

- does not carry passengers
- does not carry more than three crew
- is not a vessel primarily designed for towage
- a support vessel in the offshore oil industry
- a carrier or support vessel for the delivery of fuel or dangerous goods
- any other type of high risk vessel
- does not have frequent or regular turn over of crew.

The owner or master of a ship with an emergency plan in an alternative form still needs to review the emergency plan every three months and use a checklist that covers the following:

- vessel's name or identification number
- name of the owner or master conducting the review
- date of the review
- components reviewed.

The owner or master needs to keep a copy of the completed checklist in the ship's logbook or other suitable location.

3.10 Person overboard

The master must ensure that preventative measures are in place to reduce risk of persons falling overboard and systems are in place to raise the alarm and to immediately begin recovery procedures. The master must carry out a risk assessment to determine the appropriate frequency of drills. When there is a change of crew, the master needs to ensure that all crew are familiar with correct procedures.

The following procedure should be used as a guide only and needs to be adapted as necessary to the needs of the ship and its operation.

If a person is seen falling overboard, the witness shall give the alarm by shouting as loud as possible 'person overboard, person overboard'. The witness must continue shouting the alarm until a response is received. The witness, while sounding the alarm, should stay where they are and point, keeping the person in the water in sight.

The first person to respond to the alarm should throw a life ring or buoyant apparatus and a position-marking device to the person in the water. The witness may be able to do this but the first priority is to maintain sight of the person in the water.

3.11 Fire fighting

Where required by the table below, a vessel is to be provided with a fire control plan. The object of the fire control plan is to ensure that fire equipment provided is readily available for emergency planning and training and for use in the event of a fire.

The fire control plan must be permanently exhibited in a location suitable for ready reference by the crew.

Vessels of measured length greater than 35 metres shall have a duplicate set of control plans or a booklet containing such plans permanently stored in a weather-tight location, or located outside the deckhouse for use by shore-based fire fighting personnel.

3.12 Fire control plans (for ships greater than eight metres)

The following ships need to develop a fire training booklet, fire safety operation booklet and a fire control plan.

Category	Application
Fire risk category i	Required if measured length ≥ 25 metres
Fire risk category ii	Required if measured length ≥ 25 metres
Fire risk category iii	Required for all vessels
Fire risk category iv	Required for all vessels

See NSCV Part C4 — Fire Safety Standard for greater detail.

The fire control plan shall show clearly for each deck the following positions as applicable:

- control stations
- sections of the craft which are enclosed by fire divisions
- smoke zones
- evacuation alarms
- fixed fire detection and fire alarm systems
- fixed fire extinguishing systems
- fire appliances
- personal protective equipment including fire-fighters outfits and emergency escape devices
- the means of access to the various compartments and decks in the vessel
- the ventilating system (including particulars of the master fan controls, the positions of fire flaps, smoke flaps and fire dampers and identification numbers of the ventilating fans serving each section of the vessel)
- the location of the international shore connection if fitted
- the position of all means to control the fuel shut off valves, ventilation fan shutdown, fixed fire detection and fire alarm systems and fixed fire extinguishing systems.

A training manual for fighting fires shall be located in each crew mess room or in each crew cabin.

The training manual must explain the following information using illustrations where possible:

- general fire safety practices and precautions related to the dangers of smoking, electrical hazards, flammable liquids, dangerous goods and similar shipboard hazards
- general instructions on fire fighting activities and fire fighting procedures including procedures for notification of a fire and use of manually operated call points
- meanings of vessels alarms
- operation and use of fire equipment
- operation and use of fire doors
- operation and use of ventilation shutdowns, fire flaps, smoke flaps and fire dampers
- escape systems and appliances.

The fire safety booklet shall contain the necessary information and instructions for the safe operation of the vessel and cargo handling operations with respect to fire safety. The booklet shall include information concerning:

- the crew's responsibilities for the general fire safety of the vessel while loading and discharging cargo and while underway
- an explanation of necessary fire safety precautions for handling general cargoes
- for vessels carrying dangerous goods, relevant stowage and segregation information for the dangerous goods to be carried
- for vessels carrying dangerous goods, the applicable references to the pertinent fire fighting and emergency cargo handling instructions contained in:

  i) the Code of Safe Practice for Solid Bulk Cargoes

  ii) the *International Maritime Dangerous Goods Code* as appropriate.

The fire safety operational booklet must be located in each crew mess room or in each crew cabin. This booklet may be combined with the training manual.

The number of fire pumps, fire hoses, hydrants, portable fire extinguishers and fixed smothering systems must comply with the requirements for the class of the vessel as required by the Uniform Shipping Laws Code section 11.

3.13 Portable extinguishers

A portable fire extinguisher is a fire extinguisher that:

- complies with AS/NZS 1850—1997
- has been serviced annually and otherwise maintained in accordance with AS 1851.1—1995
- if the extinguisher is a dry powder extinguisher:
    - is fitted with a discharge hose in accordance with AS2444—1995
    - has a rating of at least 2A30B(E) under AS/NZS 1850—1997
- if the fire extinguisher is a foam fire extinguisher —– has a rating of at least 3A20B under AS/NZS 1850—1997
- if the fire extinguisher is a CO2 fire extinguisher — has a rating of at least 5B(E) under AS/NZS 1850—1997.

If a fire is discovered outside machinery spaces, the following actions should be taken in order:

1. Sound the alarm. Shout 'fire fire fire fire in the …… ' until a response is received.
2. At the same time as giving the alarm (shouting fire, fire), assess the situation. A portable fire extinguisher can be used to control a large fire for approximately one minute; this should be enough time for other crew to come to your aid. Every effort must be made to control the fire at the time of discovery, do not wait for assistance to arrive.
3. On hearing a fire alarm, crew should move to carry out their allotted tasks listed in the emergency plan. This should mean that fans are stopped, vents doors and hatches are closed, fire pumps are started, hoses laid out and all the gear required to fight a fire is made ready for use.

The first person on the scene is the person who has given the alarm and will also initially be the person who has the most information about the discovered fire. This person must take charge of the situation until relieved by the master, or until the fire is out.

The master must carry out fire fighting drills during muster drills to ensure that all crew are familiar with the stowage and operation of all fire fighting equipment. Fire scenarios should be developed and reactions planned and practised. This should include training on electrical fires, isolation of electrical equipment and the type of extinguishers that can be safely used on electrical plant. Regular drills provide a good opportunity to check the location and type of fire fighting equipment on the ship. Ensure the equipment is in good condition, and that personnel know how to use it.

Power must be isolated from the affected area, when using fire hoses and water based fire fighting equipment.

3.14 Engine room fires

If a small fire is discovered in any part of the engine room the fire procedure must be followed. Care should be taken when using water in the vicinity of electrical plant. Crew must be aware of the hazards associated with portable CO_2 extinguishers in confined spaces.

In the event of an engine room fire that can not be contained by portable fire extinguishers it may be necessary to deploy the fixed smothering system (if installed). It is necessary to ensure that the engine room is free of all personnel before activating the suppression system.

3.15 Severe weather

When operating a vessel in severe weather the master and or watchkeeper will keep a continuous monitor of meteorological forecasts and changes in weather observations. All planned routes should

be re-evaluated to find alternatives if available. The master should direct the crew to secure and stow all equipment on deck and throughout the ship. All happenings and severe weather details should be recorded in the ship's log.

3.16 Assembly stations

The purpose of assembly stations on board a vessel is to assemble the crew and passengers in a pre-determined area where they are out of danger and can be readily counted to ascertain if anyone is missing. Crew might be required to take up predetermined emergency positions near life saving appliances or be directed by the master to any other part of the vessel.

The signal to assemble at emergency stations is seven short blasts followed by one long blast of the ship's horn. This might vary according to circumstances and the signal to muster could be a pre-arranged verbal instruction delivered by the master. In a small ship with a two-person crew, prescribed assembly procedures may be impractical. Alternative arrangements can be made and must be advised to the crew.

Assembly stations shall be allocated for all persons on board. More than one assembly station may be required to accommodate all persons safely. The usual location of the assembly station on board a small vessel is at the stern end or after the cockpit. This should be marked 'assembly area'. An alternate assembly area may be on the bow of the vessel, or at any other place directed by the master.

At assembly stations the presence of all persons on board can be ascertained, and persons are in a position to move to abandon ship if required, or carry out other safety procedures in an organised and controlled manner. In designating a location as an assembly station, the following requirements shall be considered:

- ready access for persons from other spaces in the vessel to assemble at that station
- ample room for the assembly and instruction of passengers
- proximity and ready access to embarkation stations for life rafts
- ready communication to and from relevant control stations
- ready access to personal lifesaving equipment
- vessel stability.

On vessels that carry more than 36 persons, the emergency plan shall also specify alternative assembly stations in the event that one or more of the spaces specified as assembly stations are rendered unusable or inaccessible during the emergency.

3.17 Emergency station list's and escape routes

Emergency stations shall be assigned for each crew member. Clear instructions to be followed in the event of an emergency shall be provided for every person on board. These instructions shall be in the form of:

- emergency station lists for the crew
- emergency information for passengers.

The master must exhibit emergency station lists in conspicuous places throughout the ship including the wheelhouse and crew accommodation spaces if at least one of the following applies:

- where a ship has four or more crew
- at least one berthed passenger
- more than 36 un-berthed passengers
- the voyage is longer than 12 hours.

Crew identification in the emergency station list must be by designated capacity and/or name. Each crew member shall be made aware of their emergency station/s and responsibilities and shall be competent in their duties.

Illustrations and instructions shall be provided in passenger cabins and be conspicuously displayed at assembly stations and other passenger spaces to inform passengers of:

- their assembly stations
- the essential actions they must take in an emergency
- the method of donning life jackets.

This may be in the form of signs, notices and emergency brochures.

Escape routes and assembly stations shall be clearly marked, and the markings shall remain visible in emergency situations.

Escape routes shall be kept clear of obstructions whenever the vessel is operating. Furniture and fittings along and within the vicinity of escape routes shall be secured or designed to prevent them blocking the escape route in an emergency.

3.18 Collision/grounding/flooding

The master must ensure that crew are familiar with the sequence of events to deal with a collision, grounding or flood. These situations will vary greatly in severity depending upon injury to passengers and crew, the damage to the vessel, to other vessels and the potential for the situation to deteriorate.

The master must carry out damage control drills to ensure that all crew are familiar with the location of all

- watertight bulkheads
- isolating systems
- location and operation of hatches
- stowage of emergency pumping equipment
- regular pumping systems.

When developing your procedure for collision, grounding and flooding you can use the below points to assist you to determine your appropriate actions

- systems to ensure watch keepers are alert
- identify flooding
- raise the alarm
- emergency stations for crew
- assembly stations for passengers
- account for all crew and passengers
- rescue of persons from flooded areas
- actions to contain flooding
- actions to curtail flooding
- seek assistance
- removal of water
- report incident
- keep records
- assess further action.

3.19 Abandoning ship

The master is the only person who can authorise to abandon ship. Abandoning ship is a last resort and should never be taken without firstly evaluating all available options and making appropriate preparations. Preparations should be made early when it has become clear that abandoning ship is the only safe option under the prevailing circumstances.

Preparations include:

- the life raft to be launched and made fast alongside or trailed astern
- crew can be instructed to put on waterproof and warm clothing, don life jackets and prepare to take to the life raft. Persons not involved with fighting to save the ship should assist those who are by retrieving extra warm clothing and lifejackets for them.

The master should carry out an abandon ship drill once every month and when crew are changed. This drill will ensure that the crew are familiar with and understand the procedures for abandoning ship.

Post evacuation management: Instructions should then be given on how to use the raft and the equipment contained in the raft, and how to survive at sea. The manual on survival, issued by the Australian Maritime Safety Authority, should be used as the reference.

3.20 Medical emergency

In the event of a medical emergency initiate an emergent response by using the appropriate emergency radio channel or call 000 on your satphone.

Medical emergencies must be planned for and managed should they occur. During a medical emergency, the master must:

- monitor the health and safety of persons on board
- document succession of command
- provide first aid to injured person or persons
- seek medical advice by radio or satphone
- arrange to evacuate injured person or persons by helicopter or another ship
- advise next of kin of the situation.

Whenever an injury is reported on board or on an island or coral reef, first aid must be commenced by the crew.

Should the first aid available be insufficient to treat the injury, immediately contact the Queensland Ambulance Service for advice.

The Queensland Ambulance Service may be able to be contacted locally, but in an emergency use the emergency radio channel or call 000 on your satphone.

When the Queensland Ambulance Service is connected, an officer will ask for information regarding the injury. This may include information concerning the patient's previous medical history. Based on the information provided, the officer will decide what course of action to take. The Queensland Ambulance Service will also advise and coordinate any necessary medical response. Possible outcomes include evacuation of the patient where an ambulance officer will travel to the location by sea or air. The vessel may be required to travel to a location to meet with an officer from the Queensland Ambulance Service. Alternatively the Queensland Ambulance Service may decide to take no further action.

On first contact, the Queensland Ambulance Service will request information concerning the patient. This will include the patient's name, age and address. Other information might concern details of the patient's immediate condition including vital signs, extent of injury and any previous medical history. The exact location of the ship must be advised, and a reliable means of communication must be kept open with the Queensland Ambulance Service.

If there is a trained medical person on board, or in the vicinity and is able to help, the Queensland Ambulance Service must still be contacted and advised of the situation and made aware of the availability of a medical person. However, the Queensland Ambulance Service remains in control and it is their responsibility to coordinate an appropriate response.

The name and contact details of the Queensland Ambulance Service officer should be recorded in the ship's log with a description of the events leading to the emergency. A record of all communications sent and received should also be kept.

If the ship has a regular doctor whom they contact on the mainland, then the doctor can be advised of the situation and given regular updates of the injured person(s) condition. (Always remember that while the Queensland Ambulance Service is coordinating the treatment of the injured, they are the authority.)

3.21 Missing person/overdue tender or dory

In the event of a missing person or overdue tender or dory use the emergency radio channel, or call 000 on your Satphone.

The following advice is for the master and crew of a fishing ship; and it is not intended as a detailed instruction but a guide to the response in the event that a ship or person is overdue or missing at sea. The search and rescue system is activated when information is received by police or AUSSAR that a ship is overdue or a person is missing at sea. A search and rescue response is then commenced.

Tips:

- Before daily departure to fishing locations the master should request the planned time of return to the primary ship from all dory operators. Any dory not back at this arranged time is overdue and the master should begin a visual search or make a radio call to ascertain the safety status of the dory. For example, if a dory departs the primary ship at 0630 hours. Master ascertains that the dory intends returning at 1100 hours. The dory does not return; the master does a visual search or makes a radio call to ascertain the safety status of the overdue dory. If the dory is not located or cannot be contacted, the master should contact the police or AUSSAR.
- When the dory has failed to return, an immediate search should be conducted within the vicinity of the primary ship. However no undue delay should be caused by this action in notifying police that the dory is overdue. At this time, a qualified police Marine Search and Rescue Mission Coordinator will assume the coordination responsibility for the incident. Such response starts by gathering all pertinent information regarding the description of the overdue dory and its crew.
- A search area is defined and search units (ships or aircraft) are activated. Should the overdue dory return, then the response is stood down. It may be better to get early advice and commence a response and stand down on the return of the dory, than receive delayed information regarding the overdue dory or missing person, thereby creating a much larger search area. A night time search is not as effective as a day light search.

Coordination of marine search and rescue incidents in a coastal environment is the responsibility of the police. The Queensland Police Service liaises closely with the Maritime Rescue Coordination Centre in Canberra on protracted search incidents.

The Queensland Police Service has qualified Search and Rescue Mission Coordinators (SARMCs) in numerous areas along the coast. These officers are responsible for coordinating all search and rescue incidents within their area of control.

The exception to this is when an Emergency Position Indicating Radio Beacon (EPIRB) is activated. The Maritime Rescue Coordination Centre in Canberra coordinates the response to distress beacon activations and the relevant search and rescue authority is also advised.

In the case of incidents occurring in the reef and coastal waters, then the responsible authority is the police. The police SARMC then coordinate a rescue response. A large number of search and rescue units are available to the Queensland Police Service, such as aircraft, police ships, volunteer marine rescue units, commercial fishing ships, charter operators and private pleasure craft. All resources

requested to assist in marine search and rescue incidents operate under the control and direction of the police SARMC.

Whenever a ship or person is overdue or missing at sea, it is the responsibility of the person who is aware of the circumstances, to inform the local police as a matter of urgency. The earlier the advice is received, the better the chance of a favourable resolution to the situation. A poor practice is when people who are aware of an overdue situation, appear to wait and hope that the ship and crew will return of their own accord before notifying police. It cannot be stressed strongly enough that this is an unwise practice. If you do not know for sure that the overdue crew are safe and well in their ship, it is quite possible that their lives are in danger.

Section 4: Operational manual

4.1 Ship operations

The objective of this section is to ensure that vessels are operated in a manner that considers the safety of persons on board, or not on board, as well as the environment.

Where a vessel is undertaking an activity or operation that is different from that normally undertaken by the vessel, or is operating under a special permit, or where the risk has changed for whatever reason, then all operation practices and emergency procedures shall be reviewed and changed accordingly to take into account the changed risk.

A vessel must be operated to avoid unnecessary risk and to minimise risks that cannot be avoided.

Systems on board the vessel that are essential for safety must be monitored and maintained to ensure their effectiveness and continued operational status.

Records of events and information relevant to safety must be kept by those that operate the vessel and reported to those responsible for the safety management of the vessel.

4.2 Logbooks

A logbook shall be kept for each vessel. The following information, as appropriate to the vessel and its operations, shall be entered into the logbook on a regular basis:

- activities of the vessel
- position of the vessel or operating area for ships that move around within a defined area
- navigation track (course and speed) if on a through journey
- weather experienced
- illness or injury of persons on board
- initial safety training, emergency preparedness training and any other safety training undertaken
- details of any marine incident or any other accident/incident involving the vessel or its equipment
- details of any assistance rendered to another vessel
- details of any unusual occurrence or incident
- details of all communications messages in relation to an emergency.

This book is sometimes referred to as the ship's log or record book. The vessel's logbook can take many forms and the National Standard for Commercial Vessels deliberately does not specify a required format. The vessel's logbook may be kept on board, or where it is not practicable to maintain a book on board, on shore. Electronic recording is permissible where there is a back-up arrangement to prevent the loss of records.

Engine room log — a record of engineering items essential to the safe operation of the vessel should be recorded in the vessel's logbook or in a separate engineering record book.

The following information, as appropriate to the vessel and its operations, should be recorded:

- fuel and liquid levels in tanks
- operating hours of machinery
- operating temperatures of machinery
- maintenance and services carried out and usage of replacement parts
- bilge levels
- known defects.

Engineering records entered in the vessel's logbook or engineering record book should be dated, accurate, legible and made as soon as possible after an occurrence. The entries should be signed by the person making the entry and countersigned by the master.

The engineering record book can take many forms and there is no specified format required. It may be kept on board or shore provided it is readily available on request. Electronic recording is permissible where there is a back-up arrangement to prevent the loss of records.

The vessel's logbook and engineering record book where used shall be kept for a minimum period of five years.

A person shall not:

- wilfully destroy or mutilate a logbook
- wilfully render illegible an entry in a logbook/record book
- wilfully make a false or fraudulent entry in, or an omission from, the logbook/record book
- deliberately withhold a logbook/record book from inspection.

See following examples of ship's log for the situations of:

- injury and collisions
- engine failure
- recreational use of vessel
- whale watching.

