

DRAFT POLAR YACHT GUIDE for non-SOLAS pleasure yachts in Polar Waters

GOAL The goal of this document is to encourage safe and environmentally-friendly navigation by Pleasure Yachts of less than 300 GT in Arctic and Antarctic Polar Waters. Polar Waters is defined in the International Maritime Organisation (IMO) Polar Code Introduction figures 1 and 2.

The guide is presented in three parts:

Page 2	PART A - Safety of navigation and voyage planning for Arctic and Antarctic polar waters.
Page 3	PART B - More detailed guidance with particular reference to Arctic polar waters.
Page 9	PART C - More detailed guidance with particular reference to Antarctic polar waters.
Page 15	APPENDIX - a list of useful websites

Polar Yacht Guide Drafting Group and copyright

Part A has been written by Alan Green on behalf of World Sailing. It follows a similar format, and covers the same subjects, as chapters 9 and 11 of the IMO Polar Code.

Part B has been written by Victor Wejer and Andrew Wilkes with the help of contributions from a number of experienced high latitude sailors listed in Part B.

Part C has been written under the guidance of Skip Novak. It is based on the current 'Yachting Guidelines for Antarctic Cruises' produced by the Secretariat of the Antarctic Treaty which were adopted by the Antarctic Treaty Consultative Meeting in 2012.

The Polar Yacht Guide (PYG) is being made available to interested parties. It can also be downloaded and copied free of charge from the World Sailing website. It will be reviewed from time to time by the PYG drafting group which currently comprises the people named above. Copyright remains, where appropriate, with this group and the Secretariat of the Antarctic Treaty.

PART A - Safety of navigation and voyage planning for northern and southern polar waters*

1. SAFETY OF NAVIGATION

Yachts are strongly recommended to have as a minimum the following, with equipment designed, constructed and (where appropriate) installed, to function in the expected polar waters conditions.

- 1.1. Means to receive up-to-date MSI (maritime safety information) bulletins including ice and weather information
- 1.2. If voyaging to an area where a magnetic compass is not effective, non-magnetic means to determine and display heading.
- 1.3. Position-fixing equipment including one electronic system
- 1.4. Adequate narrow-beam lamps for visual detection of ice in darkness
- 1.5. If working with an icebreaker, means to indicate when the yacht is stopped
- 1.6. An echo-sounder plus a backup system that may be a lead line
- 1.7. A clear view astern from the conning position
- 1.8. When intending to operate where ice accretion may occur, awareness of how to predict icing and a method for clearing ice from aerials and rig.
- 1.9. If voyaging to latitudes >80 degrees, at least one GNSS compass or equivalent

2. VOYAGE PLANNING

Yachts are obliged under SOLAS Chapter V Regulation 34 to have a Passage or Voyage plan, which should include:

- 2.1. Any limitations on hydrographic information and aids to navigation
- 2.2. Measures to cope with environmental conditions and regulations
- 2.3. Expected extent and type of ice
- 2.4. Statistics on ice and temperature from former years
- 2.5. Places of refuge
- 2.6. Any areas to be avoided including those in which marine mammals congregate and/or may migrate and/or are designated as protected for marine mammals, birds, or other reason
- 2.7. What to do when marine mammals and birds are encountered
- 2.8. Reference to a vessel-specific checklist for briefing crew on procedures and contingency plans applicable to polar waters sailing
- 2.9. Ships' routing systems, speed recommendations and VTS services
- 2.10. Implications of operation remote from SAR capabilities
- 2.11. Local regulations and information sources, access permits, etc.

*defined in the IMO Polar Code Introduction figures 1 and 2

In addition to the IMO Polar Code, useful IMO documents include MEPC/Circ.674 (cetaceans); MSC.1/Circ.1184 (contingency plans for remote areas); MEPC.1/Circ.792 (biofouling on recreational craft); MSC.1/Circ. 1413 (oceanic voyages by non-regulated craft)++ All the foregoing can be found by Google search. Polar Code Appendix II has PWOM guidelines which although written for SOLAS ships will be helpful to Pleasure Yachts in producing an equivalent document.

++In accordance with IMO document SAR.7/Circ.14 the list of documents to be held by a JRCC or MRCC includes MSC.1/1413 which in turn references World Sailing Offshore Special Regulations, mentioned later in this Polar Yacht Guide.

PART B - Arctic Waters

- I. Safety of Navigation in the Arctic
- II. Voyage Planning and regulations
- III. Arctic environment and wildlife protection

The POLAR YACHT GUIDE offers guidance to pleasure yachts (both pleasure sailing and motor vessels) ranging from the smallest boats to vessels up to 300GT. Part B applies to the wide range of environments found in Arctic waters (as defined by the IMO Polar Code). It is therefore impossible to prescribe definitive equipment lists, procedures or codes of practice which are appropriate for every vessel. The following advice concerning safety of navigation, voyage planning and environmental protection is designed to be guidance and to be used as appropriate on a voluntary basis. It is not intended to restrict freedom of choice and individual initiative.

