4. Safety equipment

All vessels operating in South Australian waters are legally required to carry certain safety equipment, depending on the vessel's size and type, and where it is being used, for example in the open sea or in a river. For certain types of vessels and activities, it's also required that you wear a lifejacket at all times. Safety equipment must be in good working order readily accessible, and protected from the sea and weather.

In this chapter there are safety equipment checklists for all recreational vessel types and uses, and the required standards or features of the equipment.

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What you need and where

As a ready reminder of the safety equipment you need on board, safety equipment stickers are available from DPTI by telephoning 1300 183 046.

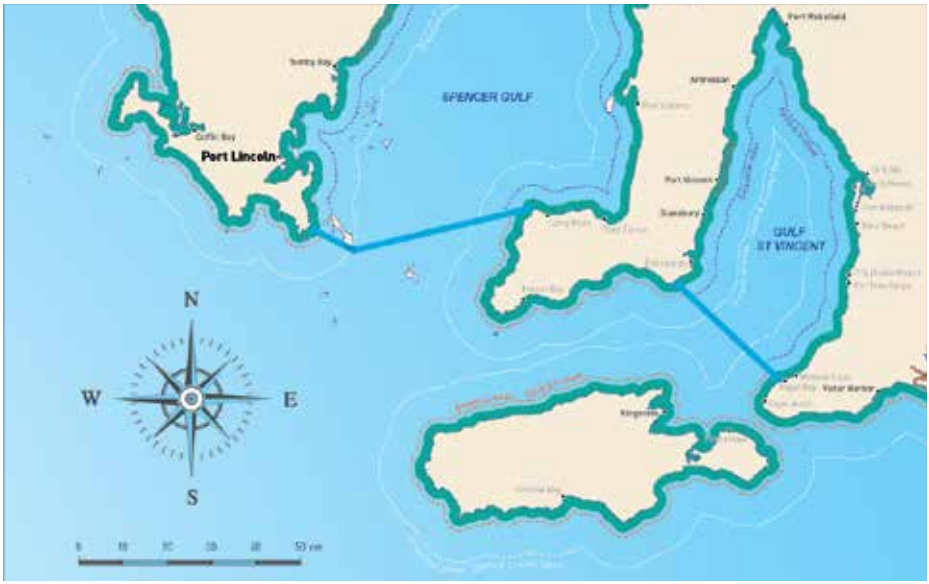
Categories of South Australian waters

Schedule 9 of the *Harbors and Navigation Regulations 2009* lists the minimum safety equipment that you're required to carry in South Australian waters; these waters are defined as being either protected, semi-protected or unprotected.

- Protected waters—all inland waters excluding Lake Albert and Lake Alexandrina and waters influenced by the tide.
- Semi-protected waters—waters inshore of a line 2 nautical miles to seaward of the low water mark of the coast of the mainland or Kangaroo Island, or the banks of Lakes Alexandrina and Albert. Tidal waterways such as the Port Adelaide River and the Coorong are classified as semi-protected waters.
- Unprotected waters—waters offshore of a line 2 nautical miles seaward of the low water mark of the coast of the mainland and Kangaroo Island, or the banks of Lakes Alexandrina and Albert.

The legislation also refers to the waters of Spencer Gulf and Gulf of St Vincent, which are defined as follows.

- Spencer Gulf—the waters north of a line drawn from Cape Catastrophe on Eyre Peninsula to Waterhouse Point on Thistle Island and then to Corny Point on Yorke Peninsula.
- Gulf of St Vincent—the waters north of a line drawn from Troubridge Point on Yorke Peninsula to Rapid Head on Fleurieu Peninsula.



