



THE GREEN BOOK

FREMANTLE SAILING CLUB

CRUISING SAFETY RECOMMENDATIONS

For monohull and multihull yachts undertaking coastal and offshore passages

Also downloadable at
www.fsc.com.au/onwater/safety

This document is based on the World Sailing Offshore Special Regulations governing Structural Features, Yacht Equipment, Personal Equipment and Training. Acknowledgement is given to Royal Prince Alfred Yacht Club NSW, whose Cruising Regulations informed much of this document.

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INTRODUCTION

The Club's main aim for Cruising risk management is to identify the risks associated with cruising and reduce them to as low as is reasonably possible. This is done through providing standards, information and advice that can be found in this document, the *FSC Risk Management Plan*, *Cruise Management Plan*, *Notice of Cruise* and other special *Cruising Event Guidelines*.

The *FSC Cruising Safety Recommendations*, generally known as the Green Book, represents the Club's baseline for cruising safety standards. It is broadly based on the 2018-2019 *World Sailing Offshore Special Regulations* which assume that a yacht meeting the regulations will be fully crewed and, in all other respects, be suitably equipped to sail offshore within the limitations of the prevailing weather and sea conditions and the safety category with which the yacht, its equipment and its crew comply.

Why do cruising yachts need different safety recommendations to racing yachts when they are sailing in the same waters? The full rationale is multi-faceted and is available as a separate document on the FSC website. In essence the motivation for being out there may be different – comfort and safety rather than speed and safety. This can flow through to differences in the type of yacht and its layout, the gear used, the demographic of the crew and the way the yacht is operated.

Proposed amendments and comments on these *FSC Cruising Safety Recommendations* are welcomed and should be addressed to the Safety Officer, FSC Cruising Section.

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1. SCOPE, RESPONSIBILITY AND DEFINITIONS

1.1. SCOPE

1.1.1. This document defines the minimum standards for cruising yachts in the following areas:

- Training
- Experience
- Structural features, stability, and fixed equipment
- Portable equipment and supplies
- Personal equipment and
- Medical kits

1.1.2. Legislation and the requirements of government authorities have precedence over the contents of this document.

1.1.3. These recommendations are not of themselves mandatory; they provide a guideline for good practice. Alternatives may prove acceptable, depending on circumstances.

1.2. APPLICABILITY

The main body of these recommendations are applicable to “Green Water” (Coastal) cruises i.e. day and night coastal passages where yachts must be prepared to meet emergencies without the expectation of outside help in less than 12 hours. This covers most Club cruises e.g. Quindalup, Bunbury, Rottnest, Jurien Bay.

For “Blue Water” (Ocean) cruises - e.g. Albany, Abrolhos, Carnarvon, Indonesia – see Appendix A for additional recommendations.

The bulk of the text is applicable to both monohulls and multihulls; special requirements for multihulls are given in Appendix B.

1.3. OWNER’S RESPONSIBILITY

1.3.1. The safety of a yacht and her crew is the sole and inescapable responsibility of the owner, or Person in Charge acting as the owner’s representative, who should ensure that the yacht is fully found, thoroughly seaworthy and crewed by suitably experienced people who have undergone appropriate training and are physically fit enough to sail in bad weather and deal with emergencies. He or she must be satisfied as to the soundness of hull, spars, rigging, sails and all gear. He or she should ensure that all safety equipment is properly maintained and stowed and that crewmembers know where it is kept and how it is to be used.

1.3.2. Neither the establishment of these *Cruising Safety Recommendations*, their use by event organisers, nor the inspection of a yacht under these Recommendations in any way limits or reduces the complete and unlimited responsibility of the owner or owner’s representative.

1.3.3. The Person in Charge of the yacht (the skipper) owes a duty of care to the rest of the crew and other participants, where there is a reasonably foreseeable risk of harm or injury to them as a result of their actions. Similarly, crewmembers owe a duty of care to each other.

1.3.4. The Person in Charge is solely responsible for deciding whether or not the yacht under his or her command should participate, or continue to participate, in a cruising event or undertake any other voyage.

1.4. DEFINITIONS

Crew	All persons on board who are capable of helping sail the yacht.
Cruising	An on-water sailing activity, which is not a speed-based competition i.e. not a race.
Club	Fremantle Sailing Club.
Event	An on-water cruising activity that is organised and coordinated under the auspices of the Club.
Event Organisers	The Club Cruising Committee, or a properly constituted Cruising sub-committee tasked to organise an on-water cruising event.
Heavy Weather	Rough conditions usually associated with mean wind speed more than 27 knots.
Jackstay	A continuous fore-and-aft line for attaching a safety harness tether.
Lifeline	Wire or rope rigged as a guardrail around the deck edge.
Monohull	A hull in which the hull depth in any section does not decrease towards the centreline. All other yachts are considered to be multihulls.
Permanently Installed	The item is effectively built-in by bolting, welding, glassing etc. and may not be removed while participating in an event.
Person in Charge (Skipper)	A person authorised by the owner of the yacht to exercise command of and otherwise take charge of the yacht and its crew.
Sheerline	The line of curvature of the deck edge, fore and aft, as viewed in side elevation.
Securely Fastened	Held firmly in place by a method (e.g. lashings, brackets, and other physical restraints) which will safely retain the fastened object in severe weather and sea conditions including a 180 degree capsize and which allows for the item to be removed and replaced whilst participating in an event.
Safety Recommendations	The standards and recommendations defined in this document (<i>The FSC Cruising Safety Recommendations</i>).
Stability	The tendency of a vessel to return to an upright condition after it is inclined by external forces: wind, seas, weight shifts, and other factors.
Working Deck	Any surface on which the crew might stand in order to work the yacht and its sails in a seamanlike manner.

1.5. ABBREVIATIONS

AG	Australian Gas
AS	Standards Australia
BS	British Standard
CPR	Cardio-Pulmonary Resuscitation

EN	European Norm (signified by use of a CE symbol)
FSC	Fremantle Sailing Club
ISAF	International Sailing Federation
ISO	International Standards Organisation
LOA	Length Overall not including pulpits, bowsprits, bumpkins etc.
LWL	Loaded Waterline Length
SOLAS	International Convention for Safety of Life at Sea

2. TRAINING AND EXPERIENCE

2.1. FIRST AID

Note additional requirements in Appendix A1 for Ocean cruising.

2.1.1. At least one member of the crew should hold a current Senior First Aid Certificate, or equivalent, or be a practising medical practitioner.

2.1.2. It is recommended that all those trained in CPR refresh those skills at least annually.

2.2. RADIO OPERATION

Note additional requirements in Appendix A1 for Ocean cruising.

At least one member of the crew should hold an Australian Waters Qualification (AWQ) or Short-Range Marine Radio Operators VHF Certificate of Proficiency (SROCP), or an equivalent overseas qualification.

2.3. SAFETY TRAINING

2.3.1. At least 50% of the crew including the Person in Charge should hold a valid AS Safety and Sea Survival Course (SSSC) Certificate of Competence, or a course of no less a standard. It is strongly recommended that all crew members do likewise:

2.3.2. The SSSC Certificate of Competence currently has a five-year validity period. Revalidation can be achieved by completing an accredited update course and maintaining a validated record of miles sailed.

2.4. CREW OVERBOARD

All Crew should be able to demonstrate equipment and a method by which crew may be assisted back on board.

2.5. REGULAR PRACTICE

Crews should practice on-board safety exercises at regular intervals.

2.6. EXPERIENCE

At least one crew member should have completed at least one equivalent passage. Novice skippers who do not meet this recommendation should advise the Event organiser (Cruise Coordinator) of their experience and that of their crew. The Cruise Coordinator will then seek guidance from the Cruising Section Safety Officer (or others as appropriate) on additional precautions to recommend.

3. STRUCTURE, STABILITY, AND FIXED EQUIPMENT

3.1. HEAVY ITEMS

- 3.1.1. Heavy items (e.g. more than 10 kg) such as ballast, tanks, ballast tanks and associated equipment should be permanently installed.
- 3.1.2. Heavy movable items such as batteries, stoves, gas bottles, toolboxes, and anchors and chain should be securely fastened. Particular attention should be paid to book stowage.
- 3.1.3. It is strongly recommended that all loose gear be secured and/or stowed before proceeding to sea.
- 3.1.4. Floorboards should be secured so that they cannot come adrift if the yacht is inverted.

3.2. STRENGTH OF BUILD, BALLAST AND RIG

3.2.1. A yacht should be:

- a. Soundly constructed;
- b. Properly rigged and ballasted;
- c. Well maintained;
- d. Fully seaworthy in all respects; and
- e. Suitable for the event in which it intends to participate.

3.2.2. Hulls should be watertight and, particularly with regard to hulls, decks and cabin trunks, be capable of withstanding solid water and knockdowns.