Example Ships Log - Injury & collision

DATE	S, **M**, T, W, T, F, S 20/03/2010	MASTER	(signature)
CREW (Duties)	Crew Induction/Training ( )	1 Master	(master 4, senior first aid & CPR)
2 crew 1	(RMDL & first aid)	3 Hospitality staff 1	(first aid)
4		5	
6		Minimum crew requirement for area of operation ...2.....	
DRILLS	Assembly(X), POB X), Fire(X), Collision(X), Abandon(X), Injury(X), Weather(X), Other..... ( )		
PRE-DEPARTURE / DAILY CHECKS	Pre-start (X), Safety Equip (X), Anchoring Equip (X), Safety Briefing (X), Propulsion (X), Steering (X), Trawl Equip ( ), Nav Equip (X), Nav / Trawl Lights (X), Comm / Alarm Systems (X), GPS Equip (X), GPS Position (Lat 25°. 07' S, Long 152°.12' E), Passenger No. (8) Radios - Contact Channels Ch 73 VMR, Ch 16 Distress (X), Harbour Control - Contact ; Mobile phone.....( )		
RUNNING LOG	Ship Name; Skipjack, Ship Rego No. 1246QD, Length 7.98 metres		

Time / Watch-keeper	Port or Location, Type of Activity, Ship Use Recreation,Commercial	Details (Activities of the vessel / Position of the vessel / Navigation track Weather experienced / Illness or injury of persons on board / Safety training undertaken / Recording of marine incidents / Assistance to other vessels / Unusual occurrences / Records of communications in relatio to an emergency / Arrival – Departure / Refuelling – Bunkering / Bilge Levels / Radio Communications / Description of Activities and Incidents / Other Comments)/ Passenger Numbers
	Tin Can Bay	Log the trip plan with the Coast Guard; the plan is to motor north to Kauri Creek,
	Commercial, day	set crab pots and fish the flats, returing to Tin Can at 1630 hours. 11 persons on
	Fishing Tour	board, check weather conditions, winds NE,10-15 knots, seas slight, clear skies
730	Depart Tin Can	Navigation by the channel markers as the tide is low and starting to rise.
752	Off Carlo Creek	A home ward bound houseboat failed to give way and avoiding action was taken to
		prevent a collision, the avoiding action caused a passenger to bruise their shin.
803		A passenger was injured by a fish hook while making up a fishing rig, the wound
		was dressed and appears ok, will keep an eye on it.
850	Off Kauri Creek	Getting crab pots ready when crew person 1 cut hand while baiting pots, applied
		dressing and glove, appears ok.
915	Kauri Creek	Set the crab pots and started fishing on the flats and in the creek.
		Every one to apply sun protection cream, hats and clothing
1200		Oil in fry pan caught fire, turned off gas and smothered fire with fire blanket, no
		injuries. Burn fish for lunch.
1400		collected crab pots and motored to inskip point to fish the gutters.
1505	Inskip point	A passenger fell over board while trying to net a fish, threw the life buoy to POB
		and retrieved them with the life line attached to the life buoy
1535	Pelican Bay	Assisted a small boat that had run out of fuel, 2 persons returned to Tin Can safely.
1600	Home ward bound	while manouvering through some floating debris, a small rope wrapped around the
		port propeller and stalled the motor, had to go over the side and cut it free, no
		damage, but delayed our return.
1620		Called the tin can bay coast guard and advised that our ETA was now 1730 hrs
1730	Tin Can Bay	Along side berth, logged off with coast guard, disimbarked passengers, shut
		down engines, checked berthing lines and springs, secured ship.

ENGINE RUNNING LOG

Time	RPM	Water Temp	Engine Oil Level &	Engine Oil Press	Gearbox Oil Level & Temp	Gearbox Oil Press	Pyro-meters	Battery Volts	Aux Battery Volts	Radio Battery Volts
715	p 900	normal	full/180	440	add .5 lt	320		25.7		12.8
	s 900	normal	full/180	445	full	320				
830	p 2,100	ok	full/200	467	full	358		25.9		13.2
	s 2,100	ok	full/200	470	full	357				
1630	p 2,100	ok	full/200	465	full	358		25.9		13.2
	s 2,100	ok	full/200	468	full	357				

FUEL	Initial Load 300	Start Level 450	ENGINE HOURS				
	Bunkered 150	End Level 300	Port Start	6,457	Generator 1 Start	2,751	
	Total Load 450	Litres Used 150	Port Finish	6,462	Generator 1 Finish	2,761	
NAUTICAL MILES TRAVELLE	45		Starboard Start	4,893	Generator 2 Start		
HOURS TRAVELLED	5 hrs		Starboard Finish	4,898	Generator 2 Finish		

WASTE DISPOSAL	Sewage / Sullage (X), Oil (O), Garbage (X), Other (X)...Rubbish.....
MAINTENANCE / DEFECT LIST	

Item 1	Port Prop	**Defect:**	Check bearing	**Rectified (Time/Date):**	0800, 21/03	**Parts serviced/replaced:**	Serviced
Item 2		**Defect:**		**Rectified (Time/Date):**		**Parts serviced/replaced:**	
Item 3		**Defect:**		**Rectified (Time/Date):**		**Parts serviced/replaced:**	

INCIDENT	Marine ( ), Medical (2), Pollution (X), Other Event (X)...POB...no injuries.....

Example Ships Log - Engine Failure

DATE	S, M, **T**, **W**, T, F, S 31 /03/2010	MASTER	(signature)

CREW (Duties)	Crew Induction/Training ( )	1 Master; Tom Black (Master 4)
2 Crew 1; Bill Smith (Coxswain)		3 Crew 2; Mick Street (Proficient hand)
4 Crew 3; Chas Luo, (Deck hand)		5, Hospitality staff (1)
6		Minimum crew requirement for area of operation ……4……
DRILLS	Assembly(X), POB(X), Fire(X), Collision(X), Abandon(X), Injury(X), Weather(X),Other Life Raft…. (X)	

PRE-DEPARTURE / DAILY CHECKS	Pre-start (X), Safety Equip (X), Anchoring Equip (X), Safety Briefing (X), Propulsion (X), Steering (X), Trawl Equip ( ), Nav Equip (X), Nav / Trawl Lights (X), Comm / Alarm Systems (X), GPS Equip (X), GPS Position (Lat25°.17' S, Long 152°.58 ' E), Passenger No. (56) Radios - Contact Channels VMR ch 67…. ( ), Harbour Control - Contact Satphone ……..…..( )

RUNNING LOG	Ship, Phillanderer, Rego No, 2083QC, Length >8 Metres.

Time / Watch-keeper	**Port or Location, Type of Activity, Ship Use** Recreation,Commercial	**Details (Activities of the vessel / Position of the vessel / Navigation track Weather experienced / Illness or injury of persons on board / Safety training undertaken / Recording of marine incidents / Assistance to other vessels / Unusual occurrences / Records of communications in relatio to an emergency / Arrival – Departure / Refuelling – Bunkering / Bilge Levels / Radio Communications / Description of Activities and Incidents / Other Comments)/ Passenger Numbers**
Bill Smith	.5 N.Mile East of	Relieved Master from watchkeeping duties, heading 315 degrees magnetic
1430 hrs	Woody Island	Speed 18 knots, Wind, N, 15 knots, seas 1.2 metres, tide ebbing, visibility good
	Commercial Day	Depth of water 10 metres, Radar on, Sounder on, Auto pilot on, Lookout, Chas
1530 hrs	tour to Fraser Is	Port engine shut down, oil filter housing cracked, oil every where in engine room
1538 hrs		Radio charter base and advised of engine breakdown, underway on one engine at
Master		8 knots, advise coach drivers and families that ETA now 1630 hrs
relieves		Crew 2 cleaning up in engine room, deactivate bilge pumps, mop up oil with
Bill Smith		asorbant material, dispose of in 20 lt drum, place container under filter, lock off
		propeller shaft, close sea water inlet and fuel tank valve
1625 hrs		Approaching harbour, radio alert to all craft, ship very difficult to manouver on one
		engine, may require assistance to get alongside the berth.
		Check operation of starboard engine and gear change control unit.
1635 hrs		Along side berth, passengers disimbark, shut down Starboard engine
		Check that no oil is escaping from the ship
1700 hrs		Engineer on board

ENGINE RUNNING LOG

Time	**RPM**	**Water Temp**	**Engine Oil Level & Temp**	**Engine Oil Press**	**Gearbox Oil Level & Temp**	**Gearbox Oil Press**	**Pyro-meters**	**Battery Volts**	**Aux Battery Volts**	**Radio Battery Volts**
1400	p nil		full		full			25.7	13.9	13.4
	s nil		full		full			25.8		
1530	p ok									
	s stopped									
	p									
	s									

FUEL	Initial Load 1,000 lt	Start Level 3,500	ENGINE HOURS			
	Bunkered 2,500 lt	End Level 2,000	Port Start	9,867	Generator 1 Start	8,456
	Total Load 3,500 lt	Litres Used 500	Port Finish	9,878.5	Generator 1 Finish	8,460.5
NAUTICAL MILES TRAVELLED	54		Starboard Start	12,465	Generator 2 Start	
HOURS TRAVELLED	4.5		Starboard Finish	12,467.5	Generator 2 Finish	

WASTE DISPOSAL	Sewage / Sullage (X), Oil (X), Garbage (X), Other ( ) Oily waste in container……

MAINTENANCE / DEFECT LIST

Item 1	Stb Engine	**Defect:**	Lost lube oil	**Rectified (Time/Date):**		**Parts serviced/replaced:**	Replace
Item 2		**Defect:**		**Rectified (Time/Date):**		**Parts serviced/replaced:**	
Item 3		**Defect:**		**Rectified (Time/Date):**		**Parts serviced/replaced:**	

INCIDENT	Marine (X), Medical ( ), Pollution (X), Other Event ( )…Manouvering difficulties……

Example Ships Log - Recreational use of vessel

DATE	S, M, T, W, T, F, S 03 /04/2010	MASTER	(signature)

CREW (Duties)	Crew Induction/Training ( )	1 Master, Jack Rabbit
2, Crew 1;	Cecil Pennyfathing	3, Crew 2 Richard Krammer
4, Crew 3;	Mary Weather	5
6		Minimum crew requirement for area of operation ……3……
DRILLS	Assembly(X), POB(X), Fire(X), Collision(X), Abandon(X), Injury(X), Weather(X),Other Life Raft.... (X)	

PRE-DEPARTURE / DAILY CHECKS	Pre-start (X), Safety Equip (X), Anchoring Equip (X), Safety Briefing (X), Propulsion (X), Steering (X), Trawl Equip ( ), Nav Equip (X), Nav / Trawl Lights (X), Comm / Alarm Systems (X), GPS Equip (X), GPS Position (Lat°.' S, Long °. ' E), Persons on board (28) Radios - Contact Channels Distress ch 16, VMR ch 67, Harbour Control - Contact Channels……..( )

RUNNING LOG	Ship name Pure Pleasure, Rego No 9876QC, LOA 18 metres	
Time / Watch-keeper	Port or Location, Type of Activity, Ship Use Recreation,Commercial	Details (Activities of the vessel / Position of the vessel / Navigation track Weather experienced / Illness or injury of persons on board / Safety training undertaken / Recording of marine incidents / Assistance to other vessels / Unusual occurrences / Records of communications in relatio to an emergency / Arrival – Departure / Refuelling – Bunkering / Bilge Levels / Radio Communications / Description of Activities and Incidents / Other Comments)/ Passenger Numbers
		Recreational use of a commercial ship
1500	Port Lincon	Pure Pleasure will be used for a recreational family outing from 0730hrs to
Jack		approximately 1600 hrs on Wednesday 04/04/2010.
		The master of the ship will Jack Rabbit, the intended outing will commence at
		Blue Berry Point and cruise to Nowhere in Particular Bay, with 25 persons
		plus 3 hospitality hostesses onboard
1700		
04/04/2010	Port Lincon	Recreational cruise went with out incident, except for some mild sun burn, and
		returned to Port Lincon at 1605 hrs. the ship is locked and secure alongside her
		berth at Happy Point marina

ENGINE RUNNING LOG

Time	RPM	Water Temp	Engine Oil Level & Temp	Engine Oil Press	Gearbox Oil Level & Temp	Gearbox Oil Press	Pyro-meters	Battery Volts	Aux Battery Volts	Radio Battery Volts
	p									
	s									
	p									
	s									
	p									
	s									

FUEL	Initial Load	Start Level	ENGINE HOURS	
	Bunkered	End Level	Port Start	Generator 1 Start
	Total Load	Litres Used	Port Finish	Generator 1 Finish
NAUTICAL MILES TRAVELLED			Starboard Start	Generator 2 Start
HOURS TRAVELLED			Starboard Finish	Generator 2 Finish

WASTE DISPOSAL	Sewage / Sullage ( ), Oil ( ), Garbage ( ), Other ( )……

MAINTENANCE / DEFECT LIST			
Item 1	Defect:	Rectified (Time/Date):	Parts serviced/replaced:
Item 2	Defect:	Rectified (Time/Date):	Parts serviced/replaced:
Item 3	Defect:	Rectified (Time/Date):	Parts serviced/replaced:

INCIDENT	Marine ( ), Medical ( ), Pollution ( ), Other Event ( )……

Example Ships Log - Whale watching

DATE	S, M, **T**, W, T, F, S 12/04/2010	MASTER	(signature)

CREW (Duties)	Crew Induction/Training ( )	1 Master; Senior First Aid & CPR
2 Crew 1;	RMDL	3 Hospitality Staff 1; First Aid
4		5
6		Minimum crew requirement for area of operation ...2.....
DRILLS	Assembly(X), POB(X), Fire( ), Collision( ), Abandon(X), Injury(X), Weather( ),Other..... ( )	

PRE-		Pre-start
Propulsion		
GPS		
Radios -		

RUNNING LOG	Ship's Name; M V Encounterer, Rego No. 1234QC	
Time / Watch-keeper	**Port or Location, Type of Activity, Ship Use** Recreation, Commercial	**Details (Activities of the vessel / Position of the**
755	River Heads	Whale watching in Platypus Bay; 8 passeners & 3 crew = 11 persons
		Passengers on board; Safety briefing, life jacket demo, abandon ship, muster stn.
800		Log on at VMR466; 'departing River heads for Platypus bay with 11 persons on
		board, confirm weather forecast, wind NE 5-10 knots, sky clear, tide Urangan 3.4 m
		at 1254. will pick up 2 passengers at Mackenzies, ETA Platypus Bay, 1030.'
830	Mackenzies	Pick up 2 passengers at mackenzies, depart for Platypus Bay Via Moon Point.
930	Moon Point	Seas calm, sky clear, .5 metre northly swell, light breeze.
1030	Platypus Bay	Sighted two pods of whales, one to port and one to starboard, pssengers excited
1200		Served lunch for passengers, wind N at 10-15 knots, some cloud to the south.
1430	Platypus Bay	Departing for River Heads, lookout reports a small boat out to Port, appears to be in
		trouble, will investigate, runabout is out of fuel, no radio, will take 2 people on board
		and tow the boat back to River Heads, the 2 people are suffering from too much sun
		they are being treated with cool packs, cool drinks skin cream.
1630	Mackenzies	Drop off 2 passengers at Mackenzies.
1635		Called VMR and requested an Ambulance to meet us at River Heads as the two
		sun burnt people appeared to be suffering from sun stroke or shock, our ETA at
		River Heads is 1700, we will berth at the western end of the inside jetty
1700	River Heads	Requested all passengers remained seated until after the ship was berthed,
		The Ambulance took charge of the 2 sun burnt people and our passengers
		disembarked safely.
1710		Shut down main engines and checked the fuel and water tanks, filled the water
		tanks and arranged for 300 liters of diesel fuel to be delivered early tomorrow.
1800		Shut down the gen set and connected the shore power cable.
		Checked the berthing lines, springs and fenders. Secured the ship.

ENGINE

Time	RPM	Water Temp	Engine Oil Level & Temp	Engine Oil Press	Gearbox Oil Level & Temp	Gearbox Oil Press	Pyro-meters	Battery Volts	Aux Battery Volts	Radio Battery Volts
800	p 950	normal	add .5 lt	440	full/ok	350		12.2	13.6	13.1
	s 950	Normal	full/ok	440	add.75lt	350		12.3		
1130	p 1800	OK +	full/ok +	460	full/ok	370		14.3	13.6	13.5
	s 1800	OK	full/ok	456	full/ok	374		14.2		
1635	p 1800	OK +	full/ok +	460	full/ok	370		14.3	13.6	13.3
	s 1800	OK	full/ok	456	full/ok	374		14.2		

FUEL	Initial Load 500	Start Level 800	ENGINE HOURS			
	Bunkered	End Level 500	Port Start	9,783	Generator 1 Start	10,465
	Total Load	Litres Used 300	Port Finish	9,790	Generator 1 Finish	10,476
NAUTICAL MILES TRAVELLED			Starboard Start	8,427	Generator 2 Start	
HOURS TRAVELLED			Starboard Finish	8,434	Generator 2 Finish	

WASTE DISPOSAL	Sewage / Sullage (X), Oil ( ), Garbage (X), Other (X)... Rubbish.....
MAINTENANCE / DEFECT LIST	

Item 1	Port Eng	**Defect:**	Clean s/w strainer	**Rectified (Time/Date):**	2000, 12/04	**Parts serviced/replaced:**	Serviced
Item 2		**Defect:**		**Rectified (Time/Date):**		**Parts serviced/replaced:**	
Item 3		**Defect:**		**Rectified (Time/Date):**		**Parts serviced/replaced:**	

INCIDENT	Marine (O), Medical (2), Pollution (O), Other Event (X)... Rescued 2 persons & runabout.....

4.3 Operating procedures

Class 1A and 2A vessels have the option of complying with Marine Orders 21, 28, 30 and 61 in order to comply with the operational procedure requirements.

The following is a list of operations that require regular monitoring and training of crew. Operating procedures should be developed for all operations performed on the ship. The following are examples of such operations but the owner/master must conduct a risk analysis to identify other procedures that should be created due to the nature of the work on that ship.

- sailing and pre-departure checks
- weather condition assessment to include the voyage suitability considering the vessel's capability and forecast conditions for the intended duration of the voyage
- testing equipment
- test the operation of all electronic aids to navigation
- passenger briefing
- recording details of passengers and crew
- communication
- safety of navigation
- watchkeeping
- watchkeeping while underway
- anchoring
- safety procedures while at anchor
- anchor winch operation procedure
- transfer of cargo while at anchor
- transfer of people to and from vessel
- mooring
- operating in restricted visibility
- carriage of loads and load limitations
- disposal of sewage
- disposal of waste oil
- disposal of garbage
- minimising noise pollution
- minimising damage to environment through anchoring
- confined space entry procedures
- managing watertight integrity
- dangerous goods and hazardous materials
- operating lifting devices
- cargo operations
- recreational use of commercial ships
- operation of the ship's tenders and dories
- laying and retrieving of fishing apparatus

- trawler stability
- trawl net hook ups and emergency procedures.
- towing
- participating in search and rescue activities
- safety gear packs
- use of an EPIRB
- hints for safety at sea.
- specific operational requirements.

Machinery

- maintenance of machinery and operating procedures
- operation of low voltage electrical equipment and shore-power supply
    - 240/415 volt electrics (low voltage system)
    - 12/24 volt electrics (extra low voltage system)
    - 240/415 volt AC shore power
- refuelling
- procedures in the event of fuel spillage
- pumping of bilges
- engine room checks
- hydraulic equipment
- cargo refrigeration
- start up/shut down of main and auxiliary machinery
- running of main and auxiliary machinery
- LP gas installation
- bilge and ballast pumping
- fire main operation
- fixed fire detection and smothering
- batteries
- deck machinery
- steering gear and emergency steering checks.

Recreational use of commercial ships

A ship with commercial or fishing registration can be legitimately used, temporarily, for private recreational purposes by the ship's owner or a nominated person.

However, all details of this recreational use must be recorded in the ship's documents, including:

- starting date and time for recreational use, recorded before the use starts
- finishing date and time for recreational use — recorded after use
- the nominated person who will be operating the ship.

While in use for recreational purposes, the ship is to comply with all rules and regulations pertaining to a recreational ship.

4.4 Sailing and pre-departure checks

This procedure should ensure that the vessel and crew are fit to encounter the conditions of the proposed voyage.

The master must ensure the ship has been subjected to a complete operational check of all machinery and radio equipment before first departure each day. Confirmation of this check must be noted in the ship's logbook (operational checks☑, radio checks ☑ at top of each page in diary).

The master is responsible for deciding if prevailing and forecast environmental conditions are safe for the voyage. Before the voyage the master must:

- ensure the vessel has sufficient stores, fuel, water and equipment for the voyage. Reserves should take account of the operational area, weather and the proposed task to be undertaken
- ensure all members of the crew are familiar with the location of life saving appliances and competent in their use
- ensure that the requirements of stability and trim have been met in accordance with the vessel's stability information
- ensure that all watertight openings required to be secured during a voyage are closed and remain secured throughout the voyage
- have a voyage plan and ensure that a responsible person has been made aware of the vessel's departure and proposed operation and has clear instructions on actions to be taken should they not hear from the vessel by the appointed time
- ensure the vessel's machinery, plant and safety equipment is in working condition and is safe to operate
- ensure that all bilge spaces are clean and dry and bilge pumps are in operating condition
- ensure the lodgement of crew and passenger manifests as applicable
- ensure that all fire fighting, safety, navigation, communication, steering, emergency steering and anchoring equipment are in good working condition
- ensure the ship is clear forward and aft before letting go.

Full water tanks are recommended when proceeding to sea, outside port limits or for an extended period.

The master must maintain a record of crew details, including name, address, phone number, next of kin and medical conditions, before the voyage.

Testing equipment — the master should ensure that the following equipment is in good order prior to departure. The master must test and record the following:

- radio communications equipment, including the compulsory speaker on the aft deck of a fishing ship
- navigation equipment including aids, lights and shapes and sound signal equipment
- ensure that all electrical residual devices are in working order and tested as per manufactures specifications
- steering gear and emergency steering gear
- main engines, auxiliary machinery and their controls and remote alarms
- remote bilge pumps and alarms
- fire pumps.

