

OSR WORKING PARTIES

REPORT OF THE OSR WORKING PARTY TO REVIEW LIFE JACKETS, HARNESES AND SAFETY LINES**Working Party membership**

Stuart Carruthers (Chair), Guy Perrin, Patrick Lindqvist, Renee Mehl, Genevieve White, Andor Serra

In attendance: Henry Thorpe

Introduction

Life jackets are the first line of defence once a sailor is outside of the life lines. Lifejackets come in many formats and there are continually changes. All nations specify standards for lifejacket; often they refer to an international standard and often to a national specification (ISO 12402, EN396, UL1180 etc). This is a confusing area for sailors. Also from the Recovery of Persons overboard, they would like to see a lifejacket that can be used to hoist sailors from the water to the safety of the boat. This WP is an information gathering WP to blueprint what is happening at present, what may come down the pipe in the near future and to give direction to the OSR subcommittee on lifejackets in regard to our regulations, submissions we may want to make to international bodies, manufacturers' associations, etc .

The focus of this review is on lifejackets (OSR 5.01), and Harnesses and Safety Lines (OSR 5.02) to be used in Category 0 to 5.

Terms of Reference:

1. To review if there is any reason to have a reduced standard for Cat 4 and 5;
2. To investigate any changes being considered by international and national organizations for lifejackets;
3. To investigate what manufacturers are proposing for future changes to lifejackets in relation to jackets suitable for oceanic and offshore racing;
4. To identify what short comings sailors have in the existing life jackets, harnesses and safety lines;
5. Should the OSR specify a crotch strap or leg straps or either?
6. Can sailors depend upon using the loops on life jackets with harnesses to lift them from the water? What is the weight lifting specification for these loops? If not what changes are required?
7. To review the lifejacket and harness and safety line section of the OSR to identify any changes that should be considered;
8. Should the OSR subcommittee consider relaxing the specification on lifejackets in Cat 4 (lights, spray hood, etc.)
9. To submit an interim report by 1 April 2014 and a final report by 22 September 2014
10. Prepare any Submissions by 22 September 2014

To review if there is any reason to have a reduced standard for Cat 4 and 5 and should the OSR subcommittee consider relaxing the specification on lifejackets in Cat 4 (lights, spray hood, etc.)

As a general observation, the WP can offer no reason why OSR should specify a reduced standard lifejacket for category 4 provided these categories are not compromised. By inference Category 0, 1, 2 and 4 races are offshore races; Category 5 and 6 races are designated inshore races.

Appendix J, Category 5 special regulations for inshore races already permit a lifejacket that is equipped simply with a whistle and reflective tape; it does not need to be inflatable which implies that a buoyancy aid is acceptable (Appendix J 5.01.1 refers). However, it is expected that adequate shelter and/or effective rescue is available all along the course. The absence of this provision in the Category 4 definition implies that boats competing in a Category 4 race are expected to be self-reliant to some extent.

The problem with category 4 is that it is being increasingly used by day boats and sport boats when a better solution maybe to rename and revise category 5 (and for that matter category 6) so that there is not an implied linear progression from 6 through 0. The purpose of this is to give race organisers a suitable category for day boats without having to compromise OSR category 4 for a group that was never its target audience.

OSR set out a specification that is accepted internationally as a minimum uniform standard for yachts that compete under its rules and the Working Party does not believe that the OSR should compromise category 4 by specifying a reduced lifejacket requirement. While it may be appropriate to permit some flexibility to use an alternative standard for lifejackets for these events (i.e. one that simply complies with a minimum recognised standard such as ISO 12402) under certain circumstances by far the better solution would be to create special regulations for inshore racing that do not lead to compromise of category 4; this may mean that the fundamental category definitions are revisited.

The WP does not believe that a buoyancy aid is adequate for races in Category 5. It has been suggested by the RORC rating office that Appendix J, 5.01.1 should state that:

“Each crew member shall have a lifejacket. Unless otherwise specified by a Notice of Race, lifejackets shall comply with OSR paragraph 5.01.1 a) i”.