3.3. WATERTIGHT INTEGRITY OF HULL

3.3.1. A hull, including, deck, coach roof, windows, hatches and all other parts, should form an integral, essentially watertight unit and any openings in it should be capable of being immediately secured to maintain this integrity.

3.3.2. Centreboard and daggerboard trunks and the like should not open into the interior of a hull except via a watertight inspection or maintenance hatch of which the opening should be entirely above the waterline of the yacht floating level in normal trim.

3.3.3. Yachts with movable keels or centreboards should have a positive non-friction device, which will prevent the keel or centreboard from moving in the event of a knockdown, or capsize.

3.4. HULL CONSTRUCTION STANDARDS

Note additional requirements in Appendix A2 for Ocean cruising.

3.4.1. Yachts should be designed and built in accordance with good yacht building practices and appropriate design and construction standards recognised by the marine industry, including those promulgated by the International Organization for Standardisation (ISO), classification society rules (Lloyds, ABS, GL

etc.) and Standards Australia (AS). Inspection by an appropriately qualified yacht surveyor is recommended.

3.4.2. ISO 12215 Category B is considered an appropriate minimum standard. Note additional requirements in Appendix A2 for Ocean cruising.

3.4.3. Any significant repairs or modifications to the hull, deck, coach roof, keel or appendages, should be assessed by an appropriately qualified professional naval architect or yacht designer as not reducing:

- a. Stability below appropriate standards or
- b. The structural integrity or
- c. Otherwise causing the yacht to be unfit for purpose.

3.5. STABILITY

Note additional requirements in Appendix A3 for Ocean cruising.

Note separate requirements for multihulls in Appendix B1.

3.5.1. A yacht should be designed and built to resist capsize.

3.5.2. Attention is drawn to ISO 12217-2. Category B is relevant. Note additional requirements in Appendix A3 for Ocean cruising.

3.5.3. Where a yacht has the keel or centreboard at a specific position to comply with the resistant to capsize conditions of these recommendations then it should not be moved to a higher position during an event.

3.6. HATCHES & COMPANIONWAYS

Note additional requirements for multihulls in Appendix B2.

3.6.1. Yachts should have two exits. A deck hatch may be considered an exit; a companionway from the cabin to the deck or cockpit may be considered an exit. One exit should be located forward of the foremost mast. In very unusual circumstances, e.g. cat-rigged yachts, where structural features prevent its installation forward of the mast, an alternative location may be acceptable.

3.6.2. The recommended minimum clearance diameter for an exit is 450mm, or minimum dimension 380mm and minimum area 0.18m².

3.6.3. No hatch forward of the maximum beam station should open in such a way that the lid or cover moves into the open position towards the inside of the hull excepting ports having an area of less than 0.07m². Hatches not complying with this requirement should be kept firmly shut whilst at sea and labelled "NOT TO BE OPENED AT SEA" or equivalent wording.

3.6.4. All hatches should be:

- a. Located such that it is above the waterline when the hull is heeled at 90 degrees to the horizontal;
- b. Permanently attached to the hull; and
- c. Capable of being immediately shut and clipped and remaining shut in the event of a 180 degree capsize.

3.6.5. A companionway hatch extending below the local sheerline, should be capable of being blocked off up to the level of the local sheerline, and should continue to give access to the interior with blocking devices (e.g. washboards) in place.

- 3.6.6. A companionway hatch should be fitted with a strong securing arrangement, which should be operable from above and below deck with the hatchway blocked and the yacht inverted.
- 3.6.7. Washboards (or blocking devices) should be capable of being retained in position in the hatchway with the companionway hatch in both the open and shut positions.
- 3.6.8. Washboards (or blocking devices), whether or not in position in the hatchway should be secured to the yacht (e.g. by lanyard) for the duration of the event to prevent them being lost overboard.

3.7. Washboards (or blocking devices), should be readily removable to permit exit in the event of an inversion. COCKPITS

Attention is drawn to ISO 11812.

- 3.7.1. Cockpits should be essentially watertight i.e. all openings to the hull from the cockpit and cockpit lockers must be capable of being sealed and secured.
- 3.7.2. Cockpits should be structurally strong and either:
- a. Self-draining quickly by gravity at all angles of heel and permanently incorporated as an integral part of the hull or
 - b. Of volume less than $(LWL/11)^3 \text{ m}^3$.
- 3.7.3. A bilge pump outlet pipe should not be connected to a cockpit drain.
- 3.7.4. A bow, lateral, central or stern well is considered a cockpit for the purposes of 3.7. Anchor and other lockers fitted with a hatch are not considered "wells".
- 3.7.5. Anchor lockers should be self-draining, capable of emptying 90% of its volume within 3 minutes .
- 3.7.6. For cockpits less than 2m^3 volume: At least two drains, each with a minimum unobstructed opening diameter of 25mm (after allowing for grids) should be fitted.
- 3.7.7. Cockpits with volume greater than 2m^3 should have minimum drain size after allowance for screens, of 20cm^2 per m^3 of cockpit.

3.8. SEACOCKS AND PLUGS

- 3.8.1. Seacocks should be permanently installed on all through-hull openings below either the 10° heeled or upright waterline, except for shaft logs, speed sensors, depth sensors and the like. However, a means of shutting off or blocking such openings should be provided.
- 3.8.2. Soft wood or rubber plugs, tapered and of a suitable size, should be attached by a lanyard to the hull fitting for every through-hull opening fitted with a sea cock or valve.
- 3.8.3. Additional plugs kept separately are recommended.

3.9. SPARS and RIGGING

- 3.9.1. The main mast should have no less than two halyards and each should be capable of hoisting a sail.
- 3.9.2. Any boom that traverses a cockpit should be at least 1.9m above the cockpit floor.
- 3.9.3. Skippers are strongly encouraged to take measures to mitigate rig and equipment damage from lightning strike, including placing electronic navigation instruments in a "Faraday cage" (a metal enclosure such as the oven - turned off).

3.9.4. The heel of a keel-stepped mast should be securely fastened to the mast step or adjoining structure.

3.10. PULPITS, STANCHIONS, LIFELINES

Note additional requirements for multihulls in Appendix B3.

Attention is drawn to ISO 15085

3.10.1. Lifeline arrangements should be taut.

3.10.2. All lines, fittings, anchorage points, fixtures and lanyards should comprise a lifeline enclosure system which has at all points at least the breaking strength of the lifeline.

3.10.3. There should be at least two lifelines with the upper lifeline not less than 600mm above the working deck. It is strongly recommended that lifelines be 750mm above the working deck.

3.10.4. Intermediate lifeline(s) should be fitted so that no vertical opening exceeds 380mm.

3.10.5. Lifelines should be of wire.

- a. They should be of a strength equivalent to stranded 316 grade stainless steel wire of minimum diameter as shown in Table 1 below.
- b. Wire lifelines should be 316 stainless, uncoated and without close-fitting sleeving. The term "uncoated" means that the wire must not be coated by any material that is moulded or otherwise bonded to the wire.
- c. A taut lanyard of rope may be used to secure lifelines provided the gap it closes does not exceed 100mm. This lanyard should be replaced annually.
- d. Notwithstanding 3.10.5(a) and (b) above, where lifelines are coated or do not exist or are not continuous, the crew should wear lifejackets and safety harnesses attached by tether to a clipping point or jackstay at all times when a crew member is outside the cabin and the yacht is underway in other than sheltered waters.

Table 1: Lifeline wire diameter

LOA	Minimum Wire Diameter
Under 8.5m	3mm (1/8")
8.5m to 13m	4mm (5/32")
Over 13m	5mm (3/16")

3.10.6. The following should be provided:

- a. A bow pulpit forward of the headstay with vertical height and openings essentially conforming to 3.10.3 & 3.10.4.

Bow pulpits may be open but the opening between the pulpit and any part of the yacht, including the forestay, should not exceed 360mm. This may be checked by presenting a 360mm sphere inside the opening.
- b. A stern pulpit with vertical openings conforming to 3.10.3 & 3.10.4. Lifelines may be fitted in place of a stern pulpit.
- c. Any opening upper rails in bow or stern pulpits should be secured shut whilst underway unless conforming with 3.10.6a.
- d. Stanchions (supporting lifelines) and pulpits should form an effectively continuous barrier around a working deck with the aim of minimising the risk of crew falling overboard. Stanchions should be spaced at intervals of not more than 2.2m.

- e. Pulpits and stanchions should be permanently installed. When there are associated sockets or studs, these should be through-bolted, bonded or welded. The pulpit(s) and/or stanchions fitted to these should be mechanically retained without the use of the lifelines. Pulpits and/or stanchions without sockets or studs should be through-bolted, bonded or welded.

3.11. Solid bulwarks offering comparable security are an acceptable alternative to the other clauses in section 3.10, provided they are fitted with freeing ports that are effective in clearing water off the decks. TOE RAIL AND NON-SKID

Note separate requirements for multihulls in Appendix B5.

