

APPENDIX A part II

Minimum Specifications for Yachtsmen's Liferafts

Appendix A does not cover liferafts intended for category 0 races

Introduction

In his report of 12/00 and in the absence of a comprehensive up-to-date standard for yachtsmen's liferafts the Sydney Coroner recommended after the Hobart Race 1998 that yachtsmen's liferafts should comply with the construction requirements of Regulation 15 of SOLAS 1960. SOLAS rafts are generally heavier, more expensive and more bulky than yachtsmen's liferafts and are designed for commercial vessels.

In 1999 the ORC Special Regulations Committee (now the Special Regulations sub Committee of ISAF the International Sailing Federation) established a working party to study liferaft specifications taking into account experiences from the Fastnet 1979, the Hobart 1998 and other sources. The present Appendix A Part II Minimum Specification has drawn on lessons learned.

In January 2002 the ISAF liferaft specification was published in the absence of the long-awaited standard 9650 under development by ISO (the International Organization for Standardization) and first published on 1st March 2005 (reference number ISO 9650-1:2005(E)). The ISAF Special Regulations sub-Committee has agreed to accept (as an alternative to the ISAF specification liferaft) ISO 9650 for Part 1 Type I Group A liferafts (with a <24 hour pack) subject to certain additional requirements set out in OSR (Offshore Special Regulations) 4.20.2 (d): it is hoped that these additions will in due course be accepted as a revision of ISO 9650.

The long-term policy of the ISAF Special Regulations sub-Committee is to allow an ISO liferaft standard eventually to supercede the ISAF liferaft specification. It is the normal practice of the ISAF Special Regulations sub-Committee to include a "grandfather" clause in such an arrangement so that equipment already manufactured at the date of a changeover, will continue to be accepted for the rest of its working life, and also to publish the intended date of changeover well in advance so that the industry has ample time to make appropriate changes in production schedules.

Alan Green
Chairman Special Regulations Liferaft Working Party
January 2006

**SPECIFICATIONS FOR YACHTSMEN'S
INFLATABLE LIFERAFTS**

PART ONE PURPOSE, CONSTRUCTION and GENERAL

1.1	purpose	The purpose of this specification is to define a yachtman's inflatable liferaft, which in its design, construction and equipment reflects current best practice and the benefit of hard-won experience in the pursuit of saving life at sea.
1.1.1	strength of build	Every liferaft shall be so constructed as to be capable of withstanding exposure for 20 days afloat in all sea conditions in air temperatures between -15 to +65° C following which the liferaft shall successfully pass the triple-pressure test in 2.03.03 below. <i>Note: As of date of this publication, a test for this requirement is not currently specified. To assure compliance we recommend the test in the LSA Code, Testing and Evaluation of Life-Saving Appliances, Part 1, 5.5 Mooring out tests, modified from 30 to 20 days.</i>
1.2	printed legends and instructions	All printed legends and instructions on the liferaft and its equipment shall be in plain English in letters as large a size as practicable (and may be repeated in another language). Lettering shall be large enough to be easily read by a person with common vision defects and without the aid of spectacles. Printing shall be in a sharply contrasting colour on a plain background.
1.3	persons definition	Where relevant, for the purposes of this Specification, "persons" will have an average naked weight of 75kg (a single person will have a naked weight of 75kg) and shall wear foul-weather clothing or immersion suits plus sailing boots and also each shall wear an inflated or fully buoyant 150 N lifejacket.
1.4	drop height	The liferaft shall be so constructed that when it is dropped into the water (while packed) from a height of 6m, the liferaft and its equipment will operate satisfactorily.
1.5	canopy	The liferaft shall have a canopy to protect the occupants from exposure which is automatically set in place when the liferaft is launched and waterborne. The canopy shall remain erected even

ISAF OFFSHORE SPECIAL REGULATIONS Appendix A Part II

		in the case of deflation of one of the buoyancy chambers.
1.6	canopy insulation	Canopy insulation is optional
1.7	Interior color not to cause discomfort	A blue or other color for this purpose on the inside of the canopy is optional.
1.8	entrance detail	Each entrance shall be clearly indicated and be provided with efficient adjustable closing arrangements which can be easily and quickly opened from inside and outside, and closed from inside the liferaft so as to permit controlled ventilation but exclude seawater, wind and cold. Liferafts for more than eight persons* shall have at least two independent entrances. Fastening methods for closures may employ easy-to-handle velcro or large zips or, provided they do not depend upon tying or knotting, strings or tapes. Fastening for strings or tapes may be provided by cleats etc. Any closure shall be easy to use with cold, wet, numbed hands. *see 1.3
1.9	ventilation	The canopy shall be capable of admitting sufficient air for the occupants at all times, even with the entrances fully closed.
1.10	viewing port(s)	The canopy shall be provided with at least one viewing port such that a viewing horizon of 360 degrees is available. Clear plastic windows may be incorporated into the canopy to assist but not to replace this function.
1.11	rainwater collection	The canopy shall be provided with a dedicated means for collecting rainwater. The rainwater collection device shall have an effective means to prevent unwanted ingress of water in heavy weather.
1.12	SART mounting	The canopy shall be provided with means to mount a survival craft radar transponder (SART) at a height of at least 1m above the sea. The mounting shall be clearly marked "SART – SEARCH AND RESCUE RADAR TRANSPONDER"
1.13	canopy height	The canopy shall have sufficient headroom for sitting occupants under all parts
1.14	carrying capacity	The liferaft shall be constructed to carry up to a specified maximum number of persons* between 4

