

FREMANTLE SAILING CLUB

CRUISING SAFETY RECOMMENDATIONS

Monohull, Multihull and Trailable Yachts

Viewable at

<http://www.fsc.com.au/cproot/894/3/FSC-Cruising-Recommendations-Green-Book-v3.03.pdf>

Or

<http://www.fsc.com.au/cruising/useful-stuff#safety>

This document is based on the ISAF Special Regulations governing Structural Features, Boat Equipment, and Personal Equipment. Particular 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 Guide, represents the Club's baseline for cruising safety standards. It is broadly based on the *ISAF Special Regulations* which assume that a boat meeting the regulations will be fully crewed and, in all other respects, be suitably equipped to sail off-shore within the limitations of the prevailing weather and sea conditions and the safety category with which the boat, its equipment and its crew comply.

Cruising boats, unlike racing boats, usually sail with a minimum of crew, (often two) and are not restricted by either the racing rules of sailing or the competitive drive to "minimalise" wherever possible to achieve a competitive edge. Consequently the risk profiles of racing and cruising differ in many areas just as they are common in many others.

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 boats in the following areas:

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

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 mandatory; they provide a benchmark for good practice. Alternatives may prove acceptable, depending on circumstances.

1.1.4.

If boats and crew intend to participate in FSC racing events they should comply with the standards and requirements defined in the *Yachting Australia Special Regulations for Racing Boats*.

1.2. APPLICABILITY

The main body of these recommendations are applicable to “Green Water” (Coastal) cruises i.e. day and night coastal passages where boats 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.

1.3. OWNER’S RESPONSIBILITY

1.3.1.

The safety of a boat and her crew is the sole and inescapable responsibility of the owner, or skipper acting as the owners representative, who should do his or her best to ensure that the boat is fully found, thoroughly seaworthy and crewed by suitably experienced people who have undergone appropriate training and are physically fit to face bad weather. 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 crew members 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 boat 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 boat (the skipper) owes a duty of care to the rest of the crew and other participants in the activity where there is a reasonably foreseeable risk of harm or injury to them as a result of their actions. Similarly, crew members owe a duty of care to each other.

1.3.4.

The skipper is solely responsible for deciding whether or not the boat under his or her command should participate, or continue to participate, in an event.

1.4. DEFINITIONS

Buoyancy	Should be achieved by the use of:- a) Semi-rigid or rigid non-absorbent material permanently fixed into the hull. b) Dedicated empty sealed compartments which may be fitted with screw-in drain plugs or an inspection port but which should remain closed whilst participating in an event. c) Inflated airbags, permanently sealed and fixed below decks.
Crew	All persons on board who are capable of helping sail the yacht.
Cruising	A non-competitive, non-time based, on-water sailing activity.
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 in accordance with the recommendations contained in this document.
Heavy Weather	Bad, or foul weather, characterised by rough seas, stormy, windy and uncomfortable conditions usually Beaufort Force 7 or above (mean wind speed more than 27 knots).
Jackstay	A continuous fore-and-aft wire/rope/webbing line for attaching a safety harness tether.
Lifeline	Wire or rope rigged as a guardrail around the deck.
Monohull	A hull in which the hull depth in any section does not decrease towards the centreline. All other boats 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.
Sheerline	The line of curvature of the deck edge, fore and aft, as viewed in side elevation.
Skipper	A person authorised by the owner of the boat to exercise command of and otherwise take charge of the boat and its crew.
Sheltered Waters	Those waters sheltered from the extremes of the sea by reefs, headlands or islands. This is to be interpreted as the ocean swell having been broken and that there is limited fetch. It may include harbours, estuaries and lakes.

Static Tether	A tether (usually shorter than a tether carried with a harness) kept clipped on to a strong point at a work-station.
Securely Fastened	Held firmly in place by a method (eg 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 boat and its sails in a seamanlike manner.

1.5. ABBREVIATIONS

ABS	American Bureau of Shipping
AG	Australian Gas
AS	Standards Australia
AVS	Angle of Vanishing Stability
BS	British Standard
CPR	Cardio-Pulmonary Resuscitation
EN	European Norm (signified by use of a CE symbol)
FSC	Fremantle Sailing Club
IMS	International Measurement System
ISAF	International Sailing Federation
ISO	International Standards Organisation
LOA	Length Overall not including pulpits, bowsprits, bumpkins etc.
LWL	Loaded Waterline Length
PFD	Personal Flotation Device (lifejacket, buoyancy aid etc.)
SOLAS	International Convention for Safety of Life at Sea
USL	Uniform Shipping Laws code

2. TRAINING AND EXPERIENCE

2.1. FIRST AID

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

2.2. CREW OVERBOARD

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

2.3. EMERGENCY STEERING

Crew must be aware of alternative methods of steering the boat in any sea condition in the event of rudder loss. At least one alternative method of steering should be practiced by the crew.

2.4. RADIO OPERATION

At least one member of the crew should hold a Marine Radio Operator's VHF Certificate of Proficiency (MROVCP) for VHF, or an equivalent overseas qualification.

2.5. SAFETY CHECKLIST

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

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 Cruise Coordinator of their experience and that of their crew. The Cruise Coordinator will then seek guidance from the Cruising Section Safety Officer on additional precautions to recommend.

2.7. REGULAR PRACTICE

Crews should practice onboard safety exercises at regular intervals

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.

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

3.2. STRENGTH OF BUILD, BALLAST AND RIG

3.2.1. A boat 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. Boats 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

3.4.1. A boat's structural strength should be commensurate with the intended service of the boat, taking into account the maximum anticipated loads.

3.4.2. Boats should be designed and built in accordance with good boat building practices and appropriate design and construction standards recognised by the marine industry, including those promulgated by the International Organization for Standardisation (ISO), and Standards Australia (AS).

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 boat to be unfit for purpose.

3.5. STABILITY

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

3.5.2. Attention is drawn to **ISO 12217-2 [Small craft -- Stability and buoyancy assessment and categorization - Part 2: Sailing boats of hull length greater than or equal to 6 m]**. Category B is relevant.

3.5.3. Where a boat 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

3.6.1. Boats should have two escape exits. One exit should be located forward of the foremost mast. In very unusual circumstances, eg cat-rigged yachts, where structural features prevent its installation forward of the mast, an alternative location may be acceptable.

3.6.2. 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.

3.6.3. An access hatch 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.

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

3.6.5. A companionway hatch should be fitted with a strong securing arrangement, which should be operable from above and below with the hatchway blocked and the boat inverted.

3.6.6. 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.

3.6.7. Washboards (or blocking devices), whether or not in position in the hatchway should be secured to the boat (eg by lanyard) for the duration of the event to prevent them being lost overboard.

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

3.7. COCKPITS

Attention is drawn to **ISO 11812 [Small craft - Watertight cockpits and quick-draining cockpits]**.

3.7.1. Cockpits should be essentially watertight, that is, 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 $(LWL/12)^3$ m³.

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.

3.7.6. At least two drains, each with a minimum unobstructed opening diameter of 25mm (after allowing for grids) should be fitted. *ISO11812* will advise the minimum number of drains required.

3.8. SEACOCKS

3.8.1. Seacocks should be permanently installed on all through-hull openings below either the 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.

3.9. PLUGS

3.9.1. 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.

3.9.2. Additional plugs kept separately are recommended.

3.10. MAST STEP

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

3.11. PULPITS, STANCHIONS, LIFELINES

Attention is drawn to **ISO 15085 [Small craft - Man-overboard prevention and recovery]**

3.11.1. Lifeline arrangements should be taut double 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.

Intermediate lifeline(s) should be fitted so that:

- a. no vertical opening exceeds 380mm and
- b. it should be not less than 230mm above the working deck

3.11.2. Lifelines may be of wire or rope.

- a. Where wire lifelines are fitted they should be stranded 316 grade stainless steel or galvanized wire of minimum diameter as shown in Table 1 below. Lifelines should be uncoated and without close-fitting sleeving.
- b. The term "uncoated" in 3.11.2a above means that the wire must not be coated by any material that is moulded or otherwise bonded to the wire except galvanising.

The application of a loose sleeve to uncoated wire is permitted provided that air can circulate along the length of the wire and that it is regularly removed for inspection and the wire remains in good condition.

- c. Notwithstanding 3.11.2 (a) and (b) above, where lifelines are coated or do not exist or are not continuous, the crew should wear PFD1 lifejackets or safety harnesses attached by tether to a clipping point or jackstay at all times when a crew member is outside the cabin and the boat is underway in other than sheltered waters.
- d. A lifeline of synthetic rope with strength equivalent to the wire in Table 1 may be used. Where the rope passes through stanchions particular attention should be paid to preventing chafe.
- e. 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 required lifeline wire.

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")

3.11.3. Carbon fibre should not be used in the construction of pulpits, stanchions or lifelines.

3.11.4. The following should be provided:

- a. A bow pulpit forward of the headstay with vertical height and openings essentially conforming to 3.11.1.

Bow pulpits may be open but the opening between the pulpit and any part of the boat, 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 3.11.1. 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 3.11.4a.
- 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.

3.12. TOE RAIL AND NON-SKID

- 3.12.1. A toe rail near the deck edge of minimum height 25mm should be permanently installed around the foredeck from abreast the mast, except in way of fittings.
- 3.12.2. All surfaces on deck and around companionways should be non-skid.

3.13. HAND HOLDS

- 3.13.1. 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 boat.
- 3.14.2. The onboard 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 should be installed.