- 3.11.1. A toe rail near the deck edge of minimum height 25mm should be permanently installed around the deck forwards from abreast the forward end of the cockpit, except in way of fittings. A minimum height of 40mm is recommended, with the inboard face perpendicular to the deck surface.

3.12. All surfaces on deck and around the companionways should be non-skid. JACKSTAYS AND TETHER CLIPPING POINTS

Note additional requirements for multihulls in Appendix B8.

- 3.12.1. Jackstays and clipping points should be located and fitted in such a way as to allow crew members to:
 - a. clip on safely before coming on deck and to unclip after going below (Note: this might be achieved by using the jackstays if the harness end of the tether reaches into the cabin);
 - b. move between the working areas on deck and the cockpit(s) with minimal tether clipping and unclipping.

Note also section 5.3.7.

- 3.12.2. Jackstays should be arranged along the length of the working deck to provide secure attachments for safety harness tethers. Jackstays should extend far enough aft to allow crew to clip their tethers on to the jackstay without leaving the cockpit. It is recommended that jackstays terminate aft at least one tether length forward of the aft end of the boat.
- 3.12.3. Jackstays should be attached to through-bolted or welded deck plates or other suitable and strong anchorage points fitted on deck.
- 3.12.4. Jackstays should be made from a material with breaking strength of at least 20kN. Webbing 25mm wide is preferred; alternatively stainless steel 1x19 wire of at least 5mm diameter, or high strength rope may be used. Wire or rope is not recommended for jackstays lying on deck because they are slippery if trodden on.
- 3.12.5. All fastenings and lashings for jackstays should have an equivalent strength to at least that of the jackstay.
- 3.12.6. Stanchion bases should not be used as strong points for the attachment of jackstays.
- 3.12.7. Plain, single action, snap hooks should not be used in any tether or jackstay system.
- 3.12.8. Additional clipping points should be located and fitted in such a way as to allow at least two-thirds of the crew to be simultaneously clipped on to clipping points without use of the jackstays.

3.13. Pad eyes, eye plates and other fixtures used as clipping points for tethers should be attached to through-bolted or welded deck plates or other suitable and strong anchorage

points adjacent to frequently occupied locations such as the helm, sheet winches and masts.HAND HOLDS

Hand holds should be fitted above and below decks so that crew members may move about safely at sea and should be positioned so as not cause a hazard.

3.14. TOILET

- 3.14.1. A toilet, which may be a fixed installation or a portable toilet, should be securely installed inside the yacht.
- 3.14.2. The on-board systems for the storage and discharge of both black (toilet) and grey (shower, sink etc.) waste should comply with the environmental regulations and legislation applicable to the cruising area.
Note: most cruising destinations are “No Discharge” zones, so holding tanks are usually required.

3.15. BUNKS

Bunks, securely fastened and sufficient for all of the crew should be fitted. Bunks should be suitable for use at sea. Fixed bunks for at least half the crew should be fitted with lee cloths or similar restraints where necessary. Lee cloths should be capable of restraining a bunk occupant at heel angles up to at least 60 degrees.

3.16. GALLEY

- 3.16.1. Galley facilities such as sink, icebox, food and utensil storage should be secured in a seaway.
- 3.16.2. A cooking stove capable of being safely operated in a seaway should be installed. **Note:** microwave ovens fixed in a horizontal plane may not function satisfactorily at sea.
- 3.16.3. Cooking stoves should be securely fastened to withstand capsize, and fitted with a safe and readily accessible fuel or power shutoff valve.
- 3.16.4. Gas stoves should be fitted and maintained in accordance with the relevant Australian Gas (AG) Standard. Onboard gas systems should include a combustible-gas detection system and automatic shut-off device. **Note:** Attention is drawn to FSC Fire and Safety Rules.
- 3.16.5. A sign reading " **TURN OFF GAS AT BOTTLE**" should be displayed near any gas appliance.
- 3.16.6. Gas is only recommended for cooking and for no other purpose. Methylated spirits, diesel, kerosene and lamp oil are also acceptable for use as cooking and lighting fuels. The use of petrol for lighting, cooking or heating is prohibited.
- 3.16.7. Gas bottles should be kept in a separate ventilated and self-draining compartment where vapour can only escape overboard, and securely fastened. An outdoor location is acceptable.

3.17. WATER TANKS AND DRINKING WATER

Note additional requirements in Appendix A4 for Ocean cruising.

- 3.17.1. If the water pump is dependent on the electrical supply for operation, then an alternative means of pumping drinking water should be provided.
- 3.17.2. The total volume of drinking water carried for the maximum likely duration of the passage should not be less than that required to supply 5 litres per day per crewmember. This may be reduced from 5 litres to 2.5 litres if a watermaker is installed and is operational.

3.17.3. At least 10 litres of drinking water, additional to that required in 3.17.2, should be carried in a dedicated container or containers. This water is for emergency use.

3.18. BILGE PUMPS

Note additional requirements in Appendix A5 for Ocean cruising.

Note additional requirements for multihulls in Appendix B6.

3.18.1. At least one manual bilge pump should be carried and this should be operable with all cockpit seats, hatches and companionways shut.

3.18.2. Bilge pumps should not discharge into a cockpit unless the cockpit opens aft to the sea. Bilge pumps should not be connected to cockpit drains.

3.18.3. Bilge pumps should have a 25mm minimum bore on the suction line.

3.18.4. Bilge pumps and strum boxes should be readily accessible for maintenance and for cleaning out any debris.

3.19. Unless permanently fitted, each bilge pump handle should be secured to the yacht by a lanyard, or catch, or similar device to prevent accidental loss. COMPASS

3.19.1. A marine magnetic compass independent of any power supply should be permanently installed and correctly adjusted, with a light and a deviation card.

3.19.2. A spare magnetic compass independent of any power supply for its operation and capable of being used as an emergency steering compass should be carried.

3.20. NAVIGATION LIGHTS

3.20.1. Navigation lights should be fitted that conform to the International Regulations for Preventing Collision at Sea (IRPCAS), (Part C and Technical Annex 1) and should be shown as required by those Regulations. Note that a masthead tricolour alone is insufficient. Full steaming lights must be carried, which may serve as reserve navigation lights under 3.20.3 if capable of being powered separately from the yacht's main electrical supply.

3.20.2. Navigation lights should be mounted above the sheerline so that they will not be masked by sails or the heeling of the yacht.

3.20.3. Reserve navigation lights, capable of being quickly mounted with a power supply independent of the yacht's main supply, should be carried.

3.20.4. Spare globes for other than the reserve navigation lights should be carried, except for lights with LED arrays.

3.21. ENGINE AND FUEL

Note additional requirements in Appendix A6 for Ocean cruising

Attention is drawn to the installations standards required by AS1799.3 and the FSC Fire and Safety Rules.

- 3.21.1. An engine capable of producing a minimum yacht speed in knots of $1.6 \times \text{square root of LWL}$ (metres) against a 12 knot headwind should be permanently installed e.g. minimum speed for 10m LWL is 5kn. Note additional requirements in Appendix A6 for Ocean cruising.
- 3.21.2. Where an outboard engine is fitted it should be securely mounted at all times.
- 3.21.3. Inboard engines should be installed so that the engine, or generator when running, can be securely and effectively covered. The associated exhaust and fuel supply sub-systems should be securely installed and adequately protected from the effects of heavy weather. The yacht should be fitted with at least one permanently installed fuel tank. Note that, in the event of capsizing, the engine mounts must withstand an abnormal tensile load.
- 3.21.4. The minimum volume of fuel carried should be sufficient to meet battery charging and propulsion requirements for the anticipated duration of the event.
- 3.21.5. Notwithstanding the above it is recommended that the minimum volume of fuel to be carried at the start of a voyage should enable the yacht to motor 50 nm. Note additional requirements in Appendix A6 for Ocean cruising.
- 3.21.6. Fixed fuel tanks should have a shut-off valve or cock fitted directly to tank outlets except when it is not possible for fuel to escape should the fuel supply line fracture.
- 3.21.7. Fixed petrol fuel tanks should be metal, vented to the open air, electrically earthed to the sea and have the filler positioned so that spillage and fumes cannot enter the yacht.
- 3.21.8. Diesel fuel tanks should be metal or other material certified as suitable by the tank manufacturer. The deck filler should be electrically bonded to the tank if it is metal.
- 3.21.9. Care should be taken to ensure that the location of fuel tank breathers minimises the chances of water entering the tank during a knockdown.
- 3.21.10. For inboard engine systems, fuel lines should be metal, clipped rigidly in place and with a flexible connection between the fixed line and the engine. A flexible line may be used throughout provided that the material and terminals are designed for that purpose.
- 3.21.11. In the case of petrol engines the flexible fuel line should be fire resistant and coded by the manufacturer as such (e.g. with a red stripe).
- 3.21.12. For an outboard engine-based propulsion system any remote fuel tanks and fuel lines should be as supplied by the manufacturer or built to a recognised National Standard and branded as complying with the standard.
- 3.21.13. Remote fuel tanks should be secured on the upper deck or in a separately ventilated compartment draining directly to sea (e.g. anchor well or gas locker).
- 3.21.14. Petrol should not be carried below decks in portable containers.