		<p>and 12 inclusive, provided that the specified number does not exceed:-</p> <p>1.14.1 the greatest whole number obtained by dividing by 0.096 the volume, measured in cubic metres, of the main buoyancy tubes (which for this purpose shall include neither the arches nor the thwarts if fitted) when inflated; or</p> <p>1.14.2 the greatest whole number obtained by dividing by 0.372 the inner horizontal cross-sectional area of the liferaft measured in square metres (which for this purpose may include the thwart or thwarts if fitted) measured to the innermost edge of the buoyancy tubes; or</p> <p>1.14.3 the number of persons* that can be seated with reasonable comfort and headroom without interfering with any of the liferaft's equipment.</p> <p>1.14.4 the liferaft, inflated to its design operating pressure in calm water, with its largest buoyancy chamber and its inflatable floor (if any) deflated, shall retain positive freeboard when loaded with its full complement of persons* or their equivalent weight evenly distributed. *see 1.3</p>
1.15	Materials	Materials shall comply with the requirements of ISO/DIS 9650-3 as at 2002-02-22 or later.
1.16	spare	
1.17	lifelines interior and exterior	<p>The liferaft shall be equipped with internal and external lifelines made from cordage or webbing which shall be of a bright colour contrasting with the colour of the liferaft, which shall be rot-proof, and resistant to weathering and to oils and petroleum products. They shall be attached to the liferaft in such a manner that, if detached or damaged, the liferaft structure is not damaged.</p> <p>The lifelines shall be able to be grabbed without injuring the hand or slipping. Rope type lifelines shall have a diameter of at least 9.5mm; webbing type lifelines shall be at least 25mm wide.</p> <p>Lifelines and supports shall be capable of withstanding shockloads and chafe caused by yachtsmens' safety harness being clipped on to the lifeline.</p> <p>The breaking load of a lifeline and of the fastening points shall be at least 2kN.</p>
1.17.1	painter line	1.17.1.1 A painter line shall be provided of >9m in

		<p>length. The painter line and its attachment shall comprise a system, which is capable of absorbing shock loads without breakage and without damage to the liferaft.</p> <p>1.17.1.2 The minimum diameter of painter line shall be 9.5mm. The breaking load of the painter line and its attachment to the liferaft shall be not less than 7.5kN or in a raft with capacity of more than 8 persons* the breaking load of the painter line and its attachment to the liferaft shall be not less than 10 kN.</p> <p>1.17.1.3 The painter line shall withstand weathering and shall be made from nylon or polyester cordage. A coloured indication shall be provided on the painter line at one metre from the firing point.</p> <p>1.17.1.4 spare number</p> <p>1.17.1.5 The painter shall be attached to the liferaft adjacent to an entrance where also a safety knife is provided in a pocket clearly marked "SAFETY KNIFE". *see 1.3</p>
1.18	lamp on canopy	A manually controlled lamp in compliance with IMO MSC 48(66) shall be fitted to the top of the liferaft canopy. Batteries shall be of a type that does not deteriorate due to dampness or humidity in the stowed liferaft.
1.19	lamp inside canopy	Lamp inside canopy is optional
1.20	Construction of buoyancy chambers	The main buoyancy chamber shall be divided into not less than two separate compartments, each inflated through a non-return inflation valve on each compartment.
1.21	floor	<p>1.21.1 The floor of the liferaft shall be waterproof. For operation in cold waters, a means shall be provided to insulate the floor. <i>A Race Organiser should specify in the Notice of Race whether insulation may be omitted.</i></p> <p>1.21.2 When a floor is insulated with metal foil a notice shall be marked on the floor and also at least once on the inside of the buoyancy tubes where it (they) may best be seen stating: "KEEP ELECTRONIC BEACONS CLEAR OF FLOOR"</p>
	inflation system	1.22.1.1 The initial inflation system shall be actuated by a sharp pull on the painter line, thereby allowing the release of a pressurised gas. All subsequent