3.15. BUNKS

- 3.15.1. 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. A cooking stove, where installed, should be securely fastened to withstand capsizing, 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 shutoff 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. Gas is only recommended for cooking and for no other purpose. Methylated spirits, kerosene and lamp oil are also acceptable for use as cooking and lighting fuels. The use of petrol (or any fuel with a flashpoint below 60°C) for lighting, cooking or heating is strongly discouraged.
- 3.16.6. Gas bottles should be kept in a separate ventilated and self-draining compartment where vapour can only escape overboard.

3.17. WATER TANKS AND DRINKING WATER

- 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 crew member.
- 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 AND BUCKETS

- 3.18.1. 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.
- 3.18.2. Bilge pumps should have a 25mm minimum bore on the suction line.
- 3.18.3. Bilge pumps and strum boxes should be readily accessible for maintenance and for cleaning out any debris.
- 3.18.4. At least one manual bilge pump should be carried and this should be operable with all cockpit seats, hatches and companionways shut.
- 3.18.5. Unless permanently fitted, each bilge pump handle should be secured to the boat by a lanyard, or catch, or similar device to prevent accidental loss.
- 3.18.6. Two buckets of stout construction each with at least 8 litres capacity should be carried. Each bucket should be fitted with a lanyard.

3.19. 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.
- 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 boat.
- 3.20.3. Reserve navigation lights, capable of being quickly mounted with a power supply independent of the boat's main supply should be carried.
- 3.20.4. Spare lamps for other than the reserve navigation lights should be carried except for lamps with LED arrays.

3.21. ENGINE AND FUEL

Attention is drawn to the installations standards required by **AS1799.3 (Small Pleasure Boats Code - General Requirements for Yachts)** and the FSC Fire and Safety Rules.

- 3.21.1. An engine capable of producing a minimum boat 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 LWLW is 5kn.
- 3.21.2. Where an outboard engine is fitted it should be securely mounted at all times.
- 3.21.3. Inboard engine based propulsion systems 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 boat should be fitted with at least one permanently installed fuel tank.
- 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 an event should enable the boat to motor 50nm
- 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 grounded and have the filler positioned so that spillage and fumes cannot enter the boat.
- 3.21.8. Diesel fuel tanks should be metal or other material certified as suitable by the tank manufacturer, and electrically grounded.
- 3.21.9. 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.
- 3.21.10. In the case of petrol engines the flexible fuel line should be fire resistant and coded by the manufacturer as such (eg. with a red stripe).
- 3.21.11. 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.
- 3.21.12. 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).

3.21.13. Petrol should not be carried below decks in portable containers.

3.22. COMMUNICATIONS

3.22.1. A permanently installed VHF radio should be fitted and should be capable of operation on channels 6, 13, 16, 67, 71, 72, 73, 77, 80.

3.22.2. The radio should have:

- a. a rated output power of at least 25 watts.
- b. A masthead antenna with a coaxial feeder should be installed . The power loss in the antenna and feeder should not exceed 40%.
- c. A dedicated emergency antenna.

3.22.3. In addition to the installed VHF radio, a waterproof hand-held VHF radio 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.

3.22.4. The effective operation of radio communication systems should be checked by test transmissions immediately prior to an event e.g. by logging on.

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

3.22.6. A fully charged mobile telephone should be carried.

3.23. BATTERIES

3.23.1. Batteries should be of a sealed type from which electrolyte cannot escape.

3.23.2. 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 to preserve power for starting.

3.24. BAROMETER

3.24.1. A barometer should be fitted.

3.25. HULL IDENTIFICATION

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

- a. The boat's name.
- b. Its State Marine Authority number.
- c. Name of the club, or home port which may be abbreviated.

4. 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 boat.
- 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. FIRE EXTINGUISHERS

4.2.1. At least two fire extinguishers of minimum 10BE rating, marked as complying with AS1841.5 or AS1841.6 should be readily accessible in suitable and different parts of the boat.

4.2.2. All boats should carry a fire blanket.

4.2.3. Fire extinguishers should be serviced at the time interval specified by the manufacturer on the extinguisher or annually whichever is the lesser interval. For extinguishers fitted with a gauge they may instead be inspected by the owner (or rep) annually.

4.2.4. A small hole in the engine casing, suitable for discharging a fire extinguisher through without introducing air is suggested.

4.3. ANCHORS

4.3.1. The nature of the holding ground together with the water depth, amount of swinging room, sea conditions, tidal range and proximity of other vessels will largely dictate the most effective anchoring system - the type of anchor, its size, and the make-up and length of anchor cable. Scope (ratio of cable length to water depth) is a major factor in determining the holding capability of an anchor and generally, the larger the scope, the greater the holding capability.

4.3.2. Two anchors should be carried, together with a suitable combination of chain and rope, all ready for immediate use.

4.3.3. The primary anchor should be carried assembled and attached to its cable.

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

4.3.5. Anchor and cable arrangements such as those shown in Table 2 and Table 3 are indicative of those commonly specified by Classification Societies and boat designers. **AS2198-1983: Anchors for Small Boats** is relevant.

4.3.6. Chain cable should be 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.

Table 2: Anchor Cable (Rode) Length

Minimum length of chain	Plus length of warp or chain	Details
10m	40m	Primary anchor and cable
5m	60m	Primary anchor and cable
5m	40m	Secondary anchor and cable

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

Table 3: Minimum ground tackle details

Boat size	Anchor (High Holding Power)		Chain	Warp	Warp Size (Suggested)	
	Plough Type eg CQR	Spade Type eg Danforth			Standard Link	Minimum Breaking Force
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

4.4. FLASHLIGHTS

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

4.5. NAVIGATIONAL CHARTS AND BOOKS

4.5.1. Navigational charts (not solely electronic) for the cruising areas and chart plotting equipment should be carried. Charts (both paper and electronic) should be corrected and maintained up to date.

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

4.6. GLOBAL POSITIONING SYSTEM

4.6.1. A permanently installed GPS receiver should be fitted.

4.7. DEPTH SOUNDER

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

4.8. EMERGENCY STEERING

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

4.8.2. Crews must be aware of alternative methods of steering the boat in any sea condition in the event of rudder loss. At least one alternative method of steering should be practiced by the crew.

4.9. TOOLS AND SPARE PARTS

- 4.9.1. Tools and spare parts, including an effective means to disconnect or separate the rigging from the mast or hull should be carried.
- 4.9.2. Boats should carry sufficient spares and the necessary tools to enable routine and emergency engine oil, drive belt and filter changes. Spares should include fuel filter(s), drive belt(s), engine oil, and water pump impeller(s), and any associated seals and gaskets.
- 4.9.3. A bosun's chair or equivalent should be carried.
- 4.9.4. A sharp knife capable of cutting high modulus fibre lines, sheathed and restrained, should be located in or near each cockpit and at the mast.

4.10. BOAT'S NAME

- 4.10.1. The boat's name or registration should be marked on or otherwise fixed to miscellaneous buoyant equipment such as PFDs, cockpit cushions, lifebuoys, danbuoys, lifebuoys and lifeslings.
- 4.10.2. Where a PFD 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.

4.11. RETRO-REFLECTIVE TAPE

- 4.11.1. Marine grade retro-reflective material should be fitted to lifebuoys, lifeslings, liferafts and PFDs.

4.12. EMERGENCY POSITION INDICATING RADIO BEACONS (EPIRBs)

- 4.12.1. An EPIRB capable of transmitting on 406 Mhz should be carried.
- 4.12.2. EPIRBs should be:
- a. regularly tested;
 - b. Stored in a dry, well marked location near the companionway; and
 - c. properly registered in the boat's name with the appropriate authority.

4.13. LIFERAFTS, TENDERS and GRAB BAG

- 4.13.1. Either a liferaft or a seaworthy tender should be carried.
- 4.13.2. 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; and
 - Small anchor plus at least 10m of rode

4.13.3. A grab bag should be carried. A “home brew” barrel may be suitable.

4.13.4. The following equipment should be in the liferaft (or tender), or grab bag, in addition to that listed in 4.13.2:

- Mobile phone;
- EPIRB;
- Space blankets
- First aid kit including sunblock
- 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)

These items may be taken from the yacht’s safety equipment.

4.13.5. Stowage should be such that the liferaft or tender can be readily removed and launched.

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

4.14. LIFEBOUYS

4.14.1. A lifebuoy with a drogue, or a Lifesling, OSCAR, Seattle Sling or a man overboard module (without a drogue) should be carried. It should be equipped with retro-reflective tape and a self-igniting light, and marked with the boat's name. It should be accessible by the helmsman and ready for immediate use.

4.14.2. Attention is drawn to **AS 2261:Rescue Buoys**. The colour of a lifebuoy other than lines, fittings and retroreflective material should be a safety colour in the yellow to red range.

4.15. PYROTECHNICS (FLARES)

4.15.1. 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:** keep expired flares as extras.

4.15.2. The following flares should be carried:

- 2 red parachute
- 3 red hand
- 2 white hand
- 3 orange smoke

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

4.16. HEAVING LINE

4.16.1. 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.

4.17. STORM AND HEAVY WEATHER SAILS

- 4.17.1. It is strongly recommended that the boat 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.
- 4.17.2. The following sails should be provided:
- a. Heavy weather jib
 - b. Mainsail reefable to 60% of its luff length
- 4.17.3. A heavy-weather jib should have
- a. an area less than 10% of (height of the foretriangle squared).
 - b. a means to attach the luff to the stay, independent of any luff-groove device.
 - c. Sheeting positions permanently fitted on deck.
- 4.17.4. 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.

4.18. SAIL NUMBERS

- 4.18.1. Sail numbers and any associated letters used to identify a particular boat should be carried on mainsails, trysails, storm jibs and heavy weather sails so that the numbers are clearly visible. Other sails should be similarly marked.
- 4.18.2. A separate piece of heavy-duty material with the boat'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. Use of this identification banner enables search and rescue units to rapidly identify the boat in an distress situation. It may be on the opposite side of the material used for the distress sheet in 4.20.1.