4.5 Passenger briefing

The master should nominate a member of the crew to brief passengers prior to departure. This briefing must contain clear instructions to be followed in the event of an emergency and the information should be either provided in a language understood by the majority of people onboard or presented in such a way to be understandable to people with other languages. It should include:

- information for passengers in the event of an emergency
- information on the location and function of life saving appliances
- instruction on how to don life jackets and location of life jackets
- information on location of muster stations
- information on emergency alarms and procedures
- restrictions to any part of the vessel while underway
- restrictions to any part of the ship after dark
- information on vessel's speaker system
- identification of smoking and non-smoking areas
- instructions for use of the toilet and shower systems
- abandonment procedures.

For short-haul commuter services, alternative methods for presenting minimum safety information may include literature, signage, or a taped message on the public address system.

4.6 Passenger manifest

A passenger manifest shall be maintained on all passenger-carrying vessels on voyages of more than 12 hours duration. For all other passenger-carrying vessels a head count of the passengers on board at any time shall be maintained (see section 8). The passenger manifest shall be retained on board and at a place on shore where it can be quickly assessed in an emergency. The passenger manifest should contain:

- the name of the vessel and identification number (as far as practicable)
- details of voyage
- names and addresses of persons on board
- information on special requirements for passengers (medical conditions or diet for example).

4.7 Maintaining a radio watch

A radio watch shall be maintained at all times while the vessel is at sea except as provided otherwise in this section.

VHF frequency assignment and use table:

Frequency (MHz)	Channel number	Purpose
156.800	16	Distress, urgency, safety and calling only
156.525 (A1)	70	Digital selective calling for distress, urgency, safety and calling only

Key: (A1) — a watch on this frequency is only required where digital selective calling is fitted to the radiotelephone.

The watch on VHF radiotelephony equipment may be suspended under any one of the following circumstances:

- the equipment is being used on another frequency for the business or safe navigation of the vessel
- a watch is being maintained on another frequency prescribed by a local pilotage or port authority
- when conditions are such that, in the opinion of the master, maintaining the watch would interfere with the safe navigation or safe working of the vessel.

Where HF radiotelephone equipment is fitted to the vessel, and HF radio watch shall be maintained on the frequencies below.

HF frequency assignment and use table:

Frequency (kHz)	Purpose
4125.0	Distress, urgency, safety and calling only
6215.0	Distress, urgency, safety and calling only
8291.0	Distress, urgency, Safety and calling only

The watch should be maintained on the most appropriate frequency or frequencies having regard to prevailing radio conditions and the position of the vessel at the time.

The frequency 2182 kHz is not included in the table as a mandatory watch frequency because it is no longer recommended for distress and safety monitoring by IMO. It is no longer generally monitored by the National Coast Radio Network in Australia or by SOLAS vessels.

The watch on HF radiotelephony equipment may be suspended under the following circumstances

- while exchanging communications with other shore based or ship stations
- when conditions are such that in the opinion of the master such watch would interfere with the safe navigation or safe working of the vessel.

The vessels call sign is "……."

The use of this equipment can only be authorised by the master, or in his absence, the appointed crew person.

Phone communications are:

- CDMA ……..……
- Satellite phone number...……...…….……...…….
- Satellite fax number ……..
- Voice mail ..……

4.8 Watchkeeping

The master must ensure a navigation watch appropriate to the conditions is maintained by competent and sufficiently rested crew at all times while the vessel is underway, at anchor, or when engaged in the transfer of cargo or passengers.

A procedure should be developed to address the following:

- compliance with *International Regulations for the Prevention of Collisions at Sea 1972* (COLREGS)
- duties of watchkeeper

- master's instructions to the watchkeeper
- strategy to manage fatigue
- the position from where the watch is to be maintained
- communication arrangements.

Watchkeeping while underway:

- follow any instructions from the master
- follow the navigation plan
- maintain safe navigation using all available navigation aids to establish the vessel's position
- call the master at any time if in doubt
- maintain radio watch
- take immediate action to keep the vessel safe
- keep a record of events
- be aware of any special conditions such as watertight integrity that might affect the vessel's performance or progress
- be fully aware of any mechanical defects, which may affect the performance and capability of the ship
- when auto-pilot equipment is in use, a look-out shall be maintained with manual operation of the steering (emergency steering) available immediately should an emergent situation occur.

Before taking over a watch, watchkeepers must be aware of the following:

- the ship's position, speed and course
- the position and numbers of hazards or other vessels close to the ship's intended course and ensure suitable clearances have been given
- be fully aware of any special conditions affecting the ship's progress or operations, including the use of aids to navigation
- have knowledge of how to assess risk and the action to avoid collision (refer to rules 7 and 8 of the *International Regulations for the Prevention of Collisions at Sea, 1972*)
- be familiar with the ship's operational duties for crew persons (may be written in the operation manual or the daily log)
- ensure watchkeeping alarm (if fitted) is operational.

All deck watchkeepers operating a commercial ship must be assessed as competent and hold at least a valid recreational marine driver licence (RMDL) as described in the *Transport Operations (Marine Safety) Act 1994* and regulations. Watchkeepers must not be fatigued or under the influence of alcohol or drugs.

*Trawler operators — keeping navigation watch from the sorting tray is not be considered acceptable watch keeping practice.

The International Maritime Organization's (IMO), Standards of Training, Certification and Watchkeeping (STCW 95 Code) should be consulted when preparing watch keeping procedures.

4.9 Safety of navigation

The vessel should be navigated safely at all times. The master should ensure that:

- the vessel is provided with appropriate navigation equipment including charts, nautical publications and equipment deemed necessary for the safety of the vessel
- crew are trained in the use of navigation equipment

- all charts are kept up to date
- manufacturer recommendations for equipment are followed
- the voyage is planned to avoid known dangers
- the crew are familiar with the use and performance capability of the automatic pilot and regularly monitor it
- the crew can change efficiently from automatic pilot to manual.

Operating in restricted visibility

It is the master's responsibility to ensure that the vessel is navigated safely under conditions of limited visibility. The master must:

- comply with the COLREGS for operating in reduced visibility
- advise the crew of actions to be taken when operating in reduced visibility
- maintain a lookout at all times especially when on automatic pilot.

4.10 Route planning and position monitoring

Means must be provided to plan and display the vessel's route for the intended voyage and then to establish, monitor and plot the vessel's position throughout the voyage in relation to the planned route as well as to known and reported dangers to navigation.

4.11 Anchoring

The master is responsible for:

- ensuring anchoring systems on board are suitable for the intended voyage and category of service
- bringing the vessel to anchor in a suitable anchorage
- anchors are readily able to be deployed
- ensuring the vessel is clear of shipping lanes
- training the crew to safely anchor the vessel during daylight hours or after dark, in all states of current and weather conditions and to ensure there is adequate room to safely swing the vessel.

The master is responsible for maintaining a proper lookout at all times while at anchor. The watchkeeper must:

- identify any approaching ships and take any necessary action
- determine and record the ship's position in relation to other ships and hazards
- ensure the ship maintains its position (does not drag anchor)
- take all necessary action to ensure the safety of the ship
- ensure day shapes are displayed; and at night, anchor lights and upper deck lights are illuminated
- monitor alarms on sounder, GPS and radar if fitted
- consider fitting a satisfactory radar reflector to enhance the ship's radar echo signal.

Anchor winch procedure — the electric winch deploys the anchor chain at five metres per 15 seconds of operation.

While deploying or retrieving the anchor chain, there should be no direct contact between hand and chain or hand and winch gypsy. Use personal protective equipment — footwear, goggles, hat, gloves, and shirt sleeves rolled down buttoned at the cuff.

The anchor chain is to be secured mechanically to the vessel (shackled when underway, and when at anchor, use an anchor snub line between the bollards to the anchor chain with the load off the winch gypsy).

Damage to sensitive marine environment should be kept to a minimum when anchoring. The master should:

- avoid anchoring in sensitive areas
- comply with legislative requirements.

4.12 Mooring

The owner and/or master must develop a procedure to ensure that the vessel can be moored safely. The master is responsible for mooring the ship and to ensure that suitable mooring equipment is provided and properly stored.

Before leaving the ship the master must ensure:

- allowance is made for tide conditions and weather
- unauthorised entry is restricted
- legitimate access of other vessels to facilities and navigation channels is not restricted
- the ship is secured to prevent any movement which could cause damage to the ship, it's berth, any other ship, or property
- the ship is moored in the traditions of good seamanship
- all machinery and associated systems, including LP gas installations are isolated and/or secured to prevent accidents or pollution.

4.13 Transfer of people to or from the ship

A procedure should be developed to ensure that people are safely transferred to and from the vessel in different situations — during calm conditions at sea, while at anchor, or alongside a wharf or berth. The procedure should ensure that:

- appropriate equipment is provided
- gangways, ladders, brows, steps meet legislative requirements
- adequate lighting is provided for gangways and tenders
- the vessel is properly secured
- crew are trained to supervise the operation
- person overboard and life saving equipment is at hand.

4.14 Disposal of sewage

Sewage is defined as drainage and any other waste from any form of toilet or urinal. Nil discharge waters are specified in *Transport Operations (Marine Pollution) Regulation 2008* to cover all ships. More extensive nil discharge sewage management requirements apply to declared ships.

A declared ship under the regulation is:

- fitted with a toilet
- is registered as a class 1B, 1C, 1D, 1E or 1F ship under the *Transport Operations (Marine Safety) Regulation 2004*
- Declared ships must be fitted with a sewage holding device and owners and operators of declared ships must keep the following documents as part of their onboard sewage management practices:
- shipboard sewage management plan — under section 51 of the *Transport Operations (Marine Pollution) Act 1995*

- sewage disposal record book — under section 51 of the regulation.

Under section 56 (2) of the regulation, the treatment system documentation and system service manual for the treatment system must be kept on board the vessel. Details concerning documentation are provided in section 54 of the regulation.

A declared ship must have on board a shipboard sewage management plan (SSMP).

The minimum requirements for a shipboard sewage management plan include:

- name, registration number and class of the ship
- size and type of the ship
- how shipboard sewage is managed to prevent unlawful discharge from the ship
- waters, if any, where the ship may lawfully discharge sewage
- equipment the ship is fitted with for holding or treating sewage
- how the equipment is operated to prevent the unlawful discharge of sewage into waters where the ship is operating
- operating and maintenance instructions for the equipment
- the way the equipment is maintained and checked to ensure the equipment is in proper working order.

Sewage management plan checklist:

- passenger numbers
- length of journeys (time, distance, destinations, coordinates)
- how sewage is managed on board
- sewage management equipment (type, model)
- how equipment is operated to prevent unlawful discharge of sewage
- list/map of areas where the discharge of sewage from ship is permitted
- list/map of nil discharge areas to demonstrate clear understanding of these areas
- sewage disposal record book to record when sewage is discharged to an onshore facility (transaction receipts, if applicable should be kept)
- equipment operating and maintenance instructions
- maintenance schedules
- routine checking measures to ensure equipment is in proper working order.

A declared ship must carry a sewage disposal record book (SDRB) that is readily available for inspection at all times.

An entry must be made in the sewage disposal record book whenever sewage is discharged into a disposal facility. The entry must:

- state the date, time, place and volume in litres of each discharge
- written in the English language
- be signed by the master or other person in control of the discharge
- be signed by the master when a page of the sewage disposal record book is completed.

Copies of maps defining the vessel sourced sewage discharge restrictions are available on the website www.msq.qld.gov.au (refer to environment/ship-sourced sewage management).

4.15 Disposal of waste oil

The master must ensure that:

- the vessel has storage facility to contain all waste oil including fuel oil, lubricating oil, hydraulic oil and bilge water contaminated by oil
- waste oil is disposed of according to the *Transport Operations (Marine Pollution) Regulation 2008*
- the place, date and quantity of waste oil disposed of must be recorded.

4.16 Disposal of garbage

Disposal of garbage into coastal waters is prohibited. The master must ensure that garbage is taken ashore where it can be disposed of according to regulation.

For ships 12 metres in length or greater a placard about garbage disposal requirements must be displayed. The placard must:

- notify the ship's crew and passengers of the prohibitions and requirements under the *Transport Operations (Marine Pollution) Act 1995* for the disposal of garbage
- be written in English and if the ship is owned or operated by a foreign country, the working language of the ship's crew.

Ships greater than 35metres in length or designed to sleep more than 15 people need to have a shipboard waste management plan. These vessels need to have the equipment required to implement the plan.

4.17 Minimising noise pollution

The master must ensure that:

- the level of noise from the vessel complies with legislative requirements.
- the level of noise does not impact on the ability of crew to maintain an efficient watch
- use strategies to minimise noise on the vessel.

4.18 Confined space entry procedures

The master must ensure that risks to persons working in confined spaces are minimised. Ship operators have a safety obligation to identify onboard confined spaces and to develop procedures for entry into the confined space. See the Australian/New Zealand Standard *AS/NZS 2865 — Confined Space Entry* and Australian Standard *AS 1319 — Safety Signs for the Occupational Environment* or other recognised national or international standards detailing procedures for this matter).

4.19 Watertight integrity

Watertight integrity should be managed and maintained to minimise risk of uncontrolled flooding. The master must ensure that:

- doors and openings critical to the vessel's watertight integrity are closed before departure
- critical doors and openings are managed while vessel is underway.

4.20 Dangerous goods and hazardous material

Risks to crew, passengers, cargo and the vessel are to be minimised. The master must ensure that:

- dangerous goods and hazardous cargo are identified before loading
- dangerous goods and cargo are properly stored
- requirements under legislation are met
- requirements under AS3846-2005 are met
- requirements of the IMDG Code are met.

4.21 Operating lifting devices

The master and crew should ensure that lifting devices like cranes, booms, derricks, service elevators and gantries are operated safely.

The master should ensure:

- that persons handling lifting gear are appropriately licensed where required
- legislative requirements regards certification and testing of lifting gear are met
- manufacturers recommendations for operation and maintenance are met
- adequate checks are made prior to operation.

4.22 Cargo and load limitations

Cargo should be transferred to and from the vessel safely and secured safely before proceeding on a voyage. The master must ensure:

- manufacturer's recommendations are applied
- crew receive adequate training on loading and discharging equipment
- cargo is properly secured before departure
- crew are adequately trained to secure cargo.

A procedure should be developed to ensure cargo is safely loaded and unloaded from the vessel and transferred to and from the shore. The procedure should:

- ensure safe transfer of cargo to and from the vessel
- ensure that crew are aware of their safety obligations
- monitor the stability of the vessel
- comply with port and state requirements for the transfer of cargo and the IMDG Code.

The master must ensure the load carried by the ship is stowed properly and meets requirements specified in the ship's stability document. Before loading, the master must be aware of the following:

- conditions specified in the ship's stability book and designers certification
- stowage position of the load considering the ship's stability
- the recommended method of securing the load
- *International Maritime Dangerous Goods (IMDG) Code*.

4.23 Operation of the ship's tenders and dories

The operation and licence requirements of the commercial tenders of the ship are as follows:

- a person without a licence is to be inducted into the operation of the tender prior to commencing, when the tender is only to be operated within 1000 metres of the main ship
- the tender is to be operated under the direct supervision and in sight of the master
- the master must have a way of immediately helping the person if the need arises (refer *Transport Operations Marine Safety Regulation 2004* section 84 (2) (d))
- a person who holds a recreational marine driver licence or equivalent may operate the tender of a commercial ship provided it is less than six metres in length.

Tenders and dories must not be launched and retrieved without the master’s permission. The master must ensure that:

- the tender is properly maintained and stored
- should the tender get into difficulties a rescue plan is in place

- the person charged with the operation of the tender or dory has an appropriate licence (for a fishing ship, a valid recreational marine driver licence is acceptable)
- the required safety equipment is provided and stowed correctly (especially drinking water)
- the tender should at all times remain within two nautical miles of the ship
- that a radio and EPIRB are carried if needed in the area of operation
- a radio and EPIRB are required if operating out of the sight of the main ship
- prevailing weather conditions at the time of launching and the forecast weather conditions at the estimated time of tender retrieval is suitable for operating the tender
- cargo carried, including fish pens and live fish tank wells, and the effect it will have on stability
- the operator is advised and aware of the main ship's movements
- that the operator is aware of the engine manufacturers recommended operating instructions
- the operator is competent in emergency procedures
- commercial fishing dories are to operate to within five nautical miles (refer Queensland Fisheries Service guidelines) of the main ship, or as otherwise specified in the vessel operating document.

In the event of the dory/tender becoming disabled or lost, immediately stop the vessel, drop the anchor and use the radio to call for assistance. Should the situation worsen, use the distress equipment on board.

4.24 Laying and retrieving fishing apparatus

The master must consider the following before the commencement of laying and retrieving fishing apparatus:

- the crew involved are fully aware/trained of the safe working practices
- equipment is in good condition
- to minimise the risk of injuring crew and fouling equipment by gear on deck, propellers and stern gear, the crew must keep the helmsman fully informed of the position of the fishing apparatus in the water to assist with manoeuvring the ship
- crew must have a system in place for these operations.

4.25 Stability

The master must monitor stability limits during the voyage to ensure they are not exceeded.

Where vessels are required to carry stability information, this information should be provided in the form of a stability book. The stability book must be in a suitable form for ready use by the operator and other persons controlling the intact stability of the vessel. The stability book shall be a paper copy with a durable cover and the information contained must be relevant to the vessel’s operations.

Trawler stability — stability considerations must be addressed with fishing vessels engaged in otter trawling. Trawler roll-over is a potential hazard for which solutions must be found and documented. Crews must be properly trained to avoid this happening. In the event of a severe hook-up a trawler can roll over fast, often with fatal consequences.

The length of trawl, depth of trawl, span of trawl booms, configuration of trawl nets (double, triple or quad), vessel speed, weather conditions, height of swell and type of bottom being trawled must all be taken into consideration if this operation is to be carried out safely.

The configuration of trawl nets can be critical to stability in the event of a hook-up. All hook-ups, or fouling of nets with obstacles on the sea-bed are potentially dangerous. Safe work-practices should be used at all times and the use of quad-gear should be carefully evaluated. Should a hook-up occur while trawling, the person on the helm and crew must respond immediately.

Wires from side mounted trawl winches often can not be released as quickly as gear using centrally mounted winches, (where tractor or truck gear boxes and heavy duty differentials are commonly used and, in emergency situations, can rapidly be put into neutral). Regardless of the type of winch used, any hook up, and especially one experienced in adverse conditions, has the potential to capsize a vessel.

Methods of rapidly releasing the load from fouled nets must be explored. A weak link inserted in trawl wires may provide one solution. All options must be considered when a vessel is trawling and solutions documented in the Safety Management System. Crews must be trained to act in an emergency situation.

4.26 Towing

The master must have procedures in place and must consider the following before towing another ship:

- ships at sea are only obligated to attempt to save life. Property rescue should only be considered when, in the master's opinion, there is no perceived risk to the crew and ship
- the vessel should be capable of towing or being towed by a vessel of similar size
- the tow should be made fast to the towing ship forward of the rudders and propellers so the ship will retain steerage. If this is not practical, a bridle using a running block can be arranged to move the effective towing point forward and retain steerage, even though the tow is attached to the stern of the ship
- the towing load should be distributed evenly across cleats and bollards, or if a strong point is provided for that purpose the tow should be attached to it
- messenger lines or a dinghy can be used to carry the towline to the tow if it is difficult or dangerous to come in close to the tow
- a means of communicating between the two ships must be established (radio, voice, flags, hand signals)
- the master will make provision for the rapid slipping or cutting of the tow in an emergency situation
- ensure the appropriate day shapes and lights are displayed
- consider contacting insurance companies/owners.

4.27 Participating in search and rescue activities

Ships are obliged to assist each other in times of distress. Before undertaking any search and rescue mission, the master should ensure that the vessel is able to participate in search and rescue activities as detailed below.

A vessel at sea, on receiving a signal from any source that a vessel, aircraft or survival craft is in distress shall proceed immediately to the assistance of the persons in distress informing them, if possible, that the vessel is doing so.

If it is considered unreasonable or unnecessary to proceed to their assistance the reason for failing to proceed to the assistance of the persons in distress shall be entered into the vessel's logbook.

The obligation to assist under the provisions of this clause shall cease to exist when advice has been received from a reliable source that another vessel has reached such persons or that assistance is no longer necessary.

4.28 Safety gear packs

The master of a commercial fishing ship has a duty of care and should ensure that sufficient safety equipment is provided as required by regulation. Additionally, the master should ensure the safety equipment is in good condition, and is carried on board each dory or other ship while it is being operated. All persons operating ships at sea must carry the required safety gear for their particular area of operation. Such equipment is the minimum required and ship operators should enhance the

safety gear carried with additional equipment (for example — extra flares, food, water, first aid kit, lighting, lifejackets and so).