		<p>force exerted on the painter line shall act directly on the towing point or any other point offering strength characteristics equivalent to the values required for the painter line (see 1.17.1).</p> <p>1.22.1.2 The inflation system mechanism shall attain the fully open position by exerting a pulling force on the painter line not exceeding 150 N and with a travel not exceeding 200 mm.</p> <p>1.22.1.3 The operating device shall be made of corrosion resistant material capable of withstanding, without damage, a load of 450 N. The operating cable assembly shall not cause any wear of the fabric of the buoyancy chambers by abrasion, and shall conform with the requirements of ISO 15738 inflation systems.</p>
1.22.2	inflation time	The design working pressure shall be achieved within a period of 3 minutes at 20°C in accordance with the test in 2.11.
1.23.1	resistance to excess pressure (relief valves)	Each inflatable compartment shall be capable of withstanding a pressure equal to at least three times the working pressure and shall be prevented from reaching a pressure exceeding twice the working pressure either by means of relief valves or by a regulated gas supply.) Each valve shall bear marking corresponding to the re-seating pressure (this marking may be a colour code specific to the valve manufacturer).
1.23.2	access to relief valves	Each relief valve shall be accessible to a person* in the liferaft in order to permit the valve to be temporarily sealed off. *see 1.3
1.24	topping up	Means shall be provided for an occupant to simply and easily fit the provided air pump to the appropriate valve in each inflatable compartment so that the working pressure can be maintained.
1.25	non-return valve	Non-return valves shall be provided at each gas inlet into an inflatable chamber.
1.26	spare	
1.27	access into raft	At least one entrance shall be fitted with a semi-rigid boarding ramp, capable of supporting a person* weighing 75kg, to enable a person* of not more than average physical ability, unaided to board the liferaft from the sea. The boarding ramp shall be so arranged as to avoid significant deflation of a

ISAF OFFSHORE SPECIAL REGULATIONS Appendix A Part II

		buoyancy compartment if the ramp is damaged and in any case to limit such deflation so that the pressure in a buoyancy compartment is not caused to fall by more than 50% below its design working pressure. Any high pressure hose or other fitting not intended to be part of the boarding system shall not interfere with the boarding process. *see 1.3
1.28	boarding ladder	Entrances not provided with a boarding ramp shall have a boarding ladder, the lowest step of which shall be weighted and situated not less than 0.4m below the liferaft's light waterline.
1.29	boarding aids	There shall be means inside every entrance to the liferaft to assist persons* to pull themselves into the liferaft: these shall include either a grab line with toggles or other hand-holds, anchored to the far side of the liferaft interior, or to the centre of the floor. Cordage and webbing shall comply with 1.17 above.*see 1.3
1.30	stability of raft	Every inflatable liferaft shall be so constructed that, when fully inflated and floating with the canopy uppermost and with any load from zero up to its full complement of passengers it is stable in a seaway.
1.31	Dis-symmetrical loading	The liferaft, inflated normally under calm sea conditions, shall neither turn over nor be flooded when all the passengers, each wearing a 150 N lifejacket, are grouped together first at any point of the liferaft, then at its opposite point.
1.32	means to right an upturned liferaft	.1 The stability of the liferaft when in the inverted position shall be such that it can be righted in a seaway and in calm water by one person*. .2 Appropriate webbing and/or cordage in compliance with 1.17 above shall be provided on the underside of the liferaft to facilitate the action of one person* in righting an upturned liferaft. .3 The position for a person* in the water to commence righting the liferaft, shall be clearly marked on the buoyancy tube. *see 1.3
1.33	spare	
1.34	ballast pocket(s)	The liferaft shall be fitted with water ballast pocket(s) complying with the following requirements:- 1.34.1 the pocket(s) shall fill(s) to at least 60% of its/their capacity within 25s of deployment. 1.34.2 the pocket(s) shall have an aggregate

ISAF OFFSHORE SPECIAL REGULATIONS Appendix A Part II

		<p>capacity of at least 220 litres for liferafts certified to carry 4-10 persons* and an aggregate capacity of at least 240 litres for liferafts certified to carry 10-12 persons*.</p> <p>1.34.3 If more than one pocket they shall be positioned symmetrically round the circumference of the liferaft. If only one pocket its periphery shall be positioned symmetrically round the circumference of the liferaft.</p> <p>1.34.4 Where appropriate, means shall be provided to enable air to readily escape from underneath the liferaft. *see 1.3</p>
1.35	exterior colour	All exterior surfaces of the liferaft including canopy, ballast pockets, bottom and ramps shall be of a highly visible colour except that the exterior surfaces of buoyancy tubes need not be of a highly visible colour.
1.36	type of gas	The gas or mixture of gases used for inflating the liferafts shall be non-toxic and non-flammable; its moisture content shall not exceed 0,015 % by mass.
1.37	spare	
1.38	spare	
1.39	spare	
1.40	spare	
1.41	gas cylinder	The cylinder, if made of steel, shall conform to ISO 9809-3 unless otherwise authorised by a National Authority. The gas cylinder shall be corrosion-proof. The cylinder shall be marked with its hydraulic test pressure.
1.42	bursting disc	Where a liquefied gas is used, the cylinder shall be fitted with a corrosion-proof bursting disc in accordance with ISO 6718 or with an equivalent safety device to prevent bursting of the cylinder. The bursting disc or the safety device shall operate prior to the internal cylinder pressure reaching the hydraulic test pressure of the cylinder.
1.43	sealing plate	A sealing plate or valve shall be used in order to retain the gas in the cylinder until the liferaft inflation system is actuated. This sealing plate or valve shall withstand the hydraulic test pressure of the cylinder.
1.44	high pressure hose	Where a high pressure hose assembly is used to convey the gas from the cylinder to the buoyancy chamber, it shall meet the following conditions:-

