Submission: SR09-14v2

Offshore Special Regulation - 3.04.4

A submission from the Sail Canada

Purpose or Objective

Modify the stability requirements for greater consistency between ISO,ORC and SSS. Addition of missing ISO 12217-2 requirements to the stability regulations

Proposal

3.04.3 Yachts shall demonstrate compliance with ISO 12217-2*, either by EC Recreational Craft Directive certification (having obtained the CE mark) or the designer's declaration, for the race categories as follows: Mo0,1,2,3

TABLE 3

ISO Category	A	B
OSR Category	1-2	3

* The latest effective version of ISO 12217-2 should be used unless the yacht was already designed to a previous version

3.04.4 For yachts which cannot demonstrate compliance in accordance with 3.04.3~~, a yacht shall provide, as specified by the race organiser, either~~ shall meet a minimum sailing weight (m) and stability values as below and shall provide: Mo0,1,2,3

a) STIX and AVS values as below; or failing that

~~a~~b) the stability index/AVS in ORC Rating System; or failing that

~~b~~c) IRC SSS Base value ~~or~~

~~c) STIX and AVS values as below~~

TABLE 4

OSR Category	**0**	**1**	**2**	**3**
STIX min	32			23
AVS min	130-0.002*m but always ≥100°			130-0.005*m but always ≥95°
m min	3,000 kg			1,500 kg
ORC Stability Index min	120	115	110	103
IRC SSS Base Value min	35		28	15
~~**OSR Category**~~	~~**0**~~	~~**1**~~	~~**2**~~	~~**3**~~
~~ORC Stability Index min~~	~~120~~	~~115~~	~~110~~	~~103~~
~~SSS Base Value min~~	~~35~~	~~35~~	~~28~~	~~15~~
~~STIX min~~	~~32~~	~~32~~	~~32~~	~~23~~
~~AVS min~~	~~130-0.002*m~~	~~130-0.002*m~~	~~130-0.002*m~~	~~130-0.005*m~~

Where "m" is the mass of the boat in the minimum operating condition as defined by ISO 12217-2

Current Position

As above.in black (3.04.3 in blue is for reference), additions in green, deletions in ~~red strike-through~~.

Reason for re-ordering

- The wording in regulations 3.04.3 and 3.04.4 indicate that ISO 12217-2 is the preferred system for stability screening.
- Meeting ISO 12217-2 STIX and AVS more closely matches ISO 12217-2 than meeting the ORC Stability Index or the IRC SSS Base Value so those regulations have been moved to a higher precedence
- Because it includes an inclination test, ORC remains ahead of SSS

Reason for additions

- In ISO 12217-2 section 6.3.1 Table 4, minimum values for *m* and for *AVS* are specified but were omitted in the 2012 OSR.
- A boat failing to the minimum *m* for a category could not achieve that ISO category under OSR 3.04.3, but could do so under ORC or SSS in 3.04.4
- A (heavier) boat failing to the minimum AVS for a category could not achieve that ISO category under OSR 3.04.3, but could do so under the minimum *AVS* stated OSR 3.04.3
- ISO 12217-2 is only obligatory in the European Common Union. Outside of the ECU there is no obligation for designers or builders to meet this standard. Race organizers can rely on OSR 3.04.3 for some boats and have to rely on OSR 3.04.4 for the rest. The failure to apply the minimum *m* and *AVS* can result in inconsistencies in the boats permitted to race. For example a design in North America could qualify for Category 2 but would meet category 3 in Europe.
- As examples of designs where applying minimum sailing weight would align ORC with ISO please consider:

Design	From an ORC certificate			From IRC Listing			
	Disp <kg>	Stability Index	ORC Category	STIX	AVS	ISO Category	ISO Category based upon m
Farr 30 OD	2,490	116.7	1	27	132	B (3)	B (3)
First 25.7	2,131	117.0	1	22	129	B (3)	B (3)
Platu 25	1,227	116.6	1	17	121	C (4)	C (4)
First 27.7	2,574	120.5	0	28	124	B (3)	B (3)
Flying Tiger 10	1,985	131.3	0	33	122	B (3)	B (3)
J/80	1,521	113.8	2	23	123	B (3)	B (3)
J/92	2,673	113.1	2	31	129	B (3)	B (3)