4.19. SPARS and RIGGING

- 4.19.1. No mast should have less than two halyards and each should be capable of hoisting a sail.
- 4.19.2. Any boom that traverses a cockpit should be at least 1.9m above the cockpit floor.
- 4.19.3. Lightning strike protection – *any suggestions??*

4.20. DISTRESS SHEET

- 4.20.1. A standard orange sheet 1.8m x 1.2m with a black “V” or black square above a black circle, with lanyards attached, should be carried. It may be on the opposite side of the material used for the registration number in 4.18.2.

4.21. EMERGENCY GUIDES

- 4.21.1. A durable stowage chart should be displayed in a clearly visible position inside the boat. It should be clearly marked with the location and name of principal items of safety equipment.
- 4.21.2. A safety checklist should be given to every new crew member on boarding, for them to complete (“seek and find” learning).

5. PERSONAL EQUIPMENT

5.1. FIT FOR PURPOSE

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 boat.
- d. Stowed in conditions in which deterioration is minimised when not in use.

5.2. PERSONAL FLOTATION DEVICES (Lifejackets)

5.2.1. A personal flotation device Type 1 (PFD1) should be carried for each crew member. All PFD1s should be of the vest type; the bulky “Mae West” type of PFD is not acceptable.

5.2.2. Each PFD1 should:

- a. Comply with Australian Standard **AS1512: Personal Flotation Devices - Type 1 (soon to be replaced by AS 4758)**; or
- b. An equivalent or more stringent overseas standard such as **EN 396: Lifejackets and personal buoyancy aids. Lifejacket 150**; and should incorporate a mark of compliance with the standard.
- c. A combined PFD1 and Safety Harness may be used provided both the PFD and harness are compliant with their respective standards.

5.2.3. Each PFD 1 should have marine grade retroreflective tape, a whistle and a suitably strong crotch strap or thigh straps. It is further suggested that each PFD should have a light attached and be fitted with a splashguard/sprayhood.

5.2.4. Each inflatable PFD1 should be checked annually or at such other interval as prescribed by the manufacturer. This check should include bladder air retention, gas bottle date, connection and activation arrangements, and for any signs of chafe and wear to the bladder, stole and harness.

5.2.5. PFDs should be worn by all crew members in unfavourable conditions when heading for shelter e.g. when there is a risk of swell waves breaking.

5.2.6. PFDs or harnesses should be worn at times of heightened risk e.g. at night, or outside the cockpit, or in strong breezes.

5.2.7. PFDs or harnesses should be worn by children under 13, elderly persons or people with a medical condition that might impair their mobility, at all times when underway

5.3. SAFETY HARNESSSES, LINES, TETHERS and JACKSTAYS

5.3.1. Each person on board should have a safety harness and tether. The tether length should not exceed 2m and should have a snap hook at each end.

5.3.2. Each safety harness and line should comply with:

- a. Australian Standard **AS 2227: Yachtsmen’s Safety Harnesses and Lines**; or
- b. An equivalent overseas standard such as **EN 1095: Deck safety harness and tether for use on recreational craft**.

- 5.3.3. All members of the crew should be able to simultaneously and adequately attach themselves to strong points on the boat.
- 5.3.4. A crotch strap or thigh straps, capable of taking heavy loads, should be fitted to each safety harness.
- 5.3.5. Crew members should carry a personal knife capable of cutting a tether in an emergency.
- 5.3.6. A crew member's PFD and harness should be compatible and before an event each crew member should adjust a harness to fit themselves and retain that harness for the duration of the cruise.

5.4. JACKSTAYS

- 5.4.1. Jackstays should be attached to through-bolted or welded deck plates or other suitable and strong anchorage points fitted on deck. Jackstays should be arranged to port and starboard of the boat's centreline 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.
- 5.4.2. Jackstays should be made from either stainless steel 1×19 wire of at least 5mm diameter, or webbing 25mm wide with a breaking strength of at least 20kN. Wire (or rope) is not recommended for jackstays lying on deck because they are slippery if trodden on.
- 5.4.3. All fastenings and lashings for jackstays should have an equivalent strength to that of the jackstay.
- 5.4.4. Stanchion bases should not be used as strong points for the attachment of jackstays.

5.5. TETHER CLIPPING POINTS

- 5.5.1. 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.
- 5.5.2. Plain, single action, snap hooks should not be used in any tether, static tether, or jackstay system.
Reason: U-bolts or eye plates can cause plain snap hooks to "capsize" or "roll-over" when rotated on one leg of the u-bolt so that the hook "gate" bears against the other leg and opens. This occurrence is known as "roll-over reversal" and is a known cause of death and injury.
- 5.5.3. Clipping points, together with jackstays and static tethers should be located and fitted in such a way as to allow:
- crew members to clip on safely before coming on deck and to unclip after going below;
 - crew members moving between the working areas on deck and the cockpit(s) with minimal tether clipping and unclipping; and
 - at least two-thirds of the crew to be simultaneously clipped on without use of jackstays or static tethers.

5.6. PERSONAL LIGHTS

- 5.6.1. 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.

5.7. PERSONAL CLOTHING

- 5.7.1. 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. Skippers 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 boat has medical equipment and supplies sufficient to deal with the medical emergencies and conditions most likely to occur on the cruise.

6.1.3. Each skipper is responsible for onboard 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
- Diarrhea / Constipation
- Flesh bruises, wounds,
- Damage to eyes, digits, limbs and ribs.
- Strained muscles
- Burns – minor and severe
- Antibiotics and other medication
- Cardiac emergencies

6.1.4. It is the responsibility of individual crew members to inform the skipper of any medical condition that may affect their capabilities as a crew member. 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 crew members should know where medical equipment and supplies are stored. The location of all medical items should be shown on the boat's stowage plan (see 4.21.1).

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 crew members 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

6.2.1. As a minimum, boats 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,

- 6.2.2. Boats 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 onboard the boat.
- 6.2.3. Medical kits listed below are **BASIC**. It is therefore recommended that if there is any possibility that special medication is needed for any crew member then that crew member 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 and should contain as a minimum the items as shown in Table 4.
- 6.2.5. All required items should be within their expiry date.
- 6.2.6. Items in Table 4 marked thus **, are 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 annually.
- 6.2.7. In an emergency, medical advice should first be obtained from the nearest coastal radio station or by contacting a doctor. This is particularly important:
- before administering morphine or pethadine,
 - when treating an eye injury,
 - when treating diarrhoea where the patient also has a fever, and
 - when treating severe burns.

Table 4: Medical kit items – Green water (Coastal) cruising

	No.
FOR VARYING DEGREES OF PAIN	
Mild Pain	
Paracetamol 500mg.(Panadol) or Nurofen 200mg	20
Moderate Pain	
Codeine 8mg + Paracetamol 500mg (Panadeine)	20
Moderate to Severe Pain	
Codeine 30mg + Paracetamol 500mg (Panadeine Forte)	20
CARDIAC EMERGENCIES	
Soluble Aspirin (Disprin)	20
FOR WOUNDS AND LIMBS	
Butterfly Steristrips (Strips of 5)	
Disposable Gloves	20
Crepe bandages 75mm x 1.5m	2
Triangular bandage	1
Band-aids	20

	No.
Adhesive tape 50mm x 2.5m (Leukoplast)	1
Roll cotton wool	1
Non adherent dressing (Unitulle)	5
Antiseptic skin solution (Betadine) 15ml	1
Antiseptic swabs (Betadine)	8
Medi-crème tube (with Xylocaine 2%)	1
FOR EYES	
Normal saline (for washing) – 250ml	1
FOR BURNS	
Superficial burns	
Solugel wound dressing 100gm	1
Severe burns	
Cover with a non-adherent dressing and obtain hospital treatment as soon as possible.	
SUNSCREEN	
30+ SPF 250ml	1
FOR DIARRHOEA	
Loperanide Hydrochloride (Imodium) 2mg – pkt of 12 or Diphenoxylate 2.5mg atropine 0.025mg (Lomotil)	1
FOR SEASICKNESS	
Some form of seasickness remedy should be carried. It should be noted that all types available may produce drowsiness and/or disorientation. In the case of severe sea sickness Stemetil suppositories are strongly 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 boats must be self-sufficient for several days, capable of withstanding storms and heavy seas and be prepared to meet serious emergencies without the expectation of external assistance in less than 24 hours. e.g. A cruise from Fremantle to Albany, Carnarvon or Abrolhos.

A1 TRAINING AND EXPERIENCE:

A1.1 At least 50% of the crew including the skipper or sailing master should hold a valid Certificate of Competence in both theoretical and practical sessions in accordance with the YA Safety and Sea Survival Course (SSSC), or a Course of no less a standard acceptable to the Event Organisers that covers as a minimum, the following topics. It is strongly recommended that all crew members do likewise:

care and maintenance of safety equipment

- liferafts
- storm sails
- fire precautions and fire fighting
- damage control and repair
- heavy weather - crew routines, boat handling, drogues
- man overboard prevention and recovery
- provision of assistance to other craft
- hypothermia
- SAR systems
- operation of communications equipment (VHF, GMDSS, satcoms)
- weather forecasting
- flares

- A1.2 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.
- A1.3 At least two members of the crew should hold a current Senior First Aid Certificate, or equivalent, or be a practising medical practitioner.
- A1.4 At least 50% of the crew should hold a relevant Australian marine radio operator's certificate of proficiency, or an equivalent overseas qualification. (Marine Radio Operator's Certificate of Proficiency (MROCP); for HF
- A1.5 At least two members of the crew, including the skipper, should have completed at least one event of the category entered or an equivalent passage. Novice skippers who do not meet this recommendation should advise the Cruise Coordinator of their experience and that of their crew. The Cruise Coordinator will then seek guidance from the Cruising Section Safety Officer on additional precautions to recommend.