The remoteness and climate of the Arctic poses particular demands on the vessels operating there. In many of these areas, there are no or minimal facilities for supplies, repairs, medical aid or crew changes. SAR resources may be minimal or non-existent. It is imperative for vessels visiting these areas to be crewed, prepared, and equipped to be self-sufficient and self-reliant.

This section (Part B) of the Polar Yacht Guide as been written with contributions from: Ann Bainbridge, Steve Brown, Paul Brynes, Captain Ken Burton, Alan Green, Richard Hudson, Mike Jaques, Michael Johnson, Vincent Moeyersoms, Randall Reeves, Skip Novak, Rev Bob Shepton, Victor Wejer, and Andrew Wilkes.

NOTE IT IS INTENDED THAT THIS DRAFT POLAR YACHT GUIDE IS DISTRIBUTED FOR CONSULTATION TO VARIOUS AUTHORITIES AND YACHT CLUBS BEFORE IT IS ADOPTED.

I. Safety of Navigation in the Arctic

Vessels should be appropriately built and equipped and crews should be appropriately trained and experienced for the intended areas of navigation. A useful guide to general design features, equipment and training can be found in the World Sailing Offshore Special Regulations (OSR) - see web link at the end of this publication. In addition, the following should be considered when navigating in Arctic waters:

1. Racing and Competition

Arctic seamanship often requires vessels to manoeuvre slowly as arctic waters are mainly poorly charted and ice can be present. Long distance racing and competitive rallies within poorly charted areas and areas where ice can be expected is not consistent with good seamanship.

2. Vessel Suitability

In addition to Part A and the OSR guidance, the following should be considered:

- 2.1. Hull material and design chosen for strength and the ability to absorb impact with ice or uncharted rocks. Note that hulls constructed from standard 'sandwich' GRP are more prone to damage by ice floes or floating timber logs than solid GRP hulls.
- 2.2. Design features which may be advantageous when navigating in ice such as a strengthened bow, watertight bulkheads, rudder and propeller protection.
- 2.3. Keel and rudder - the uncharted shoals and rocks in many Arctic waters mean that a grounding in a small vessel is likely at some point. The keel and rudder should be strong enough to cope with this.
- 2.4. Protection from the elements for the crew. Eg a wheel house or semi-enclosed space for watch keeping, hull insulation and heating.
- 2.5. A means of easily climbing the rigging is useful when searching for leads in the ice.

- 2.6. Simple systems which can be maintained with relative ease. Engine reliability is of particular importance in the Arctic
- 2.7. Fuel, water and black water tank capacity.

3. Manning levels, experience and training

In addition to the guidance given in the OSR recommendations, the following should be considered:

- 3.1. Skippers should have appropriate experience of both the type of vessel and of navigating within waters similar to the planned voyage. For example, a skipper planning a transit of the Northwest Passage should already have significant experience sailing in high latitudes and in navigating in ice.
- 3.2. If navigating in areas where the vessel is likely to encounter ice, there should be sufficient competent crew on board at all times to keep a watch and an anchor watch.
- 3.3. There should be sufficient competent crew on board at all times to weigh anchor and manoeuvre the vessel.
- 3.4. At least one person onboard should have experience in maintaining the vessel's essential systems (including the engine). Underwater maintenance will require cold water diving capabilities.
- 3.5. In addition to provisions for first aid, medical care at sea and hypothermia, (see guidance in OSR), at least one person onboard should have knowledge concerning the prevention, identification and treatment of frostbite.
- 3.6. Telemedical Advice Services (TMAS) or a 'home based doctor' - see UK MCA and Centro Internationale Radio Medico links below. Advance preparation, including completing medical forms for each crew member (downloadable from CIRM), can save time in an emergency.
- 3.7. At least one person onboard should have knowledge concerning the effect that icing has on a vessel's stability and radio communications.