4.29 Use of an emergency position indicating radio beacon

Ship operators that carry an emergency position indicating radio beacon or EPIRB are reminded that this equipment is only activated for distress (mayday) type situations. An EPIRB should only be used when the ship is threatened by grave and imminent danger and requires immediate assistance. An EPIRB is not to be used to alert authorities of a ship's position, when the crew is safe and well, and is only delayed in returning due to being broken down, out of fuel, flat battery and so on. A radio should be carried and used for these situations. Should the circumstances change with time and the crew subsequently placed in grave and imminent danger, then the EPIRB should be activated without hesitation.

4.30 Hints for safety at sea

- Carry safety equipment as required by regulation. Example — radio, flares, EPIRB, lifejacket, mirror, V sheet, and so on at all times.
- View the dory safety video ‘Your Livelihood — Your Life’ available from Maritime Safety Queensland on request.
- Advise the main ship of your planned return time and contact the ship if you decide to stay away longer; remember if you are overdue, a search will be commenced.
- Take extra items that would be of assistance if you are unable to return to the main ship including water, fuel, food, extra clothing, torch, spare batteries and so on. Two other things that are recommended are cyalume sticks secured permanently onto the dory, with easy access when needed, as the glow can be seen for over a mile by search units and they are inexpensive. Also affix retro-reflective tape on the bow and sides of the dory, as it will greatly enhance your chance of detection by search aircraft and ships at night time.
- Fish within sight of a fishing buddy and keep an eye on each other.
- Listen to the daily broadcasts from coastal radio base stations as a ship may be missing in your area, as well as taking note of the latest weather forecast.

Should there be reason to have concern for the safety of a ship in reef or coastal waters, then information should be immediately relayed to the police directly or via a coastal radio station. Time plays an important part as night fall may be approaching and as time passes, the search area increases greatly and the survival chance of the missing person(s) is greatly diminished. Search aircraft are a common search platform and the people needing rescue should make themselves as visible as possible (for example — at night time flares, lights or cyalume sticks; and in day light, a V sheet, mirror, or high-visibility-coloured dinghy) As searching ships approach the area, keep a torch on or light another flare as this allows greater speed in the rescue operation and reduces the possibility of collision.

Never hesitate to contact police regarding an overdue or distress situation. Throughout Queensland, there are police personnel trained to take operational control of search and rescue incidents on a 24 hour basis in order to save lives. For additional information, contact your local Water Police station or Maritime Safety Queensland office.

4.31 Machinery

Machinery and plant should be maintained to provide safe and reliable operation when preparing for a voyage or while on a voyage. Machinery and plant should be subject to a maintenance schedule in accordance with manufacturer's requirements and to meet periodic survey requirements. At no time should machinery or plant cause a hazard to other vessels or the ship's crew.

The master, engineer or responsible person must visually inspect the machinery and observe correct starting procedures prior to operating any machinery.

Operating instructions and documented procedures in manufacturer's handbooks should be followed except in situations where a different procedure may have to be taken for reasons of safety.

4.32 Refuelling or bunkering

Refuelling is an operation that carries a high-risk potential for accidental oil spills and fire. Bunkering operations must be managed and treated with caution.

The following checklist should be used to ensure correct procedures are followed:

- the master, engineer or responsible person must oversee the operation
- communication between vessel and fuel supplier must be tested prior to bunkering and maintained throughout the operation
- emergency shut down procedure must be tested before bunkering commences
- the fuel type ordered must be checked against the type being supplied
- the ship must be moored securely and measures must be taken to prevent fuel lines getting caught between ship and wharf
- all hoses and equipment must be inspected before use
- all non-essential personnel must stay clear of the ship and bunkering area
- no smoking and warning signs must be displayed to create a safety area
- correct bunkering signals must be displayed (by day — B flag; by night — all round red light)
- mobile phones should not be used during refuelling operations
- non-essential machinery, electrical and LPG circuits should be shut down
- oil spill response equipment must be readily available
- fit fuel catch devices under the fuel vent pipes
- ensure filler-pipes having bunding or catchment equipment
- appropriate fire extinguishers must be at hand
- appropriate air vents and overflow pipes must be clear and fitted with save alls or drip trays before commencing bunkering
- deck scuppers and freeing ports must be covered before bunkering starts to prevent any overflow from going overboard
- tanks receiving fuel must be sounded to ascertain free capacity
- valves must be opened to the appropriate tanks
- earth lead should be connected to the deck filling entry point
- the hose nozzle should be grounded to the filling point prior to and during filling operations
- the ship stability should be monitored when filling multiple tanks
- tanks should be filled to 90% capacity to allow for expansion and to prevent spillage
- attend to any spillage on deck and report any oil spill overboard into the water to the harbour master/port authority
- on completion of refuelling, close all valves to appropriate tanks
- sound tanks to ascertain quantity received and record findings
- remove the earth lead from the deck filling point
- cap refuelling entry point
- ventilate the area
- check bilges and machinery spaces

- uncover the deck scuppers and freeing ports
- take down bunkering signals, no smoking and warning signs
- enter details into fuelling record book and ship's logbook as appropriate
- review the operation and upgrade the checklist for refuelling operations as required.

Fuel spills and oil pollution — in the event of a spillage of diesel fuel or other pollutants into the sea:

- stop the flow of fuel or pollutant into the sea
- inform crew and ships in the immediate vicinity that a spill has occurred and a fire hazard may exist
- inform the harbour master/port authority
- minimise the effect and spread of the spillage (spill booms, absorbent pads and materials)
- record all spillages and the action taken in the ship's log book
- dispersants must not be used without the permission of Maritime Safety Queensland

A Shipboard Oil Pollution Emergency Plan, is required to be carried on board all ships over 35 metres in length; ships more than 24 metres in length if the ship is carrying oil as cargo, or a vehicle carrying more than 400 litres of oil as cargo.

It is an offence under the *Transport Operations (Marine Pollution) Act 1995* (TOMPA) for a vessel to discharge oil overboard. Plans must be documented to contain accidental discharge and to clean up any oil spilled. Spills must be reported to the nearest regional harbour master's office as soon as possible.

Some ships require to be provided with a shipboard oil pollution emergency plan. The meaning of ship under section 30 of *Transport Operations (Marine Pollution) Act 1995* is:

- more than 24 metres in length overall if the ship is carrying:
    - oil as a cargo
    - a vehicle that is carrying more than 400 litres of oil as cargo
- otherwise, more than 35 metres in length overall.

The ship's shipboard oil pollution emergency plan must be in the approved form and include the following:

- the procedure to be followed by the ship's master, or someone else having charge of the ship, in notifying a reportable incident that is a discharge or probable discharge of oil involving the ship
- a list of the entities to be notified by persons on board if the reportable incident happens
- the procedure to be followed for coordinating with the entities notified about the reported incident
- the name of the person on board through whom all communications about the reportable incident are to be made
- a detailed description of the action to be taken, immediately after the reportable incident, by persons on board to minimise or control any discharge of oil from the ship resulting from the reportable incident.

The shipboard oil pollution emergency plan must be lodged with Maritime Safety Queensland for approval.

Pumping of bilges - Bilge water can contain oil or oily substances that could damage the environment. All bilge spaces should be inspected and maintained on a daily basis where practical. If fuel or lubricating or hydraulic oil enter the bilges it must be:

- absorbed by suitable sorbents

- pumped ashore to an approved facility
- pumped into containers for disposal ashore
- recorded in the ship's log.

Engine room checks — the engineer or nominated person must inspect at regular intervals:

- machinery spaces while in operation
- spaces capable of flooding.

4.33 Steering gear and emergency steering checks

The master, engineer or nominated person shall be responsible for the testing of the steering gear and the emergency steering system:

- prior to departure
- when entering an area where navigation demands special caution
- after prolonged use of the auto-pilot.

4.34 LP gas systems for appliances and for engines

Any ship having a gas installation must comply with the *Gas Supply Act 2003* and the *Gas Supply Regulation 2007*.Any alteration to the fitted LPG installation will require inspection by a licensed gas fitter and a new gas certificate.

A Marine Information Bulletin is available on the Maritime Safety Queensland website called Liquefied Petroleum Gas (LPG) systems for Commercial/Fishing Ships.

4.35 Low voltage electrical plant and shore power supply

The plant shall comply with the *Electrical Safety Act 2002*.

Certificates of compliance covering design and survey are required for any new electrical work, and modifications to the existing installation. This includes:

- all low voltage electrical work
- extra low voltage where calculated load exceeds 1000 W (excluding motor starting load).

Low voltage electrical plant including leads and shore-power connections must be operated and maintained in accordance with written instructions. Work on low voltage electrical plant shall be carried out by licensed persons only. Procedures should be developed to safely isolate defective electrical plant until a licensed person is available to rectify it.

It is highly recommended that residual current devices (RCDs) are fitted to the electrical system and that these are tested regularly as per manufacturers specification and tests recorded.

4.36 Specific operational requirements

The owner and master should ensure that vessels are prepared for specific tasks and that crews are adequately trained to fulfil the required tasks safely.

For fishing vessels this includes streaming and recovery of trawl gear, sorting, and safe handling of trawl winches and awareness of hazards concerning overhead gear.

For commercial vessels this includes loading and discharge of cargo, passenger activities such as diving, boom-riding and fishing.

The master should:

- identify hazards specific to ship operations
- eliminate specific hazards
- ensure crew are adequately trained.

4.37 Fast craft vessels

The documents and procedures required for fast craft vessels are in addition to, and should be read in conjunction with the standard ship safety management system operating documents. The special documents and procedures noted for fast craft are in Part F of the National Standard for Commercial Vessels (NSCV) and are additional documents to those required for conventional craft and used accordingly.

The construction and management of high speed craft centres on the *International Code of Safety for High Speed Craft 2000* (HSC), published by the International Maritime Organization (IMO)

Definition of fast craft
A fast craft is a vessel capable of maximum speed equal to or exceeding 25 knots. The NSCV lists three categories of fast craft with special needs.

- category F1 fast craft
- category F2 fast craft
- fast craft that are neither category F1 or F2

Category F1 fast craft

(a) class 1 and 2 vessels
(b) greater than 35 metres in equivalent length
(c) either a class A,B or C vessel in terms of operational limits.

Category 2 fast craft

(a) class 1 vessels (carrying more than 12 passengers)
(b) not a category F1 fast craft.

4.38 F1 fast craft

Documents and records required for category F1 fast craft
The risk factors associated with category F1 fast craft under the national standard are considered to be comparable to those for category A and B craft, and cargo craft under the HSC Code. Hence the HSC Code substantively influences the documents required for this class of vessel.

Information to be made available
Manuals shall include a route operational manual and should be made available on board the vessel. The manuals shall contain at least the information specified below, and shall be in a language understood by the crew. The training manual shall be provided in each crew mess-room and recreation room.

Operating instructions
Posters or signs shall be provided on or in the vicinity of survival craft and their launching controls and shall:

- illustrate the purpose of controls and the procedures for operating the appliance and give relevant instructions and warnings;
- be easily seen under emergency lighting conditions; and
- use symbols in accordance with the recommendations of the IMO.

Maintenance
Fast craft which need not comply with the *High speed Craft Code*, are to have a scheduled maintenance program which must include but is not limited to:

The following tests and inspections shall be carried out weekly:

- all survival craft, rescue boats and launching appliances shall be visually inspected to ensure that they are ready for use
- all engines in rescue boats shall be run ahead and astern for a total period of not less than three minutes provided the ambient temperature is above the minimum temperature required for starting and running the engine. During this period of time, it should be demonstrated that the gearbox and gearbox train are engaging satisfactorily. If the special characteristics of an outboard motor fitted to a rescue boat would not allow it to be run other than with its propeller submerged for a period of three minutes, it should be run for such period as prescribed in the manufacturer's handbook
- the general emergency alarm system shall be tested.

Inspection of the life saving appliances, including survival craft equipment, shall be carried out monthly:

- a report of the inspection shall be entered in the log book
- a checklist for use when carrying out the inspection
- maintenance and repair instructions
- schedule of periodic maintenance
- diagram of lubrication points with recommended lubricants
- list of replaceable parts
- list of sources of spare parts
- log for records of inspections and maintenance.

Rotational deployment of marine evacuation systems
In addition to, or in conjunction with, the servicing intervals of marine evacuation systems, each marine evacuation system shall be deployed from the craft on a rotational basis at intervals to be agreed by Maritime Safety Queensland provided that each system is to be deployed at least once every six years.

All repairs and maintenance of inflated rescue boats shall be carried out in accordance with the manufacturer's instructions. Emergency repairs may be carried out on board the craft; however, permanent repairs shall be affected at an approved servicing station.

Periodic servicing of hydrostatic release units or HRU shall be serviced:

- at intervals not exceeding 12 months; where in any case this is impracticable, Maritime Safety Queensland may extend this period by one month
- at a servicing station which is competent to service them, maintains proper servicing facilities and uses only properly trained personnel.

Marking of stowage locations
Containers, brackets, racks and other similar stowage locations for life-saving equipment shall be marked with symbols in accordance with the recommendations of the IMO, indicating the devices stowed in that location for that purpose. If more than one device is stowed in that location, the number of devices shall also be indicated.

Proof of compliance
The information on controllability and maneuverability, which shall be contained in the craft operating manual shall include the characteristics under the worst intended conditions affecting the controllability and maneuverability within safe maximum speeds and the performance data.

Craft operating manual
The craft operating manual shall contain at least the following information:

- leading particulars of the craft
- description of the craft and its equipment
- procedures for checking the integrity of buoyancy compartments
- details arising from compliance with the requirements of chapter 2 likely to be of direct practical use to the crew in an emergency
- damage control procedures
- description and operation of machinery systems
- description and operation of auxiliary systems
- description and operation of remote control and warning systems
- description and operation of electrical equipment
- loading procedures and limitations, including maximum operational weight, centre of gravity position and distribution of load, including any cargo or car securing arrangement and procedures depending on operational restrictions or damaged conditions. Such arrangement and procedures shall not be included as a separate Cargo Securing Manual as required by chapter VI of the Convention
- description and operation of fire-detection and fire-extinguishing equipment
- drawings indicating the structural fire protection arrangements
- description and operation of radio equipment and navigational aids
- information regarding the handling of the craft
- maximum permissible towing speeds and towing loads, where applicable
- procedure for dry-docking or lifting, including limitations

- in particular, the manual shall provide information, in clearly defined chapters, relating to:
    - indication of emergency situations or malfunctions jeopardizing safety, required actions to be taken and any consequential restrictions on operation of the craft or its machinery;
    - evacuation procedures;
    - the worst intended conditions;
    - limiting values of all machinery parameters requiring compliance for safe operation.

In regard to information on machinery or system failures, data shall take into account the results of any Failure Mode Effects Analysis (FMEA) reports developed during the craft design.

Route operational manual
The route operational manual shall include at least the following information:

- evacuation procedures
- operating limitations, including the worst intended conditions
- procedures for operation of the craft within the limitations of paragraph.2
- the elements of applicable contingency plans for primary and secondary rescue assistance in the case of foreseeable incidents, including land-based arrangements and activities for each incident
- arrangements for obtaining weather information
- identification of the 'base port(s)'
- identification of the person responsible for decisions to cancel or delay voyages
- identification of crew complement, functions and qualifications
- restrictions on working hours of crew
- safety arrangements at terminals
- traffic control arrangements and limitations, as appropriate
- specific route conditions or requirements relating to position fixing
- operations by night and in restricted visibility, including the use of radar or other electronic aids to navigation
- communication arrangements between craft, coast radio stations, base port, radio stations, emergency services and other ships, including radio frequencies to be used and watch to be kept.

Training manual
The training manual, which may comprise several volumes, shall contain instructions and information, in easily understood terms, illustrated wherever possible, on evacuation, fire and damage control appliances and systems and on the best methods of survival. Any part of such information may be provided in the form of audio-visual aids in lieu of the manual. Where appropriate, the contents of the training manual may be included in the craft operating manual.

The following shall be explained in detail:

- donning lifejackets and immersion suits, as appropriate
- muster at the assigned stations
- boarding, launching and clearing the survival craft and rescue boats
- method of launching from within the survival craft
- release from launching appliances
- methods and use of devices for protection in launching areas, where appropriate
- illumination in launching areas
- use of all survival equipment
- use of all detection equipment; with the assistance of illustrations, the use of radio life-saving appliances
- use of drogues
- use of engine and accessories
- recovery of survival craft and rescue boats, including stowage and securing
- hazards of exposure and the need for warm clothing
- best use of the survival craft facilities in order to survive
- life saving apparatus and craft's line-throwing apparatus
- all other functions contained in the muster list and emergency instructions
- best use of the survival craft facilities in order to survive
- methods of retrieval, including the use of helicopter rescue gear (slings, baskets, stretchers),

breeches-buoy and shore life-saving apparatus and craft's line-throwing apparatus
- instructions for emergency repair of the life-saving appliances
- instructions in the use of fire protection and fire-extinguishing appliances and systems
- guidelines for use of firefighter's outfit in a fire, if fitted
- use of alarms and communications associated with fire safety
- methods for surveying damage
- use of damage control appliances and systems, including operation of watertight doors and bilge pumps
- for passenger craft, control of and communication with passengers in an emergency.

Maintenance and servicing manual/system
The craft maintenance and servicing manual/system shall contain as a minimum:
- detailed, illustrated descriptions of all craft structure, machinery installations and all installed equipment and systems required for safe operation of the craft
- specifications and quantities of all replenishable fluids and of structural materials which may be required for repairs
- operational limitations of machinery in terms of values of parameters, vibration and consumption of replenished fluids
- limitations of wear of structure or machinery components, including lives of components requiring calendar or operating-time replacement
- detailed description of procedures, including any safety precautions to be taken or special equipment required, to remove and install main and auxiliary machinery, transmissions, propulsion and lift devices and flexible structure components
- test procedures to be followed subsequent to replacement of machinery or system components or for malfunction diagnosis
- procedure for lifting or dry-docking the craft, including any weight or attitude limitations
- procedure for weighing the craft and establishing the position of longitudinal centre of gravity (LCG)
- where craft may be dismantled for transportation, instructions shall be provided for dismantling, transport and re-assembly
- a servicing schedule, included in the maintenance manual or published separately, detailing the routine servicing and maintenance operations required to maintain the operational safety of the craft and its machinery and systems.

Emergency instructions and drills
The company shall ensure that the emergency instructions and drills are implemented, and the master shall be responsible for the enforcement of these instructions and drills on board. On or before departure, passengers shall be instructed in the use of lifejackets and the action to be taken in an emergency. The attention of the passengers shall be drawn to the emergency instructions required by a deck officer suitably trained member of the crew.

Emergency fire and evacuation drills for the crew shall be held on board the craft at intervals not exceeding one week for passenger craft and one month for cargo craft. Each member of each crew shall participate in at least one evacuation, fire and damage control drill per month.

On-board drills shall, as far as practicable, be conducted to simulate an actual emergency. Such simulations shall include instruction and operation of the craft's evacuation, fire and damage control appliances and systems. On-board instruction and operation of the craft's evacuation, fire and damage control appliances and systems shall include appropriate cross-training of crew members.

Emergency instructions including a general diagram of the craft showing the location of all exits, routes of evacuation, assigned assembly stations, emergency equipment, life-saving equipment and appliances and illustration of lifejacket donning shall be available to each passenger and crew member in appropriate languages. It shall be placed near each passenger and crew seat and conspicuously displayed at assembly stations and other passenger spaces.

4.39 F2 fast craft

Requirements for documents

Information relevant to the safe operation and maintenance of a F2 fast craft that operates at high speed must be documented and provided onboard the craft and elsewhere as necessary, for ready reference by those persons responsible for the safe operation and maintenance of the craft. The documents listed below reflect the requirements of the NSCV Part F Subsection 1C (category F2 fast craft).

Provision of essential safety information craft operating manual
The craft shall be supplied with a craft operating manual. The craft operating manual shall contain at least the following information:

a) general description of the craft and its equipment including:
   (i) the rules and regulations to which the craft has been designed and built
   (ii) class of service and category F2 service notation
   (iii) classification society and class notation if applicable
   (iv) maximum number of passengers and persons on board
   (v) measured length, and the equivalent length where this differs
   (vi) maximum speed
   (vii) operational areas
b) procedures for maintaining and checking the integrity of buoyancy compartments
c) details of the stability of the craft likely to be of direct practical use to the crew in an emergency.
d) damage control procedures
e) description and operation of machinery systems
f) description and operation of auxiliary systems
g) description and operation of remote control and warning systems
h) description and operation of electrical equipment
i) loading procedures and limitations, including maximum operational weight, centre of gravity position and distribution of load
j) cargo or car securing arrangements and procedures depending on operational restrictions or damaged conditions
k) description and operation of fire-detection and fire-extinguishing equipment
l) drawings indicating the structural fire protection arrangements
m) description and operation of radio equipment and navigation and collision avoidance aids
n) description and operation of life-saving equipment
o) evacuation procedures and routes (to the extent determined by the craft design and equipment)
p) information regarding the handling of the craft
q) maximum permissible towing speeds and towing loads, where applicable
r) indication of emergency situations or malfunctions jeopardizing safety, required actions to be taken and any consequential restrictions on operation of the craft or its machinery
s) the worst intended weather and sea conditions before the craft should seek shelter, and any restrictions on speed arising from structural or passenger safety considerations over the range of anticipated operating conditions
t) limiting values of all machinery parameters requiring compliance for safe operation
u) procedures for the crew to:
   (i) advise elderly or disabled persons to remain seated when operating
   (ii) require passengers to remain seated when operating in hazardous conditions.