Blue line indicates limit of gulf waters

Required safety equipment checklists

Required safety equipment	Protected Waters	Semi-protected Waters	Unprotected Waters
Vessels less than 8 metres long			
Approved lifejacket per person ^	✓	✓ Level 100 or above	✓ Level 100 or above
Bucket with line attached or bilge pump(s)	✓	✓	✓
Fire bucket	✓	✓	✓
One approved fire extinguisher (if engine fitted or cooking facilities on board)	✓	✓	✓
Anchor and cable	✓	✓	✓
Waterproof and buoyant torch	✓ if operating at night	✓	✓
Approved compass fitted to the vessel			✓
Four litres fresh water			✓
Two approved flares and smoke signals		✓	✓
Marine radio			✓
Paddles/oars (if your vessel is under six metres)	✓	✓ *	✓ *
Vessels 8 metres long and over			
Approved lifejacket per person ^	✓	✓ Level 100 or above	✓ Level 100 or above
Bucket with line attached and bilge pump(s)	✓	✓ two bailers	✓ two bailers
Fire bucket	✓	✓	✓
Two approved fire extinguishers (if engine fitted or cooking facilities on board)	✓	✓	✓
Anchor and cable	✓	✓ two #	✓ two
Waterproof and buoyant torch	✓ if operating at night	✓	✓
Approved compass fitted to the vessel			✓
Four litres fresh water			✓
Two approved flares and smoke signals		✓	✓
Marine radio			✓
Lifebuoy with line	✓	✓	✓
Additional equipment for all vessels regardless of length in prescribed unprotected waters i.e.: • **more than three nautical miles from shore**, except in inland waters, in Lakes Alexandrina and Albert; or • **more than five nautical miles from shore** in Gulf of St Vincent or Spencer Gulf			
EPIRB (Radio Distress Beacon)			✓
V sheet			✓
• **more than ten nautical miles from shore.**			
Two approved rocket parachute flares			✓
Chart of the area of water			✓
If your vessel is over 15 metres in length you are required to carry an extra lifebuoy with line and a life raft.			

* or another type of propulsion # If vessel is under 12 metres, second anchor can be carried as a spare
^ specific legislation applies to wearing of lifejackets – see table under When to wear a lifejacket Chapter 3 Safety on the Water

Variations from standard requirements

Certain types of vessels are either partially or totally exempt from the safety equipment requirements. Those vessels exempted must instead carry the following:

- Canoes, kayaks, rowboats, or similar small, unpowered vessels—in protected or semi-protected waters
  - a lifejacket, Level 100 or higher, 50 or 50S must be worn by each person on board, except when in a rowboat
  - one suitable bailer, unless the hull is permanently enclosed
  - if the vessel is being operated at night, a waterproof and buoyant torch or lantern.
- Canoes, kayaks, rowboats, or similar small, unpowered vessels—in unprotected waters:*
  - an approved lifejacket level 100 or above or level 50 with whistle attached, must be worn at all times by each person on board
  - one suitable bailer, unless the hull is permanently enclosed
  - if the vessel is being operated at night, a waterproof and buoyant torch or lantern
  - one spare paddle
  - V distress sheet
  - one tow line at least 15 m in length and strong enough for the vessel to be towed in any conditions
  - two hand-held red flares and two hand-held orange smoke signals
  - one approved compass fitted to the vessel
  - Approved navigation chart of the area of operation
  - one litre of fresh water
  - one EPIRB.
- Personal watercraft (PWC) - an approved lifejacket level 50 or 50S must be worn at all times.

A PWC may not be operated in unprotected waters.

- Sailboards or kite boards require:
  - within 400 m of shore – a lifejacket Level 100 or higher, 50 or 50S worn at all times
  - more than 400 m from shore – a lifejacket level 100 or higher, worn at all times.
- Surfboards or surf skis – in protected waters, an appropriate approved lifejacket, worn at all times.
- Surf rescue boats propelled by motor, when involved in rescue work within 1500 m of the shoreline or patrol work within 1000 m—pair of paddles or oars, or other means of auxiliary propulsion.
- Surf rescue boats propelled by paddles or oars—a bailer attached to the vessel by a lanyard.
- Tender vessels, while being used in conjunction with another vessel must carry:
  - one pair of paddles or oars, or other means of auxiliary propulsion
  - one bucket, bailer or bilge pump/s to drain each compartment
  - lifejackets must be worn in accordance with requirements for vessel size and area of operation – see table under When to wear a lifejacket Chapter 3 Safety on the Water.
- Waterskiers or people being towed by a vessel in any other way – an approved lifejacket Level 50 or 50S worn at all times.