		<p>1.44.1 there shall be no leaks or any sign of deterioration after having been subjected, during at least one minute, to a hydraulic test according to ISO 1402, under a pressure of 12,5 MPa for liquefied gases and or 20 MPa for non-liquefied gases;</p> <p>1.44.2 it shall operate within a temperature range between -45 and $+65^{\circ}\text{C}$ inclusive for liquefied gases, between -20 and $+65^{\circ}\text{C}$ inclusive for non-liquefied gases.</p> <p>1.44.3 at the lowest temperature of each of the ranges defined in 1.44.2 above, the hose shall be bent through 180° over a 5 cm radius mandrel and shall meet the requirements of 1.44.1.</p> <p>1.44.4 the hose assembly shall not be in contact with any sharp edges and shall not show any sign of corrosion when tested in accordance with the appropriate test defined by the ISO (a new hose may be used for each operating test).</p> <p>1.44.5 the bursting pressure of the hose assembly shall be not less than 168% of the hydraulic test pressure of the hose assembly.</p> <p>1.44.6 a high pressure hose shall be installed in such a manner as to avoid impeding the boarding operation (see 1.27 above).</p>
1.45	raft markings certificate	<p>The liferaft and its container or valise, and also an accompanying certificate which shall be kept on board the yacht shall show the following information. Markings on the liferaft shall be in a readily visible location, in a clear and indelible manner and shall have no harmful effect on adjacent materials. All written instructions shall be in the English language and may be repeated in any other language. It is permitted to mark this information on a seawater-resistant label securely attached to the liferaft in a prominent position:</p> <ul style="list-style-type: none"> .1 number of persons* .2 manufacturer's name .3 raft type name if any .4 "conforms to ISAF OSR Appendix A Part II " plus a description of any optional extras fitted (eg insulated floor, enhanced contents pack) .5 date of last service and identity of service station .6 recommended service interval

		.7 max launching height .8 painter line length .9 launching instructions .10 serial number (see 6.2 identification) .12 date of manufacture .13 any optional features installed :- .13.1 insulated floor Y/N? .13.2 insulated canopy Y/N? .13.3.special interior colour Y/N? .13.4 interior lamp Y/N? .14 list of contents of equipment pack *see 1.3
1.46	spare	
1.47	spare	
1.48	equipment pockets	At least two equipment pockets shall be provided made from transparent flexible plastic material with drain holes and provided with velcro flaps, appropriately fixed to a canopy arch tube. Purpose is to stow loose equipment where it can be seen and kept readily available but safe against loss and as far as possible away from constant wetting.
1.49	retro-reflective material	A minimum surface area of 1500 cm ² of reflective material shall be attached to each liferaft. Around 2/3 of this material surface shall be fixed to the upper half of the canopy and approximately 1/3 to the outer part of the liferaft bottom. The reflective material must comply with IMO A.658 (16).

2.0 PART TWO TESTING

The following tests shall be satisfactorily completed on a representative sample of each raft. Weights used in the tests may be eg bags filled with water or sand.

2.1	launching test	Position the complete liferaft, packed in its valise or container, at a height of 6m above the water. Attach the painter line to a fixed point so that it pays out when the liferaft drops. Let the liferaft drop into the water and leave it to float for 30 minutes, then inflate it by pulling on the painter line. Measure the time taken: 2.1.1 by the buoyancy chambers to inflate to their final shape and for the canopy to fully deploy 2.1.2 to reach the design working pressure. Remove the liferaft from the water. Thoroughly inspect the liferaft and its equipment. There shall
-----	----------------	---