The operating manual shall take into account the results of any Failure Mode Effect Analysis (FMEA) reports developed during the craft design.

Maintenance and servicing manual
The craft shall be supplied with maintenance and servicing manual containing at least the following information:

a) detailed, illustrated description of all craft structure, machinery installations and all installed equipment and systems required for safe operation of the craft
b) specifications and quantities of all replenish able fluids and of structural materials which may be required for repairs
c) operational limitations of machinery in terms of values of parameters, vibration and consumption of replenished fluids
d) limitations of wear of structure or machinery components, including lives of components requiring calendar or operating time replacement
e) detailed description of procedures, including any safety precautions to be taken or special

equipment required, to remove and install main and auxiliary machinery, transmissions, propulsion and lift devices and flexible structure components

f) test procedures to be followed subsequent to replacement of machinery or system components or for malfunction diagnosis
g) procedure for lifting or dry-docking the craft, including any weight or attitude limitations
h) procedure for weighing the craft and establishing the position of longitudinal centre of gravity (LCG)
i) where craft may be dismantled for transportation, instructions shall be provided for dismantling, transport and re-assembly.

A servicing schedule, included in the maintenance manual or published separately, detailing the routine servicing and maintenance operations required to maintain the operational safety of the craft and its machinery and system

Deemed to satisfy solutions — crewing and competencies

Fast craft competencies

The crew of a fast craft shall have the competencies relevant to their particular duties so as to minimise the risks associated with the high-speed operation of a craft. Each crew member of a category F2 fast craft shall possess the relevant competency level listed in the table provided corresponding to their individual responsibility by showing they have satisfactorily achieved the training outcomes. These competencies shall equip the crew member to identify potential hazards when a vessel is travelling at high speed to recognise the potential risks and take actions where appropriate to control or minimise those risks.

Fast craft competencies for crew of category F2 fast craft

Crew responsibility	Competency level
Well-being of persons on board a fast craft	Level 1
Operation of a fast craft from helm position	Level 1 and 2
Overall responsibility for navigation and collision avoidance on specified fast craft (A)	Level 1, 2 and 3

Key

(A) Required for a category F2 fast craft that:

a) has an equivalent length 15 meters or more
b) carries more than 36 passengers
c) operates at night or in restricted visibility at speeds 25 knots or more.

Competency levels

Three competency levels are defined in the table below for crew on a category 2 fast craft. Each competency level shall include the elements within the applicable tables (Tables 20, 21 and 22) of Part C Section 1 Subsection 1C to the extent they are relevant to the particular type and operation of the craft

Fast craft competency levels

Competency level	Title
Level 1	Protect the safety of persons on fast craft
Level 2	Safely operate a fast craft
Level 3	Safely navigate a fast craft

Competency level 1 — protect persons on a fast craft

Competency element	**Performance criteria**
Understanding the safety system	Awareness of the nature of risk
	Awareness of the special risks associated with a craft operating at high speed
	Awareness of documentation relevant to safety
Protect safety of persons	Watching for hazards
	Limits on passenger movement
	Securing of luggage and other potential projectiles
	Instructing passengers to be seated
	Instruct passengers in the use of safety equipment
	Cargo and vehicle stowage and securing systems
Reducing losses arising from collision or grounding	Assessing extent of damage and damage control
	Provide basic first aid to reduce consequences of injury till arrival of emergency response personnel
	Supervise and perform evacuation
	Regaining control of craft in emergency situations

Competency level 2 — safely operate a fast craft

Competency element	Performance criteria
Understand the craft handling characteristics	Awareness of the modes of operation and their manifestation in various types of fast craft
	Awareness of the performance characteristics of different types of fast craft
	Awareness of maneuvering and berthing characteristics and technique
	Awareness of potential impact of fast craft operations on others
Understanding the craft's systems relevant to high speed	Awareness of the characteristics of different types of propulsion and control systems
	Capacity to communicate effectively and quickly
	Understanding and the use of basic navigation equipment needed for a a person under supervision to steer a safe course
	Understanding of the interrelationships between electrical, hydraulic and pneumatic systems with the safety of a craft operating at speed
	Operating the craft to avoid and identify damage to structure
Function effectively as a lookout and/or helsman	Effectively identify collision hazards assess risks and take appropriate action
	Effectively identify grounding and other navigation hazards, assess risks and take appropriate action
	Function effectively as a member of the crew responsible for the safe operation of the craft
Understanding the effect of loading on craft performance and safety	Awareness of the effect of loading on operational characteristics
	Understanding risks associated with damage and ability to apply appropriate damage control measures

Competency level 3 — safely navigate a fast craft

Competency element	Performance criteria
Utilise available aids to navigation	Understanding and use of navigation and collision avoidance equipment as applied to fast craft
Apply navigation techniques	Planning a route
	Apply techniques that reduce risk of navigational or collision incidents at speed
	Apply appropriate passage execution techniques
Function effectively as master or watchkeeper of a fast craft	Effectively identify collision hazards, assess risks and take appropriate action
	Effectively identify grounding and other navigational hazards, assess risks and take appropriate action
	Effective leadership of the crew of a fast craft to encourage teamwork in both operational and emergency situations

Competencies to be craft specific
The competency elements listed in the tables above shall apply to the extent that the competencies are relevant to the type and operation of the particular craft being considered. The competencies shall be sufficient to safely operate the particular craft and ensure that safety systems provided on board are available and effectively deployed at time of need.

Note: The specific competencies needed to operate a particular craft would normally be recognized by a type rating certificate issued by the owner. The type rating certificate could be valid for an individual craft or a fleet of very similar craft.

Operational requirements
Preliminary
A category F2 fast craft shall be deemed-to-satisfy the required outcomes in Chapter 2 of the NSCV Part E, as they relate to operational requirements if the craft complies with the requirements of this Chapter. Alternatively, the craft may comply with the requirements of Subsection 1B of NSCV Part F.

Suitability for operation in a particular location
A craft shall be suited to provide for acceptable safety when operating within its intended locality of operation. Where specified, the proposed operation of a category F2 fast craft within a particular locality shall be subjected to a documented risk management process that identifies hazards, assesses the risks and determines appropriate controls necessary to reduce to acceptable levels any of those risks that would otherwise be unacceptable.

Account shall be taken of the risk control measures that apply to the craft. In undertaking the risk assessment, the following matters shall be reviewed and addressed:

a) suitability of the craft for the service intended, with regard to:
   i) the characteristics of the craft
   ii) the prevailing weather, wave and wind conditions to be encountered
   iii) the nature and proximity of navigational hazards
   iv) the number, nature and routes of other vessels that operate on the same waters;
   v) the safety of other users of the waterway
   vi) the impact of the craft's operation on the local environment
b) availability of weather, wave and wind information that may be essential for the safe operation of the craft
c) availability of safe havens or shelter in the event of unfavourable weather, wave or wind conditions
d) the competencies and work load required of the crew to safely operate and navigate the particular type of fast craft in the intended waters of operation
e) special arrangements required at terminals including arrangements for berthing, access and egress, fuelling, transfer of water and wastes
f) port or other traffic control arrangements and compliance with any existing traffic control
g) the possible operation of the craft in restricted visibility or at night
h) local communication arrangements between craft, coast radio stations, base ports

radio stations, emergency services and other vessels, including radio frequencies to be used

i) the availability of readily accessible resources to undertake maintenance and servicing of the craft and its machinery on a regular basis in accordance with legislation and the manufacturers' warranties.

Safety management system — general

Category F2 fast craft shall be provided with a safety management system that complies with Part E of the NSCV.

The safety management system shall provide for the operational controls needed to give effect to and maintain the safety outcomes, including the applicable minimum required operational risk control measures specified in the table below

Seating and handrails

Craft characteristics	Minimum deemed to satisfy design level	Design risk control measures for spaces normally occupied by persons	Associated operational risk control measures
Equivalent length > 35m or Speed ,35 knots	Design level 1	Seats for each person on board (Clause 3.4.6 Part F section 1 subsection 1C) Ready availability of hand holds and grab rails in all spaces that persons normally occupy (Clause 3.4.7 Part F section 1 subsection C) Furniture, structures and fittings shall be designed and constructed without sharp edges to avoid injury	Advice to elderly or disabled persons to remain seated when operating Passengers to remain seated when operating in hazardous conditions
Equivalent length < 35m and speed > 35 knots	Design level 2	As for design level 1 and Padding of hard surfaces, including seats frames, sofas and edges of tables Seating that is either forward or rear facing	As for design level 1

Note: the above table represents the minimum required standard. A higher standard may be needed to fulfill broader safety obligations

The safety management system shall include such operational, training and maintenance manuals required for the safe operation of the craft in normal and abnormal conditions, and for maintaining the full function of safety systems on board the craft.

Note: This clause does not preclude the combining of manuals on simpler craft.

Type rating of crew
Crew to be type rated for particular craft
The safety management system shall establish a system of type rating, whereby the crew of a fast craft is provided with appropriate training and their competencies assessed prior to serving as crew on a particular craft.

Training to be craft specific
The training shall be specific to the craft and shall make direct reference to applicable parts of the craft documentation. Such documentation shall include, to the extent relevant to the particular craft:

a) the craft operating manual including:
   i) the use and operation of navigation and collision avoidance equipment
   ii) limitations on the craft's operation in sea conditions
b) the route operating manual
c) the maintenance and service manual
d) the training manual
e) the safety management system documentation

f) emergency plans
g) operational procedures
h) stability book.

Changes in operating environment
The safety management system shall provide for appropriate training and assessment of the crew before they are required to operate a craft in unfamiliar areas.
Note: This requirement is to ensure that they have a clear understanding of the navigational, collision and other hazards that affect the safe operation of the craft.

Status of systems or equipment essential for safety
The safety management system shall specify procedures that limit operation should systems or items of equipment essential for safety when operating at high speed becomes unserviceable before departure or during operation.

Note: Such procedures would normally require that the craft proceed at reduced speed. For example, a 35 metre craft with more than 100 passengers that normally operates in excess of 35 knots and requires 2 radars might be restricted to less than 30 knots if one of the two radars was not serviceable and available for use.

Operations in conditions of restricted visibility
The safety management system shall specify procedures for actions to be taken when a fast craft is operating in conditions of restricted visibility.

Note: Refer to NSCV P art E Annex B for guidance on this requirement.
This procedure should ensure that the vessel is navigated safely in conditions of restricted visibility.

This procedure should address the following:

- requirements under collision regulations for operations in restricted visibility
- actions to be taken in restricted visibility
- equipment to be used
- requirements when using automatic pilot:
- when using an automatic pilot an effective look-out shall be maintained at all times
- in areas where navigation demands special caution, the performance of the automatic pilot, when in use, shall be closely monitored for correct performance
- the change over to manual steering shall be able to be effected immediately should a fault in the automatic pilot be detected.

Route operational manual
Craft that carry more than 36 passengers shall be provided with a route operational manual that includes at least the following information:

- evacuation procedures
- operating limitations, including the worst intended conditions
- procedures for operation of the craft within the operating limitations
- elements of applicable contingency plans for primary and secondary rescue assistance in the case of foreseeable incidents, including land-based arrangements and activities for each incident
- arrangements for obtaining weather information
- identification of the ‘base port(s)’
- identification of the person responsible for decisions to cancel or delay voyages
- identification of crew complement, functions and qualifications
- restrictions on working hours of crew

- safety arrangements at terminals
- traffic control arrangements and limitations, as appropriate
- specific route conditions or requirements relating to position fixing, operations by night and in restricted visibility, including the use of radar or other electronic aids to navigation
- communication arrangements between craft, coast radio stations, base ports radio stations, emergency services and other ships, including radio frequencies to be used and watch to be kept.

Specification for data logger
Category F2 Fast Craft must be provided with data loggers in order to:

- monitor the ongoing operation of the craft to verify that it does not exceed stated design and operational limits
- assist in establishing the causes of incidents so that appropriate corrective or preventative action can be taken that will avoid similar or other associated incidents in the future.

Data type

The data logger shall collect data from GPS, radar images, system monitoring and craft response signals. The data need only be of the type essential to establishing the operational safety of the craft when travelling at high speed. Typical data to be recorded is listed in the table below.

Typical data to be recorded by data logger

Data category	Data source
Basic functions	Craft position (GPS) Radar image Heading (true or compass) Speed over ground Time
Control commands	Helm position in use Throttle control position Directional control position Propeller pitch control position Clutch control position Backup control mode switch position Stabiliser, ride control, lift control position
Mechanical Response	Direction actuator position (e.g. rudder position) Engine speed (RPM) Gearbox position (ahead/astern) Shaft speed (RPM) Hydraulic pressure of essential systems Source of essential hydraulic pressure (main/backup) Power to control system (main/backup)

Data storage
The data shall be stored in a robust storage medium. The storage medium shall be protected from exposure to the environment, access by non-authorised persons and collision accelerations, but need not be capable of withstanding submergence or exposure to fire.

Sufficient data storage shall be provided for not less than two hours recording of all data.

Note: The data logger specified for the purposes of this standard serves a similar function to a voyage data recorder (VDR). However it is not required to comply with the specific IMO standard for VDRs, especially in regard to the protection of data in the event of catastrophic incident.

Power source
The data logger shall be connected to the emergency power source so that, in the event of a power failure, the data logger shall continue to function without interruption.

4.40 Air cushion vehicles

Air cushion vehicles, mostly known as hovercraft, have unique handling properties. Training requirements outlined in these documents seek to provide the operator of an air cushion vehicle with the competencies to safely operate the craft taking into account their handling characteristics compared to other fast craft in addition to the different types of hazards they encounter and the different responses that should be undertaken to control risks.

Requirements for type rating to operate an air cushion vehicle
Persons who operate an air cushion vehicle of less than 12 metres in measured length within sheltered waters shall satisfy the type rating requirements specified in Clause F4 of Annex F of Part F Section 1 subsection 1C of the NSCV. Persons who operate an air cushion vehicle of 12 or more metres in measured length and any other air cushion vehicle not operating within sheltered waters, shall satisfy the requirements for type rating specified in the HSC Code.

Assessment for type rating to operate a small air cushion vehicle within sheltered waters
An applicant shall:

(a) have achieved the competencies listed in the table below
(b) have operational experience and training including not less than 10 hours on the type of air cushion vehicle for which the type rating is required
(c) be assessed by means of a practical test witnessed by an independent assessor.

Maritime Safety Queensland may require that a certificate of competency be endorsed with the make and model of air cushion vehicle as stated by the manufacturer. Further experience and a further practical test may be required for other models.

Competencies for type rating to operate a small air cushion vehicle within sheltered waters

	Outcome	Methods for demonstrating competence	Standards for evaluating competence
1	ACV is prepared and ready for operation	Pre-operational checks undertaken and engine(s) are started	All pre-operational checks completed and engine(s) started in accordance with the operational manual for the type/make of ACV. Identify the factors that can limit operational performance and the need to operate within the design criteria of the craft.
	Outcome	Methods for demonstrating competence	Standards for evaluating competence
2	Passenger boarding procedure	Operator instructs passengers in all boarding and emergency procedures. Issue of hearing protection/life jackets/helmets/hair nets and so on.	Operator demonstrates that he/she is aware of all marine safety precautions and occupational health and safety for passengers.
3	Pre-departure checks complete	Passengers are considered to be seated passengers clear of fans/propellers. Pre-start up checks. Engine(s) started	Passengers seated as instructed by operator Pre-departure checks are completed in accordance with operating manual.
4	ACV is d safely at low speed	ACV is manoeuvred ahead at slow speed over land, stopped, turned 1800 then returned to original starting point. ACV is moved ahead at slow speed and turned through 90 then another 90 then returned to original starting point. Engines switched off.	Operator demonstrates that he/she is able to manoeuvre the ACV at slow speed, safely and under control at all times.
5	Manoeuvring the ACV	ACV is moved from shore to water allowing for leeway. ACV is steered on a straight course allowing for leeway: a) at slow speed; and b) at full speed ACV is manoeuvred at high speed over figure-of-8 course. Changing course at high speed Rapid alteration of course through 180° at high speed returning on a reciprocal course re-establishing on the cushion. Returning to shore (through breakers) Maneuvering ACV up sloping ramp/beach.	ACV is manoeuvre within view of assessor /or with assessor on board. Manoeuvres completed safely with full control of the ACV at all times.
6	Dealing practical/ theoretical with emergency situations	Emergency Stop Man Overboard procedures Avoiding plough in Maneuvering at low speed off the cushion Location of fire extinguishers etc. Use of bilge pumps. Any other emergency procedure appropriate to the type/make of ACV. Failure of lift engine during a turn. Failure of main propulsion engine during a turn. Failure of steering during a turn.	Manoeuvres completed within demonstrable limits imposed by the nature of the ACV and the environment and in accordance with recommended procedures contained in the operating manual.
7	Passengers are disembarked safely	ACV proceeds up the beach safely Passengers remain seated until engine shut off Passengers assisted to disembark Lifejackets and so on returned.	ACV returns safely to shore/embarkation point, engines shut down and passengers safely disembarked

	Outcome	Methods for demonstrating competence	Standards for evaluating competence
8	The ACV is mechanically maintained for safe and reliable operation	Engineering knowledge appropriate to the type/model of ACV	Ability to supervise routine maintenance in accordance with technical manual. Ability to undertake minor adjustments and repairs to lift and propulsion engines.

4.41 Documents and records for fast craft that are neither F1 nor F2 fast craft

Documents required to be provided for this category of fast craft shall either -

- meet the requirements for conventional vessels given in Parts C to E of the NSCV where the vessel has a maximum speed of less than 30 knots
- meet the requirements for conventional vessels, modified as appropriate by application of risk management techniques, where the vessel has a maximum speed of 30 knots or more.

Part F of the NSCV does not distinguish between registrable commercial ships and fishing ships. Fast craft are placed in three categories which are explained at the beginning of this document, consequently any commercial vessel with speeds over 25 knots is considered a fast craft and falls within one of the three categories.

Fast craft in this category (neither category F1 nor category F2) with speeds between 25 and 30 knots should address risk management techniques and carry documents required under sections 133 and 134 of the *Transport Operations (Marine Safety) Regulation 2004* which relate to conventional craft.

Fast craft in this category, with speeds in excess of 30 knots, are required to address risk management techniques described in documents for conventional craft under section 133 and 134 of the *Transport Operations (Marine Safety) Regulation 2004*. However, after meeting the requirements for documents for conventional craft, Maritime Safety Queensland may ask for special documents and records to be provided.

4.42 Wearing a lifejacket in high risk operations

The owner/master of the vessel must determine what operations they participate in, that they deem to be a high risk situation. When the vessel is engaged in these operations, the master must ensure that the crew are wearing their life jacket and also any other personal protective equipment that is deemed necessary.

There may be some tasks in these operations that may be deemed unsafe to wear a life jacket and these should also be noted. For example entering enclosed spaces or going below decks.

Section 5: Technical manual

5.1 Technical manual

The objective of this section is to ensure that vessels have a comprehensive technical reference for the vessel. Some areas may not be applicable to this vessel and should be deleted. Any and all extra items that your vessel may have should be added as an addendum.

All details shall be completed based on the information provided by the manufacturer or other appropriate accredited persons specific to the item. Any and all limitations or crew identified idiosyncrasies of items should also be included in this section.

Section 6: Maintenance and service records

6.1 Maintenance and service schedules

A maintenance cycle should be established for hull, machinery and equipment on the vessel. This may be based on either frequency of slipping or it can be done seasonally.

Arrangements shall be made to ensure that all fire, safety, communications, navigation and anchoring equipment specified in Part C Section 4 of the NSCV are:

- maintained, serviced, stowed and labelled in accordance with Part C of the NSCV
- replaced when no longer serviceable
- operational prior to embarking on, and throughout a voyage.

Risk management strategies should be put into place for example redundancy for essential equipment. Where necessary the voyage should be terminated if essential equipment fails.

The owner and/or master should insert in the right hand column the times/periods the maintenance work or inspection is to be carried out. If an item is not applicable, it can be marked as N/A (not applicable).

Items of machinery or equipment on the ship, which do not appear in the prepared plan, should also be included.

Once the plan has been established, it should remain unchanged unless the ship is altered or improvements to the system are made.

Accredited surveyors, builders or manufacturers of machinery or equipment may be able to assist with the completion of this plan.

6.2 Maintenance and service record

This section has the same categories as the maintenance and service schedule plus a section to record the service, maintenance and modifications.

Where a manufacturer supplies specific instructions or recommendations relating to the installation, operation and maintenance of equipment, such instructions or recommendations should be complied with.