3.22. BATTERIES

- 3.22.1. Batteries should be of a sealed type from which electrolyte cannot escape.
- 3.22.2. When the primary propulsion engine can only be started with an electric starter, a battery dedicated for that purpose should be fitted. The dedicated battery should be able to be isolated from other uses, in order to preserve power for starting.
- 3.22.3. Recommended that a jump-start pack of suitable capacity be carried.

3.23. ELECTRICAL

3.23.1 Wiring should be in good condition to AS requirements.

3.23.2 Recommended that all electrical wiring be tinned.

3.24. HULL IDENTIFICATION

Note additional requirements for multihulls in Appendix B7.

Yachts should have on both sides or on the transom in legible characters a minimum of 50mm high:

- a. The yacht's name.
- b. Its State Marine Authority number.

4. Name of the club, or homeport, which may be abbreviated. PORTABLE EQUIPMENT and SUPPLIES

4.1. FIT FOR PURPOSE

4.1.1. All equipment should function effectively and be:

- a. Regularly checked, cleaned and serviced.
- b. Readily accessible.
- c. Of a type, size and capacity suitable and adequate for the intended use and size of the yacht.
- d. Stowed in conditions in which deterioration is minimised when not in use.

4.1.2. It is strongly recommended that all loose gear be secured and/or stowed before proceeding to sea.

4.2. TOOLS AND SPARE PARTS

4.2.1. Tools and spare parts, including an effective means to disconnect or separate the rigging from the mast or hull should be carried. If a hacksaw is to be used for this purpose, it should be of high quality and equipped with at least 6 blades.

4.2.2. Yachts should carry sufficient spares and the necessary tools to enable routine and emergency engine and electrical maintenance and repair. Spares should include fuses, tinned wire, soldering iron and solder, fuel filter(s), drive belt(s), engine oil, and water pump impeller(s), and any associated seals and gaskets.

4.2.3. A bosun's chair or equivalent should be carried.

4.2.4. A sharp knife capable of cutting high modulus fibre lines, sheathed and restrained, should be located in or near each cockpit and at the main mast.

4.3. FIRE EXTINGUISHERS

4.3.1. At least two fire extinguishers of minimum 10B:E rating marked as complying with AS1841.5 (dry powder) or AS1841.6 (CO₂) should be readily accessible in suitable and different parts of the yacht. All fire extinguishers should be checked at least annually. For dry powder extinguishers, ensure the pressure gauge is in the green, the nozzle is clear, there is no corrosion and the contents are shaken. Record the

inspection on the extinguisher at the start of each season. CO₂ extinguishers should be maintained in accordance with the manufacturer's instructions.

4.3.2. All yachts should carry a fire blanket near the galley.

4.3.3. A small hole in the engine casing, suitable for discharging a fire extinguisher through without introducing air is suggested. The fire extinguisher should then be equipped with a nozzle to enable its contents to be delivered into the engine compartment.

4.4. ANCHORS

4.4.1. At least two anchors should be carried, together with a suitable combination of chain and rope, all ready for immediate use. When sailing within 10 miles of land or shallows, one anchor should be deployable within 2 minutes.

4.4.2. The bitter (inboard) end of the warp or chain cable should be secured to a structurally strong point in the yacht prior to deploying the anchor and capable of rapid detachment under load.

4.4.3. Anchor cables for each anchor should comprise either:

- a. At least 10m chain plus 40m of warp or chain (minimum 50m total) or
- b. At least 5m chain plus 60m of warp or chain (minimum 65m total).

Vessels under 9m LOA may reduce chain length by 2m provided total rode length is maintained

4.4.4. It is recommended that chain cable is manufactured in accordance with BS 6405: Non-Calibrated Short Link Steel Chain (Grade 30) for General Engineering Purposes: Class 1 and 2 or equivalent. The minimum breaking force should in no way be construed as a safe working load.

4.4.5. Anchor and cable sizes such as those shown in Table 2 (indicative of those commonly specified by Classification Societies and yacht designers) are recommended. AS2198-1983 is relevant. An alternative guide for High Holding Power anchors is given by the formula:

$$\text{Anchor weight (kg)} = 3 \times \text{LOA (m)} - 16$$

e.g. for a 10m yacht you would need a 14kg anchor.

Table 2: Minimum ground tackle details

Yacht size	Anchor (High Holding Power)		Chain	Warp	Warp Size (Suggested)	
	Plough Type e.g. CQR	Spade Type e.g. Danforth			Standard Link	Minimum Breaking Force
Displacement	kg	Size	mm	kN	mm	mm
Tonnes	kg	Size	mm	kN	mm	mm
< 2.5	7	13S	6	9	10	10
2.5 – 4.3	9	22S	8	20	16	12

4.3 – 6.5	11	22S	8	30	20	14
6.5 – 9.5	15	40S	10	39	24	16
9.5 – 13.5	20	65S	10	39	24	16
13.5 – 20.0	25	65S	13	45	26	18
20 - 27	34	80S	13	45	26	18
>27	45	80S	14	60	32	20

Note: Super-High Holding Power (SHHP) anchors may be 30% lighter than HHP anchors.

4.5. BUCKETS

Two buckets of stout construction each with at least 8 litres capacity should be carried. Each bucket should be fitted with a lanyard.

4.6. FLASHLIGHTS

Note additional requirements in Appendix A7 for Ocean cruising.

4.7. At least two flashlights of a water resistant and floating type, with spare batteries, should be carried. NAVIGATION EQUIPMENT

Note additional requirements in Appendix A7 for Ocean cruising.

4.7.1. Navigational charts for the cruising areas and chart plotting equipment should be carried.

4.7.2. If fewer than 2 independent electronic charting systems are carried (i.e. separate power supplies), a folio of paper charts should be carried suitable for navigating to harbours of refuge.

4.7.3. Charts should be corrected and maintained up to date.

4.7.4. A copy of the current *International Regulations for the Prevention of Collision at Sea* should be carried.

4.7.5. A permanently installed GPS receiver should be fitted. Note additional requirements in Appendix A10 for Ocean cruising.

4.7.6. A calibrated depth-sounding instrument should be permanently installed. The display should be visible from the helm.

4.7.7. A barometer should be fitted.

4.8. COMMUNICATIONS

Note additional requirements in Appendix A11 for Ocean cruising.

4.8.1. A permanently installed VHF radio should be fitted and should be capable of operation on channels 6, 16, 21, 22, 67, 72, 73, 77, 80, 81, 82. DSC capability is strongly recommended, with an assigned MMSI and connected to GPS.

4.8.2. The radio should be capable of transmitting over a range of at least 20 miles. In order to achieve this, it is expected that the radio will have:

- a. a rated output power of at least 25 W.

- b. a masthead antenna with a coaxial feeder installed (this can be on any mast used to set sails). The power loss in the antenna and feeder should not exceed 40%.

4.8.3. The radio installation should have a separate dedicated emergency antenna and a speaker audible from the cockpit.

4.8.4. In addition to the installed VHF radio, a waterproof hand-held VHF radio (minimum 5W power) and associated battery charging equipment, or spare batteries, should be carried. It is recommended that the hand-held be capable of operation on one or more aviation frequencies e.g. VHF Ch 6.

4.8.5. The effective operation of radio communication systems should be checked by test transmissions immediately prior to an event, to a station at least 20nm away.

4.8.6. A radio receiver capable of receiving weather bulletins should be carried.

4.9. A fully charged mobile telephone should be carried. EMERGENCY STEERING

4.9.1. An emergency tiller, capable of being fitted quickly to the rudderstock where the normal method of steering is other than by a tiller fitted directly to the rudderstock, should be carried.

4.9.2. Crews must be aware of alternative methods of steering the yacht in any sea condition in the event of rudder loss. The crew should practice at least one alternative method of steering.

4.10. AUTOMATIC STEERING

Note separate requirements in appendix A12 for Ocean cruising

Yachts with fewer than 3 crew should be equipped with a non-manual means of steering e.g. autopilot, wind vane.

4.11. EMERGENCY GUIDES

4.11.1. A durable stowage chart should be displayed in a clearly visible position inside the yacht. It should be clearly marked with the location and name of principal items of safety equipment.

4.11.2. A durable checklist chart of actions in emergencies should be displayed in a prominent place.

4.11.3. A safety checklist should be given to every new crewmember on boarding, for them to complete (“seek and find” learning).

4.12. YACHT’S NAME

4.12.1. The yacht’s name or registration should be marked on or otherwise fixed to miscellaneous buoyant equipment such as lifejackets, cockpit cushions, lifebuoys, and lifeslings.