Changes being considered by international and national organizations for lifejackets.

Improvements in lifejacket design and materials for construction are continually being made. In addition the 10 parts of the ISO 12402 series are under current review and the Author together with Henry Thorpe (ISAF) are fully involved in the ISO review process.

As a result of the opportunities presented by the review of ISO 12402, ISAF has submitted a proposal for an addition to ISO 12402-6 that specifies the safety requirements and additional test methods for an enhanced use lifejacket for the recreational offshore sailing activities.

The scope of Part 6 specifies the safety requirements and additional test methods for special purpose PFDs that go beyond the basic general requirements set out in Parts 2 and 3. The ISAF proposal brings together the basic requirements of ISO 12402-3, specific ISO 12402-8 accessories

and a combined ISO 12401 harness/hold down retention device into a specification for a lifejacket that is intended for offshore recreational sailing and is easily identifiable as such to the owner/ user.

ISAF already sets out what it requires by way of a lifejacket in OSR 5.01 and 5.02, based on considerable user input and experience. This is accepted internationally as a minimum uniform standard for those that compete under its rules. These specifications form the basis of the proposal which has been submitted for comment among ISO members is attached at Annex A.

To investigate what manufacturers are proposing for future changes to lifejackets in relation to jackets suitable for oceanic and offshore racing.

It is clear that standards are intended to ensure that lifejackets provide an effective standard of performance in use. Equally essential is the need for the designer to encourage the wearing of the equipment by making it comfortable and attractive for continuous wear on or near water, rather than for it to be stored in a locker for emergency use. While modern equipment now provides much of this, of much more concern is for the user to buy a lifejacket that is suitable for offshore sailing activities and is readily recognised as such and includes the necessary accessories without having to compromise.

Improvements in lifejacket design and materials for construction are continually being made to remain competitive, however, there is some discontent in the industry that innovative design is to some extent being stifled by the current ISO 12402 series particularly in relation to hybrid solutions and rigid testing regimes. The industry is well represented on TC 188/SC1 where ISAF has observer status and is influencing the review process.

Some manufacturers already make products that meet ISAF requirements and the endorsement of a sailing specific product in Part 6 intended for use by persons engaged in offshore sailing activities is creating considerable interest among some manufacturers. (It will be recalled that it was an ISAF specification for a liferaft that lead to an ISO standard).

To identify what shortcomings sailors have in the existing life jackets, harnesses and safety lines.

ISO 12402 has been prepared to give guidance on the design and application of personal flotation devices for persons engaged in activities, whether in relation to their work or their leisure, in or near water not just recreational offshore sailing activities. The standard makes it clear that conformity of a PFD to a part of ISO 12402 does not imply that it is suitable for all circumstances.

ISO 12402 covers two main classes of PFD:

- Those which provide face up in-water support to the user regardless of physical conditions (lifejackets);
- Those which require the user to make swimming and other postural movements to position the user with the face out of the water (buoyancy aids).

Within these main two classes there are a number of levels of support, types of buoyancy, activation methods for inflatable devices, and accessories, all of which will affect the user's probability of survival. Within the different types of buoyancy allowed, inflatable PFDs either provide full buoyancy

without any user intervention other than arming (i.e. PFDs inflated by a fully automatic method) or require the user to initiate the inflation. These alternatives have the potential to create a bewildering array of lifejackets all with differing characteristics, many of which are marketed as offshore lifejackets!

The ISAF requirement set out in OSR 5.01 and 5.02 includes little that is not covered by the existing ISO 12402 ten part series already. However, it is a fact that the standard is not readily available to members of the recreational boating public and it is not reasonable to expect them to be familiar with it. The information is set out in a number of parts that requires some understanding and it is regrettable that Part 10 which gives guidance for the selection and application of personal flotation devices is not readily available in the public domain.