Figure 1

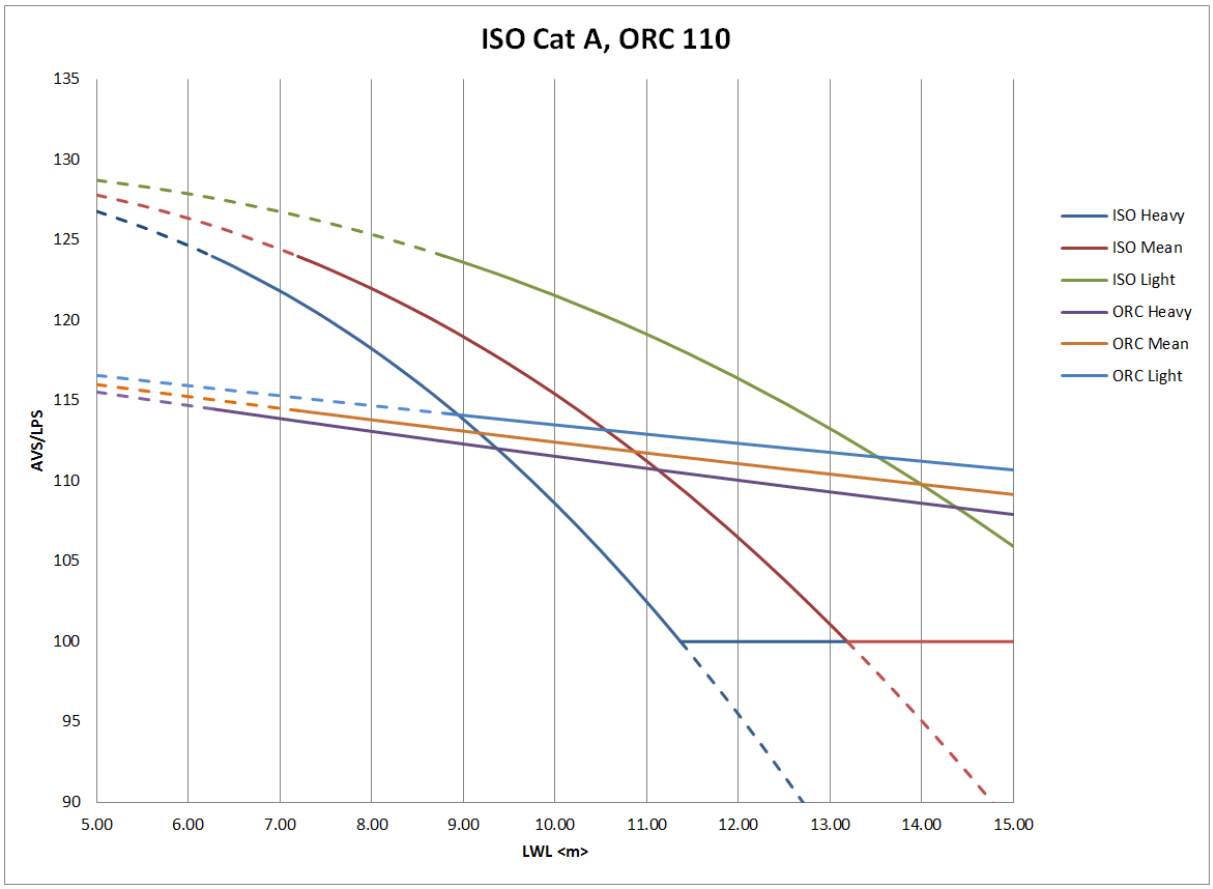

Figure 1 above compares the current sections 3.04.3 and 3.04.4 as it applies to OSR category 2. Note that:

- The solid ISO lines show the AVS permitted under ISO (OSR 3.04.3)
- The dashed extensions show what is also accepted using the current OSR 3.04.4
- The solid ORC lines and their dashed extensions show what is accepted using the current OSR 3.04.4
- The wording in this submission disqualifies any boat on the dashed extensions of the lines. Given the different ways in which ORC and ISO determine the minimum threshold for an offshore race category, it is inevitable that the threshold will differ between the two systems. By adding the words in this submission, the difference will be significantly reduced.
- The pattern for OSR category 3 is similar. For categories 1 and 0 the ORC curves shift upward approximately 5° and 10° respectively.

Explanation for Figure 1

For purposes of this illustration some broad generalizations have been made, those being that AVS (under ISO) and LPS (under ORC) are equivalent. For purposes of applying the ORC size increment it is assumed that ORC LSM0 is equivalent to LWL. It is further assumed that the boats have other proportions that don't trigger further penalties under the respective system. Using real data will shift the lines somewhat but the overall picture will be the same.

For LWL in the range of 5 m to 15 m, the displacement at the heavy, mean and light (taken from Principles of Yacht Design (1994), Larsson & Eliasson, Figure 5.35) end of the range was calculated.

For the ISO curves, the respective displacements were entered as m into the formula 130-0.002*m and the curve was plotted.

For the ORC curves, LWL was used as LSM 0 in the formula for Size Increment (SI). The formula LPS = Stability Index – SI was used, where the Stability Index = 110 was used for OSR category 2.

Extract from Minutes of 2014 Special Regulation Sub-Committee

4 (i) OSR 3.04.4 Monohull Stability

Submission SR09-14 from Sail Canada was received.

Will Apold explained that the submission sought to introduce a minimum mass requirement in order to assist a Race Committee in screening yachts which cannot demonstrate compliance with ISO 12217-2, either by EC Recreational Craft Directive certification (having obtained the CE mark) or the designer's declaration.

As a member of the monohull stability working party, Mike Urwin noted that when the ISO Stability Standard 12217-2 was re-published in 2013, the following requirements had been amended:

"6.3 Angle of Vanishing stability and minimum mass ", had been deleted and replaced by :

"6.4 Minimum Righting Energy" and "6.5 Angle of vanishing stability"

As a minimum mass requirement has been removed from the ISO standard and replaced by a minimum righting energy he felt that this should be reflected in any change to 3.04.4.

Boris Hepp questioned how an owner was supposed to know all the details of ISO 12217.

It was noted that the primary simple solution applicable to most competing yachts was that the yacht has the appropriate CE mark or a designer's declaration.

There was a view that the term "or failing that" in the proposal was not appropriate and that a simple 'or' would be preferable. It was also noted that 3.04.3 ISO Category A should be linked to ORC Category '0-2', currently noted as '1-2'.

Sten Edholm noted that the submission needed further work. He felt that the subject had reached a level of complexity that he was not comfortable with and that he wished to withdraw from being chairman of the Monohull Stability working party.

On a proposal to defer by Sten Edholm, seconded by Will Apold and a vote of 9 in favour, 0 against and 0 abstentions it was agreed:

Recommendation to the Oceanic and Offshore Committee: Defer

Oceanic and Offshore Committee Decision: Defer