* A canoe, kayak, rowboat or similar small, unpowered vessel operating in unprotected waters is exempted from carrying flares, smoke signals, compass, EPIRB or chart of the area, if the vessel is:

- with at least two other similar vessels, or a support vessel; and
- at least one of the accompanying vessels is equipped with all listed equipment; and
- the exempted vessel remains within 50 m of the fully-equipped vessel at all times.

Recommended equipment

Vessels longer than 6 metres, auxiliary power such as paddles, oars or a spare motor is strongly recommended.

Additionally every motorised vessel should be equipped or fitted with:

- a sounding signaling device (horn or whistle)
- a towing harness and rope
- an isolating switch
- emergency steering
- GPS (valuable to assist navigation, but do not rely on as the sole navigation tool. The units are electrical and batteries can go flat, while maps can be incomplete)
- first aid kit.

Standards and features

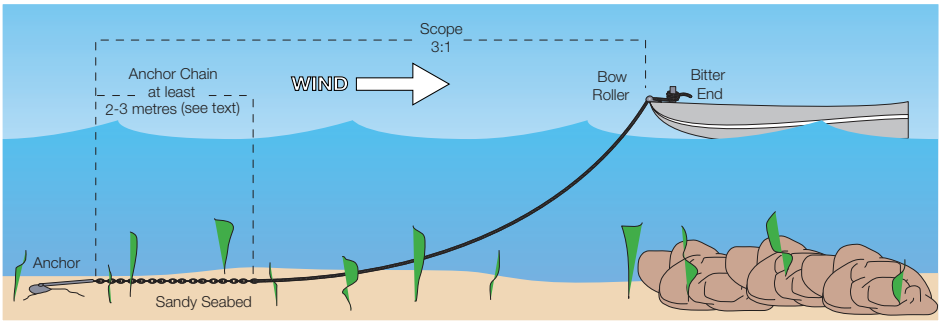
This section outlines the minimum standards and features your safety equipment requires to perform as you expect when needed.

Anchors

An anchor is a very important item of equipment and should be selected carefully.

Choose an anchor that will suit your circumstances and the area of operation. The most common types are:

- Danforth
  - recommended for small craft
  - small, light, easy to handle
  - excellent holding power, especially in sand, but may get caught on reefs.
- Coral quick release (CQR) or plough
  - suited to larger and heavier vessels
  - excellent holding power, but best suited to mud; may get caught on reefs.
- Grapnel
  - flexible prongs (suitable for anchoring on reefs)
  - suited to snag and rock conditions (for example, the River Murray)
  - though these anchors are fine in South Australia they may not be approved in all states; you should check with local authorities before going boating interstate.
- SARCA (sand and rock combination anchor)
  - superb holding power
  - multi-purpose—suited to mud, sand, gravel and rock bottoms
  - not suited to snags (for example, the River Murray).
- Sea anchor or drogue (not an approved anchor)
  - this may be anything that can be used for offshore boating to slow drift, eg. a large bucket trailing behind the vessel



The length of the anchor line is dependent on the depth of the water and the prevailing conditions.

  - keeps bow facing into wind and waves
  - a sea anchor or drogue will not hold your vessel fast, so if using a sea anchor you must also carry an approved type.

Consider the following points in selecting the line.

- Don't use a line that floats, such as polypropylene as it inhibits the anchors ability to dig in and is prone to being cut by other propellers
- Nylon and silver ropes have strength, stretching ability and resistance to abrasion, and don't easily float in water
- Nylon is stronger than silver rope
- The line must be resistant to chafing at the deck lead.
- For best performance, insert a length of chain between the anchor and line:
  - at least 2 m long, for nylon lines; or
  - at least 3 m long, for other lines
- All-chain lines are recommended for larger vessels, to increase holding power and absorb shock.

