Working Parties

a) Keel Improvements - ISO 12215-9 Sailing Craft Appendages

ii) To note correspondence between World Sailing and the Chairman of ISO TC 188

Hello Simon –

I have an update for you regarding your letter.

In working with ISO, TC 188 will be opening the systematic review of ISO 12215-9 early on Oct 15, 2021.

The SY is a 5 month period where comments and recommendations can be made to revise the document.

TC 188 is looking for and currently accepting nominations for a Convenor and Project Leaders for the Scantling documents.

Kind Regards,

Craig Scholten

Chair TC 188

From: Craig Scholten
Sent: 05 August 2021 16:55
To: Jason Smithwick
Cc: Simon Forbes; Anette Eriksson (SIS)
Subject: ISO 12215-9

Hello Jason –

I am Craig Scholten, the current ISO TC 188 Chairperson.

Thank you for your email regarding sailing yacht keel fatigue within the ISO 12215 Part 9.

As noted in a reply from the ISO TC 188 Secretariat, the Scantlings WG was disbanded and is not currently active.

An improvement list is maintained for all ISO standards, so concerns can be addressed at the next systematic review.

Specific concerns to the related clause numbers with proposed solutions are welcomed.

Please forward those to Anette.

The following Scantlings standards open for SR 2022-07-15 and close 2022-12-03;

ISO 12215-1:2000 (WG 18)

Small craft — Hull construction and scantlings — Part 1: Materials: Thermosetting resins, glass-fibre reinforcement, reference laminate

ISO 12215-3:2002 (WG 18)

Small craft — Hull construction and scantlings — Part 3: Materials: Steel, aluminium alloys, wood, other materials

ISO 12215-4:2002 (WG 18)

Small craft — Hull construction and scantlings — Part 4: Workshop and manufacturing

ISO 12215-6:2008 (WG 18)

Small craft — Hull construction and scantlings — Part 6: Structural arrangements and details

ISO 12215-8:2009 (WG 18)

Small craft — Hull construction and scantlings — Part 8: Rudders

ISO 12215-9:2012 (WG 18)

Small craft — Hull construction and scantlings — Part 9: Sailing craft appendages

If you have nominations for a Scantlings Convenor and Project Leaders we welcome those as well.

Kind Regards,

Craig Scholten

Chairperson ISO TC 188

World Sailing

sport / nature / technology

10 August 2021
ISO TC188

Sent by email to: chair of TC188: Mr Craig Scholten, cscholten@abycinc.org
CC: TC188 Secretariat: Annette Eriksson, anette.eriksson@sis.se

Dear Mr Scholten

Re: ISO 12215 Part 9 and Sailing Yacht Keel Fatigue

World Sailing, through its Offshore Special Regulations Structural Plan Review Scheme has established a process to have cruising and racing yachts reviewed and certified through notified bodies in order to be eligible to compete in races. This process uses ISO12215-9 amongst other standards. In 2019 World Sailing's Oceanic & Offshore and Special Regulations committees established a working party to investigate the requirements within ISO12215 Part 9 – Sailing Craft Appendages particularly related to the fatigue recommendations within the standard.

The Working Party includes representatives including Chairman of World Sailing Committees, National Sailing Authorities, Classification Societies, Sailing Class representatives. The working party was established due to the continued failure of sailing yacht keels (cruising and racing) with often the reason failure related to fatigue.

Many of the cruising and racing yachts that go through the World Sailing plan review process are standard production yachts that have undergone CE assessment or other regional verification using the ISO standards. It is therefore essential that the ISO standard itself is suitable for all types of yachts so they can sail and race safely.

It is notable that the standard states "The operational life of the craft is assumed to be 8 million stress cycles. This is based on an assumed operational envelope various times on different points of sail, average tacking 2 times for beating, average rolling periods for downwind, typical wave encounter periods, estimated heel angles and is only intended to be representative. This corresponds to about 25–30 years of moderate-to-high usage recreational sailing or about five years of very extensive ocean racing (one, 30 000 NM, competition plus associated training and preparation annually). This is 15 % of the figure of the number of cycles normally used in ship fatigue assessment."

Our background investigation has established the following statistics and observations:

- In relation to the World Sailing OSR structural plan review, circa 60% of keels certified are hollow welded structures and around 5% are canting keels.
- Welding design in sailing yachts seems to be frequently performed by novices or composite engineers and often rely on manufacturer's standards showing lack of understanding of structural importance.
- The fatigue methodologies in ISO 12215-9 has produced an awareness, but it is too slow. Designers need to have knowledge and capabilities through a process of "education".
- Fatigue Design is essential for metal keels and provisions already exist for proper design
- Production can be a "common" marine standard if instructions given on design drawings are appropriate
- The awareness of importance of a proper weld design, even today, is often poor

- The awareness of high strength steel properties and behaviour today is poor.
- High profiled projects with correct design are often not subject to failure.
- A reduction of 25% stress range would extend the fatigue life by a factor of 2.
- 25% better FAT class (quality) extends the life by a factor of 2.

World Sailing kindly request that ISO12215 Part 9 is opened for revision in respect of this criteria to investigate the validity of the keel fatigue requirement and also the option of making these recommendations a requirement under the standard. The working party has suggested the following areas for investigation under the proposed revision of ISO 12215-9 as follows:

- Examine the Total Damage Ratio “MSF” value in ISO 12215-9
- Establish if the current fatigue recommendations should be part of the mandatory requirements for ISO 12215-9

World Sailing recognise that this project may require additional assistance in terms of expertise and funding and request a dialogue with TC188 on how to best initiate the project as detailed above?

Yours sincerely

Matt Allen – Chairman of World Sailing Ocean and Offshore Committee, Sailor and owner
Stuart Caruthers – Chairman of World Sailing International Regulations Commission, RYA Cruising Manager
James Dadd – World Sailing Special Regulations Sub-committee, International Maxi Association Technical Officer
Hasso Hoffmeister – Member of World Sailing Keel Fatigue Working Party, Senior Principal Engineer – DNV
Sally Honey – Chairman of World Sailing Special Regulations Sub-committee, Sailor and owner
Stan Honey – Member of World Sailing Ocean and Offshore Committee, Professional Sailor and Navigator
Jason Smithwick – Chairman of World Sailing Keel Fatigue Working Party, RORC Rating Office Technical Director