Regular maintenance such as lubrication, oil and filter changes should be recorded in the ship's daily operational log. This section should be signed by the owner or master of the ship and the date recorded.

Any additional work carried out, not listed in the plan, must be inserted in the ship’s log or maintenance log.

If additional work becomes a routine, the plan should be amended to include this work.

6.3 Slipping records

An integral part of any vessel maintenance is the slipping of the vessel. All vessel slipping shall be recorded and should include the details of:

- date out and in
- yard/Slipway that it took place at
- any details of work that was carried out and notations of work that needs to be scheduled for the next time out of the water

Section 7: Crew levels and training

7.1 Responsibilities of the ship's crew

A ship is seaworthy if it is appropriately equipped and crewed to meet the ordinary perils of the voyage on which the ship is proceeding or about to proceed.

7.2 Drills and emergency training

Drills or emergency preparedness training are part of contingency planning and should address all potential emergency situations that could arise during the operation of the vessel for which the risk to persons, the vessel or the environment could reasonably become unacceptable if the emergency response to that hazard was left uncontrolled.

Drills are required to be carried out for the minimum emergency situations listed below. Depending on the nature and operation of the vessel, other drills may be added to the list:

1. person overboard
2. fire onboard
3. severe weather
4. collision and grounding
5. personal injury
6. assembly stations (for very small ships this will be a brief statement)
7. abandon ship

Training may involve several scenarios — such as explosion followed by fire, followed by abandon ship with injured persons. New crew members should be given a safety induction and trained to respond to emergency situations as soon as practicable.

In addition to the initial training required, there shall be ongoing individual and team emergency preparedness training or drills in the operational and emergency procedures specified in the emergency plan.

This training shall establish, maintain and verify the competence and capacity of the crew to respond rapidly and effectively to an emergency situation and to follow the requirements of the emergency plan.

The training shall be tailored to suit the duties of each member of the crew to ensure they are able to fulfil the roles required of them in the emergency plan. Training should allow for variations to the plan due to planned and unexpected changes to the crew for example leave, changes to schedules, ill health.

7.3 Master

The master of a commercial ship must:

- be appointed by the ship owner or the owner's representative
- be responsible for the safe operation of the ship and all personnel on board and implementation of the Safety Management System aboard the vessel
- ensure the vessel is operated within the vessel's capability considering sea-state conditions, weather and stability limitations
- identify crew (appropriate number, qualifications and role) required for the vessel and its safe operation
- identify delegations and command structure on board
- identify roles and duties for each crew member
- manage fatigue

- communicate strategy
- hold an appropriate and valid licence commensurate with the length of the vessel and area of operation
- provide a system to identify hazards on board
- ensure the ship's crew and passengers are aware of planned emergency procedures
- maintain a complete record of the ship's operations which must be held for a period of at least five years
- be responsible for maintaining the vessel to an acceptable level of seaworthiness
- be responsible for maintaining life-saving, medical, communication and fire fighting equipment to standards required by regulation
- provide a system to record defects and rectifications of defects
- must hold an appropriate engineering qualification if an engineer is not carried onboard.

7.4 Engineer

The engineer on a commercial ship must:

- hold an appropriate and valid licence to take charge of and operate the ship's machinery
- keep the master fully informed about the condition of the ship's machinery, its effect on the ship's operations, and where defective machinery could affect the safety or operation of the ship
- oversee the operation of all machinery onboard the ship
- take responsibility for safe maintenance of defects and maintaining records.

7.5 Coxswain or deckhand

The coxswain/deckhand on a commercial ship:

- must work under the direction of the master
- may assist the master with navigation and conning
- may be required for watchkeeping duties as authorised by the master including direct supervision of any unlicensed persons while on watch
- may operate the ship if the master believes, on reasonable grounds, the unlicensed person is competent to operate the ship, holds at least a recreational marine driver licence and gives the unlicensed person clear instructions on the way the person is to operate the ship

7.6 Short term crew training

The owner and master of a ship must ensure that every crew member on a commercial ship, who has been employed for six months or longer, must have completed an approved course entitled Occupational Health and Safety at Sea, or an approved equivalent course.

Crew members who have served less than six months are required to complete an approved safety induction course.

The safety induction course shall provide information on:

- operational procedures
- administrative procedures and legal obligations
- emergency procedures including:
    - their emergency station and emergency station duties
    - the layout, operation and user level maintenance of safety equipment on the vessel

- specific safety features, practices or precautions onboard the ship
- location of personal safety equipment
- instruction on how to use the personal safety equipment
- actions to be taken in the event of an emergency
- ship abandonment procedures.

Further information is provided in section 9 of this manual (Crew records and training).

7.7 Safety and communications

In addition to safety training, including initial safety training for crew, all crew shall be informed of the location of all safety and emergency response equipment. Crew shall be trained to be competent in the use and user level maintenance of fire, safety, communications, navigation and anchoring equipment that is relevant to their duties.

7.8 Number of crew

Emergency planning should also involve the determination of adequate crew numbers to cope with emergency situations. The owner and/or master must carry out risk evaluations in foreseeable circumstances to ensure that the vessel, at all times when underway or operating, carries sufficient crew in terms of both numbers and competence to:

- operate safely and control acceptable levels of risk
- respond to emergencies that might affect persons on board and the safety of the vessel when considering all aspects of the vessel's operation
- provide rapid and safe evacuation of all persons onboard in the event of an emergency
- contain ship-sourced pollution.

Crewing levels (other than minimum licenses) need to be determined to meet the general safety obligation under Queensland law. Safe crewing of ships is part of the general safety obligation placed on owners and masters.

Crew determinations need to include both the minimum crew (in terms of numbers and certification levels) as well as the adequate crew required on board their vessels in order to meet their safety obligation for a particular voyage. The reasoning in crewing for a voyage will be influenced by circumstances specific to that voyage and need to be documented.

7.9 Minimum crew

When under way or operating but not ‘working’ within the normal purpose of business, for example, when simply shifting the ship or doing a delivery, the owner and/or master can consider sufficient competent and trained crew requirements so that:

- the vessel can safely navigate, berth and unberth
- the essential vessel systems can be operated and monitored safely
- immediate and appropriate emergency action can be taken when there is a failure of an essential system
- immediate and measured response can be provided in an emergency situation
- the crew can safely abandon the vessel if required.

Based on circumstances surrounding a particular vessel on a particular voyage, owners and masters are able to determine crewing levels that might result in a reduction, or increase in crew numbers.

7.10 Adequate crew

A vessel should at all times when underway/operating in its designed purpose, carry sufficient crew in terms of both numbers and competence to:

- eliminate or control to acceptable levels risk associated with the nature of the activity conducted by the vessel
- provide a measured response to emergencies or risks that may threaten the vessel or persons onboard during normal or abnormal conditions when considering all facets of the vessel's operation
- facilitate the rapid and safe evacuation of all persons onboard the vessel.

In determining the adequate crew required, the risks to the vessel and to the persons on board (crew and passengers) should be evaluated. The evaluation may include the following factors:

- task or employment (that is, passenger carrying, commercial fishing, and so on) of the vessel and any particular demands on the crew that the task imposes on the vessel in addition to its safe navigation
- number of persons carried on the vessel
- design characteristics of the vessel including its machinery and equipment
- expected conditions including weather, climate and water temperatures
- length of voyage
- fatigue
- foreseeable emergencies
- state and repair of the vessel and its machinery and equipment
- safe and timely evacuation of all people from the vessel in an emergency
- risks to the environment and other persons
- skills and experience of crew
- support available to the vessel and its crew
- any factors identified by Maritime Safety Queensland as relevant to safe operation
- any other identified factors or known risks.

The *Uniform Shipping Laws Code* provides a general guideline of at least one crew for each 50 passengers on board. This is a guideline only and the best crew determination will be affected after considering the needs of the passengers and the surrounding circumstances.

7.11 Crewing level guidelines

Crewing level guidelines from the National Standards for Commercial Vessels (NSCV), Part D – Crew Competency. In this standard, Table 4 — Minimum Crew must be read in conjunction with Annex A.

Table 4 NSCV Part D

Vessel size and area of operation	Number of minimum crew (includes certificated crew)	Additional minimum crew requirements for voyages of more than 12 hours
Ships 80 metres and over	By determination	By determination
Ships 35 metres and over but less than 80 metres		
Australian Coastal Middle Waters (600 nautical miles)	6	—
Offshore (200 nautical miles)	5	—
Offshore (30 nautical miles)	4	—
Sheltered waters	4	—
Ships 24 metres and over but less than 35 metres		
Australian Coastal Middle Waters (600 nautical miles)	5	—
Offshore (200 nautical miles)	4	—
Offshore (30 nautical miles)	3	—
Sheltered waters	3	—
Ships 12 metres and over but less than 24 metres		
Australian Coastal Middle Waters (600 nautical miles)	3	1
Offshore (200 nautical miles)	3	1
Offshore (100 nautical miles)	2	1
Offshore (30 nautical miles)	2	—
Sheltered waters	2	—
Ships less than 12 metres		
Offshore (200 nautical miles)	2	1
Offshore (100 nautical miles)	1	1
Inshore(15 nautical miles)	1	

Table A.1 — NSCV Part D

Certification requirements — deck crew

Vessel size	Area of operation	Master	Mate	Watchkeeper
Vessels in excess of 80 m in length and 3000 GT; or more than 100 m and less than 3000 GT.	All areas	To be determined on the basis of a risk assessment and with guidance from Marine Orders	To be determined on the basis of a risk assessment and with guidance from Marine Orders	To be determined on the basis of a risk assessment and with guidance from Marine Orders
80 m but less than 100 m provided vessel does not exceed 3000 GT	ACMW (600 n mile) — trading vessel	Master Class 3	Master Class 3	Second Mate Class 2
	ACMW (600 n mile) — fishing vessel	Skipper Grade 1	Skipper Grade 1	***Skipper Grade 2
	o/s (200 n mile) — trading vessel	Master Class 3	Master Class 3	***Mate Class 4
	o/s (200 n mile) — fishing vessel	Skipper Grade 1	Skipper Grade 1	***Skipper Grade 2
35 m and over but less than 80 m	ACMW (600 n mile) — trading vessel	Master Class 3	Master Class 4	Mate Class 4
	ACMW (600 n mile) — fishing vessel	Skipper Grade 1	Skipper Grade 2	***Skipper Grade 2
	o/s (200 n mile) — trading vessel	Master Class 3	Mate Class 4	***Mate Class 4
	o/s (200 n mile) — fishing vessel	Skipper Grade 2	Master Class 5/Skipper Grade 3	***Master Class 5/Skipper Grade 3
	i/s (15 n mile) — trading vessel	Master Class 4	Mate Class 4	
	i/s (15 n mile) — fishing vessel	Skipper Grade 2	Master Class 5/Skipper Grade 3	
24 m and over but less than 35 m	Unlimited — trading vessel	Master Class 3	Master Class 4	Mate Class 4
	Unlimited — fishing vessel	Skipper Grade 2	Master Class 5/Skipper Grade 3	***Master Class 5/Skipper Grade 3
	ACMW (600 n mile) — trading vessel	Master Class 4	Master Class 5/Skipper Grade 3	
	ACMW (600 n mile) — fishing vessel	Skipper Grade 2	Master Class 5/Skipper Grade 3	
	o/s (200 n mile) — trading vessel	Master Class 4	Master Class 5/Skipper Grade 3	
	o/s (200 n mile) — fishing vessel	Skipper Grade 2	Master Class 5/Skipper Grade 3	
	i/s (15 n mile) — trading vessel	Master Class 4	Master Class 5/Skipper Grade 3	
	i/s (15 n mile) — fishing vessel	Skipper Grade 2	***Master Class 5/Skipper Grade 3	

Vessel size	Area of operation	Master	Mate	Watchkeeper
	Sheltered waters — trading vessel	Master Class 4	***Master Class 5/Skipper Grade 3	
	Sheltered waters — fishing vessel	Skipper Grade 2	***Master Class 5/Skipper Grade 3	
12 m and over but less than 24 m	Unlimited — trading vessel	Master Class 3	Mate Class 4	***Master Class 5/Skipper Grade 3
	Unlimited — fishing vessel	Skipper Grade 2	Master Class 5/Skipper Grade 3	
	ACMW (600 n mile) — trading vessel	Master Class 4	Master Class 5/Skipper Grade 3	
	ACMW (600 n mile) — fishing vessel	Skipper Grade 2	Master Class 5/Skipper Grade 3	
	o/s (200 n mile)	Master Class 5/ Skipper Grade 3	Master Class 5/Skipper Grade 3	
	o/s (100 n mile)	Master Class 5/ Skipper Grade 3	***Master Class 5/ Skipper Grade 3	
	i/s (15 n mile)	Master Class 5/ Skipper Grade 3	***Master Class 5/ Skipper Grade 3	
	Sheltered waters	Master Class 5/ Skipper Grade 3	***Master Class 5/ Skipper Grade 3	
Less than 12 m	Unlimited — trading vessel	Master Class 3	Master Class 5/Skipper Grade 3	***Master Class 5/Skipper Grade 3
	Unlimited — fishing vessel	Skipper Grade 2	Master Class 5/Skipper Grade 3	
	ACMW (600 n mile) — trading vessel	Master Class 4	Master Class 5/Skipper Grade 3	
	ACMW (600 n mile) — fishing vessel	Skipper Grade 2	Master Class 5/Skipper Grade 3	
	o/s (200 n mile)	Master Class 5/ Skipper Grade 3	Coxswain	
	o/s (100 n mile)	Master Class 5/ Skipper Grade 3	***Coxswain	
	i/s (15 n mile)	Coxswain	***Coxswain	
	Sheltered waters	Coxswain	***Coxswain	

Legend
*** Italics show the recommended level of certification should the position be required for adequate crewing, or required by an Authority.
Note: In sheltered waters an Authority may accept a restricted certificate in lieu of those indicated in this table (see Clause 1.9.1).

Table A.2 — Certification requirements — engineering crew

Engine power	Area of operation	Chief engineer	First engineer
3000 kW and over	All areas	To be determined on the basis of a risk assessment and with guidance from Marine Orders	
1500 kW and over but less than 3000 kW	o/s (200 n mile) and sheltered waters	Engineer Class 3	***Engineer Class 3
1000 kW and over but less than 1500 kW	ACMW (600 n mile)	Engineer Class 3	***Marine Engine Driver Grade 1
	o/s (30 n mile) and sheltered waters	Marine Engine Driver Grade 1	***Marine Engine Driver Grade 1
750 kW and over but less than 1000 kW	ACMW (600 n mile)	Engineer Class 3	***Marine Engine Driver Grade 1
	o/s (30 n mile) and sheltered waters	Marine Engine Driver Grade 1	***Marine Engine Driver Grade 2
500 kW and over but less than 750 kW	Unlimited	Engineer Class 3	***Engineer Class 3
	ACMW (600 n mile)	Marine Engine Driver Grade 1	***Marine Engine Driver Grade 1
	o/s (200 n mile) and sheltered waters	Marine Engine Driver Grade 2	***Marine Engine Driver Grade 2
250 kW and over but less than 500 kW	Unlimited	Engineer Class 3	***Marine Engine Driver Grade 1
	ACMW (600 n mile)	Marine Engine Driver Grade 2	***Marine Engine Driver Grade 2
	o/s (30 n mile) and sheltered waters	Marine Engine Driver Grade 3	***Marine Engine Driver Grade 3
Less than 250 kW	Unlimited	Engineer Class 3	***Marine Engine Driver Grade 1
	ACMW (600 n mile)	Marine Engine Driver Grade 2	***Marine Engine Driver Grade 2
	o/s (200 n mile)	Marine Engine Driver Grade 3	***Marine Engine Driver Grade 3
	i/s (15 n mile) (vessels less than 12 m) and sheltered waters	Coxswain	

LEGEND
*** Italic shows recommended level of certification should the position be required for adequate crewing or by direction of an Authority.
NOTES:
1. For vessels operating outside of offshore limits (near coastal waters) refer to Clause 1.5 for definition of ‘propulsion power’.
2. An engineering qualification is not required on vessels that are powered by outboard motors provided those vessels do not have auxiliary machinery onboard.

7.12 Crew training record

Crew members should familiarise themselves with emergency procedures documented in this manual (Section 3) and be trained to:

- handle the emergency situation on board using developed and practiced emergency procedures and to request assistance if necessary
- communicate distress using emergency HF and VHF channels. Where marine telephone coverage is provided crew should call 000
- during an emergency situation the person requesting assistance should identify their ship give its position and provide clear details of the emergency on board and the service required.

Induction/short term/trial crew
The master of the ship will ensure all short term crew members (less than six months) on board that particular vessel) are trained in the following areas:

Ship's safety features, practices and precautions

- the layout and tour of inspection of the ship
- location of life jackets
- the location of the life ring(s)
- the location, operation, and use of doors and hatches
- the location of the inflatable life raft, or dinghy
- the location of distress flares and EPIRB(s)
- the location of the ship's first aid kit and associated equipment
- the location of portable fire equipment (extinguishers, fire blankets)
- the location of additional fire fighting equipment and closing devices (fuel shut off valves, air dampers, fixed fire suppression system)
- the location of personal protection equipment (ear muffs, wet weather cover alls, boots, gloves, safety glasses)
- the muster alarm device

Location of personal safety equipment

- the location of crew member's life jackets
- muster stations

Instruction and demonstration on how to use the personal safety equipment

- don a life jacket
- deploy a life ring, line and light device
- operate a portable fire extinguisher
- crew member's role in fire emergency situations
- operate hand held and rocket flares, and an EPIRB
- operate air dampers and fuel shutoff devices.

7.13 Communication and languages

All crew and key onshore staff with responsibility to ship's safety need to be able to communicate effectively. Initial safety training, supervision in work practices, relevant sections of the Safety Management System and other relevant written safety material shall be supplied to crew in a language that they understand. Where illiteracy is an issue there will need to be a strategy in place to overcome any safety or record keeping issues that may arise from illiteracy.

Section 8: Certificates and documents

8.1 Certificates and other documents to be kept

All vessels require a range of certificates and documents specific to the type of operation of the vessel and the equipment it may carry. These certificates and documents shall be carried on board the vessel and must be current.

8.2 Surveyor's reports

These reports record the condition of the ship according to the type of survey performed. Surveys must be carried out by an accredited marine surveyor.

Some of the other documents the vessel may be required to carry:

- Certificate of Compliance for Safety Equipment
- Certificate of Compliance for Survey
- Certificate of Compliance for Build
- Certificate of Compliance for Load Line
- Certificate of Compliance for Stability
- Certificate of Compliance for Design
- Electrical Inspection Certificate
- Fire Extinguishing Equipment Service Certificate
- Marine Incident Reports
- Safety Equipment Inspection Certificate
- Gas System Inspection Certificate
- Inflatable Life Raft Inspection Certificate
- Machinery-space Fixed Fire Smothering System Certificate
- Positive Flotation Statement
- Positive Flotation Statement for Tender
- Rigging Inspection Certificate for Sailing Vessels
- Shipping Inspector Report
- Section 18A exemption
- Restricted Use Flag Certificate
- Parasailing Equipment Inspection Certificate
- Statement for Open Reversible Liferaft

Section 9: Assessing and managing risk

Given the number of hazards in the maritime environment, identifying and managing hazards are paramount for safety.

9.1 Hazard checklist

The following checklist may assist in focusing attention on specific and possible OHS hazards on board:

- Housekeeping, health and hygiene — deficiencies in ship structure, equipment and furnishings, spillages and water on deck, poor security of heavy objects, doors and so on, deck fittings, wires and ropes, lines under tension, suspended weights and loads, litter, aerosols and heat, personal cleanliness and hygiene, food handling hygiene, low/high temperatures and humidity.
- Fire and heat — smoking and naked flames, electrical installations and fittings, heaters, exhausts and spontaneous combustion cooking.
- Shipboard emergencies — fire and smoke, use of safety equipment, drowning and hypothermia, person overboard.
- Ship access — ladders and gangways, pilot embarkation, tender transport.
- Movement about ship — vessel movements, stowage and obstructions, deck surfaces, unsecured doors and hatches, lighting, guards and fencing, access to holds and deck spaces, drainage.
- Enclosed or confined spaces — holds, tanks, lockers and voids, atmospheres (explosive, toxic and/or oxygen-deficient).
- Manual lifting and carrying — weight, size and shape of loads, sharp edges and protrusions, greasy surfaces, ship movement, coordination of two or more handlers.
- Machinery, tools and materials — engine spaces, deck machinery, cargo gear, hand tools, portable power tools, workshop machines, compressed air, spirit lamps, compressed gas cylinders.
- Welding and hot work — electric welding, flame cutting and brazing.
- Working aloft and over side — cradles and stages, bosun's chair, portable ladders and scaffolding, rope ladders, working from punts.
- Electricity and electrical equipment — primary wiring, wandering leads and portable equipment, rectifiers and electronics, radio equipment (especially aerials), batteries, computers, radio display units.
- Dangerous substances and radiation — toxic and other dangerous goods, unsaturated polyesters, adhesives, insulation, paint and surface treatments, asbestos, synthetic mineral fibres, radio and radars, passive smoking.