Charts and maps

Vessels operating more than 10 nautical miles from shore must carry a navigation chart or map of the waters they are navigating.

Navigation charts should:

- be suitable for navigation purposes
- be up-to-date
- help the operator plot a course or destination
- identify navigation features including the location of shipwrecks and other submerged hazards, depth of water, and the location of islands and hidden reefs
- show details such as navigation beacons and markers to harbours and channel entrances.

Note: GPS plotters while useful are not a substitute for a marine chart.

Distress flares

Flares are only used in emergencies to attract attention from passing vessels or aircraft, or to pinpoint your position to rescuers. They can't be re-used so use your marine radio or other distress signals first.

Ensure everyone on board knows where the flares are kept and how to use them.

In handling flares, it is important to:

- familiarise yourself with their operation (refer chapter 9, Emergency action)
- store them so they are accessible in an emergency
- keep them dry and stow them away from fuel and combustibles
- protect them from pounding in rough conditions, such as in speedboats.

Note: Flares have an expiry date of three years from date of manufacture and must not be kept beyond the expiry date.

It's an offence to misuse flares, or to activate a flare for 'practice'. Some volunteer marine rescue groups hold authorised demonstrations and these are recommended if you're unsure how to use your flares.

To dispose of expired flares contact Safework SA at www.safework@sa.gov.au for a list of disposal locations.

Emergency position indicating radio beacon (EPIRB)

An EPIRB is a buoyant, self-contained radio transmitter designed for marine use. When activated, continuously emits an alert signal for a minimum of 48 hours along with approximate location so that the search area can be identified and the rescue coordinated.

All recreational vessels operating more than three nautical miles from the shore or more than five nautical miles from the shore in Gulf St Vincent or Spencer Gulf must carry a 406 MHz EPIRB that complies with legal requirements. This does not apply to vessels navigating Lakes Alexandrina and/or Albert.

Once activated, the EPIRB's signal can be detected by both the international search and rescue satellite system, Cospas–Sarsat, and overflying aircraft. The Australian Maritime Safety Authority's (AMSA) Rescue Coordination Centre (RCC-Australia) in Canberra receives EPIRB signals detected, and acts on them immediately.

All 406 MHz beacons must be registered with AMSA and evidence of registration should be carried in the vessel. Each beacon carries a unique identifier and registration of the beacon provides emergency contact information which provides valuable information that can assist with a timely rescue. Registration is compulsory but is free of charge (refer chapter 13). There is no penalty for accidental activations however misuse of an EPIRB is an offence.

Standards

Your EPIRB must meet the Australian and New Zealand standard: AS/NZS 4280.1:2003 406 MHz Satellite distress beacons—Marine emergency position-indicating radio beacons (EPIRBs).

Personal locator beacons (PLBs) although they meet AS/NZS 4280.2 are not designed for marine use.

Your EPIRB should be tested regularly in accordance with the manufactures' instructions. Ensure the battery and registration are not past the expiry date.

EPIRBs should be mounted in an accessible position using the bracket supplied.

Fire extinguishers

Your fire extinguisher must comply with Australian Standard AS 1841 and be maintained in accordance with AS 1851 including 6 monthly servicing.

The minimum size of your fire extinguisher is related to the amount of flammable liquid you are carrying:

Amount of flammable liquid (litres)	Minimum fire extinguisher size (kg)
Not more than 115	0.9
More than 115 up to 350	2.0
More than 350 up to 695	4.5
More than 695	9.0

Note: you must have one extinguisher of the minimum size; for example, two x 1 kg extinguishers do not meet your needs if you're required to have a 2 kg extinguisher. If your vessel is of a size that requires more than 1 fire extinguisher each extinguisher must meet the minimum standard for the amount of fuel carried.