A2 WATER TANKS AND DRINKING WATER

- A2.1 At least two independent drinking water tanks should be permanently installed or securely fastened, and these should be capable of being discharged through a pump. If the water pump is dependent on the electrical supply for operation then an alternative means of pumping drinking water should be provided.
- A2.2 The total volume of drinking water carried for the maximum likely duration of the passage should not be less than that required to supply 10 litres per day per crew member.
- A2.3 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).

A3 BILGE PUMPS AND BUCKETS

- A3.1 Two manual bilge pumps should be securely fitted to the boat'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.

A4 ENGINE AND FUEL

- A4.1 An inboard propulsion engine based system capable of producing a minimum boat speed in knots of $1.8 \times \text{square root of LWL (metres)}$ against a 12 knot headwind should be permanently installed e.g. minimum speed for 10m LWL is 5.7kn.
- A4.2 The minimum volume of fuel to be carried at the start of an event should enable the boat to motor 200nm

A5 COMMUNICATIONS

- A5.1 A permanently installed HF transceiver should be fitted and have:
- a) A suitable HF antenna system
 - b) A dedicated HF emergency antenna.
 - c) Operate on frequencies 2056, 2182, 2284, 2524, 4125, 4149, 4426, 6215, 6230, 6507, 8113, 8176, 8291, 12290, 12359, 12362 kHz

A5.2 Satellite telephones are an acceptable alternative to HF radio.

A6 ANCHORS

A6.1 The specification of anchor, chain and rope should be in accordance with relevant class rules or the rules of a recognised Classification Society (Lloyd's, DNV etc.).

A7 FLASHLIGHTS

A7.1 At least three flashlights of a water resistant and floating type, with spare batteries and bulbs, one of which is suitable for signaling, should be carried.

A8 FOGHORN

A8.1 A foghorn should be carried. It is recommended that it be capable of operation without reliance on a containerised gas supply.

A9 RADAR REFLECTOR

A9.1 A radar reflector should be carried. Attention is drawn to **ISO 8729: Ships and marine technology - Marine radar reflectors**. 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 at or near the masthead, or at least 9m above sea level, whichever is the lesser.

A10 GLOBAL POSITIONING SYSTEM

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

A11 LOG

A11.1 A distance measuring instrument (other than GPS) should be fitted.

A12 EMERGENCY POSITION INDICATING RADIO BEACONS (EPIRBs)

A12.1 The number of EPIRBs carried on board should be not less than the number of liferafts carried.

A13 LIFERAFTS AND TENDERS

A13.1 Liferafts designed and constructed in accordance with Appendix C and capable of carrying the entire crew should be carried.

A13.2 The liferaft stowage should be such that the liferaft can be readily removed and launched regardless of whether or not the yacht is inverted.

A13.3 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, or if not exceeding 40kg in weight, securely stowed below deck adjacent to the companionway, 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; and
- iii) The compartment is designed and built to allow the liferaft to be removed and launched quickly and easily.

A13.4 Liferaft stowage should be such that the liferaft can be readily removed and prepared for launching within 15 seconds. On a multihull this applies whether or not the yacht is inverted.

A13.5 Liferafts 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.

A13.6 The yacht end of the liferaft painter should be permanently secured to a strong point on board the yacht.

A13.7 Each liferaft should have a valid 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 Appendix A and stating the official capacity of the liferaft which should not be exceeded. When a manufacturer so specifies, a raft may be externally inspected (i.e. not unpacked) and certified annually by the manufacturer or an approved servicing agent.

A13.8 A member of the crew should have witnessed the inspection of the liferaft carried.

A14 LIFEBOUYS

A14.1 In addition to 4.14.1, one additional lifebuoy should be carried, accessible by the helmsman and ready for immediate use. It should be equipped with a whistle, drogue and a self-igniting light.

A14.2 When two lifebuoys are carried at least one of them should be a Lifesling, OSCAR, Seattle Sling or man overboard module.

A14.3 Every inflatable lifebuoy should be tested at such interval prescribed by the manufacturer.

A15 FLARES

A15.1 The following flares should be carried:

- 6 red parachute
- 4 red hand
- 2 white hand
- 4 orange smoke

A16 STORM SAILS

A16.1 The following sails should be provided:

- a) storm jib
- b) Mainsail reefable to 60% of its luff length
- c) Storm trysail

- A16.2 Storm jib
- A storm jib should have an area not greater than 4% height of the foretriangle squared, and luff maximum length 60% height of the foretriangle.
- A16.3 Storm trysail
- 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 lowered whether or not the mainsail is stowed on the main boom.
- A16.4 All trysails and storm jibs should be of highly visible coloured material (e.g. Dayglo 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. A rotating wing mast used in lieu of a trysail should have a highly visible coloured patch on each side.
- A17 DROGUE, SEA ANCHOR**
- A17.1 A drogue or alternatively a sea anchor or parachute anchor should be considered. (Appendix F refers).
- A18 EMERGENCY GUIDES**
- A18.1 A durable checklist chart of actions in emergencies should be displayed in a prominent place.
- A19 PERSONAL FLOTATION DEVICES**
- A19.1 At least one spare type 1 PFD should be carried.
- A20 SAFETY HARNESSSES, LINES, TETHERS AND JACKSTAYS**
- A20.1 At least 30 % of the crew should, in addition to the tether listed in the main recommendations, be provided with either:
- a) A tether not more than 1m long; or
- b) A 2m tether, with a manufacturer fitted mid-point snap hook.
- A21 PERSONAL LOCATOR BEACONS (PLBS)**
- A21.1 A registered Personal Locator Beacon (**AS4280.2**) should be carried by or attached to each member of the crew when on deck. Crew members are to be trained in the use of this equipment.
- A22 MEDICAL KITS**
- A22.1 As a minimum, boats should carry:
- e. *Ship Captain's Medical Guide* or the *International Medical Guide for Ships*, or an equivalent publication.

- A22.2 Items in the medical kit should be increased on a pro-rata basis when there are more than 4 crew members onboard.
- A22.3 One of the common brand names of the generic product is indicated in brackets and the quantities for each category are indicated under the category column in Table 4. Alternate pharmaceuticals in equivalent amounts and having similar action to those stated are acceptable.

Table 5: Medical kit items – Blue water (Ocean) cruising

	No.
FOR VARYING DEGREES OF PAIN	
Mild Pain	
Paracetamol 500mg.(Panadol) or Nurofen 200mg	40
Moderate Pain	
Codeine 8mg + Paracetamol 500mg (Panadeine)	40
Moderate to Severe Pain	
Codeine 30mg + Paracetamol 500mg (Panadeine Forte)	20
Very Severe Pain	
** Oxycodone – 5mg (Endone)	20
or ** 30mg suppositories (Prodone)	10
** Morphine injections 15mg/1ml	5
** Pethedine injections 100mg/2ml	5
** Disposable 2ml syringes/ 23G X 1 1/4 inch needles	15
** Naloxene Hydrochloride injections	5
CARDIAC EMERGENCIES	
Soluble Aspirin (Disprin)	20
Nitrolingual Spray (Anginine)	1
FOR WOUNDS AND LIMBS	
Butterfly Steristrips (Strips of 5)	10
Disposable Gloves	20
Crepe bandages 75mm x 1.5m	2
Crepe bandages 100mm x 1.5m	1
Triangular bandage	1
Inflatable splint	1
Band-aids	20
Adhesive tape 50mm x 2.5m (Leukoplast)	1
Roll cotton wool	1
Non adherent dressing (Unitulle)	10
Antiseptic skin solution (Betadine) 15ml	1

	No.
Antiseptic swabs (Betadine)	8
Medi-crème tube (with Xylocaine 2%)	1
Hot water bottle	1
FOR EYES	
Normal saline (for washing) – 250ml	1
** Chloromycetin eye 10ml drops or 4gm ointment	1
Sterile eye patches	5
ANTIBIOTIC	
** Vibra-tabs 50mg	20
** Keflex 500mg caps.	20
** Augmentin Duo	10
FOR BURNS	
Superficial burns	
Solugel wound dressing 100gm	1
Severe burns	
Cover with a non-adherent dressing and obtain hospital treatment as soon as possible.	
Silvazine cream 100gm	1
SUNSCREEN	
30+ SPF 250ml	1
FOR DIARRHOEA	
Loperanide Hydrochloride (Imodium) 2mg – pkt of 12 or Diphenoxylate 2.5mg atropine 0.025mg (Lomotil)	1
FOR DEHYDRATION	
Gastrolyte 4.9g sachet - pkt of 10	1
FOR SEASICKNESS	
Some form of seasickness remedy should be carried. It should be noted that all types available may produce drowsiness and/or disorientation. In the case of severe sea sickness Stemetil suppositories are strongly recommended.	10
** Prochlorperazine suppositories (Stemetil) 25gm 5 5	5
FOR ALLERGY	
** Prednisdone tablets 25 mg	25
** Adrenaline Injections 1:1000	5
INSTRUMENTS	
Scissors, stainless steel	1
Thermometer, clinical	1

	No.
Forceps, splinter, stainless steel	1
Safety pins, assorted sizes	10
CPR mask or 4 face shields	1
Automatic defibrillator, checked at least annually	1

B Special recommendations for multihulls

B1 STABILITY

Attention is drawn to **ISO 12217-2 [Small craft - Stability and buoyancy assessment and categorization - Part 2: Sailing boats of hull length greater than or equal to 6 m]**

- 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.
- B1.3 A hull should have a watertight “crash” or “collision” bulkhead either:
- Within 15% of LOA from the bow and abaft the forward end of LWL; or
 - Between 5% and 15% of LWL behind the forward end of LWL. This watertight compartment should be divided horizontally by a bulkhead above the waterline; or
 - Permanently installed closed-cell foam buoyancy effectively filling the forward 30% LOA of the hull.