ISAF OFFSHORE SPECIAL REGULATIONS Appendix A Part II

		be no detectable damage or deterioration.
2.2	capacity test	Verify by an actual test with the raft afloat that the stated number of persons* can be accommodated each in a seated position. *see 1.3
2.2.1	minimum freeboard test	Inflate the liferaft to normal working pressure and under calm sea conditions load the liferaft uniformly with 75 kg weights equal to the number of persons* which is the rated capacity. The freeboard measured at various peripheral points shall be at least 250 mm on a 4-person* capacity liferaft and 300 mm for all larger liferafts. *see 1.3
2.3.1	pressure maintenance test for buoyancy chambers and canopy support	Inflate to the design working pressure, then leave to stand for 30 minutes. Readjust, if necessary, the design working pressure, note the ambient temperature, wait 1 hour and record the measured final pressure and the ambient temperature. Apply if necessary a correction taking account of the variation in temperature at the rate of 0.4 kPa per degree centigrade. The final pressure, corrected if necessary, shall not be less than 95 % of the initial pressure. The test is only valid if the temperature variation within the chamber is less than or equal to 3°C.
2.3.2	pressure maintenance test for inflatable floor (if fitted)	Inflate to the design working pressure, wait 30 minutes and record the final pressure, which shall be not less than 95% of the design working pressure.
2.3.3	excess pressure test	Inflate the buoyancy chambers and the canopy to 3 times the design working pressure at a temperature of 20+/- 2°C and wait 10 minutes. The relief valves shall be rendered inoperable during this test. Record the final pressure, which shall be not less than 95% of the design working pressure. Thoroughly inspect the liferaft and its equipment. There shall be no detectable damage or deterioration.
2.4	flooding resistance test	.1 The liferaft, inflated to its design working pressure and under calm water conditions shall carry its full load of persons* If an inflatable floor is fitted this shall be deflated. See OSR Appendix

ISAF OFFSHORE SPECIAL REGULATIONS Appendix A Part II

		<p><i>A Part II, 1.3 .</i></p> <p>.2 The liferaft shall then be filled with water to the top of the upper buoyancy chamber and maintained in this condition for 10 minutes.</p> <p>.3 The liferaft shall not suffer any deformation during this test. Thoroughly inspect the liferaft and its equipment. There shall be no detectable damage or deterioration. *see 1.3</p>
2.5	jumping test	<p>The liferaft, in calm water conditions and inflated to its design working pressure, shall be able to withstand without any detectable damage or deterioration the falling onto the canopy and into a liferaft entrance (in both closed and open conditions) of a weight of 75 kg from a height of 3 metres above the water level. The total number of “drops” shall be equal to the rated carrying capacity of the liferaft.</p>
2.6	3 knot tow streaming sea anchor	<p>.1 Inflate the liferaft to the design working pressure in calm water and deploy the sea anchor. Load the liferaft with its full complement of persons* or with an equivalent number of 75 kg weights.</p> <p>.2 Secure a tow line to the yacht end of the painter line so that the total length of the tow line is 30m. A painter weak link device at the yacht end of the painter line is not part of the requirement of this standard.</p> <p>.3 For an overall period of at least 30 minutes, tow the liferaft at a speed of 3 knots, whilst:-</p> <p>.3.1 stopping and resuming towing, jerking forward several times.</p> <p>.4 During the test:-</p> <p>.4.1 the sea anchor shall remain deployed in a stable position beneath the water surface</p> <p>.4.2 the sea anchor shall not become tangled in its shroud lines</p> <p>.4.3 the minimum traction exerted on the sea anchor during towing shall be 450 N</p> <p>.5 the liferaft shall not capsize or become flooded.</p> <p>.6 After the towing test:-</p> <p>.6.1 a tensile test shall be performed on the sea anchor line and its attachment. The breaking load of the sea anchor line and its attachment shall be >7.5 kN</p>

		<p>.6.2 a tensile test shall be performed on the painter line and its attachment. The breaking load of the painter line and its attachment shall be >7.5 kN</p> <p>.6.2 thoroughly inspect the liferaft and its equipment. There shall be no detectable damage or deterioration.</p> <p>*see 1.3</p>
2.7	paddling test	<p>The liferaft, in calm sea conditions and normally inflated, loaded with its full load of passengers each wearing a foul-weather suit and a 150 N lifejacket and seaboots, shall be able to move forward under the action of the passengers with the supplied paddles, at a speed of at least 0.5 knots over a distance of at least 20 metres.</p>
2.8	canopy watertightness test	<p>.1 Inflate the liferaft to the design working pressure.</p> <p>.2 Verify that the interior is dry and attach the canopy closures at each entrance in accordance with the manufacturer's instructions.</p> <p>.3 During a period of at least five minutes, continuously direct a jet of water at the canopy from a distance of no more than 3m(10ft) whilst changing the angle of approach at an even pace through 360 degrees. The water jet shall be delivered via a 25mm (one inch) diameter nozzle at a flow rate of at least 245 litres per minute (54 UK or 65 US gallons per minute)</p> <p>.4 The quantity of water that penetrates into the liferaft shall not exceed 5 litres.</p>
2.9	spare	
2.10	stability during boarding test	<p>.1 The liferaft shall be inflated to its design working pressure and deployed in calm water</p> <p>.2 Three persons* shall take part in the test.</p> <p>.3 Two persons* on board the liferaft shall be capable of taking on board a third person* floating on his or her back, without the liferaft being capsized or flooded. *see 1.3</p>
2.11	inflation test at ambient temperature	<p>.1 Let the liferaft packed in its valise or container stand for 24 hours at an ambient temperature of 20 +/- 2°C.</p> <p>.2 Inflate the liferaft by pulling on the painter line.</p> <p>.3 The buoyancy chambers shall be inflated to their final shape and the canopy deployed within 60 seconds of actuating the inflation device.</p>