4. High Latitude Equipment

In addition to the equipment listed in Part A and OSR guidance, the following should be considered:

- 4.1. A portable GPS receiver which can be included in a 'grab bag'.
- 4.2. A portable satellite communications device capable of operation in all latitudes (eg Iridium).
- 4.3. A tracking device capable of automatically transmitting position, time and course overground at least once in an hour. Time should be set to UTC time. Details of the tracking device and the vessel's email address should be given to the appropriate SAR authority and/or reporting authority (US Coast Guard, Canadian Coastguard, Greenpos, etc).
- 4.4. A means of sending and receiving email.
- 4.5. Radar
- 4.6. A dinghy is a necessity and a spare dinghy is recommended.
- 4.7. At least two heavy anchors and a kedge anchor. Anchoring in arctic waters is often in deeper water than is normally the case and anchorages can be subject to very strong katabatic winds. Anchors should be heavier than normal and anchor rodes should be longer than usual.
- 4.8. At least two lines of 100m or longer which can be used for shore lines or as a tow line.
- 4.9. One or more liferafts (to comply with SOLAS LSA code 1997 Chapter IV or later OR to comply with World Sailing Offshore Special Regulations requirements - see web link below) OR with ISO 9650 when an insulated floor is included. If the life raft does not have an insulated floor, insulation should be included in a grab bag designed to be taken into the life raft.
- 4.10. It should be assumed that a yacht and her crew will need to be entirely self-sufficient for the duration of a voyage. This will include having and a comprehensive set of spare parts necessary for maintenance and repairs. A spare propeller should be considered.
- 4.11. A heavy-weight wetsuit or, preferably, a drysuit, diving hood, boots and gloves. If a portable air supply is carried, the regulator should be capable of operating at 0°C.
- 4.12. In addition to survival suits, a flotation suit or similar for every person onboard.
- 4.13. One or more suitable firearm(s) and ammunition if navigating in waters where polar bears are likely to be encountered. Users should be trained to use firearms safely.
- 4.14. Ice and expedition specific equipment: skippers and expedition leaders navigating in icy waters are expected to have sufficient experience to list and specify appropriate equipment. This could,

for example, include ice anchors, rock salt, wooden mallets for clearing ice accretion, snow shovels, squeegees and scrapers, shore camp and survival equipment.

II. Voyage Planning in the Arctic

1. Voyage Plan

A voyage plan should be made for every voyage in accordance with Part A and SOLAS V (regulation 34). This does not have to be a written plan but it may be useful to write down parts of the plan. In addition to the criteria set out in Part A, vessels should note that Association of Arctic Expedition Cruise Operators (AECO) has a code for yachts travelling in the Arctic (see link in Appendix 1).

In addition to the above, the following high latitude criteria should be considered:

- 1.1. Environmental protection measures (see below).
- 1.2. MOB and abandon ship procedures (including survival in a life raft, on ice and on land).
- 1.3. The fuel range of the vessel (allowing for possible additional consumption whilst navigating in ice) and possible re-fuelling locations.
- 1.4. Protection from wildlife (bears) - appropriate and timely action including non-lethal and lethal options as well as risk mitigation strategies. See Parks Canada for info.
- 1.5. The skipper should be aware of the effect that icing has on a vessel's stability and radio communication systems. Mitigation measures should be considered.
- 1.6. National, territorial and local regulations (some of which are listed in the RCCPF Arctic and Northern Waters and NW Passage Periplus - see web link below).
- 1.7. National, territorial and local nature reserves, parks, marine conservation areas, bird sanctuaries, local anchoring restrictions etc (some of which are listed in the RCCPF Arctic and Northern Waters and in the NW Passage Periplus - see web link below).

2. Reporting

- 2.1. Vessels should comply with local mandatory reporting requirements (eg US Coast Guard, NOR-DREG and GREENPOS).
- 2.2. Vessels may consider complying with local non-mandatory reporting requirements.
- 2.3. Vessels may benefit from staying in contact with other vessels navigating in the vicinity.

3. Publications

The following publications are recommended:

- 3.1. Official paper charts (corrected) and manual plotting aids.
- 3.2. If a 'leisure' style chart plotter using 'leisure' charts is used, Skippers should be aware that the cartography may not be to official S-57 standard.
- 3.3. Official pilot books and sailing directions
- 3.4. In addition, small craft guides such as the 'Northwest Passage Periplus' and 'Arctic and Northern Waters' may be carried - see web site below.
- 3.5. Tide tables (which may be in an electronic form).
- 3.6. Appropriate ice forecasting schedules and information to decipher the 'Egg code'.
- 3.7. Weather forecast and navigation warning schedules (ie Admiralty List of Radio Signals or country specific downloads such as Canadian Radio Aids to Marine Navigation).
- 3.8. If operating in areas where ice is likely to be present, the Canadian Manual of Ice is useful (which can be downloaded free from the Canadian Coastguard website (see below)).
- 3.9. If operating within the Canadian Arctic, a number of useful documents including the annual and monthly Notices to Mariners can be downloaded free of charge from the Canadian Coastguard Notices to Mariners website (see below).