B2 EXITS

The recommended minimum clearance through a multihull escape hatch is 450mm diameter.

- B2.1 Each hull which contains accommodation should have at least two exits.
- B2.2 Multihulls of 12m LOA and greater in each hull which contains accommodation should have:-
- An escape hatch for access to and from the hull in the event of an inversion.
 - When the multihull is inverted each escape hatch should be above the waterline.
 - In a multihull each escape hatch should be at or near the midships station.
 - Each escape hatch should be on the side of a hull nearest the centreline of the boat.
 - A catamaran fitted with a central nacelle should have on the underside of the boat around the central nacelle, handholds of sufficient capacity to enable all persons on board to hold and/or clip on securely.
 - In a catamaran with a central nacelle, each hull should have an emergency refuge, accessible via a special hatch in the side of the hull nearest the central nacelle, which may be opened and closed from the inside and outside.
- B2.3 A trimaran of 12m LOA and greater should have:
- At least two escape hatches in accordance with B2.2b).
 - On the underside of the boat around the central hull, handholds of sufficient capacity to enable all persons on board to hold on and/or clip on securely.

- B2.4 Multihulls less than 12m LOA should either comply with B2.2b), or 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 COCKPITS

The minimum drain sizes after allowance for screens should be 20cm² per m³ of cockpit.

B4 PULPITS, STANCHIONS, LIFELINES

- B4.1 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.
- B4.2 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.
- B4.3 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.
- B4.4 Catamaran - lifelines from bow to stern on each hull. 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.

B5 MULTIHULL NETS OR TRAMPOLINES

- B5.1 The word "net" is interchangeable with the word "trampoline". 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 fixed at regular intervals on transverse and longitudinal support lines and should be fine-stitched to a bolt rope.
 - d) Able to carry the full weight of the entire crew when the yacht is upright or inverted.
 - e) Each tie point of the net should be individually tied and not continuously connected to more than four attachment points per connecting line.
- B5.2 Trimarans with double crossbeams
- A trimaran with double crossbeams should have nets on each side covering the:
- a) Rectangles formed by the crossbeams, central hull and outriggers.

- b) Triangles formed by the aft end of the central pulpit, the mid-point of each forward crossbeam, and the intersection of the crossbeam and the central hull.
- c) Triangles formed by the aftermost part of the cockpit or steering position (whichever is furthest aft), the midpoint of each after crossbeam, and the intersection of the crossbeam and the central hull.

B5.3 Trimarans with single crossbeams

A trimaran with single crossbeams should have nets between the central hull and each outrigger: On each side between two straight lines from the intersection of the crossbeam and the outrigger, respectively to the aft end of the pulpit on the central hull, and to the aftermost point of the cockpit or steering position on the central hull (whichever is furthest aft).

B5.4 Catamarans

On a catamaran the total net surface should be limited:

- a) Laterally by the hulls.
- b) Longitudinally by transverse stations through the forestay base, and the aftermost point of the boom lying fore and aft. However, a catamaran with a central nacelle (non-immersed) may satisfy the recommendations for a trimaran.

B6 **TOE RAIL AND NON-SKID**

B6.1 A toe rail is not required on multihulls.

B7 **BILGE PUMPS AND BUCKETS**

B7.1 Multihulls should have provision to pump out all watertight compartments except those filled with impermeable buoyancy.

B8 **HULL IDENTIFICATION**

B8.1 Multihulls should show on the underside, not less than 2 areas of highly visible colour of at least 1m² each.

B9 **JACKSTAYS**

B9.1 At least two jackstays or multiple tether clipping points should be fitted on the underside of a multihull in case of inversion.

B10 **TETHER CLIPPING POINTS**

B10.1 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.

C LIFERAFT SPECIFICATIONS

C1 GENERAL DESIGN AND CONSTRUCTION:

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

- a) the construction requirements of Regulation 15 of the International Convention of the Safety Of Lives At Sea 1974 (SOLAS) with amendments, except that an insulated floor and insulated canopy are optional , or
- b) ISO 9650 Part 1 Type 1 Group A, 9 (Group B acceptable for warmer northern waters)
- c) 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.

C2 EQUIPMENT

Each raft should have 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. Compliance with either ISO 17339: or an equivalent, is recommended.
- One safety knife.
- One bellows or hand pump for hand inflation that is of one piece, ready for use and does not require assembling.
- One water resistant torch (signalling) together with one spare set of batteries and one spare bulb in a waterproof container.
- One heliograph mirror.
- One bailer easily identifiable as such.
- One sponge per person.
- One repair outfit complete with six emergency buoyancy tube leak stopping plugs capable of repairing punctures in buoyancy compartments.
- One buoyant rescue quoit attached to at least 30 metres of buoyant line.
- Four red hand-flares and two smoke signals.
- Two red parachute flares.
- One signalling whistle.
- Drinking water, at least 0.5 litres per person.
- One tin of emergency rations per person.
- Two tubes of sun cream (SPF 30+)
- Five plastic bags, not less than 450mm x 300mm per person.
- 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.
- A USL Coastal Pack First Aid Kit.
- A hand operated water maker.

- Two buoyant paddles with handles.
- Six anti seasickness tablets for each person.
- One waterproof copy of the illustrated table of life-saving signals referred to in Regulation 38 of Chapter V of SOLAS 1997.
- One waterproof copy on how to survive in the life raft.

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.

C3 GRAB BAG

It is recommended that a “grab bag” be accessible. The following contents should be considered for inclusion 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
- SART (Search & Rescue Radar Transponder)
- "dry" survival suits
- space blankets
- second sea anchor and line
- two safety tin openers
- tins to open!!
- waterproof hand-held VHF transceiver
- waterproof hand-held VHF transceiver or mobile phone
- 406 Mhz EPIRB
- a first aid kit incl. sunblock
- one plastic drinking vessel graduated into 10, 20 and 50 ml
- two "cyalume" sticks or similar watertight floating lights or lamps
- one daylight signalling mirror
- sun hats
- 10 litres per person
- Note: 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)

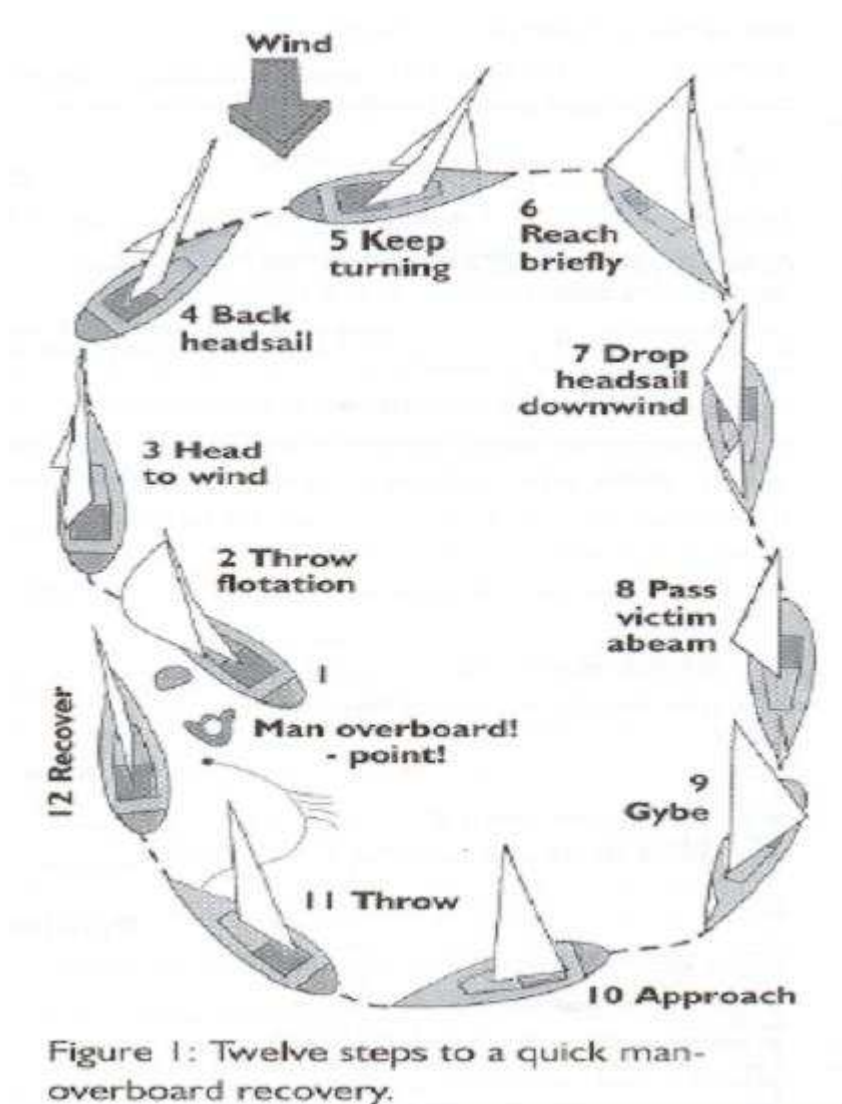
D MAN OVERBOARD RECOVERY

D1 QUICK STOP AND THE LIFE SLING (OR SEATTLE SLING) RECOVERY METHODS

When a crew member goes over the side recovery time is of the essence. In an effort to come up with a recovery system that is simple and lightning quick, the US Yacht Racing Union Safety at Sea Committee, the US Naval Academy Sailing Squadron, the Cruising Club of America Technical Committee and the Sailing Foundation of Seattle, Washington, joined forces to conduct extensive research and sea trials. The result of their collaboration is the "Quick-Stop" method of man-overboard recovery.