ISAF OFFSHORE SPECIAL REGULATIONS Appendix A Part II

		.4 The design working pressure shall be achieved within 3 minutes of actuating the inflation device.
2.12	inflation test at high temperature	.1 Let the liferaft packed in its valise or container stand in a heating chamber for at least 7 hours. .2 The chamber temperature shall have reached 65°C in less than 2 hours and shall be maintained at this value during the remainder of the 7 hours. .3 Note: it is preferable to heat up the liferaft in a chamber large enough to be able to inflate it therein, but it is also permitted to remove it from the chamber after 7 hours heating up, provided that it is inflated as early as possible after withdrawal. .4 Inflate the liferaft by pulling on the painter line. Check that the pressure relief valves are operating suitably. Record the maximum pressure in the buoyancy chambers. .5 The maximum pressure in any buoyancy chamber during the test shall not exceed twice the design working pressure. .6 Thoroughly inspect the liferaft and its equipment. There shall be no detectable damage or deterioration.
2.13	inflation test at low temperature	.1 Let the liferaft packed in its valise or container stand in a cold chamber for at least 24 hours at a temperature of -15°C. The tests in .2 .3 and .4 below shall be carried out on the liferaft within the cold chamber. .2 Inflate the liferaft by pulling on the painter line. .3 The buoyancy chambers shall be inflated to their design working pressure and the canopy deployed within 5 minutes of actuating the inflation device. .4 Thoroughly inspect the liferaft and its equipment. There shall be no detectable damage or deterioration.
2.14.1	ballast pocket strength test (when more than one pocket is installed)	.1 Inflate the liferaft to the design working pressure, supporting it in the air in such a manner that 2 water pockets, on opposite sides and as near as possible to the periphery of the liferaft, are suspended freely with a 300 mm space between the support and the pocket attachment. .2 Load each water pocket with a weight equivalent to three times the mass of water that

		<p>they can contain and maintain this test condition for at least one hour.</p> <p>.3 Thoroughly inspect the water pockets and attachments. There shall be no detectable damage or deterioration.</p>
2.14.2	Ballast pocket strength test (single-pocket liferaft)	A test similar in effect to that in 2.14.1 shall be specified by the manufacturer and carried out satisfactorily.
2.14.3	ballast pocket deployment test	<p>.1 Inflate the liferaft to its design working pressure, in calm water of temperature not exceeding 4°C.</p> <p>.2 After 25 seconds lift the liferaft from the water and measure the amount of water collected in the ballast pockets, which shall in the case of each pocket be at least 60% of its capacity.</p> <p>3. A similar test may be defined by the manufacturer of a single-pocket liferaft and shall be carried out satisfactorily.</p>
2.15	righting test	<p>.1 Inflate the liferaft to its design working pressure, in a swimming pool in water of >3m depth</p> <p>.2 Overturn the liferaft. A righting stop should reach the water. Provide 4 persons* in turn to attempt to right the liferaft. The persons* shall preferably not be good swimmers, shall have different physiques, and shall comprise two male and two female. For each righting attempt the liferaft shall have no persons* inside.</p> <p>.3 Each person* shall swim 50 metres before attempting to right the liferaft and there shall be no rest period between the swimming and the righting attempt.</p> <p>.4 Each person* shall be able to right the liferaft unaided. *see 1.3</p>

3.0 PART THREE RAFT CONTAINER

3.1	container general	<p>The liferaft shall be packed in a valise or hard container which is:-</p> <p>.1 so constructed as to withstand hard wear under</p>
-----	-------------------	---

		<p>conditions encountered at sea</p> <p>.2 of sufficient inherent buoyancy when packed to enable the upthrust of the inherent buoyancy to pull the painter from within the container and to operate the inflation mechanism should the parent yacht sink</p> <p>.3 as far as practicable watertight, except for drain holes in the container bottom</p> <p>.4 clearly marked on the outside with the intended stowage attitude (e.g. "THIS WAY UP")</p> <p>.5 clearly marked on the side intended to be uppermost "NO STEP"</p> <p>.6 so arranged as to ensure, as far as possible, that the waterborne liferaft inflates in an upright position on breaking free from its container</p> <p>.7 provided with carrying handles or other means to enable the unit to be manhandled with reasonable ease</p> <p>.8 capable of providing the liferaft and its equipment with adequate protection in conditions of prolonged stowage on board.</p>
<p>3.2</p>	<p>printed instructions for the yacht</p>	<p>Instructions, printed on durable waterproof medium in large clear type shall be provided stating:-</p> <p>.1 how to stow the liferaft the correct side up, in an appropriate stowage (see SR 4.20 and secure the painter</p> <p>.2 the location of the grab bag(s)</p> <p>.3 what else is recommended to take into the liferaft</p> <p>.4 a reminder to send a distress message by the yacht's main radio or satcom before leaving</p> <p>.5 importance not to launch the liferaft until absolutely necessary in order to minimise risk of damage</p> <p>.6 how to launch the liferaft</p> <p>.7 how to right the liferaft</p> <p>.8 diagram of the raft with locations of knife, sea anchor, lifebuoy (throwing line) and inflation points</p> <p>.9 importance of fittest individual being first person* to board the raft, to help others get in</p> <p>.10 the date of the next required service</p> <p>.11 first measures –see 4.15.6 below.</p> <p>*see 1.3</p>

**4.0 PART FOUR
EQUIPMENT PACKED INSIDE RAFT**

The following minimum equipment shall be provided appropriately packed inside the liferaft. (*This list closely but not precisely follows that of SOLAS B*).