Note that many publications, including the official sailing directions published for the U.S., Canada and Greenland, are available in the form of free downloads. If publications are carried on board in a digital format, a second device and copy of the digital publication should be considered.

4. Permits and Licences

- 4.1. Firearms licence(s) if appropriate.
- 4.2. Hunting and fishing licence(s), if appropriate
- 4.3. A copy of the local regulations and reporting requirements for the areas of the voyage (if this is an electronic format, a copy of the data and an alternative means of reading it should be carried).
- 4.4. Insurance and, for some areas, specific Search and Rescue Insurance.
- 4.5. Permits for access to special areas. Eg: Greenlandic expedition permits, US and Canadian national parks, Russian waters. Note that Permits often specify Search and Rescue Insurance.

III. Arctic Environment and Wildlife Protection

Attention is drawn to the guidance given in: Association of Arctic Expedition Cruise Operators (AECO) guidelines, the World Sailing Offshore Special Regulations (OSR) Environmental Code, the current Periplus to the Northwest Passage and the various national regulations (including the Canadian Arctic Waters Pollution Prevention Act) and current MARPOL regulations. Please see the web site links in Appendix 1.

Vessels are recommended to have their own Environment Protection Plan which can, but need not be, a written plan relating to:

1. Preventing pollution
2. Managing waste
3. Dealing with sewage and waste water
4. Biosecurity
5. Behaviour ashore
6. Behaviour when visiting historical sites
7. Behaviour when close to wildlife

A vessel's Environment Protection Plan will, to a degree, depend on the type and size of vessel. For example, larger craft may have sewage treatment systems, many pleasure yachts will have black water tanks and small craft may have no specific systems.

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PART C- Antarctic Waters

The POLAR YACHT GUIDE offers guidance to pleasure yachts (both pleasure sailing and motor vessels) ranging from the smallest boats to vessels up to 300GT. Part C applies to Antarctic waters (as defined by the IMO Polar Code). **The Secretariat of the Antarctic Treaty have produced Yachting Guidelines for Antarctic Cruises which were adopted by the Antarctic Treaty Consultative Meeting in 2012 and by kind permission are reproduced below.**

In addition to the ATS guidance, please note that NOAA ice charts are produced weekly and can be received by email (nic_analyst@noaa.gov). Ice charts are also available from: www.polarview.aq.

Secretariat of the Antarctic Treaty:

Yachting guidelines for Antarctic cruises

I. Introduction

For yacht owners the Antarctic presents a unique, remote and challenging destination. A typical season may well see 20 to 30 yachts visiting the Antarctic Peninsula. Of these many are commercial charter operations, but a significant number of private yacht owners undertake expeditions each year. Any yacht expedition heading south of 60°S will need to be well planned, prepared and crewed by experienced yachtsmen. All intended activities are to be assessed for potential environmental impacts.

The Antarctic is unique because its administration does not fall to any one country and in that it is protected as a natural reserve dedicated to peace and science. It is regulated via the Antarctic Treaty (AT), the Environmental Protocol and regulations which have been agreed between the Treaty Parties and enacted into their domestic law. Strict penalties may apply to any vessel or any person on an expedition proceeding south of 60°S without authorization or a permit.

Treaty Parties have become increasingly concerned about yachting activity in Antarctica following reports of safety, environmental incidents, and damage to historic sites. The guidelines have been produced to aid planning private Antarctic expeditions on yachts or other non-regulated crafts and review the considerations they should take. In Annex A, the "Checklist for Antarctic yachting" gives a comprehensive summary of the preparatory items to reassess. The documents focus primarily on the most popular and accessible cruising ground of the Antarctic Peninsula. These guidelines do not replace, but rather supplement, the requirements of national authorities, flag states and international regulations.

Additional considerations apply to yacht visits to other parts of Antarctica, which are significantly more distant from ports and from outside assistance, are less frequented, and generally experience more severe conditions. Yacht visits to other Antarctic regions may thus require additional arrangements, more detailed contingency planning and close consultation with competent authorities.

II. Regulatory framework and permits

Each country Party to the Antarctic Treaty is responsible for the regulation of visits to the Antarctic Treaty area organized by its nationals, but the Environmental Protocol requires that an environmental impact assessment be prepared for all activities planned to take place south of 60°S. Please contact your competent authority to get informed on your particular case and apply for the authorization. You may find specific contact details in Annex B.

It is a condition of any authorisation that a Post Visit Report is submitted within 90 days of the expiry date of the permit. A standard format for the report as a document is available from either the national authority's homepage or the website of the International Association of Antarctic Tour Operators (IAATO).

III. Particular conditions in the Antarctic cruising area

Antarctic weather is notoriously challenging and changeable. You will need to be well prepared to deal with the conditions and be familiar with the dominant weather systems. A good understanding of the region's weather systems, access to sufficient weather data and careful planning are required to mitigate the inherent risks of yachting expeditions to Antarctica.