The hallmark of this method is the immediate reduction of boat speed by turning to windward and then manoeuvring slowly, remaining near the casualty. In most cases, this is better than reaching off, then gybing or tacking and returning on a reciprocal course.

D2 QUICK-STOP PROCEDURE



1. **Shout "man overboard"** and detail a crew member to spot and point to the casualty's position in the water. The spotter should not take their eyes off the casualty (see Figure 1).

2. **Provide immediate flotation.** Throw buoyant objects such as cockpit cushions, life rings and so on. These objects may not only come to the aid of the casualty, but will "litter the water" where he went overboard and help your spotter to keep the casualty in view. Deployment of the pole and flag (danbuoy) requires too much time. The pole is saved to "put on top" of the casualty in case the initial manoeuvre is unsuccessful.
3. **Bring boat head-to-wind** and beyond.
4. **Allow headsail to back** and further slow the boat.
5. **Keep turning** with headsail backed until wind is abaft the beam.
6. **Head on beam-to-broad reach course** for two or three lengths then go nearly dead downwind.
7. **Drop the headsail** while keeping the mainsail centred (or nearly so). The jib sheets are not slacked, even during the dousing manoeuvre, to keep them inside the lifelines. **Note:** Furling headsails might be better stowed before heading downwind.
8. **Hold the downward course** until casualty is abaft the beam.
9. **Gybe.**
10. **Approach the casualty** on a course of approximately 45 degrees to 60 degrees off the wind.
11. **Establish contact with the casualty** with heaving line or other device. The US Naval Academy uses a "throwing sock" containing 75 feet of light floating line and a bag that can be thrown into the wind because the line is kept inside the bag and trails out as it flies to the casualty.
12. **Effect recovery** over the windward side.

D3 QUICKSTOP UNDER SPINNAKER

The same procedure is used if a spinnaker is flying. Follow the preceding instructions. As the boat comes head-to-wind and the pole is eased to the head stay, the spinnaker halyard is lowered and the sail is gathered on the fore deck. The turn is continued through the tack and the approach phase commences.

D4 QUICKSTOP IN YAWLS & KETCHES

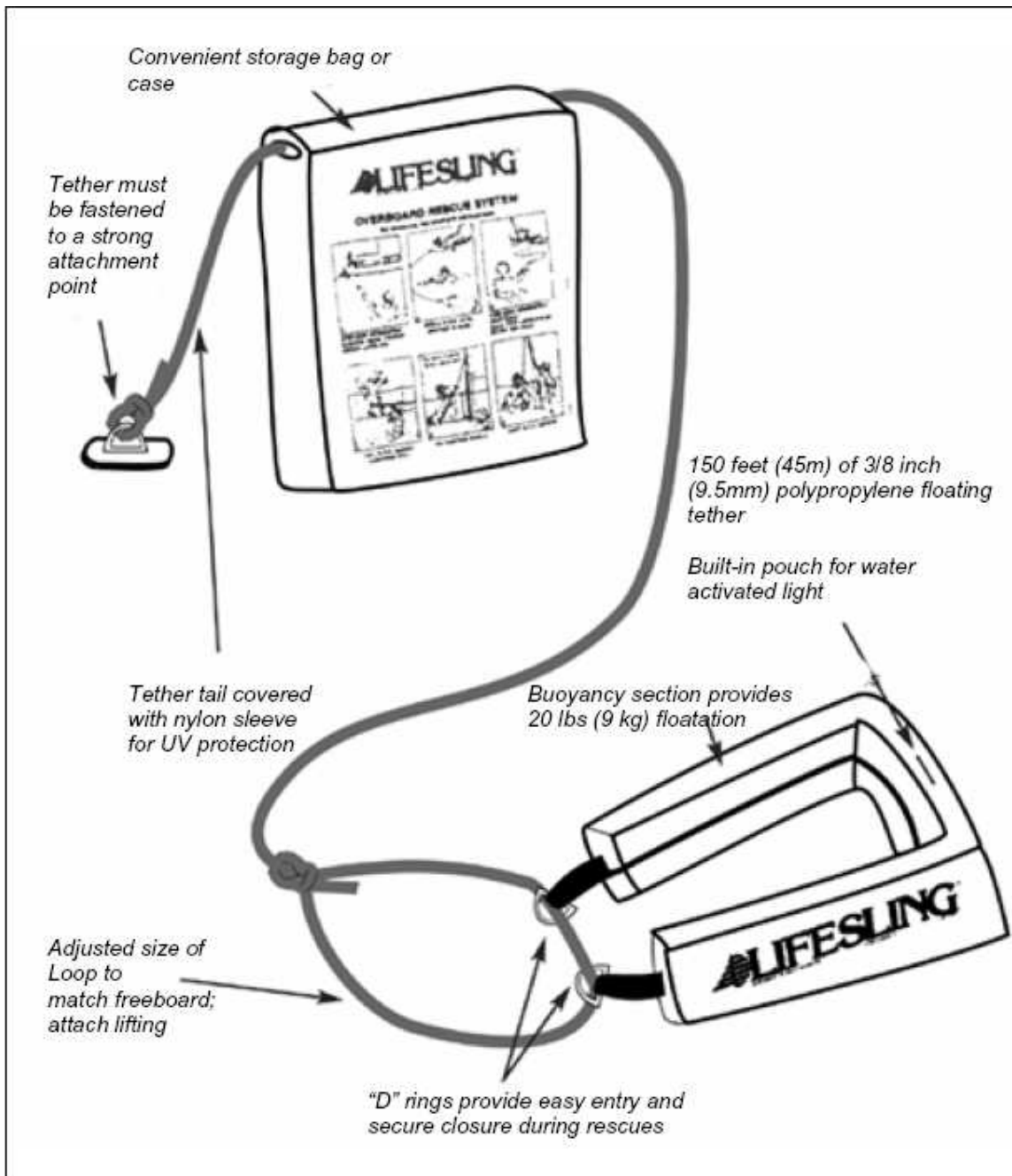
Experiment with your mizzen sail. During sea trials, it was found best to drop the mizzen as soon as possible during the early phases of Quick-Stop.

D5 QUICKSTOP USING ENGINE

Use of the engine is not essential, although it's advisable to have it running in neutral during Quick-Stop in case it is needed in the final approach. Check first for trailing lines!

D6 SHORTHANDED CREWS

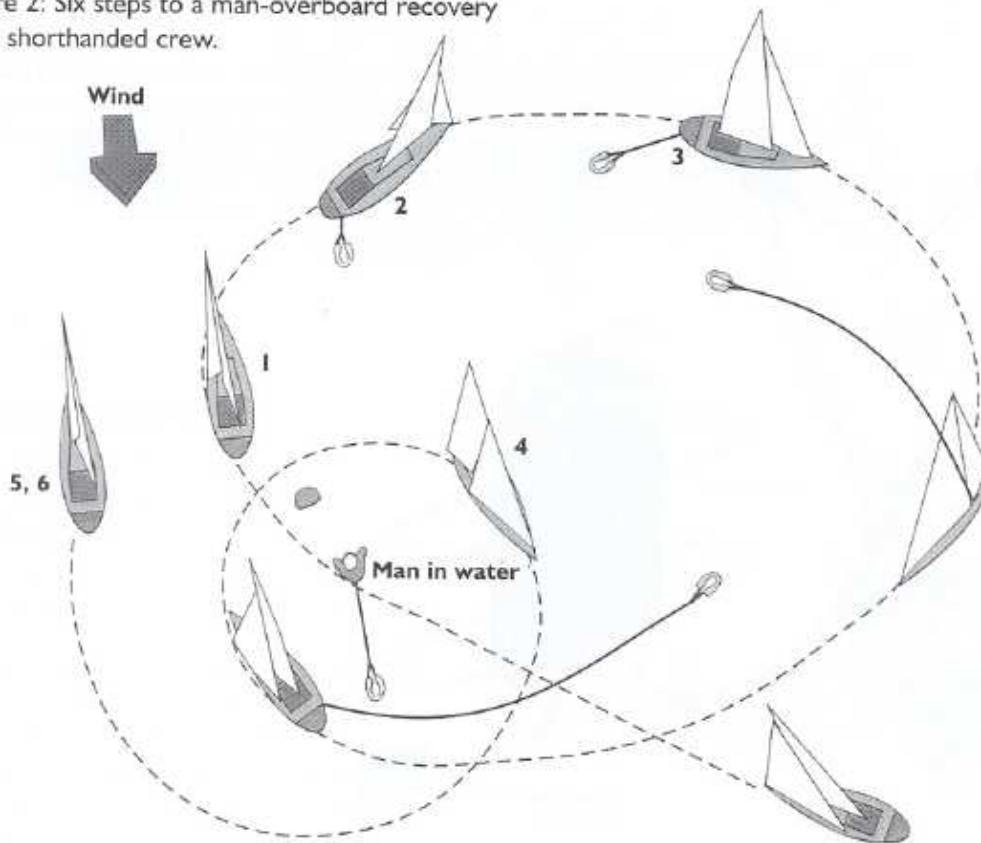
When there are only two people sailing together and a man-overboard accident occurs, the remaining crew member may have difficulty in handling the recovery alone. If the victim has sustained injuries, getting them back aboard may be almost impossible. The Quick-Stop method is simple to effect by a singlehander, with only one alteration to the procedure: the addition of the "Lifesling", a floating horsecollar device that doubles as a hoisting sling. The Lifesling is attached to the boat by a length of floating line three or four times the boat's length.