4.1	general	<p>4.1.1 Every package, closure and item of equipment shall be:-</p> <p>4.1.1.1 capable of being opened and re-sealed easily and used with cold, wet, numbed hands and without an implement of any kind</p> <p>4.1.1.2 impervious to water and rust.</p> <p>4.1.2 Every package shall have readily re-sealable closures of velcro, large zips, captive elastic shockcord loops. shockcords or cords with jamb cleats, or other suitable methods.</p> <p>4.1.3 Portable items shall be capable of being fitted into installed pockets provided in the interior of the liferaft.</p> <p>4.1.4 Portable items shall have lanyard or tape “tails” with velcro self-seal strips at the ends to facilitate making captive without tying knots</p> <p>4.1.5 Portable items shall (except where essential) be without sharp corners, sharp edges and unnecessary protrusions which could injure survivors or cause damage to the liferaft fabric.</p> <p>4.1.6 The equipment pack shall be inherently buoyant, brightly coloured and captive by a line to the inside of the raft.</p> <p>Instructions shall be marked on each item as appropriate (see 1.2).</p>
4.2	rescue throwing line min 30m	A rescue throwing line of min breaking strain 1.0kN and length >30m shall be stowed in a re-useable “throwing sock”.
4.3	safety knife in pocket	One non-folding safety knife with buoyant handle and lanyard attached in a pocket on the exterior of the canopy adjacent to the fixing point of the painter line. Both knife and pocket shall be clearly marked “SAFETY KNIFE”
4.4	bailer	One portable buoyant bailer, clearly marked “BAILER”. If a sleeve bailer (optional) is permanently fitted in the floor of the liferaft the portable bailer shall be provided as a spare.
4.5	sponges	One sponge for each person
4.6	sea anchor	At least one sea anchor to ISO 17339 equipped

ISAF OFFSHORE SPECIAL REGULATIONS Appendix A Part II

		<p>with at least one swivel connected to the raft so that it will stream on deployment. Diameter of line to be not less than 9.5mm to make it easy to handle. The line shall be >30m in length. The sea anchor, line and fixing arrangement to the liferaft, must be capable of withstanding heavy shock loads as described in 1.17.1.2 painter criteria.</p> <p>When only one sea anchor is carried in the liferaft a second sea anchor shall be carried in the yacht's grab bag.</p>
4.7	2 buoyant paddles	Two buoyant paddles with handles (not mitts) tied into raft adjacent to an entrance. The location of the paddles shall be indicated in large clear lettering on the outside and the inside of the canopy.
4.8	first aid kit	A basic first-aid kit shall include at least 2 tubes of sunscreen and 1 tube of sunburn treatment cream. If water is not included in the liferaft kit, at least 0.5 litre to aid taking seasickness or analgesic tablets etc shall be provided in a soft plastic drinking pack with a built-in valve. Small bottle caps etc shall if possible be captive to aid the action of re-sealing. All dressings shall if possible be capable of being effectively used in wet conditions. The first-aid kit shall be clearly marked and it is recommended, should fit into a prepared and clearly marked stowage pocket.
4.9	whistle or bull horn	At least one.
4.10	torches	2 waterproof sealed-for-life torches. Each torch shall be sealed in clearly marked packaging, which prevents the operation of the torch until the packaging is removed. Torch packaging shall be clearly marked with the expiry date of the torch. Each torch shall be capable of providing a continuous light of 6 hours. Torches that are not sealed-for-life are unacceptable.
4.11	spare	
4.12	signal mirror	A signaling mirror shall be provided clearly marked with instructions.
4.13	copy of the lifesaving	In accordance with SOLAS regulation V/16