The majority of yacht visits are heading for the South Shetland Islands and the Antarctic Peninsula which stretches towards the tip of South America. This region provides the shortest sea route to the continent. It is comparatively better charted than the rest of Antarctica and can regularly have more favourable ice conditions than other areas.

III.1 The Antarctic season

Antarctica is only accessible to most vessels during the Austral summer. Typically, yachting expeditions to the Antarctic Peninsula take place from November to March.

III.2 Weather

The weather patterns in the Antarctic Peninsula region are primarily dominated by the succession of depressions passing continually through the Drake Passage from west to east and the high pressure area over the Antarctic land mass. There are significant variations in the typical weather. In this turbulent area, forecasts change quickly and conditions often exceed those forecast. It is common for very complex low pressure systems to develop in the passage. Wind speeds encountered within these low pressure systems regularly exceed 50 knots and very large seas can develop.

The South Shetland Islands lie very much in the path of the depressions described above. The weather found here is therefore typically wet, windy and generally not very pleasant. The weather on the Antarctic Peninsula is governed by the dominance of the Antarctic High Pressure system and the effect of the depressions passing through the Drake Passage. It is possible that when the high pressure becomes stable and dominant, the depressions are forced far enough north to give pleasant settled weather on the peninsula for days at a time.

Temperatures on the Antarctic Peninsula during the summer months can be expected to be between 5° and 10° C during the day, falling to around -5° C to zero at night. Wind chill can be a significant factor and at times makes the conditions on the peninsula inhospitable.

III.3 Ice

The skipper should be aware of the ice conditions using up-to-date ice information, especially at the beginning and the end of the summer season. Ice in these waters originates from two sources: either from calving glaciers and ice shelves or frozen sea-ice. These types of ice differ greatly in their appearance and the dangers they pose to a vessel. The primary danger from ice occurs when it is unseen due to darkness, poor sea-state, fog or poor watch-keeping.

Most of the ice encountered is likely to be glacial and seen as ice bergs, bergy bits, growlers and brash ice (see below). Icebergs can be liable to split or turnover without warning and without any identifiable reason. In doing so, they can cause a large wave capable of swamping a small vessel. Similarly tide water glaciers collapse frequently, especially on warm sunny or wet days, again causing large waves.

Over time, as an iceberg breaks up, it disintegrates forming progressively smaller lumps. Pieces of ice that rise less than a meter out of the sea are known as growlers, whereas larger pieces (up to 4 meters high) are called bergy bits. As a hazard to navigation, these smaller pieces of ice are the primary concern rather than icebergs. They are often difficult to detect with the naked eye and in certain conditions, they can be small enough to remain undetected by radar and large enough to cause damage. A good radar system, the ability to use it proficiently and a suitable ice light are all essential equipment in these waters.

The clearing of sea-ice on the Antarctic Peninsula during the summer varies greatly from year to year. Some useful bays and anchorages can be the last places to clear, as the process is dependent on local conditions of wind, sea state and current. As a general rule, the ice clears at the northern end of the peninsula first. Constricted sections of water further south sometimes do not clear even towards the end of the season and are often choked with a combination of sea ice floes and bergs.

A vessel can often also be threatened by ice while at anchor, with large pieces of ice moving remarkably quickly due to the wind or currents. In addition to the vessel being struck by encroaching ice it is also possible that larger bergs could block the vessel's exit from an anchorage or could position themselves above an anchor, preventing its retrieval.

The effect of freezing spray can also present a hazard to vessels. Build-up of ice can cause damage to masts and rigging or can cause a loss of vessel stability.

IV. Vessel selection, equipment and operational planning

The craft should be of suitable construction for the intended voyage and possess adequate buoyancy.

IV.1 Vessel construction and equipment

A wide variety of yachts, both sailing and motor, have visited Antarctica and there are no fixed criteria that ensure a vessel is 'Antarctica' capable. However the selection and preparation of a reliable well found yacht is fundamental to a safe Antarctic expedition. The first requirement is to be able to reach the continent and return safely through the large seas of the Drake Passage. Most of the commercial yachts regularly operating in these waters have been knocked down, and several have been rolled through 360 degrees. Self-righting of the vessel should be achievable whether or not the rig is intact. Any skipper should be mindful of this when preparing a vessel for the area.

Experienced yachtsmen, who make frequent expeditions to the Antarctic, favour vessels with metal hulls, either steel or aluminium. The inherent strength of the material and its ability to deform on impact, whilst maintaining hull integrity, are prime considerations when operating in these imperfectly charted and ice ridden waters.