9.2 Risk assessment

By way of the nature of a ship's construction and operation, certain hazards and risks are present. Unlike workplaces ashore, a ship operates in a dynamic environment. They present owners and operators with a particular set of environmental conditions that would not be encountered in a shore based environment. Owners and operators should be aware that identification and management of risk is an integral part of the safe operation of the ship.

The *Australian Standard AS/NZS: 4360 2004 Risk Managemen*t, key definitions are:

- risk is the chance that something will happen that will impact on what we do. It is measured in terms of consequence and likelihood
- hazard is a source of potential harm or a situation with the potential to cause loss

- risk identification is the process of determining what can happen, why and how
- risk assessment is the overall process of risk analysis and evaluation
- risk control is the process used to implement policies, standards, procedures and physical change to eliminate or minimise adverse risk.

The next section will provide guidelines on risk assessment based on the National Standard for Commercial Vessels (NSCV), which will replace *Uniform Shipping Laws Code*.

9.3 Method of risk assessment:

Step 1 — identify hazards

List every reasonably foreseeable hazard at the workplace that has the potential to cause harm.

Step 2 — assess and prioritise risks

An assessment of risks associated with that hazard should be made for all identified hazards. Using all available means and information, prioritise risks separately in terms of their likelihood and the seriousness of their consequences.

Step 3 — decide on control measures and hierarchy of control

Control measures should adequately control hazards, not create another hazard, and avoid undue discomfort and distress.

Step 4 — implement control measures

Some of the processes that may be involved in implementation may include:

- the development of new work procedures
- communication
- supervision
- ensuring new measures are maintained over time.

Step 5 — monitor and review

For some time after implementation of risk control measures it may be necessary to seek answers to the following questions.

- Have the control measures been implemented as planned?
- Are they working?
- Have they introduced any new problems?

9.4 Step 1 — hazard identification

All reasonably foreseeable hazards to health and safety arising from a vessel and systems of work associated with the vessel should be identified. When assessing hazards, consider the typical factors relating to hazards.

Typical factors relating to hazards on vessels
Hazards associated with the following factors relevant to the design, construction and use of the vessel, should be identified:

- suitability of the type of vessel for the particular service
- the intended areas of operation including
- navigational hazards
- sea and wind states

- traffic
- rescue facilities
- availability of shelter
- weather forecasting
- maintenance facilities
- berthing facilities
- characteristics of the actual and intended use of a vessel
- foreseeable abnormal situations and operating conditions
- potential for personal injury due to: entanglement; crushing; trapping; cutting; stabbing; puncturing; shearing; abrasion; tearing; and stretching
- hazardous conditions due to: pressurised content; electricity; noise; vibration; fire; smoke; explosion; temperature; moisture; vapour; gases; dust; hot or cold parts
- failure of machinery or engineering systems on a vessel resulting in: the loss of the watertight integrity; loss of control and manoeuvrability; fire; explosion; loss of emergency systems; evacuation
- failure of the structure by: yield; buckling; ultimate failure or fatigue resulting in the loss of watertight integrity; structural collapse under load; loss of emergency systems; effect on evacuation
- collision or grounding of the vessel resulting in: loss of watertight integrity; loss of stability; loss of emergency systems; need for evacuation
- failure of closing appliances on the vessel resulting in: loss of watertight integrity; stability; and emergency systems; need for evacuation
- uncontrollable fire resulting in: flame; heat; smoke and toxic fumes; loss of emergency systems; need for evacuation
- inadequate arrangements for access, egress and escape from within the vessel or from the vessel itself resulting in personal injuries in normal conditions and injuries and potential loss of life in emergency conditions
- inadequate arrangements for seating or berthing resulting in personal injuries in normal or abnormal conditions of operation
- operator error arising from lack of competency (skill and knowledge), fatigue, inadequate systems of work, inadequate information and feedback
- failure of control, monitoring or communication systems resulting in: loss of control; loss of manoeuvrability; mechanical failure; failure to identify and respond quickly to an emergency; failure of emergency systems
- loss of stability arising from: improper loading; excessive heeling moments (wind, passenger, crane, fishing and so on); dynamic effects of a seaway; breach of watertight integrity
- ergonomic needs
- hazards arising during and after evacuation including: personal injury during disembarkation; exposure; hypothermia; drowning; starvation; thirst.

9.5 Step 2 — assess and prioritise risk

Where a hazard is identified, an assessment of risks associated with that hazard should be made.

Nature of risk - The operator must assess the level of the risk by working out the likelihood the event will occur and the level of consequence if it does. The highest level risks are considered as a priority.

Likelihood —- likelihood of a risk is the degree of probability that the dangerous event will occur. The various levels of hazard likelihood are as follows:

- almost certain — where an occurrence is likely to occur often during the operational life of a particular vessel
- likely — where an occurrence is unlikely to occur often but which may occur several times during the total operational life of a particular vessel
- possible — where an occurrence is unlikely to occur to every vessel but may occur to a few vessels of a type over the total operational life of a number of vessels of the same type
- unlikely — where an occurrence is unlikely to occur when considering the total operational life of a number of vessels of the type, but nevertheless should be considered as being possible
- rare — where an occurrence is so extremely remote that it should not be considered as possible to occur

Consequence — consequence of a risk is the most likely outcome of a potential accident including injuries, financial cost, productivity and/or environmental damage. The various levels of hazard consequence are as follows:

- insignificant-an effect which has no injuries or loss of work and low financial loss
- minor — an effect which can be readily compensated for by the operating crew. It may involve one or more of the following:
    - + a small increase in the operational duties of the crew or in their difficulty in performing their duties.
    - + a moderate degradation in handling characteristics
    - + slight modification of the permissible operating conditions
    - + first aid treatment on site
- moderate — an effect which produces one or more of the following:
    - + a significant increase in the operational duties of the crew or in their difficulty in performing their duties which by itself should not be outside the capability of a competent crew provided that another major effect does not occur at the same time
    - + significant degradation in handling characteristics
    - + significant modification to the operating conditions, but will not remove the capability to complete a safe journey without demanding more than the normal skill on the part of the operating crew
    - + medical treatment required on site. Hazard contained with outside assistance, high financial loss

- major — an effect which produces one or more of the following:
    - a dangerous increase in the operational duties of the crew or in their difficulty in performing these duties of such magnitude that they cannot reasonably be expected to cope with them and will probably require outside assistance
    - dangerous degradation of handling characteristics
    - dangerous degradation of the strength of the vessel
    - extensive injuries or death. hospitalisation
    - major financial loss
    - an essential need for outside rescue operations
- catastrophic — an effect which results in the loss of the vessel and/or fatalities and or huge financial loss.

Create a risk register by prioritising the risks to the ship and its operations. Address the greatest risks first.

Extreme risk — immediate action required.

High risk — attention needed.

Moderate risk — responsibility must be specified.

Low risk — managed by routine procedures.

Acceptable and unacceptable levels of risk

Relative levels of risk are determined by considering the likelihood of occurrence against the severity of the consequences. An assessment is made to determine whether particular combinations of likelihood and consequence are a negligible, tolerable or intolerable risk

Intolerable risk — the presence of the hazard in the system or situation cannot be justified and the risk level must be reduced. An intolerable risk would almost certainly be unacceptable. If it is impossible to achieve risk reduction cost-effectively, serious consideration should be given to abandoning the project, activity or system for another option.

Tolerable risk — the hazards in the system or situation will probably give rise to accidents, but that the frequency and nature of the consequences could probably be tolerated. If it is possible to reduce the risk levels cost-effectively, then an effort should be made to do so, particularly for hazards that fall just below the intolerable threshold. A tolerable risk may or may not be acceptable depending upon the effort that might be required to further reduce the risk compared to the benefits of doing so.

Negligible risk — means the hazards in the system or situation are most unlikely to lead to accidents and no effort need be expended to reduce their risk levels. A negligible risk would normally be acceptable.

9.6 Step 3 — control of risk

Where an assessment identifies a requirement to control a risk to health or safety, that risk should be eliminated or, where it cannot be eliminated, controlled to an acceptable level.

It is often necessary to use more than one control measure to manage exposure to risk. For example, to minimise exposure to a risk involving a chemical you could decide to:

- replace the chemical with a less toxic one
- implement safer work procedures
- use personal protective equipment.

Some control measures are more powerful than others. The different levels of control solutions are called the control hierarchy.

- eliminate
- substitute
- redesign
- isolate
- administrative controls
- personal protective equipment (PPE)

Eliminate the risk is the first choice — hazard removal or transfer. This is the most effective control measure and should always be considered first for example. Remove hazard or stop doing something.

Substitute a less hazardous material, process or equipment.

Redesign the equipment or work process.

Isolate by engineering solutions — protective barriers on machinery. Can the hazard be removed from interaction with people or vice versa?

Administrative controls allow you to minimise exposure to a risk through the use of procedures or instruction.

Personal protective equipment (PPE) is used as a last resort and is worn by people as a final barrier between themselves and the hazard, for example: clothing, respirators, eye protection, hearing protection. PPE does not control the hazard at the source. It must be accompanied by changes in behaviour (wear it), and must be used correctly and maintained.

9.7 Common hazards to consider

Access/egress — there should be sufficient access and egress (exit) to each of the following:

- the vessel itself and public spaces in both normal and abnormal conditions having regard to the demographic characteristics of persons on board, including access for the disabled, where appropriate
- assembly and evacuation stations
- parts of a vessel that require inspection, cleaning and maintenance
- spaces normally or potentially manned by members of the crew.

Enclosed spaces

Where access to enclosed spaces in a vessel is required as part of normal operation and persons may become entrapped exposing them to increased risk due to heat, cold or lack of oxygen, then the following should be provided:

- emergency lighting
- means of opening the door from both sides
- alarm systems

Dangerous areas

Where an assessment identifies a risk of exposure to areas that are or become dangerous during operation, examination, lubrication, adjustment or maintenance, that risk should be eliminated or, where it cannot be eliminated, it should be controlled to an acceptable level.

Where guarding is used as a control measure, a person with the responsibility for the control of risk should ensure that the arrangements for guarding are appropriate for the particular application.

Sources of information to assist in risk management

There many ways to get different ideas on risks and how to treat them including:

- crew and staff suggestions
- customer feedback
- past records
- relevant experience
- industry practice and lessons
- expert advice
- standards, codes and legislation
- manufacturer manuals and procedures.

9.8 Step 4 — implement control measures

Putting the control measures in place may require you to complete one off changes to the vessel, change a procedure, improve your maintenance, increase or change training.

The vessel operator should record the changes they've made to implement controls and let the crew and other relevant people know about then.

9.9 Step 5 — monitor and review

As part of your risk assessment you must continue to monitor and review the changes you have made to ensure they are implemented, working and reached the intended outcome.

Questions you should ask in this process:

- Have your controls worked?
- For some time after implementation of risk control measures it may be necessary to seek answers to the following questions.
- Have the chosen control measure been implemented as planned
- Are the measures being used correctly?
- Are the control measures are working?
- Has exposure to the assessed risks been eliminated or adequately reduced?
- Have implemented control measures resulted in the introduction of any new problems or worsening of any existing problems?

9.10 Emergency scenarios with potential controls

These lists provide a further set of scenarios where emergency plans can reduce risk with control measures to remove, reduce or transfer risk. The list of emergencies and the controls is a guide only. The point is for the owner and/or master to think about the risks to the ship and what controls they could implement to address those risks. Section 7 provides further information on how to do this.

Engine room fire — potential controls

policy in relation to weather and sea conditions

pre-departure procedures

storage of flammable liquids

vessel design and construction

extinguishers and location

engine room start-up checks

life rafts

fuel choices

hot surfaces and materials

electrical maintenance

lighting

insurance policy

crew briefing procedure

crew adequacy

fixed fire-fighting systems

radio support

smoke alarm and extraction

crew training

passenger and crew numbers control

inspection schedule

sea-worthiness of vessel

fire suppression systems

insulation of engine room

ventilation

smothering systems

fuel auxiliary cut-off switch

Abandon ship — potential controls

policy in relation to weather and sea conditions

crew emergency preparedness

shore-based maintenance

location of assembly stations

accessibility of assembly stations

life rafts and personal flotation devices

engine room log records

lighting

insurance policy

passenger safety briefing

crew drills and emergency stations

remote sensors

inspection schedule

voyage planning

crew induction procedures and education

communication proficiency between crew and passengers

Collision with beacon — potential controls

policy in relation to weather and sea conditions

crew watch

vessel design and construction

machinery maintenance schedule

fenders on vessel

alcohol and drugs policy

watch rotation system

lighting

insurance policy

navigation equipment

construction of vessel

navigation and voyage planning

crew training

radio contact

inspection schedule

fatigue management procedures

crew adequacy

passenger number policies

Crew fatigue — potential controls

- policy in relation to weather and sea conditions
- crew shifts and length
- number of hours of broken sleep
- alcohol and drug policy
- crew recruitment and selection procedures
- crew numbers
- voyage planning
- lighting
- insurance policy
- sleeping conditions (noise and layout)
- morale and duties
- crew leave policies
- crew induction procedures
- crew training
- job rotation schedules
- inspection schedule
- fit-for-work policy
- guards over machinery
- personal protective equipment
- engineering controls – dead man switches

Anchor cable snapping — potential controls

- policy in relation to weather and sea conditions
- communication between post at anchor and wheel
- guards over winch
- preventative maintenance
- chain quality
- lighting
- insurance policy
- vessel design
- maintenance
- safeguards
- fatigue-management policy
- chain cutters on hand
- voyage planning
- crew training
- crew selection procedures
- inspection schedule
- machinery controls
- isolation controls (remote control)
- proximity alarms
- medical facilities on vessel

Injury on moving vessel — potential controls

- policy in relation to weather and sea conditions
- safety signs
- hatches secured
- no sharp edges policy
- number of passengers
- voyage planning
- hull construction
- non-slip paint
- non-slip carpet areas
- lighting
- insurance policy
- carpet on combings
- responsible service of alcohol policy
- passenger briefing
- medical supplies on board
- high railings safety system tube with wire
- inspection schedule
- davit mechanical system
- safety rail on stairs
- non-slip stairs
- medical evacuation procedures and training

Food poisoning on board — potential controls

- policy in relation to weather and sea conditions
- log medical condition
- operational procedures
- hazard-identification strategies
- voyage planning
- crew training and induction procedures
- insurance policy
- food handling policies
- emergency review procedures
- crew emergency response planning
- menu planning and food storage procedures
- inspection schedule
- crew training in HACAP

Confined space gas leak — potential controls

- policy in relation to weather and sea conditions
- breathing apparatus equipment
- crew rotation and planning
- communications equipment with shore
- minimum crew policy
- passenger information records
- alarm system
- lighting
- insurance policy
- life lines for crew
- communications with bridge
- customer feedback process
- crew training
- gas systems maintenance and cleaning
- inspection schedule
- entry procedures to confined spaces
- safety management and incident reporting procedures

Section 10: Glossary and acronyms

10.1 Glossary and acronyms

A

Adrift	floating free with the currents and tide; said of a free floating object or vessel which can not move by its own power; floating at random
Aft	at, near or towards the stern; to move aft is to move back
Aground	when the hull or keel is touching or fast to the bottom of any body of water; on or onto the shore
Ahead	in front of the vessel, forward; in a forward direction; opposite of astern
Allision	is the act of dashing against or striking upon; it is often used to describe the action of one boat hitting against another, or of the sea dashing against a boat. The word is commonly used in place of 'collision' to distinguish that one of the objects was fixed.
Aloft	above the deck, usually overhead on the mast or in the rigging
Alongside	close beside a vessel, wharf or jetty
Anchor	(1) a heavy metal object, fastened to a chain or line to hold a vessel in position, partly because of its weight but chiefly because the designed shape digs into the bottom (2) the act of using an anchor
AMSA	Australian Maritime Safety Authority
Antifouling paint	a paint applied to the vessel's bottom below the waterline to inhibit the growth of marine life such as weeds or barnacles
Ashore	on the land or aground
Astern	backwards, somewhere behind the vessel, towards the stern; in the direction of or behind the stern; opposite of ahead
Autopilot	electro-mechanical steering device; an instrument designed to control automatically a vessel's steering gear so that the vessel follows a predetermined track through the water
Auxiliary	(1) a second method of propelling a vessel, on a sailboat this would be the engine (2) machinery fitted in steam and motor vessels which is not part of the main propelling machinery (3) a support group, for example Coast Guard Auxiliary
Awash	water washing over; the situation of an object when almost submerged

B

Bail	to remove water from the vessel by hand, bailer, bucket or pump
Ballast	weight at the bottom or the lower portion of the vessel to give it stability and/or to provide satisfactory fore and aft trim
Ballast tanks	tanks carried in various parts of a vessel for water ballast, for stability and to make the vessel seaworthy
Bar	a region of shallow water usually made of sand or mud, usually running parallel to the shore. Bars are caused by wave and current action, and may not be shown on a chart
Bare boat charter	a charter in which the bare vessel is chartered without crew; the charterer, for a stipulated sum taking over the vessel for a stated period of time, with a minimum of restrictions; the charterer appoints the master and the crew and pays all running expenses

Barge	(1) a cargo carrying vessel, usually without an engine, towed or pushed by a tug. Small barges for carrying cargo between vessel and shore are known as lighters (2) a term in sail racing where a vessel which forces its way illegally between another contestant and the starting line is said to be barging
Barnacle	a small shellfish which sticks to the bottom of a vessel
Bay	an indentation of the coastline between two headlands
Beacon	a lighted or unlighted fixed (non-floating) aid to navigation that serves as a signal or indication for guidance or warning (lights and day beacons both constitute 'beacons')
Beam	(1) the transverse measurement of a vessel at its widest point, also called breadth (2) one of the transverse members of a vessel's frames on which the decks are laid
Bearing	(1) a compass direction, in compass points or degrees, from one point to another. Relative bearing is the direction relative to the heading of the vessel with the bow 0° and the stern 180°. True bearing is the direction from the vessel relating to true north with north being 0° and south 180° (2) a device for supporting a rotating shaft with minimum friction, which may take the form of a metal sleeve (bush), a set of ball bearings (roller ball), or a set of pins around a shaft (needle bearing)
Berth -	(1) a place for a person to sleep (2) a place where the vessel can tie up or anchor (3) a position of employment onboard a vessel (4) a safe and cautious distance
Bilge	the part of the floors of a vessel on either side of the keel which approaches closer to a horizontal rather than vertical direction. The very lowest part of a vessel's interior where water is likely to collect
Bilge keels	shallow keels, usually placed in conjunction with or in place of a centre keel. Attached to each side of a vessel, they provide lateral resistance and stability, as well as support the weigh of the hull of the vessel on the ways when launching, or when in dry dock for cleaning or repairs
Bilge pump	a mechanical, electrical, or manually operated pump used to remove water from the bilge
Block	a wooden, metal or plastic case in which one or more sheaves (pulleys) are placed, through which turns of line (falls) are threaded for the purpose of gaining mechanical advantage or changing the direction of motion. Lines used with a block are known as tackle
Bollard	a large solid post on a wharf or pier for securing mooring lines; the same when constructed on the deck of a vessel
Bosun's chair	canvas or wood seat attached a halyard to raise and lower someone to work on the mast
Bow	the forward most or front part of the vessel. Opposite of stern
Bowline	a knot use to form an eye or loop at the end of a rope. A knot with many uses, it is simple and strong, its loop will not slip, and it is easily untied after being exposed to a strain (also see running bowline)
Breach	(1) said of seas that break over a vessel or over a sea wall (2) a whale breaches when it leaps out of the water
Bridge	(1) the location from which a vessel is steered and its speed controlled, being the navigation and command centre of the vessel (2) a man made structure crossing a body of water
Broach	to spin out of control and capsize or nearly capsize; the turning of a vessel broadside to the wind or waves, subjecting it to possible capsizing; a turning or swinging of the vessel that puts the beam of the vessel against the waves, creating a danger of swamping or capsizing; loss of steering; a knockdown

Bulkhead	a name given to any vertical partition or wall which separates different compartments or spaces from one another, also adding strength. Sometimes bulkheads are also watertight, adding to the vessel's safety
Bulwark(s)	a railing around the deck of a vessel to keep things from going overboard and the seas from coming onboard; the strake of shell plating above a weather or shelter deck; the part of a vessel's side that extends above the main deck to protect it against heavy weather
Bung	a round wood plug inserted in a hole to cover a nail, screw, or bolt
Bunker(s)	a compartment in which fuel is stored; fuel consumed by the engines of a vessel
Buoy	(1) a floating object employed as an aid to mariners to mark the navigable limits of channels, their fairways, sunken dangers, isolated rocks and so on (2) an anchored float marking a position or for use as a mooring.
Buoyancy	the capacity for floating