4.12.2. Where a lifejacket is the personal equipment of a crew member it should be marked instead to identify the owner. Preferably this should be the name of the owner and a contact telephone number.

4.13. RETROREFLECTIVE TAPE

Marine grade retroreflective material should be fitted to lifebuoys, lifeslings, liferafts and lifejackets.

4.14. EMERGENCY POSITION INDICATING RADIO BEACONS (EPIRBs)

- 4.14.1. An EPIRB capable of transmitting on 406 MHz must be carried. GPS-capable EPIRBs are strongly recommended.
- 4.14.2. The number of EPIRBs carried on board should be not less than the number of liferafts carried.
- 4.14.3. EPIRBs should be
 - a. In accordance with Government regulations;
 - b. Regularly tested;
 - c. Stored in a dry, well-marked location near the companionway; and
 - d. Properly registered in the yacht's name with the appropriate authority.

4.15. LIFERAFTS, TENDERS and GRAB BAG

Note separate requirements in Appendix A13, A14 and A15 for Ocean cruising.

- 4.15.1. Either a liferaft or a seaworthy tender should be carried.
- 4.15.2. For everyday use, a tender should be equipped with:
 - 1 life jacket per person (they should usually be worn in the tender)
 - 2 oars; good quality and proven effective in sea breeze
 - Hand-held VHF radio with Ch16
 - Water-proof torch
 - Small anchor plus at least 20m of rode
- 4.15.3. A grab bag should be carried. It should:
 - a. Have inherent flotation;
 - b. Be marked with a safety colour (yellow to red range);
 - c. Have a lanyard and clip; and
 - d. Be located in a place readily accessible in case of emergency.

A "home brew" barrel may be suitable.

- 4.15.4. The following equipment should be in the liferaft (or tender), or grab bag, in addition to that listed in 4.15.2:
 - Mobile phone
 - EPIRB
 - Space blankets or survival bags
 - First aid kit including sunblock
 - Medical supplies for pre-existing conditions for any of the crew
 - Two "cyalume" sticks or similar watertight floating lights or lamps
 - Signalling mirror
 - Sun hats

- 2 litres drinking water per person. Note: water containers should be ready to grab, should have a lashing and should float (e.g. do not fill right up).

Those items may be taken from the yacht's safety equipment.

4.15.5. Stowage should be such that the liferaft or tender can be readily removed and launched within 60 seconds (unless fitted externally with a hydrostatic release).

4.15.6. The yacht end of the painter should be tied to a strong point on board the yacht.

4.16. FLARES

Note separate requirements in Appendix A16 for Ocean cruising.

4.16.1. Flares conforming with AS 2092 or a higher standard should be carried and stored in waterproof container(s). The age of all required pyrotechnics should not exceed the manufacturer's expiry date marked on the items. **Note:** you may keep expired flares as extras.

4.16.2. The following should be carried:

- 2 red parachute flares
- 2 red hand or a red LED or laser flare
- 2 orange smoke flares
- 2 white hand flares

Protective gloves and goggles **Note separate requirements in Appendix A16 for Ocean cruising.**

4.16.3. Irrespective of the minimum numbers shown above, the numbers and types of flares should conform to state legislative requirements for the cruising area.

4.17. LIFEBOUYS

Note additional requirements in Appendix A17 for Ocean cruising.

4.17.1. A Lifesling, OSCAR, Seattle Sling or similar should be carried. It should be equipped with retro-reflective tape, whistle and a self-igniting light, and marked with the yacht's name. It should be accessible by the helmsman and ready for immediate use.

4.17.2. Attention is drawn to AS 2261. The colour of a lifebuoy should be a safety colour in the yellow to red range i.e. white is not acceptable.

4.18. HEAVING LINE

A floating line at least 15m long that is readily accessible to cockpit, with a buoyant object at one end should be carried. The "throwing sock" type is recommended.

4.19. SAILS AND SAIL NUMBERS

4.19.1. It is strongly recommended that the foot of all headsails overlapping the mast should fly above the upper lifeline, to aid vision.

- 4.19.2. Sail numbers and any associated letters used to identify a particular yacht should be carried on mainsails, trysails, storm jibs and heavy weather sails so that the numbers are clearly visible. It is recommended that other sails should be similarly marked.
- 4.19.3. A separate piece of heavy-duty material with the yacht's sail number or registration number on it should be carried. It should be capable of being displayed across the deck or along the lifelines and it should be complete with eyelets and lashings.

4.20. STORM AND HEAVY WEATHER SAILS

Note separate requirements in Appendix A18 for Ocean cruising.

- 4.20.1. It is strongly recommended that the yacht designer and sailmaker be consulted to determine the most effective size and materials for storm and heavy weather sails and to ensure that they are fit for purpose. The purpose of these sails is to provide safe propulsion for the yacht in gales and storms. The sail areas referred to below are maxima. Smaller areas are likely to suit some yachts according to their stability and other characteristics.
- 4.20.2. A yacht with only one propulsion engine should have as a minimum:
- Heavy weather jib, and
 - Mainsail reefable to 50% of its luff length
- 4.20.3. A yacht with twin propulsion engines capable of operating independently, including separable fuel supplies, should have as a minimum either:
- Heavy weather jib or
 - Mainsail reefable to 50% of its luff length.
- 4.20.4. A heavy-weather jib can be a reefable or furlable sail. It should have
- An area less than 10% of (height of the foretriangle squared).
 - Sheeting positions permanently fitted on deck.
- 4.20.5. Aromatic polyamides such as Kevlar, and carbon and similar fibres should not be used in the construction of a heavy weather jib but spectra/Dyneema and similar materials are permitted.

5. PERSONAL EQUIPMENT

5.1. FIT FOR PURPOSE

All equipment should function effectively and be:-

- Regularly checked, cleaned and serviced.
- Readily accessible.
- Of a type, size and capacity suitable and adequate for the intended use and size of the yacht.
- Stowed in conditions in which deterioration is minimised when not in use.

5.2. LIFEJACKETS

Note additional requirements in Appendix A19 for Ocean cruising.

- 5.2.1. A lifejacket must be carried for each crewmember.

5.2.2. All lifejackets should be of the vest or inflatable type; the bulky “Mae West” type of lifejacket is not acceptable.

5.2.3. Each lifejacket should:

- a. Comply with Australian Standard AS 4758 – 2008 (minimum level 150N); or
- b. AS 1512-1996- Type 1; or
- c. an equivalent or more stringent overseas standard.
- d. A combined lifejacket and safety harness is recommended provided both the lifejacket and harness are compliant with their respective standards.

5.2.4. Each lifejacket should have marine grade retroreflective tape, a whistle and a suitably strong crotch strap or thigh straps. It is further recommended that each lifejacket should have a light attached (note section 5.4) and be fitted with a splashguard/sprayhood.

5.2.5. Each inflatable lifejacket should be checked annually or at such other interval as prescribed by the manufacturer. This check should include bladder air retention; gas bottle date & condition, connection and activation device condition & date if applicable; and for any signs of chafe and wear to the bladder and harness. The inspection date should be recorded on the lifejacket.

5.2.6. It is recommended that lifejackets are worn at times of heightened risk e.g. at night, or outside the cockpit, when alone on deck, or in true wind speeds greater than 25kn.

5.2.7. It is recommended that lifejackets are worn by children under 13 or people with impaired mobility, at all times when underway.

5.3. SAFETY HARNESSSES, LINES and TETHERS

5.3.1. Each person on board should have a safety harness and tether.

5.3.2. The tether length should not exceed 2m and should have three snap hooks: one at each end and one manufacturer fitted mid-point snap hook. Plain, single action, snap hooks should not be used in any tether or jackstay system.

5.3.3. Each safety harness and line should comply with:

- a. Australian Standard AS 2227 or
- b. An equivalent overseas standard such as EN 1095.

5.3.4. A crotch strap or thigh straps, capable of taking heavy loads, should be fitted to each safety harness.

5.3.5. Crewmembers should carry a personal knife capable of cutting a tether in an emergency.

5.3.6. A crewmember's lifejacket and harness should be compatible. Before an event each crewmember should adjust a harness to fit them and retain that harness for the duration of the cruise.

5.3.7. All members of the crew should be able to simultaneously and adequately attach themselves to strong points on the yacht (note section 3.12).

5.3.8. Harnesses should be used at times of heightened risk e.g. at night, or outside the cockpit, or when alone on deck, or in true wind speeds greater than 25kn.

5.3.9. Harnesses should be used by children under 13 or people with impaired mobility, at all times when underway.

5.4. PERSONAL LIGHTS

A personal location light (either a strobe or complying with SOLAS LSA 2.2.3), should be carried by, or attached to, each crew member when on deck at night. Note that many lifejackets already have such a light attached.

5.5. PERSONAL CLOTHING

During heavy, wet and/or cold weather, crew members on deck should wear clothing that will protect them from hypothermia.