Good ground tackle is essential. Suitable equipment is usually significantly heavier than that specified for normal cruising grounds in order to deal with the high winds that can be encountered in any anchorage and the typically poor holding afforded by the rocky nature of the sea bed. In addition it is often necessary to run long warps to the shore in order to back up the anchor.

Sufficient heating will be required to reduce the potential for medical difficulties related to the cold and damp.

Above all an expedition must ensure their absolute self sufficiency when operating south of 60° S. There is no guarantee of assistance or back up of any kind that can be relied upon to arrive within several days (depending upon location and time of season). For essential systems or critical elements of such systems, strong consideration should be given to installing backup arrangements such that a failure can be rapidly replaced. A very comprehensive spares selection and the necessary tools should be carried along with the knowledge and experience to resolve any serious problem that might arise. Please follow the "Checklist for Antarctic Yachting" in Annex A for a more detailed listing.

IV.2 Charting

Surveying and charting of Antarctica is by no means comprehensive and some of the formal charting of less visited areas dates back many years. Generally the degree of charting is proportional to the volume of traffic visiting an area, although it is still possible that a vessel may encounter uncharted rocks in any area.

Electronic charting and GPS cannot be relied upon to fix a vessel's position in this region as much of the charting in the region derives its information from old surveys. GPS equipment often highlights the inaccuracies in these charts when the GPS derived position is plotted and appears to be significantly in error.

IV.3 Foresighted supply

It is very clear that no supplies of any kind exist in the Antarctic region, neither commercially nor from other operators. Once leaving ports in any South Atlantic region no fuel, water or any other supplies are available.

Sailing yachts should expect to make significant use of their engines. Particularly once on the continent, the wind is often too strong, too light or in the wrong direction to make sailing effective. In addition, the manoeuvrability afforded to a vessel under motor is often advantageous when moving in ice laden waters. Depend-

ing on the fuel tank locations, the viscosity of fuel may well be affected by the cold water temperatures and consideration should be given to adding cold weather treatments or purchasing treated fuel.

Whilst in some locations water can be collected from melting ice, those expecting to use water makers should be aware that their performance will be significantly reduced by the colder sea water temperatures.

IV.4 Emergency equipment and training

Approved types of life rafts are required in emergencies as well as sufficient life jackets for all crew members and passengers. If possible include immersion survival suits in your journey equipment. At least two cold water diving suits are useful to enable basic repairs underwater.

Radio communications should be adequate for the specific region, e.g. two types of alerting systems: long-range communications and a satellite EPIRB properly registered. An appropriate number of fire extinguishers, suitable for the yacht size, but at least two, should be readily accessible in suitable and different parts of the yacht. Fire extinguishers should be capable of operation in freezing conditions.

Each yacht should be equipped with a man over board alarm including an emergency button immediately accessible to a helmsman which will sound an audible alarm in the accommodation and simultaneously send an appropriate signal to the ship's navigational software.

All crew members should have satisfactorily completed appropriate training for the intended voyage, survival courses and first aid courses. At least one member of the crew should have basic safety and equipment operations training similar to that expected of the professional seafarer. Such courses may be developed by (based on the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers) or are available through national programs or associations (cp. Annex A).

IV.5 Search and Rescue

The maritime search and rescue coordination arrangements south of 60°South are provided by the appropriate Maritime Rescue Co-ordination Centres but only very limited assets are maintained within the area around the Peninsula. There is no rescue service. Other vessels operating in the area have usually been the first to come to the assistance of those in trouble in past emergencies. In particular the International Association of Antarctic Tour Operators (IAATO) operates an Emergency Contingency Plan providing mutual support for its member vessels. Some member companies within IAATO are specialized in assisting private yachts and can provide a range of support and advice.

An expedition will be required to demonstrate that they have adequate search and rescue, medical and evacuation insurance in place for all persons on board and appropriate contingency plans.

V. Careful itinerary planning

The person in charge should prepare a voyage plan and leave that plan with a responsible person ashore together with details of the vessel. In addition, the voyage plan may be submitted to the Maritime Administration of the port of departure. Please consider the General Guidelines for Visitors (Resolution 3 (2011)); http://www.ats.aq/e/ats_other_tourism.htm).

V.1 Special Areas and Historic Sites and Monuments

There are a number of areas in Antarctica which are protected due to their outstanding environmental, scientific, historic, aesthetic or wilderness values, or ongoing/planned scientific research. These have been designated Antarctic Specially Protected Areas (ASPAs), and you need to know where ASPAs are located to ensure that you do not enter one inadvertently.