It is essential for owners and users to choose those PFDs that meet the correct standards for the circumstances in which they will be used. The ISAF proposal at Annex A seeks to achieve this by providing a specification and marking for a suitable product for offshore sailing activities that is readily identifiable as such.

Should the OSR specify a crotch strap or leg straps or either?

Because there are a number of designs emerging it would be better to refer to these generically as hold down retention devices.

An important issue to ISAF is the use of hold down retention devices. This is because of the significantly increased safety to the wearer of the lifejacket in waves. This is supported by the recent ISO TC188/WG6 working party report which concludes: *“ride up is not a problem when a crotch strap is used”*. It also facilitates the lifejacket being worn in a way to remain comfortable rather than with an over-tightening the waist belt. Of more significance is the increased security when hold down retention devices are used as part of a deck harness, hence the standard specifically mentions the provision for an attachment as mandatory and defines the webbing thickness. (ISO 12401 – 4.3.6 refers).

It is important to be able to utilise existing products and accessories and therefore the aim is still primarily the addition of a hold down device as a mandatory accessory. The webbing of the crotch strap defined in ISO 12401 is however more than capable of assisting in man overboard recovery without failing. However existing hold down retention devices are regularly compromised by weak plastic buckles/connectors. Recent testing by the US Naval Academy shows stitching/breaking failure loads of over 1000kg on webbing representative of that used for Hold down retention devices, (far in excess of any lifting loop load), however the buckle connectors are failing at 60kg and are often prone to damage and unclipping due to their low quality.

ISAF fully understands that hold down retention devices for all PFD user groups may not be desirable due to other risks, but for recreational offshore sailing the International Sailing Federation considers that they are vital; it has strongly recommended their use for over two decades and has mandated them since 2010.

Can sailors depend upon using the loops on life jackets with harnesses to lift them from the water? What is the weight lifting specification for these loops? If not what changes are required?

This question refers to two lifting methods for which there are different specified tests:

- a. Lifting loop fitted to all ISO12402 part 2 and 3 lifejackets as a mandatory accessory
- b. The harness attachment point.

Lifting Loop

A 'lifting loop' is a mandatory accessory on all ISO 12402 part 2 and 3 lifejackets which facilitates manual recovery of a person from water; it is tested in accordance with ISO 12402-9:2006. A vertical load of 3200N (326Kg) must be maintained for 30 min and at the conclusion of the test procedure it must show no physical damage that would likely prevent its function.

Safety Harness

The requirements for performance and testing for deck safety harnesses and safety lines are specified in ISO 12401:2004. It represents a strength test under overload conditions in order to ensure sufficient durability of the components tested. The standard covers three sizes of harness; size 1 is applicable to harnesses and lines for body mass exceeding 50Kg.

The harness attachment point is tested by dropping a dummy with a mass of 100Kg vertically through a distance of 2 m. The safety line is tested using the same parameters.

Both of these tests provide a dependable level of performance; no changes are required.

To review the lifejacket and harness and safety line section of the OSR to identify any changes that should be considered.

The Working Party agrees that the section on lifejackets and harnesses is confusing and requires review and simplification. Currently 5.01.1 requires all lifejackets in categories 0 to 4 be they manufactured to ISO 12402-3, EN396 or UL1180 to be fitted with a harness in accordance with ISO 12401. (The reference to ISO 1095 is incorrect it should be EN 1095). However 5.02.1 only requires a harness for categories 0, 1, 2 and 3.