Ensure your fire extinguisher is:

- readily accessible and mounted on a suitable bracket
- suitable for the type(s) of fire that may occur on board your vessel (eg. wood or petrol)
- readily available to combat possible sources of fire (galley, engine compartment, or fuel storage)

Portable Fire Extinguisher Guide

Class & Type of Fire / Type of Extinguisher	Colours	A Wood, Paper, Plastic	B Flammable & Combustible Liquids	C Flammable Gases	D Combustible Metals	(E) Electrically Energised Equipment	F Cooking Oils and Fats	
Water		✓	✗	✗	✗	✗	✗	Dangerous if used on flammable liquid, energised electrical equipment and cooking oil/fat fires.
Carbon Dioxide (C02)		LIMITED	LIMITED	✗	✗	✓	✗	Not suitable for outdoor use or large class A fires.
Dry Chemical Powder (ABE/BE)		✓ AB(E) ✗ B(E)	✓	✓	✗	✓	✗ AB(E) ✓ B(E)	Look carefully at the extinguisher to determine if it is a BE or ABE unit.
Foam		✓	✓	✗	✗	✗	LIMITED	Dangerous if used on energised electrical equipment.
Wet Chemical		✓	✗	✗	✗	✗	✓	Dangerous if used on energised electrical equipment.
Fire Blanket		LIMITED	LIMITED	✗	✗	✗	✓	Fire Blankets effective for oil and fat fires within saucepans and are effective for extinguishing clothes that catch on fire. (Ensure you replace after every use).

Note: Image supplied by Fire and Safety Australia

Marine radio

A marine radio transceiver is specially designed for the marine environment. It allows you to keep up-to-date with weather information, monitor distress frequencies, contact other vessels nearby for help, and contact shore-based stations that can coordinate a rescue if needed.

If you are operating a vessel in unprotected waters, you must have a two-way marine radio that is capable of communicating with stations ashore.

There are three types of two-way marine transceivers:

- VHF
- MF/HF
- 27 MHz (commonly called '27 meg').

VHF and 27 MHz marine transceivers are relatively inexpensive and provide short-range communications. VHF is by far the more effective of these, as large ships are required to monitor the emergency channel 16. VHF offers a longer range and better quality transmission than 27MHz, with DPTI Coastal VHF network further improving coverage. However if you venture far offshore (i.e. more than about 30 nautical miles from shore) you will need to install an MF/HF marine transceiver.

The *Marine radio operator's handbook* provides information on correct operating procedures, maintenance of equipment and how to deal with minor faults at sea. The person operating the marine transceiver must hold an appropriate *Marine Radio Operator's Certificate* administered by the Australian Maritime College. (refer chapter 13).

MF/HF also requires an apparatus licence administered by the Australian Communications and Media Authority (ACMA) (refer chapter 13). Requirements may change from time to time, so you are advised to contact ACMA www.acma.gov.au for the latest requirements.

When buying a new MF/HF or VHF radio, it is advisable to select one that has Digital Selective Calling (DSC), which is Global Maritime Distress and Safety System (GMDSS) compatible.

DSC allows an automated distress message by the press of a switch to all other DSC radios within range, producing an alarm signal to gain their attention. If connected to a GPS, the DSC distress message will also include the vessel's position.

To make the most of DSC, the transceiver must be programmed with a unique nine-digit identification number, the Maritime Mobile Service Identity (MMSI), which uniquely identifies the vessel.

MMSI registration is free through AMSA. Further information on the HF radio communications system is also available from AMSA.

Use a VHF repeater channel or HF safety working frequencies 2524 or 4483 kHz in the first instance. Different repeater stations operate on different channels or frequencies, so familiarise yourself with the appropriate channels or frequencies for the area, through consulting with the local volunteer marine rescue organisation (refer chapter 13).

Doing this not only records your journey in the event you need help, but also gives you regular practice using your marine radio.

You can also do this by marine radio, using VHF channel 16, HF channels 2182, 4125, 6215, or 8291 kHz, and 27 MHz channel 27.88.

Note: HF channel 2182 kHz may only be monitored by some volunteer marine rescue stations, so use another of the listed frequencies if possible.