A number of further areas have been designated Antarctic Specially Managed Areas (ASMAs). The purpose of ASMAs is to assist in the planning and coordination of activities within the specified area, avoid possible conflicts and minimize environmental impacts. ASMAs may include areas where activities pose risks of mutual interference or cumulative environmental impacts, as well as sites or monuments of recognized historical value. Individual Management Plans are prepared for each ASMA. Entry into an ASMA does not require a

permit, but activities have to be in line with the regulations of the Code of Conduct set out in the Management Plan. Please note that within an ASMA there are likely to be smaller ASPAs which may not be entered.

Finally, a number of sites or monuments are of recognized historic value and listed as a Historic Site or Monument (HSM). Listed Historic Sites and Monuments are not to be damaged, removed or destroyed. Respect no entry-statements due to danger of collapse and don't change any item within the HSM.

Details of current APSAs, ASMAAs and HSMs can be found on the Antarctic Treaty Secretariat website, along with much other useful information, at http://www.ats.aq/e/ep_protected.htm and a full list of protected areas at http://ats.aq/devPH/apa/ep_protected.aspx?lang=e.

V.2 Research Station visits

All station visits require advance approval. It should be remembered that the primary purpose of all stations is scientific research and any visits permitted are purely on a goodwill basis. For UK British Antarctic Survey bases (Signy, Rothera) and the US Palmer Station this should be obtained from the parent organization well in advance of the expedition. Unannounced visits will be refused.

Some of the other bases (e.g. Vernadsky Research Base (UKR)) may be willing to accommodate a visit at shorter notice if contacted once in Antarctica (typically 72 hours notice is requested).

In addition the former British 'Base A' at Port Lockroy has been preserved on Goudier Island as a 'living museum'. During the summer months the base is manned and frequently visited by vessels. Visits for passing yachts are normally possible if the base is contacted in advance.

V.3 Responsible planning and Coordination

Private sector travel to Antarctica has benefited from mutual support and coordination for over twenty years. Potential expeditions should first and foremost adhere to requirements emerging from the ATCM, and consider seeking additional advice on IAATO guidelines. Recognizing the potential environmental impacts that growing numbers of tourism could cause, regular tour operators to the area formed a member organization. The International Association of Antarctica Tour Operators (IAATO) which works to promote and practice safe and environmentally responsible private-sector travel in this remote, wild and delicate region of the world. Together they have established an emergency support system for their membership as well as extensive procedures and guidelines of commendable high standard of private-sector travel to the Antarctic. In particular their guidelines for wildlife watching and boot & clothing decontamination are available via their website (www.iaato.org). Additional information on Antarctic yacht expeditions can be found in the pamphlet provided at <http://iaato.org/yachts>.

VI. Environmental and further safety considerations

The Environmental Protocol to the Antarctic Treaty requires that every effort be made to minimize the environmental impact of all activities and that an environmental impact assessment be prepared and approved prior to departure.

VI.1 Site visitor guidelines

Since 2011, the "General guidelines for Visitors to the Antarctic" (http://www.ats.aq/documents/recatt/at-t483_e.pdf) provide guidance on appropriate behaviour at every possible landing site. Read these Guidelines before visiting Antarctica and plan how to minimize your impact. When preparing your sailing trip, particularly consider preventing the introduction of any plants or animals into the Antarctic. The taking of, or harmful interference with, Antarctic wildlife and its flora is prohibited.

Local site guidelines for visitors have been adopted for some of the most visited sites by the Antarctic Treaty Parties. These short, usually two page, documents provide a succinct overview of the landing site and essential information for any expedition such as landing areas, sketch maps and closed areas to protect the wildlife or scientific sites. They are available from the Antarctic Treaty Secretariat website (http://www.ats.aq/e/ats_other_siteguidelines.htm).

VI.2 Non-Native Species

Detailed guidelines relating to the biosecurity of the Antarctic and ballast water management are set out in the Non-Native Species Manual endorsed by the ATCM in 2011. The manual is available at the Antarctic Treaty Secretariat website (http://ats.aq/e/ep_faflo_nns.htm).

VI.3 Waste

Detailed regulations apply to the disposal of waste in Antarctica, but the basic principle for all visiting yachts is 'if you take it in, take it out'. Vessels should consider being fitted with sewage retention tanks. No discharges are allowed for oil and chemicals. Respect the more stringent provisions for avian products and garbage.

The full regulations are within the Treaty documents available via http://www.ats.aq/e/ep_waste.htm.

Subject to any conditions in your environmental impact assessment, sewage and liquid domestic waste may be disposed of into the sea. For vessels certified to carry more than ten persons this should take place a minimum of 12 miles from the nearest land or ice shelf and whilst moving at a speed of not less than four knots. Treated sewage may be discharged from vessels over 200 Gross Register Tonnage or more than 10 persons on board when operating between 4 and 12 nautical miles from land with operational requirements. For smaller vessels, sewage and liquid domestic waste may be dispersed closer to land, but consideration should be given to its rapid dispersal and this should not be done in confined waters.