ISAF OFFSHORE SPECIAL REGULATIONS Appendix A Part II

	signal code	
4.14	seasick pills	min 6 per person
4.14.1	seasick bags	1 seasick bag per person with a simple effective closure system
4.15	survival instructions	<p>Printed instructions on durable waterproof medium written in plain English (<i>see 1.2 above</i>) shall include the following:-</p> <ul style="list-style-type: none"> .1 the list of equipment packed in the raft .2 use of the liferaft .3 how to survive on board .4 how to right the liferaft after a capsize .5 diagram of liferaft with locations of knife, painter fixing, sea anchor, throwing line, equipment and PLB pockets and all inflation points. .6 first measures to be taken ie <ul style="list-style-type: none"> .6.1 disengage the painter line and move clear of the parent vessel .6.2 deploy the sea ancho to resist capsize .6.3 close the liferaft entrance <p>maintain the liferaft in good condition by bailing, inflate or deploy the insulated bottom (if fitted and if requiring manual deployment), checking for and repairing leaks, etc.</p> <ul style="list-style-type: none"> .6.4 deploy PLB appropriately and maintain watch etc.
4.16	red flares	3 red hand flares in accordance with SOLAS regulation 36.
4.17	2 thermal protective aids (survival bags)	In accordance with SOLAS LSA 2.5 (waterproof, and designed to reduce convective and evaporative heat loss from the wearer's body).
4.18	repair outfit	To enable persons* with numbed, wet, cold hands to repair leaks in the inflatable compartments including e.g. buoyancy tubes, inflatable floor (if fitted), inflatable canopy support (if fitted), inflatable boarding ramp (if fitted). Repair systems must work when wet and be capable of being applied during violent motion. The repair outfit shall include at least 6 leak-stop pugs. *see 1.3
4.19	air pump	must be simple, robust, and complete with all

		necessary connections (loose parts must be captive to the main apparatus) ready for instant use to enable persons* with numbed, wet, cold hands to pump air into the inflatable compartments including e.g. buoyancy tubes, inflatable floor (if fitted), inflatable canopy support (if fitted), inflatable boarding ramp (if fitted). The air pump must be designed and built specifically for easy operation by hand.
4.20	spare	
4.21	“wet” notebook and pencil	A notebook shall be supplied with toughened paper designed to be capable of use in wet conditions. A pencil shall be provided captive to the “wet” notebook.
4.22	paddles, torch and instructions to be immediately available	Of the equipment items listed above, the paddles, torch and instructions shall be immediately and obviously available to a survivor on boarding the liferaft.

5.0 PART FIVE - GRAB BAG

The liferaft is designed to be complemented by the grab bag described in Special Regulations. See ISAF Offshore Special Regulation 4.21.3 .

6.0 PART SIX DOCUMENTATION, MAKERS’ MARKS, SERVICING

6.1	service record sheet on water-proof medium	One copy shall be stowed inside liferaft container. A second copy shall be provided to be kept inside the yacht.
6.2	Liferaft identification	A unique serial number (which may comprise a set of numbers and letters) shall be marked in strongly contrasting colour and as large as possible on the outside of the canopy and on the outside of the bottom; this serial number shall be marked also on the certificate and on the outside of the valise or container.
6.3	servicing general	With the aim of guaranteeing correct operation and maintenance of the quality of the equipment during its entire lifetime, liferafts shall be regularly serviced by manufacturer-approved service stations. Manufacturers are responsible for:

		<p>.1 ensuring that their liferafts are designed and constructed to be serviced in accordance with their recommendations</p> <p>.2 approving a sufficient number of service stations</p> <p>.3 ensuring that each of their approved service stations has staff suitably trained, qualified and certificated and familiar with all changes and new techniques introduced by the manufacturer</p> <p>.4 placing at the disposal of the service stations-</p> <p>.4.1 servicing manual(s) (see 6.4.3 below)</p> <p>.4.2 modifications to the servicing manual(s) and also appropriate bulletins and instructions</p> <p>.4.3 appropriate materials and spare parts</p>
6.4	servicing	<p>Liferafts shall be serviced every 12 months after a possible period without servicing defined below.</p> <p>.1 When designed and built to have an extended period between initial services the liferaft may provided the manufacturer clearly specifies the intervals, have its first service no longer than 3 years after commissioning and its second service no longer than 2 years after the first. Subsequent services, and services for all other liferafts, shall be at intervals of not more than 12 months.</p> <p>.2 At each service inspection shall be made of-</p> <p>.2.1 the structure</p> <p>.2.2 the inflation system</p> <p>.2.3 the emergency equipment (e.g. torches)</p> <p>.2.4 the liferaft equipment (e.g. ladders, lines, sea anchor(s))</p> <p>.2.5 the packaging</p> <p>.3 A detailed list of the points to be serviced, the procedures to be followed, the items to be replaced etc. shall be clearly set out in the servicing manual supplied to the service station and which may be consulted by the public. All items having an expiry date shall be replaced when this date would occur prior to the next scheduled service. All inspections carried out shall be recorded and the records maintained by the service station.</p>

7.0 PART SEVEN LIFERAFT STOWAGE

7.1	Liferaft stowage in offshore racing is subject to Special Regulation 4.20
-----	---

8.0 QUALITY ASSURANCE

8.1	Quality Assurance	<i>A liferaft manufactured in or after 1/04 should be produced in compliance with ISO 9001:2000.</i> A liferaft manufactured in or after 1/05 shall be produced in compliance with ISO 9001:2000.
-----	-------------------	--