Recommendation

The WP recommends that the OSR Subcommittee consider the following:

- **A lifejacket as specified in 5.01.1 and in line with the ISAF submission to TC188/SC1 is a requirement for categories 1 to 4;**
- **A combination of a separate lifejacket and a separate harness for race categories 1 to 4 is not acceptable;**
- **A tether is required for each crew member on board in race categories 1 to 4;**
- **Rename and revise category 5 (and for that matter category 6) so that there is not an implied linear progression from 6 through 0 and to ensure that there is a suitable category for day boats without having to compromise OSR category 4 for a group that was never its target audience;**
- **Confirm that ISAF should continue to press TC188/SC1 to include a special purpose offshore lifejacket that meets the OSR 5.01.1 specification (Annex A) in ISO 12402 part 6;**

- Amend OSR Appendix J, 5.01.1 to state: “Each crew member shall have a lifejacket. Unless otherwise specified by a Notice of Race, lifejackets shall comply with OSR paragraph 5.01.1 a) i”;
- Rewrite OSR rules 5.01 and 5.02 for a submission in 2015.

Stuart Carruthers

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ANNEX A

ISO 12402-6 YACHTING SPECIFIC LIFEJACKET FOR ISO TC

Proposed Text for ISO 12402-6

The proposed initial text for part 6 is as follows:

5.7 PFDs for Offshore Sailing

5.7.1 General

These lifejackets are intended for offshore sailing on yachts and utilising a combined ISO 12401 harness and specific ISO 12402-8 accessories. General requirements see ISO 12402-3:20xx, 5.6.1 and the in-water performance shall comply with ISO 12402-3:20xx as a minimum.

5.7.2 Specific requirements for PFDs used for Offshore Sailing

5.7.2.1 This type of enhanced-use PFD shall:

- a) Be equipped with automatic inflation which may have the option, although not fitted, for prevention or blanking to the auto activation function.
- b) Be equipped with a hold down retention device.

5.7.2.2 This type of enhanced-use PFD shall also be fitted with the following ISO 12402-8 Accessories as standard:

- a) Sprayhood
- b) Protective cover for abrasion and puncture resistance
- c) Emergency light
- d) Deck Safety Harness in compliance with ISO 12401.

5.7.2.3 Additional Requirements

It is recommended that provision of a means of storing a Personal Location Beacon (PLB) when un-inflated is provided. When storage is provided the name(s) of the product(s) or product range tested with the PFD shall be provided in the PFD owner's manual together with information on optimal mounting. The PFD shall be tested with the PLB fitted in its

stored position and should be subjected to a 3.0m jump test. When jump tested the PLB shall not get dislodged or damaged and shall not cause harm to the wearer or the PFD. When the PFD is inflated the PLB shall be accessible to the wearer from the stored position for deployment. Consideration for a mounting point when in the deployed, inflated condition should be given.

5.7.3 Testing

Accessories required by clause 5.7 of this part of ISO 12402 or accessories designated to be used with PFD shall be attached to the PFD before testing in accordance with ISO 12402-9.

Neither component claimed to be usable in conjunction with the other shall have any attachment which impairs the operation or performance of the other, or that is likely to cause damage to the other.

Any integral combination or claimed permissible or usable combination shall conform to the requisite standards on each individual item, and in each permissible combination.

In addition to the ISO 12401 test, the lifting loop test shall, having been tested with the ride up prevention system undone, be repeated with it fastened without [additional] adjusting the waistbelt system. The means of adjustment on both the lifejacket and hold down prevention device shall not have a slippage exceeding 25 mm when subjected to the test and at the conclusion of the test procedure the hold down retention device shall show no physical damage that would prevent its function.

5.7.4 Marking and Product Information

5.7.4.1 General

Marking shall comply with the requirements of 12402-3 clause 6, except as follows:

- a) Products shall carry ISO 12401 and 12402-3 marks.
- b) Item 6.2 I) shall be replaced with the number of this Part.
- c) The final paragraph of 6.2 shall not apply.

5.7.4.2 PFD used for Offshore Sailing

In addition to the above-required marking, each PFD shall be marked with the following [details]:

- a) "FOR USE BY PERSONS ENGAGED IN OFFSHORE SAILING ACTIVITIES".
- b) "This is an Enhanced Specific Use PFD designed to provide all the features deemed suitable for offshore sail activities."
- c) Products shall carry the offshore sailing pictogram to indicate compliance with this Part. This shall also be clearly displayed on the products packaging"