VI.4 Off vessel activities

Potentially the most dangerous moments during any expedition are when members are away from the main vessel, either in small craft or on land. When operating in small boats, either cruising or making shore landings, a robust safety program should be in place. The main vessel should stay during the landing and be all the time prepared to pick up landed people in case of an emergency.

It is not unusual for tenders to be unable to return to the mother ship due to rapid changes in weather and/or sea conditions and at times this has necessitated a forced overnight stay ashore. In conditions of fog or whiteout it is very easy for the crew of a tender to become disorientated and navigation to become difficult. Suitable precautions should be taken and emergency supplies and equipment carried in all tenders.

Ice is even more of a threat to a small boat than a ship. When operating amongst sea ice or icebergs always be vigilant to its movement in relation to local currents. Pack ice can move very quickly potentially affecting small boat and shore operations, especially as the tide changes.

All expedition members should be aware of the dangers of crevasses when ashore. In recent years all glaciated terrain has become more dangerous due to higher temperatures. Expedition members should only venture on to snow slopes with the utmost caution and with the appropriate equipment and skills.

Appendix

Some useful websites:

World Sailing Offshore Special Regulations (although these are designed for the regulation of racing boats, the equipment and training recommendations apply to all ocean going craft)

<https://www.sailing.org/specialregs>

International Maritime Organization: www.imo.org

Canadian Coastguard publications (including the Manual of Ice, Notices to Mariners, Canadian Aids to Navigation)

<https://www.ccg-gcc.gc.ca/publications/index-eng.html>

Canadian Coastguard Notices to Mariners (including radio aids and aids to navigation links)

<https://www.notmar.gc.ca>

Canada Small Vessel regulations:

<https://www.tc.gc.ca/eng/marinesafety/debs-small-vessels-menu-2258.htm>

Checklist for Vessels Navigating in Canadian Arctic Waters

<https://www.tc.gc.ca/eng/marinesafety/debs-arctic-checklist-117.htm>

Naalakkersuisut - Greenland permit requirements (click on About Greenland - travel activities in remote parts)

<http://naalakkersuisut.gl/en>

Danish Maritime Authority. Several useful links relating to navigation in Greenland

<https://www.dma.dk/SikkerhedTilSoes/Arktis/SejladsGroenland/Sider/default.aspx>

NOAA US Coast Pilots and charts (FOC)

<https://nauticalcharts.noaa.gov>

Association of Arctic Expedition Cruise Operators: Guidelines for private yachts sailing in the Arctic:

<https://www.aeco.no/wp-content/uploads/2019/04/2019-AECO-Arctic-Yacht-Guidelines.pdf>

Association of Arctic Expedition Cruise Operators: Guidelines for general and specific geographic areas:

<https://www.aeco.no>

International Association of Antarctica Tour Operators (although this refers to the Antarctic, it is a useful reference document for Arctic visitors too)

<https://iaato.org/visitor-guidelines>

International Association of Antarctica Tour Operators guidance for yachts

<https://iaato.org/documents/10157/72175/ATCM35+Yacht+Guidelines.pdf/15d218ae-440a-48ed-a643-34210d302a18?version=1.0> (although this refers to the Antarctic, it is a useful reference document for Arctic visitors too)

UK Maritime and Coastguard Agency safety codes for small (<24m) commercial vessels:

<https://www.gov.uk/government/publications/small-craft-codes>

UK Maritime and Coastguard Agency guidance Pleasure Vessels - Regulations and Exemptions - Guidance and Best Practice Advice (MGN 599)

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/847649/MGN_599_on_Pleasure_Vessel_Regulations.pdf

UK MCA Telemedical Advice Service (TMAS) for Ships at Sea (MGN 623 (M+F)) at: <https://www.gov.uk/government/publications/mgn-623-mf-telemedical-advice-service-tmas-for-ships-at-sea>

DRAFT Polar Yacht Guide (Combined v 1.0)

Rome service Centro Internazionale Radio Medico Telemedical Advice Service (TMAS): www.cirmtmas.it

RCCPF Arctic and Northern Waters and NW Passage Periplus: <https://rccpf.org.uk/pilots/136/Arctic---North-ern-Waters>

Secretariat of the Antarctic Treaty: <http://www.ats.aq>

International Association of Antarctic Tour Operators: <http://iaato.org/>

International Association of Antarctica Tour Operators visitor guidelines: <https://iaato.org/visitor-guidelines>

Ice charts: www.polarview.aq