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When a crew member falls overboard the scenario should proceed as follows:

Figure 2: Six steps to a man-overboard recovery for a shorthanded crew.



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1. A cushion or other flotation is thrown while the boat is brought IMMEDIATELY head-to-wind, slowed and stopped.
2. The Lifesling is deployed by opening the bag on the stern pulpit and dropping the sling into the water. It will trail astern and deploy the line.
3. One deployed, the boat is sailed in a wide circle around the casualty with the line and sling trailing. The jib is allowed to back from head-to-wind, increasing the rate of turn.
4. Contact is established with the casualty by the line being drawn inward by the boat's circling motion. The casualty places the sling over his head and under his arms.
5. Upon contact, the boat is put head-to-wind again, the headsail is dropped to the deck and the main is doused.
6. As the boat drifts slowly astern, the crew begins pulling the sling and the casualty to the boat. If necessary, a cockpit winch can be used to assist in this phase, which should continue until the victim is alongside and pulled up tightly until he/she is suspended in the sling (so that they will not drop out). A horizontal lift is preferable when there is a choice.

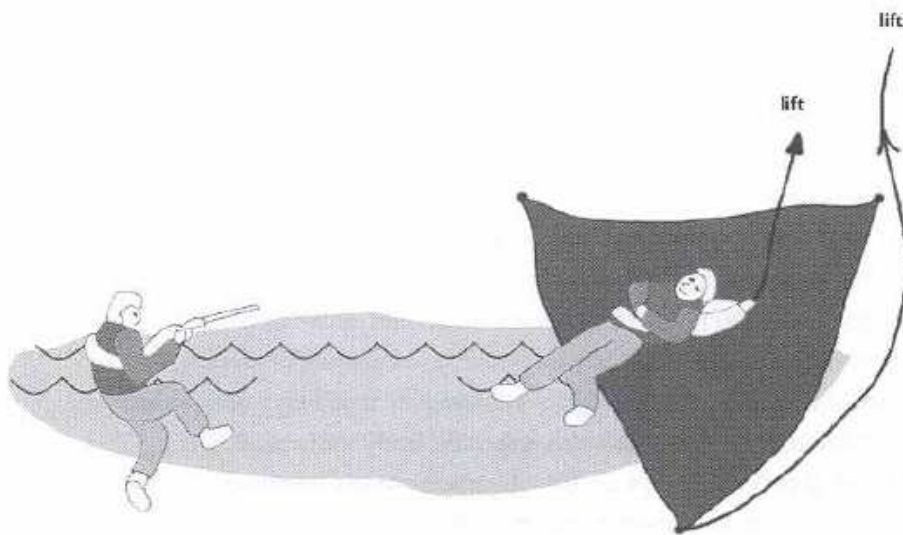
D7 THE HOISTING RIG

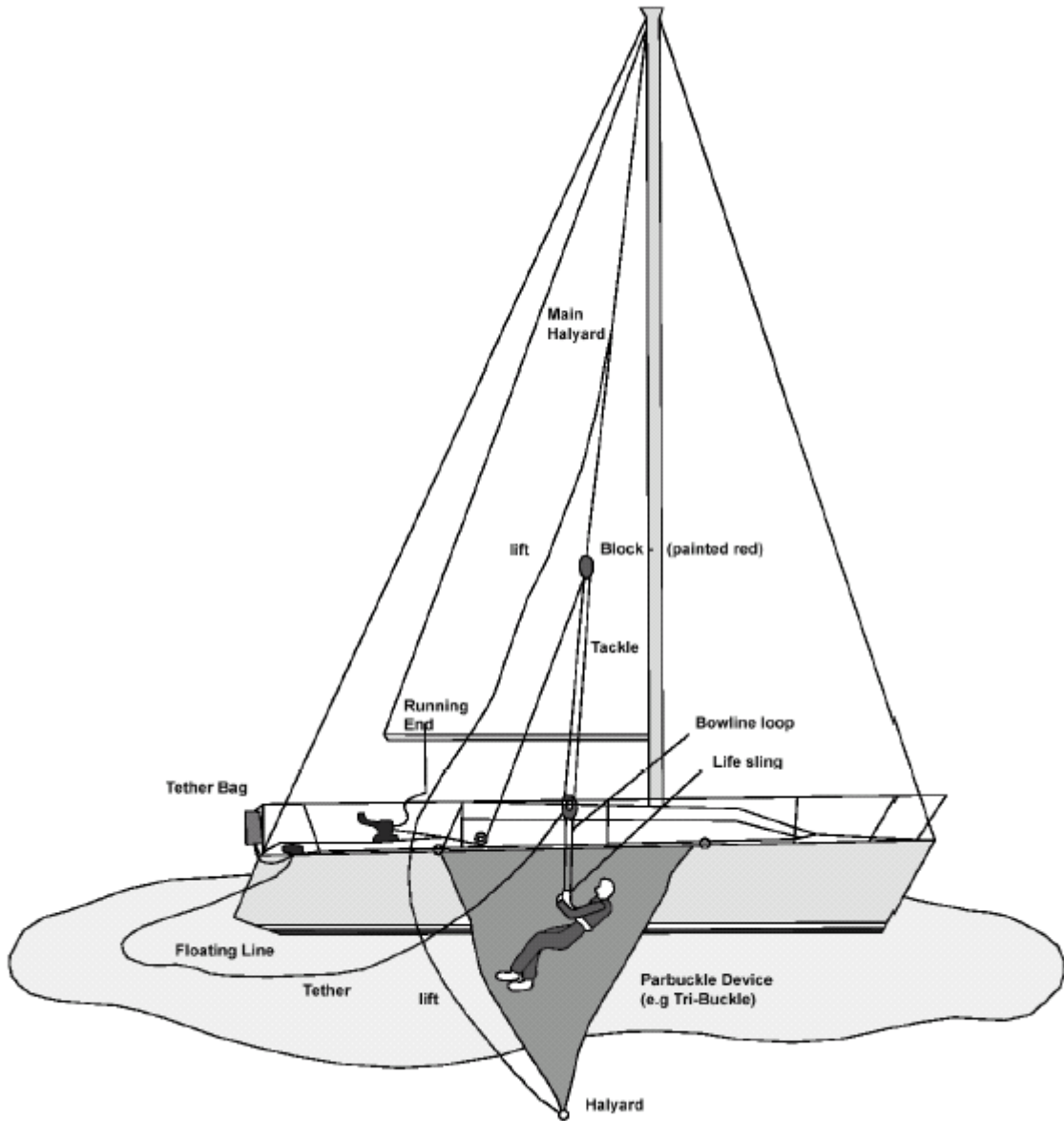
Note: Since the hoisting rig was developed, more evidence has emphasised the value in keeping a casualty horizontal particularly after long or hypothermic immersion. A parbuckle or horizontal lift is highly desirable (see below).

1. With the floating tether line, haul the casualty alongside, preferably on the windward side, from amidships to the quarter, wherever there are available cleats and winches.
2. Pull up on the tether line (with winch assistance, if necessary) to get the casualty's head and shoulders out of the water and cleat it. The casualty is now safe.
3. Attach a three-or four-part tackle to the main halyard, haul it up to a pre-determined point, about 3m above the deck or high enough so that the casualty can be hoisted up and over the lifelines. Cleat the halyard.
4. Attach the lower end of the tackle to the (previously sized) loop in the tether line that passes through the D-rings of the sling.
5. Reeve the running end of the tackle through a sheet block or snatch block on deck and put it on a cockpit winch. Hoist the casualty aboard by winching on the running end of the tackle.

D8 PARBUCKLE DEVICE

This is an alternative to the hoisting rig. A patent version is known as the Tribuckle. Another version is rectangular, like a climbing net. The net, or triangle of strong porous material, is clipped to the toe rail, the triangle top or net extremity clipped to a halyard extension. The casualty is dragged or otherwise positioned into the triangle or net then rolled onto the deck by hoisting the halyard. Hypothermic aftershock may be minimised by this method which keeps the casualty essentially horizontal.





E HYPOTHERMIA

E1 WHAT IS IT?

Hypothermia is a condition in which exposure to cold air and/or water lowers body core temperature. Death can result from too low a brain and heart temperature.

E2 WHY BE CONCERNED?

Hypothermia, even mild cases, decreases crew efficiency and increases risk of costly accidents. Proper planning against hypothermia can avoid accidents.

E3 PREVENTION

Wear warm clothing and a lifejacket/harness and have proper foul-weather kit for all crew. Dry suits are excellent. Insulate all areas of the body, especially the high heat-loss areas such as the head, neck, armpits, sides of chest and groin. Keep warm and dry, but avoid sweating; wear layered clothes.

Other preventative measures include:

Rotate the deck watch frequently.

Get plenty of rest, prevent fatigue.

Eat and drink normally, *no alcohol*.

Prevent dehydration; watch urine colour (drink more if colour becomes more intense).

Avoid seasickness.

Take into account special medical problems of crew members.

Regularly train crew in Man Overboard recovery.

Have two or more crew trained in CPR (Cardio-pulmonary Resuscitation).

E4 SURVIVAL IN COLD WATER (UNDER 25°C)

If the boat is in trouble, put on dry or survival suits if carried. Radio for help; give position, number of crew, injuries, boat description. Make visual distress signals. Stay below if possible. Remain aboard until sinking is inevitable.

If going overboard, launch liferaft and EPIRB. Take grab bag, visual distress signals and waterproof hand-held VHF. Get into raft, stay out of water as water conducts heat out of the body 20 times faster than air. Remain near boat if practicable.

If in the water, crew should stay together near the boat. This makes everyone easier to find and helps morale. Enter liferaft, keep dry suit or survival suit on if worn.