C

Cable	(1) a strong rope or chain for pulling or securing anything, usually a vessel's anchor (2) a nautical measurement of distance (a tenth of an international nautical mile - 185.2 metres)
Capsize	to turn a boat over
Cardinal points	the compass points of north, east, south and west. Inter-cardinal or half cardinal points are south-east, south-west, north-west and north-east
Cast off	to let go of a line; to leave a dock or a mooring; to untie or loose a rope or line
Cavitation	loss of effective propeller thrust caused by the blades cutting across the column of water sucked along by the propeller instead of working in it. Can also lead to heavy vibration of the vessel
Chain locker	the compartment, near and below the hawse holes at the bow, for stowing the anchor chains; a compartment in the lower part of a vessel for stowing an anchor chain
Chart	a representation on a plane surface of the spherical surface of the earth. The equivalent of a map for use by navigators
Charter	the renting of a vessel
Chine	the angle of intersection between the topsides and the bottom of a vessel. In a hard chined vessel this angle is pronounced
Cleat	fitting of wood or metal, secured to the deck, mast, or spar, with two horns around which ropes are made fast. The classic cleat to which lines are belayed is approximately anvil shaped
Cockpit	the location from which the vessel is steered, usually in the middle or at the stern
COLREGS	*Convention on International Regulations for Preventing Collisions at Sea*; Rules of the road. Internationally accepted rules by which vessels at sea must keep clear of each other
Compass	navigation instrument, either magnetic, containing a magnetized card indicating the direction to magnetic north (showing magnetic north) or gyro (showing true north)
Crew	personnel, excluding the master, who serve onboard a vessel (also excludes the passengers on passenger vessels). In some cases, a differentiation between officers and ratings is made; but officers are crew in a legal sense
Current	the movement of waters associated with large scale circulation of the oceans

D

Deck	a permanent covering over a compartment, hull or any part of a vessel serving as a floor
Deckhand	seaman who works on the deck of a vessel and remains in the wheelhouse attending to the orders of the duty officers during navigation and manoeuvring. He also comes under the direct orders of the bosun
Depth sounder	an instrument that uses sound waves to measure the distance to the bottom
Deviation	(1) differences between the compass reading and an actual magnetic direction caused by magnetic forces in the vicinity of the compass, which are usually the result of masses of metal, speaker magnets and so on (2) vessel departure from specified voyage course
Dinghy	a small open vessel often used as a tender and lifeboat for a larger vessel; a small open vessel, usually carried aboard a yacht for going ashore
Displacement	the weight of a floating vessel measured as the weight of the amount of water it displaces. A vessel displaces an amount of water equal to the weight of the vessel, so the vessel's displacement and weight are identical
Dory	hard chined dinghy with flared sides, considered a useful weight carrying work vessel
Draught	(1) the depth of the vessel below the waterline; the amount of vertical distance from a vessel's water line to the bottom of it's keel (2) the depth of water necessary to float a vessel (3) the belly or chord depth of the sail, its fullness
Drag	(1) the resistance to movement (2) an anchor drags when its flukes do not hold
Drift	the distance a vessel is moved out of position by current or tidal flow
Dry dock	a dock into which a vessel is floated, which when raised lifts the vessel out of the water. Can also be a watertight basin with one end open to the sea that can be closed and sealed with a gate, thus allowing the basin to be pumped out. This facility allows inspections, painting and repairs to be made on the hull and any underwater machinery

E

Echo sounder	an electrical depth sounder or fish finder that uses sound echoes to locate the depth of objects in water. It does so by timing the sound pulses
EPIRB	Emergency Position Indicating Radio Beacon
Estimated position	a position based on estimations of a vessel's position using course and distance, currents and leeway since the last known position / fix of the vessel
ETA	estimated time of arrival
ETD	estimated time of departure
Extra low voltage	applies to those parts of a vessel's electricity supply that do not exceed 50 V a.c and 120 V d.c.

F

Fender	a protective cushion of durable material hung from the sides of a vessel to protect it from rubbing or chafing against a dock or another vessel.
Fix	a vessel's position determined by observation and navigational data
Flood	(1) to fill a space (room) with water (2) a rising tide
Foul	(1) generally something wrong or difficult (2) to be tangled (line) or in turmoil (air) to entangle or obstruct (3) in racing, rules infraction
Fouled	any piece of equipment that is jammed, clogged, entangled, or dirtied
Freeboard	the vertical distance from the lowest point of the main deck (usually near midships) to the waterline
Freeing port	an opening in the bulwark or rail for discharging large quantities of water, when thrown by the sea upon the vessel's deck. Some vessels have 'swing gates' which allow water to drain off but which automatically close from the pressure of sea water

G

Galley	(1) the kitchen area of a vessel (2) very old fighting vessel propelled by oars
Gear	a general term for ropes, blocks, tackle, equipment, instruments, riggings, any apparatus used aboard a vessel; clothing and other personal items taken aboard a vessel
Gross tonnage	a common measurement of the internal volume of a vessel with certain spaces excluded. One ton equals 100 cubic feet; the total of all the enclosed spaces within a vessel expressed in tons, each of which is equivalent to 100 cubic feet
Gunwale	the upper edge of a vessel's side; the part of a vessel where hull and deck meet. *(pronounced 'gunnel')*

H

Harbour master	the official who is in charge of a harbour, enforcing all its applicable regulations
Hatch	a sliding or hinged opening in the deck, providing people with access to the cabin or space below; an opening in a vessel's deck fitted with a watertight cover
Haul	to pull in or heave on a line by hand; to pull
Hazard	an object that might not allow safe operation. A group of rocks just under the water or a submerged wreck could be a navigational hazard
Head	(1) a marine toilet or the compartment containing a toilet (2) generally, the top or forward part (3) the upper corner of a triangular sail (4) the top portion of a mast
Head sea	a sea which is travelling in the opposite direction to that of the vessel
Heading	direction in which vessel's bow is pointing at any instant
Heel	(1) the movement of a vessel away from upright due to an external force (wind or waves) (2) the after end of a vessel's keel (3) the lower end of a mast
Helm	the apparatus by which a vessel is steered, including the rudder, steering wheel and tiller
Hold	a general name for the spaces below the main deck designated for stowage of general cargo

Hull	the main structural body or shell of the vessel, not including the deck, keel, mast, or cabin
Hypothermia	a life threatening condition where there is loss of body core heat; the greatest danger for anyone in the water

I

IMO	*International Maritime Organization*
Inboard	(1) toward the centre of the vessel (2) an engine that is mounted inside the vessl
Inflatable	a dinghy or raft that can be inflated for use or deflated for easy stowage
Inshore	near or toward the shore

J

Jacobs ladder	a rope ladder with wooden steps, lowered from the deck for pilots or passengers to come aboard
Jetty	a man made structure projecting from the shore. May protect a harbor entrance or aid in preventing beach erosion
Jib	the foremost sail; a triangular shaped foresail forward of the foremast

K

Keel	(1) the backbone of a vessel, running fore and aft along the centre line of the bottom of the hull; the timber at the very bottom of the hull to which frames are attached (2) a flat surface built into the bottom of the vessel to prevent or reduce the leeway caused by the wind pushing against the side of the vessel. A keel also usually has some ballast to help keep the vessel upright and prevent it from heeling too much. There are several types of keels, such as fin keels and full keels
Knot	(1) a speed of one nautical mile (6,076 feet or or 1,852 metres) per hour. It is incorrect to say knots per hour (2) a method of attaching a rope or line to itself, another line or a fitting

L

Landmark	a distinctive fixed reference point that can be used for navigation
Launch	(1) to float a vessel off the ways in a building yard after it is completed (2) a small vessel used to ferry people to and from a larger vessel
(2)	
Lead	refers to the direction in which a line goes
Lead line	a line with a weight on the end used to measure depth. The lead is dropped into the water and marks on the line are read to determine the present water depth. The lead usually has a cavity to return a sample of the bottom type (mud, sand)
Lee	the side of a vessel, or a shore location, sheltered from the wind; also used in context to refer to a sheltered place out of the wind, as in the lee of the island; the area to the leeward
Leeward	direction away from the wind. In the Rules of the Road, the leeward vessel is the one farthest from where the wind is coming from. Opposite of windward
Life jacket	a device used to keep a person afloat. Also called a life preserver, life vest, PFD or personal floatation device
Liferaft	a raft used in case of emergencies, such as sinking

Life vest	a wearable device used to keep a person afloat. Also called a life jacket, life preserver, PFD or personal flotation device
Lifeboat	small vessel carried on the primary vessel and used in case of emergency
Line	rope and cordage used aboard a vessel. On small vessels they are all called lines
Log	(1) a record of all the activities aboard a vessel (log book) (2) a device used to measure the distance travelled and speed through the water
Lookout	a person designated to watch for other vessels and hazards
Low voltage	Low voltage exceeds 50V ac and 120V dc but is less than 1000V ac and 1500V dc

M

Make way	moving through the water
Manifest	a document containing the vessel's name and port of registry, a full list of the vessel's crew, passengers, full details of its cargo, and other relevant information
Mariner	in general, a person employed in a sea going vessel. In some cases, applied to a seaman who works on deck
Mark	an object used as a reference point while navigating
Mast	the vertical pole or spar that supports the boom and sails. A mast on a mechanically propelled vessel holding electronics antennas and lights
Master	the captain of a vessel. Highest ranking officer aboard the vessel, overseeing all vessel operations and communications. Keeps ships records, handles accounting and bookkeeping. Takes command of vessel in inclement weather and in crowded or narrow waters
Mate	a deck officer ranking next below that of master. Usually divided into first, second, third, and so on to indicate seniority
Mayday	an internationally recognized distress signal used on a radio to indicate a life threatening situation. Mayday calls have priority over any other radio transmission and should only be used if there is an immediate threat to the vessel. Mayday comes from the French M'aidez which means help me
Mermaid	a mythical creature, half human and half fish
Mess	dining room facilities and kitchen for crew separate from the passenger dining room and kitchen
Moor	to attach a vessel to a mooring, dock, post, anchor, etc
Mooring	an anchor or weight, permanently attached to the sea floor, with a connection to a buoy at the surface, used to hold the vessel in a certain area
Muster	to assemble passengers and / or crew

N

Nautical mile	distance at sea is measured in nautical miles, which is about 6067 feet, 1.15 statute miles or 1852 metres. A nautical mile has the unique property that it is equal to a minute of latitude. Measurement of speed is done in knots (one knot equals one nautical mile per hour)
Naval architect	a person who designs vessels
Navigation	the art and science of determining the position of a vessel and the course needed to safely and efficiently move the vessel from place to place

Navigation lights	required lights on a vessel help others determine its course, position and what it is doing. A vessel underway should have a red light visible from its port bow, a green light on the starboard bow, and a white light at its stern. Other lights are required for vessels under power, fishing, towing and so on
Navigational aid	any object that a navigator may use to find his position, such as permanent land or sea markers, buoys, radio beacons, and lighthouses
Navigator	the officer onboard responsible for the navigation of the vessel
Net tonnage	useful cargo carrying capacity of vessel. The volume of cargo a vessel could carry, equal to gross tonnage minus the crew cabins, storerooms and machinery spaces. One ton equals 100 cubic feet
NMSC	*National Marine Safety Committee*
NSCV	*National Standard for Commercial Vessels*

O

Oar	a pole with a blade at the end used to row a rowboat. Oars are different than paddles because they have a provision to be secured to the vessel for rowing, such as an oarlock. The three parts to an oar are: the blade, the part which enters the water; the shaft, the main body of the oar: and the loom, the inboard end on which the rower pulls
Offshore	away from land, toward the water
Outboard	(1) toward or beyond the vessel's sides (2) a detachable engine mounted on a vessel's stern
Overboard	in the water outside of the vessel
Overhaul	(1) repairing or refitting (2) to overtake another vessel at sea (3) to extend a tackle so that a distance between blocks is increased
Overhead	nautical equivalent of ceiling

P

Paddle	a stick with a blade in the end of it used to propel a small vessel through the water; the act of using a paddle to propel a vessel
Painter	a line tied to the bow of a small vessel for use in towing, securing or tying up
Pan pan	an urgent message used on a radio regarding the safety of people or property
Passage	a journey from one place to another
Personal flotation device (PFD)	official terminology for life jacket. When properly used, a PFD will support a person in the water. Also called a life jacket, life preserver or life vest
Personal watercraft (PWC)	small vessel similar to and including jetskis
Pilot	an individual with specific knowledge of a harbor, canal, river or other waterway, qualified to guide vessels through the region. Some areas require that vessels be piloted by a licensed pilot
Plane, planing	to gain hydrodynamic lift, causing the vessel to lift, rising slightly out of the water so that it is gliding over the water rather than plowing through it, reaching speeds in excess of those normally associated with its waterline length
Plot	to mark a course on a chart

Port	1) the left side of the boat when facing forward; originally called larboard. The opposite of starboard (2) a porthole. A window in the side of a vessel, usually round or with rounded corners (3) a harbour
Propeller	a rotating device, with two or more blades, that acts as a screw in propelling a vessel. Sometimes called a screw

Q

Quadrant	(1) a nautical instrument, on the arc of which is a finely graduated scale showing degrees and minutes, with adjustable reflectors and so on, used to find the altitude of heavenly bodies, angular distances, and so on (2) on a steering gear, the rudder quadrant is a section of a wheel or sheave fastened to the rudder head
Quick flashing light	a navigational aid with a light that flashes about once per second

R

Radar	Radio detection and ranging. An electronic instrument that uses radio waves to find the distance and bearing of other objects. Used to avoid collisions, particularly in times of poor visibility
Radio	an instrument that uses radio waves to communicate with other vessels. VHF (very high frequency) radios are common for marine use, but are limited in range. Single Side Band (SSB) radios have longer ranges
Raft	a small flat vessel, usually inflatable
Reckoning	the record of courses steered and distances travelled since the time a vessel's position was last fixed by shore or astronomical observations
Render	(1) the action of a line as it passes over the sheave of a block (2) the act of easing away gently
Right of way	the right to maintain a course according to the rules of navigation. When two vessels are on intersecting courses, one is the 'stand on' vessel (has 'right of way' and must hold its course steady) so the other 'give way' vessel may steer clear
Rudder	a board shaped swinging vane, controlled by a tiller or wheel, and attached to the rudderpost or stern for steering and manoeuvring a vessel
Rules of the road	the rules concerning which vessel has the right of way if there is a possibility of collision between two or more vessels; written to prevent accidents and collisions; includes right of way, lights, pennants, and whistle signals
Running lights	lights required to be shown on vessels underway between sunset and sunrise; they tell other vessels not only where you are, but what you are doing

S

Safety harness	a device worn around a person's body that can be tethered to jack lines to help prevent a person from falling overboard
Salvage	recovery and reclamation of damaged, discarded or abandoned material, vessels, and floating equipment for reuse, repair, re-fabrication or scrapping. Also the property which has been recovered from a wrecked vessel, or the recovery of the vessel.
Scope	the ratio of the length of an anchor line, from a vessel's bow to the anchor, to the depth of the water

Screw	a vessel's propeller
Scupper	an opening in a deck, cockpit, toe rail or gunwale to allow water to run off the deck and drain back into the sea
Seaworthiness	statement on the condition of the vessel. The sufficiency of a vessel in materials, construction, equipment, crew and outfit for the trade in which it is employed. Any sort of disrepair to the vessel by which the cargo may suffer, overloading, untrained officers and so on, may constitute a vessel unseaworthy
Secure	to make fast; and to make safe. To stow an object or tie it in place
Shaft	machined or extruded metal of cylindrical section transmitting power to or from pulleys, gears, propellers and so on
Shift	a change in the wind direction
Shipping lane	path through open water used for commercial vessel passage and so noted on chart
Shipwright	a vessel builder, or one who works (wood carpentry) about a vessel. Builds launching ways and launches vessels
Side lights	green and red lights on the starboard and port sides of the vessel required for navigation at night. Each light is supposed to be visible through an arc of 112.5°, beginning from directly ahead of the vessel to a point 22.5° aft of the beam
Snub	to stop the running out of a line by taking a turn around a cleat, piling, and so on; to suddenly stop or secure a line. A vessel with too much way can be snubbed by letting an anchor go
Snubber	a spring line tied from the vessel to chain rode, usually near the water's surface. It helps disperse tension forces. It also prevents damage to the vessel by ground tackle and can help in the retrieval of the ground tackle in heavy weather
SOLAS	*International Convention for Safety of Life at Sea*
SOS	a 'distress call' made by a vessel requiring assistance. These three letters were chosen because they were easy to make and read using Morse Code. Some believe the letters meant 'Save Our Ship' or 'Save Our Souls'
Squall	a sudden and violent gust of wind often accompanied by rain
Stability	the tendency in a vessel to keep an upright position or to return to it when heeled
Starboard	the right side of the vessel when facing forward
Stern	the back (aftermost) part of a vessel
Stern Line	a line running from the stern of the vessel to a dock or pier when moored
Stow	to pack or store away; especially, to pack in an orderly, compact, safe manner
Superstructure	any structure built above the top full deck, such as a deck house, bridge and so on
Swamp	to fill with water, but not settle to the bottom
Swell	succession of long and unbroken waves that are not due to meteorological conditions in the vicinity. Generally due to wind or storms at a distance from the position

T

Tender	(1) describing a vessel that heels readily or returns slowly to the vertical when rolling in a heavy seaway (2) a small vessel (dinghy, launch) used to transport crew and equipment from shore to a larger vessel (3) one who serves as a precautionary standby, such as a line tender
Tether	a line from a safety harness to a secure part of the vessel
Tide	the predictable, periodic regular rising and lowering of water in some areas due to the pull of the sun and the moon. Tidal changes can happen approximately every 6 or 12 hours depending on the region

Tiller	a bar or handle for turning a vessel's rudder or an outboard motor, thereby steering the vessel
Ton	a measure of weight ashore and a measure of capacity on a vessel
Tonnage	a measure of a vessel's interior volume. The weight or displacement of a vessel
Topside	above the main deck
Tow	to pull a vessel with another vessel, such as a tugboat towing a barge. When used as a noun, it refers to the vessel being towed
Transit	two navigational or geographic features that, when aligned, provide a reference line for a vessels position they can be used in determining a fix or guiding a vessel along a fairway (leading lights) or in assessing the accuracy of a compass
Transom	the athwartship portion of a hull at the stern. The flat, vertical aft end of a vessel
Transverse	placed at right angles to the keel, such as a transverse frame, transverse bulkhead and so on
Transverse bulkhead	a bulkhead placed athwartships
Trapeze	a belt and line or wire used to help a crew hike out beyond the edge of a vessel to counteract the vessel's heel. Usually used on small vessels for racing
Trawl	a large net with its mouth held open, towed by a trawler along the bottom to catch bottom fish
Trough	the bottom of a wave, the valley between the crests

U

Underway	not attached to the shore or the ground in any manner. Usually, but not necessarily, moving through or making way through the water
Upper deck	the highest continuous deck which runs the full length of the vessel without a fall or interruption
Upwind	to windward, in the direction of the eye of the wind; toward the wind; in the direction from which the wind is coming
USL	*Uniform Shipping Laws Code*

V

Voyage	a journey made at sea by a vessel, usually including both the outbound and homebound passages

W

Wake	moving waves, track or path that a vessel leaves behind it when moving through the water; the track of disturbed water a vessel leaves as it moves
Wash	(1) broken water at bow of a vessel making way (2) disturbed water made by a propeller or paddle wheel (3) the rush or sweeping of waves on a bank, shore, or vessel
Watch	the day at sea is divided into six four hour periods. Three groups of watchkeepers are on duty for four hours and then off for eight, then back to duty; also refers to those standing watch as an individual, pair, or group. In order to prevent the same men from keeping the same watch each day, the watch between 1600 and 2000 is divided into two half watches, known as the first and last dog watches, in order to produce an odd number of watches each day
Watertight bulkhead	a bulkhead that will not let water pass from one side of it to the other

Watertight compartment	a compartment having a watertight bulkhead at each end
Waterway	a river, canal or other body of water that vessels can travel on
Wave	oscillations of the sea caused by wind blowing along the surface and moving in the direction from which the wind blows
Way	a vessel's movement through the water; such as headway, sternway, or leeway
Waypoint	a charted feature or chosen position on a chart
Wheelhouse	the deckhouse of a vessel where the helm is located
Wide berth	to avoid something by a large distance
Winch	a metal drum shaped device used to increase hauling power when raising or trimming sails, loading and discharging cargo, or for hauling in lines. A machine that has a drum on which to coil a rope, cable or chain for hauling, pulling or hoisting
Windward	towards the wind. Windward is an adjective meaning the direction from which the wind is blowing. The windward side of a vessel is the one which the wind hits first. 'Sailing to windward' means sailing towards the wind. Opposite of leeward

Y

Yaw	swinging off course, usually in heavy seas. The bow moves toward one side or the other of the intended course