6. MEDICAL

6.1. GENERAL REQUIREMENTS

6.1.1. The skills and training of crew and the quantities and types of medical supplies to be carried will depend on a number of factors including the number of crew, individual state of health, the duration and location of cruise, the level of access to external assistance and the approach to risk management.

6.1.2. The Person in Charge should be able to demonstrate that the level of first aid skills and training amongst the crew is adequate to competently render first aid and that the yacht has medical equipment and supplies sufficient to deal with the medical emergencies and conditions most likely to occur on the cruise.

6.1.3. The Person in Charge is responsible for on-board medical risk planning and management. The most likely medical emergencies and conditions to require treatment during a cruise include: -

- Hypothermia
- Pain relief – mild, moderate and severe
- Sunburn
- Dehydration
- Seasickness
- Diarrhoea / Constipation
- Flesh bruises, wounds,
- Damage to eyes, digits, limbs and ribs.
- Strained muscles
- Burns – minor and severe
- Infection requiring antibiotics and other medication
- Cardiac emergencies

6.1.4. It is the responsibility of individual crewmembers to inform the skipper of any medical condition that may affect their capabilities as a crewmember. It is the responsibility of the skipper to ask for such information. Similarly, it is the responsibility of the skipper to inform the crew of any medical condition that may impair her or his capabilities as skipper.

6.1.5. All crewmembers should know where medical equipment and supplies are stored. The location of all medical items should be shown on the yacht's stowage plan (see 4.11.1).

6.1.6. The scope and currency of the medical reference information carried on board should be adequate for the likely emergencies and medical conditions noted above. All crewmembers should be capable of seeking

external medical assistance by phone, radio or other means and relevant instructions should be readily available.

6.2. MEDICAL KITS

Note additional requirements in Appendix A21 for Ocean cruising.

6.2.1. Yachts should carry a first aid manual such as:

*First Aid at Sea; Douglas Justins & Colin Berry; Adlard Coles,
First Aid - Authorised manual of the St. John Ambulance Assn. In Australia,
Advanced First Aid Afloat; Peter F. Eastman MD,
The Authorised Manual of the Australian Red Cross Society.*

These may be in electronic format provided at least two independent sources are on board e.g. laptop, smart phone, e-reader.

6.2.2. Yachts should be equipped with a medical kit of which the contents and their storage reflect the guidelines of the recommended manual, the likely conditions and duration of the passage, and the number of people on board the yacht.

6.2.3. If there is any possibility that special medication is needed for any crewmember then that crewmember should obtain medical advice before the event and provide any necessary medication.

6.2.4. The medical kit should be stored in a waterproof container(s) with the contents listed so as to be visible without opening the container.

6.2.5. The rate of progress in medical knowledge means that better ones often supersede previous products and methods. The items in the medical kit in Table 3 are the minimum that should be carried, but substitutions may be made on the basis of documented evidence that they provide equivalent or better solutions.

6.2.6. All required items should be within their expiry date.

6.2.7. Items in Table 3 marked thus **, are usually only obtainable on prescription. It should be noted that most prescription medication must be stored at a temperature of 25° C or less. As the temperatures inside a yacht during the summer months can exceed 40° C it is recommended that all prescription medication be replaced at least annually.

6.2.8. One of the common brand names of the generic product is indicated in brackets in Table 3. Alternate pharmaceuticals in equivalent amounts and having similar action to those stated are acceptable.

Table 3: Medical kit items – Green water (Coastal) cruising

FOR VARYING DEGREES OF PAIN		No.
Mild Pain		
Paracetamol 500 mg.(Panadol) or Ibuprofen 200 mg (Nurofen)		20
Moderate Pain		
**Codeine 8 mg + Paracetamol 500 mg (Panadeine)		20
Moderate to Severe Pain		

**Codeine 30 mg + Paracetamol 500 mg (Panadeine Forte)	20
CARDIAC EMERGENCIES	
Soluble Aspirin (Disprin)	20
FOR WOUNDS AND LIMBS	
Butterfly Steristrips (Strips of 5)	5
Disposable Gloves	20
Crepe bandages 75 mm x 1.5 m	2
Triangular bandage	1
Water resistant bandaids	20
Adhesive tape 50 mm x 2.5 m (Leukoplast)	1
Wide area adhesive stretch tape (e.g. Fixomull) 50 mm x 10 m	1
Roll cotton wool	1
Low absorbency non-adherent dressing/plain gauze (Melolin)	10
Antiseptic skin solution (Betadine) 15 ml	1
Antiseptic swabs (Betadine)	8
Anti-septic cream with Lignocaine HCL (Medicreme)	1
FOR EYES	
Normal saline (for washing) – 250 ml	1
FOR BURNS	
Superficial burns	
Hydrogel wound dressing 100 g (Solosite, Duoderm Gel, Purilon)	1
SUNSCREEN	
30+ SPF 250 ml	1
FOR DIARRHOEA	
Loperanide Hydrochloride (Imodium) 2 mg – pkt of 12 or Diphenoxylate 2.5 mg atropine 0.025 mg (Lomotil) - pkt	1
FOR SEASICKNESS	
Some form of seasickness remedy should be carried (Stugeron, Avomine, Travacalm). In the case of severe seasickness **Ondansetron wafers 4 mg (e.g. Zofran Zydis) are recommended.	10
INSTRUMENTS	
Scissors, stainless steel	1
Safety pins, assorted sizes	10
CPR mask or 4 face shields	1, 4

APPENDICES

A EXTRA RECOMMENDATIONS FOR BLUE WATER (OCEAN) CRUISING

This appendix lists the extra recommendations for events comprising an ocean passage or a series of offshore coastal passages (legs) where yachts must be self-sufficient for several days, capable of withstanding storms and heavy seas and be prepared to meet serious emergencies without receiving outside help in less than 24 hours. e.g. A cruise from Fremantle to Albany, Abrolhos or Bali.

A1 TRAINING AND EXPERIENCE:

This section replaces sections 2.1.1, and 2.2.

- A1.1 At least two members of the crew should hold a current Senior First Aid Certificate or equivalent, or be a practising medical practitioner. It is strongly recommended that if injectable items are carried, that the first aiders have additional training in the use of injectables.
- A1.2 At least two of the crew should hold an Australian Waters Qualification (AWQ) or Short Range Marine Radio Operators VHF Certificate of Proficiency (SROCP), or an equivalent overseas qualification.
- A1.3 If an HF transceiver is fitted, at least one of the crew should hold a Long-Range Marine Radio Operators Certificate of Proficiency (LROCP), or an equivalent overseas qualification.

A2 HULL CONSTRUCTION STANDARDS

ISO 12215 Category A is considered an appropriate minimum standard.

A3 STABILITY

ISO 12217-2 Category A is considered an appropriate minimum standard.

A4 WATER TANKS AND DRINKING WATER

A leak in any one component of the drinking water system should not result in the loss of more than two thirds of the total water volume carried (including that in portable containers) e.g. If there are 300 litres in tanks and 30 litres in portable containers, the maximum allowable loss is 220 litres.

A5 BILGE PUMPS

Two manual bilge pumps should be securely fitted to the yacht's structure, one operable above, the other below deck. Each pump should be operable with all cockpit seats, hatches and companionways shut and should be provided with permanently fitted discharge pipe(s) of sufficient capacity to accommodate the simultaneous discharge from both pumps.

A6 ENGINE AND FUEL

- A6.1 An inboard propulsion engine capable of producing a minimum yacht speed in knots of $1.8 \times$ square root of LWL (metres) against a 12 kn headwind should be permanently installed e.g. minimum speed for 10m LWL is 5.7 kn.
- A6.2 The minimum volume of fuel to be carried at the start of an event should enable the yacht to motor 200 nm.

A7 FLASHLIGHTS

In addition to the flashlights listed in section 4.6, a watertight high-intensity searchlight should be carried. It should be readily available for use on deck, and equipped with spare bulbs (unless LED) and spare batteries if not rechargeable.

A8 FOGHORN

A foghorn should be carried. It is recommended that can be operated without relying on a containerised gas supply.

A9 RADAR REFLECTOR AND AIS

A9.1 An AIS transceiver (“transponder”) should be carried. The transceiver should have the yacht’s MMSI coded in.

A9.2 A radar reflector should be carried. Attention is drawn to ISO 8729. If a radar reflector is octahedral it should have a minimum diagonal measurement of 450mm, or if not octahedral it should have a documented RCS (radar cross section) of not less than 10m². It should be fitted least 5m above sea level.

A10 NAVIGATION EQUIPMENT

A10.1 A second GPS, which is hand held and water resistant, should be carried on-board.

A11 COMMUNICATIONS

In addition to the requirements of 4.8, the following should be carried:

A11.1 Email capability should be installed, with a distribution list of emergency contacts set up.

A11.2 A satphone is recommended.