If not wearing dry suit or survival suit, make sure you wear a lifejacket, keep clothes and shoes on for some insulation and flotation. Keep hat on to protect head. Get all or as much of body out of water as soon as possible - into raft or swamped boat or onto flotsam. Avoid swimming or treading water, which increases heat loss. Minimise exposed body surface. A splashguard accessory on the lifejacket greatly improves resistance to swallowing seawater and also accommodates involuntary "gasping" when plunged into cold water.

E5 WARNINGS

First aid for severe and critical hypothermia is to add heat to stabilise temperature only. Rapid re-warming, such as a hot shower or bath, may prove fatal; it will, at least, cause complications. Allow the body to re-warm itself slowly. Body core temperature lags behind skin temperature during re-warming. Keep the casualty protected for extended period after apparent full recovery or medical help arrives.

Many hours are required for full return to normal temperature even though the casualty may say they have recovered.

Always assume hypothermia is present in all man overboard situations in which the casualty has been exposed for more than 10-15 minutes. Casualties may also be suffering from near drowning, thus needing oxygen. Observe the casualty for any signs of vomiting.

In a helicopter rescue, protect the casualty - including the head - from rotor blast wind chill.

E6 HYPOTHERMIA FIRST AID

E7 ALL CASES

Keep casualty horizontal

Move casualty to dry, shelter and warmth

Allow to urinate from horizontal position

Handle gently

Remove wet clothes - cut off if necessary

Apply mild heat (comfortable to your skin) to head, neck, chest and groin - use hot water bottles, warm moist towels

Cover with blankets or sleeping bag; insulate from cold — including head and neck

Report to doctor by radio

E8 MILD CASES

Primary task is to prevent further heat loss and allow body to re-warm itself

Give warm, sweet drinks - no alcohol - no caffeine

Apply mild heat source to stabilise temperature and/or re-heat to point of perspiring

Keep casualty warm and horizontal for several hours

E9 MODERATE CASES

Same as above, plus:

Give warm, sweet drinks if the casualty is fully conscious and able to swallow without difficulty - no alcohol - no caffeine.

Apply mild heat source to stabilise temperature and/or re-heat to point of perspiring. Keep the casualty warm and horizontal for several hours.

Have the casualty checked by doctor.

E10 SEVERE CASES

Obtain medical advice as soon as possible using your radio.

Assist the casualty, but avoid jarring her as rough handling may cause cardiac arrest or ventricular fibrillation.

No food or drink should be given.

Observe for any vomiting and be prepared to clear airway.

Ignore any pleas of "*Leave me alone, I'm OK*" - keep a continuous watch over the casualty.

Lay casualty down in bunk, wedge in place, elevate feet, keep immobile; no exercise.

Apply external mild heat to head, neck, chest and groin, keep the body temperature from dropping, but avoid too rapid a temperature rise.

E11 CRITICAL CASES

Always assume the patient is revivable; live hypothermic casualties may often look dead so don't give up - pulse very difficult to feel, breathing may have stopped.

Handle with extreme care

Tilt the head back to open the airway; look, listen and feel for breathing and pulse for one to two full minutes

If there is any breathing or pulse, no matter how faint or slow, do not give CPR, but keep a close watch on vital sign changes

Stabilise temperature with available heat sources, such as naked chest to back warming by other crew member (leave legs alone)

If there is no breathing or pulse for one or two minutes, begin CPR immediately. Do not give up until the casualty is thoroughly warm - alive or dead.

Medical assistance is imperative - hospitalisation is necessary.

F DROGUES AND SEA ANCHORS

F1 TERMINOLOGY

The term "drogue" generally describes a device dragged from the stern of a vessel. The vessel with a drogue deployed continues to make steerage way through the water but at reduced speed. The term "sea anchor" generally identifies a device streamed from the bows of a vessel whose drift is slowed or halted by the action of the sea anchor.

F2 LIFERAFTS

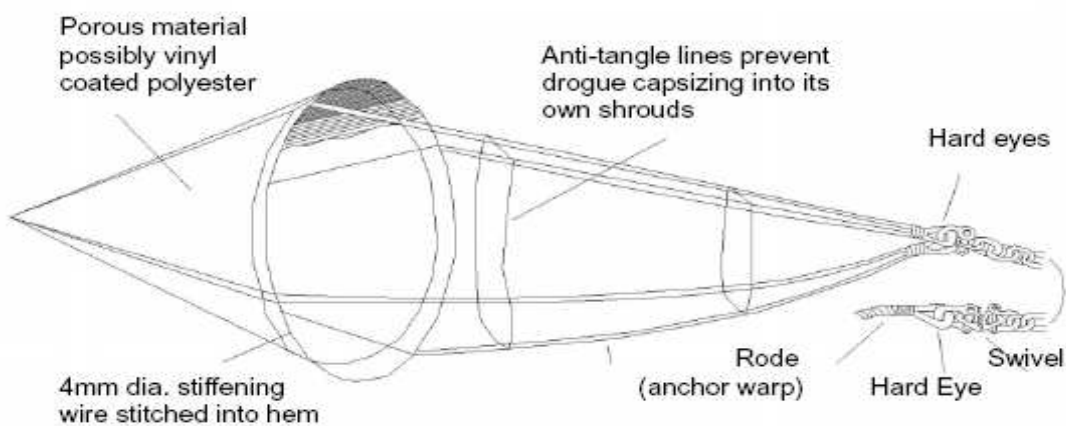
Every liferaft has a sea anchor supplied as part of its equipment. A sea anchor is critical to the safe use of a liferaft and significantly reduces the probability of liferaft capsizing. Its secondary function is to limit drift. A spare sea anchor may be carried in a grab bag. Sea anchors in liferafts should comply with ISO 17339: Ships and marine technology. Sea anchors for survival craft and rescue boats, and the opportunity should be taken at service intervals to ensure compliance with this standard.

F3 DROGUES ON YACHTS

Research and testing associated with drogue deployment has repeatedly shown that the use of a drogue can prevent typical yacht forms from being slewed sideways and rolled in heavy breaking seas.

Deployment of a drogue over the stern means that heavy water will break over that part of the yacht, so all openings must be properly secured shut. A "series-drogue" invented by Donald Jordan has the ability to continue to provide drag even if part of the device is "surfing" under a wave crest.

SAILMAKER'S DROGUE (Not to scale)



Typical Dimension

LWL	Mouth dia (Min)	Slope Length (Min)	Shroud Lines (Min)
10m (33ft)	1m (3ft 4ins)	1.3m (4ft 3ins)	1.3m (4ft 3ins)
13 m (43ft)	1.3m (4ft 3ins)	1.7m (4ft 11ins)	1.7m (4ft 11ins)

F4 SEA ANCHORS ON YACHTS

The most common form of sea anchor for yachts is the "parachute" anchor whose design was originally based on that of aviation parachutes. Specialist manufacturers have accumulated a considerable volume of data which demonstrates the effectiveness of the device which can enable a vessel to take seas bows-on, reduce drift to the order of one knot, and resist capsize. Bridle lines led to port and starboard main winches can provide emergency steering. It is recommended that any sea anchor or drogue be obtained from a specialist supplier/manufacturer.

G STABILITY

G1 INTRODUCTION

Stability can be defined as the tendency of a vessel to return to an upright condition after it is inclined by external forces such as wind, seas, weight shifts, and other factors.

Ultimate (Latent) Stability is the resistance to capsize and heel. One of the best predictors of ultimate stability is the "angle of vanishing stability" (AVS) or the angle to which a boat can heel and still right itself.

A dinghy will have a stability range of about 80 degrees; an inshore cruising boat should have a stability range of at least 100 degrees; and, an offshore cruising boat at least 120 degrees. Boats which have a vanishing stability angle of less than 140 degrees may be left floating upside down once capsized. Boats with a higher angle will usually right themselves. Compliance with these AVS figures does not guarantee that a boat will resist capsize or self-right in all sea conditions.

An introduction to the subject of stability for cruising boats may be found at <http://www.johnsboatstuff.com/technica.htm>

The 1998 Sydney to Hobart Race Review Committee report noted:

"There is no evidence that any particular style or design of boat fared better or worse in the conditions. The age of yacht, age of design, construction method, construction material, high or low stability, heavy or light displacement, or rig type were not determining factors. Whether or not a yacht was hit by an extreme wave was a matter of chance."

G2 REQUIREMENTS

A cruising boat can demonstrate its stability characteristics in one of two ways:

if the boat has an IMS certificate (current or expired), that certificate could be used to demonstrate compliance. If the certificate is not current, more information may be required to verify that the information therein remains relevant (ie, if the boat has had significant changes made to it, the certificate may no longer be valid); or

if the boat has no such certificate, it may demonstrate compliance with other standards and information. This could be design and build information about the boat, showing a GZ curve and the angle of vanishing stability (AVS). If it is a production boat, satisfactory stability information and applicable standards may be obtainable from the manufacturer.

ISO 12217-2 [Small craft – Stability and buoyancy assessment and categorization – Part 2: Sailing boats of hull length greater than or equal to 6m.] may be used as a guide to the boat's general suitability for cruising categories as follows:

Boats participating in Blue Water (Ocean) events should have an IMS Stability Index of 115 or greater; or comply with ISO 12217-2 Category A, except that the STIX number should be a minimum of 35.

Boats participating in Green Water (Coastal) category events should have an IMS stability index of 110 or greater; or comply with ISO 12217-2 Category B.

Boats participating in only sheltered water events should have an IMS stability index of 103 or greater; or comply with ISO 12217-2 Category C.

Note: Compliance with ISO 12217-2, or any other standard, does not guarantee total safety or total freedom of risk from capsize or sinking.