As these are both calling and distress channels, you will be directed to a 'working' channel once you have made contact.

Miscellaneous safety equipment standards

The minimum standards for other safety equipment are:

- A torch or lantern must be powered by internal batteries, waterproof and buoyant.
- An anchor must be:
  - appropriate to the vessel and its area of operation in both size and type (refer previous detail about anchor types)
  - attached to a length of chain or rope or both, appropriate in length and breaking strain to the vessel and waters in which the vessel is operating.
- A compass must be:
  - marked with cardinal points
  - one from which it is possible to determine, with reasonable accuracy, bearings and the vessel's heading
  - fitted to the vessel, not hand held.
- A bilge pump must be:
  - an appropriate type and pumping capacity for the vessel
  - fitted with a mesh strainer on the suction pipe
- A bailer must be:
  - suitable for bailing water without distorting or breaking when hauled over the side
  - attached to a lanyard.
- Paddles, oars or other means of auxiliary propulsion must be capable of propelling and manoeuvring the vessel.

Lifejackets

Lifejackets are also known as personal flotation devices (PFDs) and must comply with one or more approved standards.

Note: Australian Standard AS 4758.1:2015 incorporates all of the former approved Australian standards - AS 1512, AS 1499, AS 2259 and AS 2260. Some European, Canadian and New Zealand standards comply for details check the website at www.sa.gov.au/boatingmarine.

A person being towed by a vessel in any way must wear an approved lifejacket 50 or 50S at all times

Level 100, 150 or 275 (PFD Type 1)

- may be inflatable or non inflatable
- minimum required for semi protected and unprotected waters (not PWC)
- designed to promote "face up" floating position

Level 50 (PFD Type 2)

- less buoyancy than Level 100
- commonly used for canoeing or kayaking
- suitable for protected waters
- may be used for waker ski, PWC and special activities in semi proected water (see chapter 4 'Safety Equipment').

50S (PFD Type 3)

- similar to Level 50 but may have features for specific activities and in a wide range of colours.

SOLAS lifejacket

A very bulky lifejacket, with a light and whistle attached, that is designed to keep the body afloat for long periods. Carried by commercial vessels and recommended for use on larger vessels operating long distances offshore.

Coastal lifejacket

Has more flotation than a Level 100. Has a

whistle attached. Recommended for use on larger vessels operating long distances offshore.

Tide times

Some waterways, as well as boat ramps and other launching facilities, can only be safely used in certain conditions, so it's important to check the high and low tide times before you go boating.

Chart datum is the lowest predictable level of a tide and the common level from which all depths are measured. All soundings on a navigation chart are referenced to chart datum. To calculate the total depth of water, you must add the depth on the navigation chart to the tide height at that time.

Access to some boat ramps is restricted at low tide, so keep an eye on the time and leave a comfortable margin in case the ramp is busy.

Tide tables for South Australian ports contains tides for the main South Australian ports. In other locations, use the tide time and height ratios provided to determine the tide times. The book is not mandatory equipment, but it is wise to keep a copy on board—it could prevent you running aground.

Tide tables for South Australian ports can be purchased from Service SA customer service centres (refer chapter 13), most marine dealers, tackle shops or newsagents.

Chapter 4. Self-check questions

1) In which of the following occasions would you activate your EPIRB to attract attention?

A. When your vessel is threatened by grave and imminent danger, and only after trying other reasonable distress options available, such as flares and marine radio.

B. When you've run out of fuel and can't see any other boats nearby.

C. When a person on board has suffered a broken foot and you wish to notify authorities of the injury.

2) You need to choose an anchor for a boating trip; which of the following factors should you consider when making your choice?

A. The area you will be operating in, including the sea or river bed conditions.

B. The size of the boat.

C. Whether the anchor is an approved type.

D. All of the above.

3) When must a fire bucket be carried on board most recreational vessels?

A. Only in unprotected waters.

B. Only when carrying extra spare fuel.

C. At all times.