A11.3 The effective operation of all radio, email and phone communication systems should be checked by test transmissions prior to departure. Minimum transmission distance for HF and satellite systems is 200 nm.

A12 AUTOMATIC STEERING

This section replaces section 4.10.

Yachts with fewer than 4 crew should be equipped with a non-manual means of steering e.g. autopilot, wind vane.

A13 LIFERAFTS AND TENDERS

This section replaces section 4.15.1.

A13.1 Liferaft(s) capable of carrying the entire crew should be carried and these should comply with either:

- a. The construction requirements of SOLAS, except that an insulated floor and insulated canopy are optional, or
- b. ISO 9650 Part 1 Type 1 Group A, (or Group B for warm waters only) or
- c. An Australian or overseas standard of equivalent or better performance.

Consideration should be given on a case-by-case basis to other forms of life-saving dinghy e.g. Tinker auto-inflation dinghy with canopy and drogue.

A13.2 Each liferaft should have a valid (current) certificate from the manufacturer or an approved servicing agent certifying that it has been inspected, that it complies with the design and construction and equipment standards defined in A13.1 and stating the official capacity of the liferaft which should not be exceeded.

A13.3 It is recommended that a member of the crew witnesses the inspection of the liferaft carried. Each raft should contain at least the following equipment, properly stowed and secured so as to be available undamaged after launch and inflation:

- One sea anchor or drogue (attachment line should not be less than 15m) attached so that the entry point to the raft is leeward. ISO 17339 standard is recommended.
- One bellows or hand pump for hand inflation that is of one piece, ready for use and does not require assembling.
- One repair outfit complete with six emergency buoyancy tube leak stopping plugs capable of repairing punctures in buoyancy compartments.
- One bailer easily identifiable as such.
- One sponge per person.
- One safety knife.
- Two buoyant paddles with handles.
- One buoyant rescue quoit attached to at least 30 metres of buoyant line.
- One water resistant torch (signalling) together with one spare set of batteries and one spare bulb (unless LED) in a waterproof container.
- Two red parachute flares, one red laser flare (or four red hand-flares) and two orange smoke signals.
- One signalling whistle.
- One signalling mirror.
- Drinking water, at least 0.5 litres per person.
- A hand operated water maker.
- One tin of emergency rations per person.
- Two tubes of sun cream (SPF 30+)
- First aid kit incl. anti-seasickness tablets.
- Five plastic bags.
- A clear instruction card describing the operation of the liferaft and its contents. This may be either waterproofed or stencilled on the inside of the canopy or on the inside of the buoyancy compartments.
- One waterproof copy of the illustrated table of life-saving signals.
- One waterproof copy on how to survive in the life raft.

A13.4 The above equipment should be packed in bags capable of holding the contents comfortably so that they do not burst out when opened in difficult conditions. The closure should be by a plastic zip or Velcro along the side and not at one end. The bags must be securely fastened to the inside of the raft.

A13.5 A liferaft should be stowed either:

- a. In a transportable rigid container or u-v resistant valise on the working deck or in the cockpit. The container must be stowed the right way up, in chocks of the correct size and shape;
or
- b. In a purpose-built rigid compartment opening into or adjacent to the cockpit or working deck, or opening through a transom, containing liferaft(s) only, provided that:
 - i) Each compartment is watertight or self-draining; and
 - ii) The cover of each compartment is capable of being easily opened under water pressure;
 or
- c. If not exceeding 40kg in weight, securely stowed below deck adjacent to the companionway.

A13.6 Liferrafts of more than 40kg weight should be stowed in such a way that they can be dragged or slid into the sea without significant lifting.

A13.7 Stowage should be such that the liferaft or tender can be readily removed and launched within 15 seconds (unless fitted externally with a hydrostatic release).

A13.8 The yacht end of the liferaft painter should be permanently secured to a strong point on board the yacht.

A14 GRAB BAG CONTENTS

This section replaces section 4.15.4.

A14.1 The following contents should be considered for inclusion in the grab bag (some may already be in the liferaft) and should be appropriately packed and waterproofed (the packing should be capable of being opened with wet fingers and without tools):

- Waterproof hand held GPS
- Space blankets or survival bags
- One safety tin opener
- Tins of food
- Waterproof hand-held VHF radio
- Mobile phone or satphone
- GPS capable 406 MHz EPIRB
- Medical supplies for pre-existing conditions for any of the crew
- One plastic drinking vessel graduated into 10, 20 and 50 ml
- Two "cyalume" sticks or similar watertight floating lights or lamps
- Sun hats and sun glasses
- Reading glasses for any crew who need them

A14.2 Drinking water in containers should also be ready to grab. Containers should have a lashing and should float (e.g. do not fill right up).

A15 DINGHY

It is recommended that a dinghy and oars be carried in addition to a liferaft.

A16 FLARES

This section replaces section 4.16.2.

The following should be carried:

- 6 red parachute flares
- a red laser flare (or 4 red hand flares)
- 4 orange smoke flares
- 4 white hand flares
- 2 white parachute flares
- Protective gloves and goggles

A17 LIFEBOUYS

A17.1 In addition to section 4.17.1, one additional lifebuoy should be carried, accessible by the helmsman and ready for immediate use. It should be equipped with a whistle, drogue, danbuoy (pole and flag) and a self-igniting light.

A17.2 Every inflatable lifebuoy should be tested at such interval prescribed by the manufacturer.

A18 STORM SAILS

This section replaces section 4.20.

A18.1 It is strongly recommended that the yacht designer and sailmaker be consulted to determine the most effective size and materials for storm and heavy weather sails and to ensure that they are fit for purpose. The purpose of these sails is to provide safe propulsion for the yacht in gales and storms. The sail areas referred to below are maxima. Smaller areas are likely to suit some yachts according to their stability and other characteristics.

A18.2 All trysails and storm jibs should be of highly visible coloured material (e.g. Day-Glo pink, orange or yellow) or, should have a highly visible coloured patch of at least 20% of the area of the sail added on each side to assist visibility in extreme conditions.

A18.3 Storm sails must be capable of being rigged in severe weather. It is strongly recommended that crews practice this in progressively more difficult conditions.

A18.4 A yacht with one main propulsion engine should have:

- a. Storm jib and
- b. Storm trysail or mainsail reefable to 50% of its luff length.

A18.5 A yacht with twin propulsion engines capable of operating independently, including separable fuel supplies, should have as a minimum either:

- a. Storm jib or
- b. Storm trysail or mainsail reefable to 50% of its luff length.

A18.6 It is recommended that yachts with in-mast or in-boom furling and only one engine should have a trysail.

A18.7 Storm jib specifications. A storm jib should have:

- a. An area not greater than 4% height of the foretriangle squared, e.g. for a 10m foretriangle height, the maximum area is 4m².

- b. A means to attach the luff to its stay, independent of any luff-groove or furling device.
- c. Sheeting positions permanently fitted on deck.
- d. It is recommended that sheets are permanently attached to the sail by sewing or splicing, not by J clips.

A18.8 Storm trysail specifications.

- a. A storm trysail should be capable of being sheeted independently of the boom with area not greater than 15% mainsail luff length x mainsail foot length. It should have neither headboard nor battens.
- b. In a yacht with an in-mast furling mainsail, the storm trysail should be capable of being set while the mainsail is furled.
- c. A trysail track should allow for the trysail to be hoisted quickly when the mainsail is stowed whether or not the mainsail is stowed on the main boom.

A18.9 Aromatic polyamides such as Kevlar, and carbon and similar fibres should not be used in the construction of a storm sails but spectra/Dyneema and similar materials are permitted.

A19 LIFEJACKETS

In addition to the requirements of section 5.2, at least one spare lifejacket should be carried.

A20 PERSONAL LOCATOR BEACONS (PLBS)

A20.1 A registered 406MHz Personal Locator Beacon should be carried by or attached to each member of the crew when on deck. GPS capable PLBs are strongly recommended. A Personal AIS transponder is also recommended.

A20.2 PLBs and PAISs should be:

- a. Within battery life
- b. Regularly tested and
- c. Registered in the user's name.

A20.3 Crewmembers should be trained in the use of this equipment.

A21 MEDICAL

These requirements are in addition to the requirements of section 6.

A21.1 It is strongly recommended that all crew should consult their GP or travel doctor to obtain advice regarding immunisation etc. Prior to voyages longer than a few days, a check-up with both GP and dentist is recommended.

A21.2 As a minimum, yachts should carry *Ship Captain's Medical Guide* or the *International Medical Guide for Ships*, or an equivalent publication (electronic versions are acceptable).

A21.3 Items in the medical kit should be increased on a pro-rata basis when there are more than 4 crewmembers on-board.

A21.4 Medical kit contents: Table 4 replaces table Table 3 of the main document.

