

Personal Safety Equipment for Sailing Classes

1. Introduction

The Equipment Committee of WS has formed a Working Party to investigate the use of personal protective equipment in WS classes. The WP membership consists of:

- Cathy Mac Aleavey (IRE)
- Will Apold (CAN)
- Hendrik Plate, WS Staff

This WP's purpose is to prepare recommendations for a way forward for WS classes to adequately protect participants with personal protective safety equipment.

Our workplan has included review of presentations at the Sarasota Safety Symposium, discussions with three class Association representatives and available reports and presentations.

2. Discussion

Water speeds of boats and boards have increased dramatically over the past 2 decades; first with a move to planning hulls and then to foiling. Injuries have also changed. From a study conducted by the WS Medical Commission on athletes competing in qualification trials and in the 2016 Sailing Summer Olympics, injuries tend to be from two sources; overuse of muscles- 60% (torn ligaments) and acute – 40% (broken bones, serious cuts). With faster boats comes more acute injuries as shown in the study by the Nacra, 49er and FX.

The energy that a sailor's body has increases by the square of the boat speed. A change from 10 knots to 20 knots results in a 4-fold increase and at 30 knots the energy increases 9-fold.

Studies of pedestrian vs automobile crashes show that under 14 knots crash that 10% of pedestrians have serious injuries while over 20 knots that increases to 20% and at 30 knots it is over 50%. (Teff, B.C. (2011) Impact Speed and a Pedestrian's Risk of Injury or Death. AAA Foundation for Traffic Safety).

Work done by WS Medical Commission has identified crash risks as follows:

Risk 1: Crash into water

- I. Water contact only
- II. Water contact and then run over by own boat / foils
- III. Water contact and then run over by another boat / foils

Risk 2: Crash onto own boat / foils

- I. Into boat or exposed part of foils above the deck and deck gear
- II. Into foils under own boat

Risk 3: Crash with another craft (competitors, media, race officials, spectators)

- I. Two or more vessels collide

In the above risks, the injury to the sailor can also be during the release (angle/foot injuries when ejected from angle strap on 49er).

The weight of the boat also increases safety risk for crashes with another craft but speed is likely the key parameter.

Work done by the Australian Safety Committee has noted areas that need to be considered when developing protocols for reducing risk:

- Equipment –design of the boat and position of gear (e.g. safe release of angles from foot straps)
- Equipment – personal safety equipment
- Race management (e.g. course designs that reduce possibility of high-speed contact)

- Medical emergency procedures (e.g. ensuring adequate number of safety boats with boat handling skills for number of competitors and wind/wave conditions)

This WP is focusing on the personal safety equipment.

Demistifying the various testing certifications:

This website (<https://www.sweetprotection.com/en/blog/tech/tech-certifications.html>) explains the difference of the various testing and specifications for helmets; EN1385 (whitewater), EN1077 (snow sports), EN12492 (mountaineering) and EN1078 (biking) .

One often sees that a helmet is certified to

3. Findings

1. Speed is the primary risk increasing factor - particularly over 20 knots;
2. Boat size (weight) is a significant risk for collisions;
3. Foiling adds additional risks because of the position and the shape of foils;
4. Class Associations do recognize the key issues around safety for their sailors and boats. They are likely the best group to develop safety protocols for their classes including what protective equipment and when to wear it;
5. Non planning and non-foiling boats/boards are of limited risk when considering personal protective gear; and
6. Adding protective padding to likely impact areas or design changes can reduce injuries.
7. WS should require WS Classes to include in their mandatory Classes Annual Report the findings of their review of personal protective equipment for their Class and the changes made to their Class Rules.

4. Recommendations

1. WS shall require all WS Classes to prepare a review of their requirement for personal protective equipment within a specified time frame;
2. This review should also include any additions of padding or design changes to the equipment;
3. This review shall identify the personal protective equipment, its performance specification and when it should be worn (always, only over specified wind speeds, etc). It is suggested that a standard class rule format as described in Section 5 should be used when possible; and
4. WS shall start and focus first on classes that are foiling or are high speed planning (boat and boards normally sailing over 20 knots);

5. Personal Equipment Rules

The Class Rules can define the personal safety equipment required. This may be optional or mandatory as determined by the Class Rule or Notice of Race.

The class rule framework only governs those acting as a competitor at an event and consideration needs also be given to guests, coaches, or media personnel on board. These requirements would be stated within the Notice of Race or Support Team Regulations, etc.

The class rules as can specify any changes to requirements for changes in wind speed, sea conditions or race location (cold water, distance from safe shore, etc).

A proposed standard Class Rule framework for personal safety equipment are as follows and are offered as examples:

PERSONAL EQUIPMENT

X.X1 MANDATORY

- (a) The boat shall be equipped with a **personal floatation device** for each crew member to the minimum standard ISO 12402-5 (CE 50 Newtons), or USCG Type III, or AUS PFD 1. (Note: In certain classes such as wind surfers/kites other approved personal floatation devices could be allowed; ex. USCG Type V or in some classes they do not have a requirement for a floatation device. Whatever the Class requirement, to should be clearly stated in the Class Rules.)

Or

- (a) The boat shall be equipped and the crew trained to the minimum standard detailed World Sailing Offshore Special Regulations Category (*depending upon Category of race as defined in the OSR*).
- (b)

X.X2 OPTIONAL (THE CLASS RULES OR NOTICE OF RACE COULD MAKE THE FOLLOWING MANDATORY)

- a) Each **crew** member shall wear a helmet that shall be to the minimum standard EN1385 or EN1077 or equivalent.
- b) Each **crew** member shall wear body protection, if the body protection also acts as a personal flotation device it shall be to the minimum standard in X.X1(a). Body protection shall be to the minimum standard EN121 (Level 1 or 2).
- c) Each **crew** member shall carry an emergency air cylinder device with a minimum of 1 min air at 1 m below the surface.
- d) Each crew member shall carry a safety knife. The blade shall be fixed (not a folding blade or multitool), carried in a scabbard and with a minimum blade length of 70 mm. The knife shall be attached to the sailor's gear and readily available to the sailor while on the boat or in the water.
- e) Hiking harness. The weight shall not exceed ... kg. (other defining parameter?)
- f) Trapeze harness. The weight shall not exceed ... kg. (other defining parameter?)
- g) Other equipment as ankle covering sailing boots, Kevlar socks, impact protecting gloves, glasses, reinforced wetsuits, etc

X.X3 TOTAL WEIGHT

The total weight of worn equipment shall not exceed ... kg.

6. Event Rules (NoR, SIs, ERs)

Within an event framework in the Notice of Race, the safety rules may be invoked by referencing the necessary class rules as follows (this assumes that the class rule is optional):

Safety

NoR XX.YY In accordance with Class Rule C.3.2(a) it is mandatory that each crew member wears a helmet that meets or exceeds EN1385 or EN1077 or equivalent. Or .

Or where a class rule does not exist the Notice of Race may be as follows:

Safety

NoR XX.YY Each crew member **[may/shall]** wear a helmet that shall be to the minimum standard EN1385 or EN1077 or equivalent.