Table 4: Medical kit items for Blue water (Ocean) cruising

FOR VARYING DEGREES OF PAIN	No.
Mild Pain	
Paracetamol 500 mg.(Panadol)	40
Ibuprofen 200 mg (Nurofen) (also as an anti-inflammatory)	30
Moderate Pain	
**Codeine 8 mg + Paracetamol 500 mg (Panadeine)	40
Moderate to Severe Pain	
**Codeine 30 mg + Paracetamol 500 mg (Panadeine Forte)	20
Very Severe Pain	
** Oxycodone – 5 mg (Endone)	20
CARDIAC EMERGENCIES	
Soluble Aspirin (Disprin)	20
Nitrolingual tablets 300 mcg	5
FOR WOUNDS AND LIMBS	
Butterfly Steristrips (Strips of 5)	10
Disposable Gloves	20
Crepe bandages 75 mm x 1.5 m	2
Crepe bandages 100 mm x 1.5 m	2
Triangular bandage	2
Inflatable or malleable splint	1
Water resistant Band-aids	20
Adhesive tape 50 mm x 2.5 m (Leukoplast)	1
Wide area adhesive stretch tape (e.g. Fixomull) 50 mm x 10 m	1
Roll cotton wool	1
High absorbency non-adherent dressing (Exu-Dry)	10
Low absorbency non-adherent dressing/plain gauze (Melolin)	10
Antiseptic skin solution (Betadine) 15 ml	1
Antiseptic swabs (Betadine)	8
Anti-septic cream with Lignocaine HCL (Medicreme)	1
FOR EYES	
Normal saline (for washing) – 250 ml	1
** Chloromycetin eye 10 ml drops or 1% 4 gm ointment	1
ANTIBIOTIC	
Infection	
** Ciprofloxacin 500 mg (e.g. Ciproxin, C-Flox, CiloQuin, Piprol, Profloxin)	14
** Amoxicillin trihydrate/clavulanic acid 500/125 mg (eg Augmentin Duo Forte)	10
Fungal skin infection	

Clotrimazole cream (Lamisil, Daktarin)	1
FOR BURNS	
Superficial burns	
Hydrogel wound dressing 100 g (Solosite, Duoderm Gel, Purilon)	1
Severe burns	
Silvazine cream 100 g (Flamazine)	1
SUNSCREEN	
30+ SPF 250 ml	1
FOR DIARRHOEA/ GASTRIC PROBLEMS	
Loperanide Hydrochloride (Imodium) 2 mg – pkt of 12	1
or Diphenoxylate 2.5 mg atropine 0.025mg (Lomotil) - pkt	
Antacid tablets (pkt) or liquid (bottle) (Mylanta, Gaviscon)	1
Laxatives	
FOR DEHYDRATION	
Electrolyte replacement 4.9 g sachet - pkt of 10 (Gastrolyte)	1
FOR SEASICKNESS	
Some form of seasickness remedy should be carried. (Stugeron, Avomine, Travacalm)	10
In the case of severe sea sickness:	
** Prochlorperazine 12.5 mg ampules or	5
** Ondansetron wafers 4mg (e.g. Zofran Zydis wafer)	10
FOR ALLERGY	
** Antihistamine tablets 10 mg (Phenergan)	25
** Adrenaline ampoules 1:1000	5
INSTRUMENTS	
Scissors, stainless steel	1
Thermometer, clinical	1
Forceps, splinter, stainless steel	1
Safety pins, assorted sizes	10
CPR mask or 6 face shields	1
Recommended:	
Automatic defibrillator, checked at least annually	1
Hot water bottle	1

A21.5 Additional medical recommendations for tropical sailing:

- a. All crew to consult GP or travel doctor for advice regarding malaria prophylaxis and ear canal wax build-up.
- b. Aqua ear drops (or similar over the counter product) for prevention and treatment of swimmer's ear.
- c. **Kenacomb otic drops for infections (if Aqua ear not sufficient).

- d. Antibiotic cream (bactroban) for infected ulcers or skin wounds (not responding to Betadine or Medcream.).
- e. **Azithromycin 2x500 mg for moderately severe diarrhoea not settling with over the counter preparations.
- f. **Clindamycin for severe skin infection (as second line if keflex doesn't help).

B SPECIAL RECOMMENDATIONS FOR MULTIHULLS

B1 STABILITY

These requirements replace the requirements of section 3.5.

A multihull, which is classified as lying outside the “vulnerable to inversion” category of ISO 12217-2, is exempt from the requirements of B1; nevertheless they are recommended. All other multihulls should comply with the following:

- B1.1 Adequate watertight bulkheads and compartments (which may include permanently installed flotation material) in each hull should be provided to ensure that a multihull is effectively unsinkable and capable of floating in a stable position with at least half the length of one hull flooded.
- B1.2 Any watertight bulkhead should be strongly built to take a full head of water pressure without allowing any leakage into the adjacent compartment.

B2 EXITS AND ESCAPE HATCHES

These requirements are in addition to the requirements of section 3.6.

A multihull which is classified as lying outside the “vulnerable to inversion” category of ISO 12217-2 is exempt from the requirements to fit escape hatches (but not exits); nevertheless they are recommended. All other multihulls should comply with the following:

- B2.1 Each hull, which contains accommodation, should have at least two exits. A deck hatch may be considered an exit. A companionway from the hull to the bridge deck may be considered an exit.
- B2.2 Each hull, which contains accommodation, should have at least one escape hatch for access to and from the hull in the event of an inversion. An exit may be considered an escape hatch if it complies with the requirements below.
- B2.3 The recommended minimum clearance through a multihull escape hatch or exit is 450mm diameter, or minimum dimension 380mm and minimum area 0.18m².
- B2.4 All exits and escape hatches should be capable of being opened from inside or outside the hull.
- B2.5 Each escape hatch should be:
 - a. Above the waterline when the multihull is inverted.
 - b. At or near the midships station.
 - c. On the side of a hull nearest the centreline of the yacht.
- B2.6 Multihulls unable to comply with B2.5 should comply with the following as a minimum:-
 - a. Each hull, which contains accommodation, should have, for the purpose of cutting an escape hatch, appropriate tools kept ready for instant use adjacent to the intended cutting site. Each tool should be secured to the vessel by a line and a clip, and

- b. In each hull at a station where an emergency hatch may be cut, the cutting line should be clearly marked both inside and outside with an outline and the words: “**ESCAPE - CUT HERE**”.

B3 PULPITS, STANCHIONS, LIFELINES

- B3.1 Trimarans - a bow pulpit on the main hull, with lifelines around the main hull supported on stanchions. The lifelines may be discontinuous where there are nets or crossbeam wings outboard of the main hull.
- B3.2 Trimarans – where a net joins the base of a bow pulpit on the main hull, an additional lifeline from the top of the pulpit to the forward crossbeam at or outboard of the crossbeam mid-point.
- B3.3 Trimarans - at a main or emergency steering position on an outrigger with or without a cockpit, lifelines protecting an arc of 3 metres diameter centred on the steering position.
- B3.4 A catamaran without a forward or aft crossbeam should have transverse lifelines at the extremity of the net forward and aft. The transverse lifelines should be attached to bow and stern pulpits or superstructure. A webbing, strop or rope (minimum diameter 6mm) should be rove zigzag between the transverse lifelines and the net.

B4 MULTIHULL NETS OR TRAMPOLINES

The word "net" is interchangeable with the word "trampoline".

- B4.1 Nets should be:
 - a. Essentially horizontal.
 - b. Made from durable woven webbing, water permeable fabric, or mesh with openings not larger than 50mm in any dimension. Attachment points should be designed to avoid chafe. The junction between a net and a yacht should present no risk of trapping the limbs of the crew.
 - c. Solidly connected at regular intervals on transverse and longitudinal support lines (i.e. a lattice work style) and should be fine-stitched to a boltrope.
 - d. Able to carry the twice the full weight of the entire crew when the yacht is upright or inverted.

Each tie point of the net should be tied in such a manner that the net shall remain attached and functioning with 50% of the ties broken. The lashings shall be replaced at intervals of no more than 2 years.

- B4.2 Tie points should be inspected for chafe after rough weather and at least every 7 sailing days.

B5 TOE RAIL AND NON-SKID

A toe rail is not required on multihulls.

B6 BILGE PUMPS

Multihulls should have provision to pump out all watertight compartments except those filled with impermeable buoyancy.

B7 HULL IDENTIFICATION

Multihulls should display a total of at least 2 m² of highly reflective Class 1 or Class 2 film on the underside of the bridge deck to aid visibility if capsized.

B8 JACKSTAYS AND TETHER CLIPPING POINTS

- B8.1 At least two jackstays or multiple tether clipping points should be fitted on the underside of a multihull in case of inversion.

B8.2 In a trimaran with a rudder on the outrigger, adequate clipping points that do not constitute any part of the deck gear or the steering mechanism should be fitted to enable the steering mechanism to be reached by a crew member whilst clipped on.