

## World Sailing Race Officials

### Tracking System for Race Officials

A submission from US Sailing

#### Purpose or Objective

To initiate the development of a system specifically designed for World Sailing Race Officials to confidently acquire, manage and analyze event tracking information.

#### Proposal

1. Require World Sailing to assign the necessary resources to develop an application to collect and view event tracking data. The system, also known as Tracking for Race Officials (TRO), would be specifically designed for use by race officials in running races and deciding protests by IT and GNSS<sup>1</sup> experts, with input from World Sailing race officials.
2. In cooperation with existing tracking companies, develop the specifications for a standard protocol for efficiently transferring race tracking data between the event tracking company and the WS TRO application. The World Sailing standardized tracking protocol<sup>2</sup> will allow any provider of tracking services to interface with the World Sailing TRO system.
3. The TRO application will allow a race official to view the raw tracking position data, with the parameters effecting accuracy, both in real time (e.g., starting races) and historically (e.g., deciding protests). The tracking data is presented without the graphics enhancements shown on the public viewer, but will include the calculation of accuracy that is currently not available on the public graphical display.

#### Current Position

1. There is currently no tracking viewer application specifically designed for use by race officials. The typical animated graphical tracking presentation is made available to the public on the tracking company's website. The data is occasionally made available to race officials in an export file for use with generic mapping applications. Neither of these presentation methods is suitable for technical use by most race officials. Some race officials have the training and skills to interpret and plot the raw export file in third party applications. It would be fairer to make this useful information available to all race

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1 Global Navigation Satellite System - GNSS trackers receive one or more of the four GNSS signals that are currently in use or being implemented - GPS (USA), GLONASS (RUS), Galileo (EU) and BeiDou2 (CHN).  
2 The World Sailing standard for transferring GNSS data shall be similar in concept to the World Sailing XRR standard for transmitting race results. A WS certified standard protocol ensures compatibility between TRO and the tracking system implementing the protocol.

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officials in a standardized format.

2. The information available to the public via the tracking company websites is heavily enhanced with inferred information derived from the raw data. This 'manufactured' information is not viable for technical use. For example, the tracking company display will show a boat tacking that was calculated from a path based on successive fixes. The display is not accurate within the context of the racing rules and can therefore be misleading to the sailors, race officials and the parties in any subsequent hearing.
3. The accuracy of each GNSS receiver position fix will vary considerably depending on a number of factors, including the number and positions of the satellites in view, and the distance from land based reference receivers. The accuracy of the position fix is calculated by the GNSS receiver but not displayed on the tracking company websites, so the quality of the data is unknown to the public. The information on the quality of the signal and accuracy of the positions can be very useful to a race official.
4. World Sailing has no agreement to obtain Olympic competition race tracking data from the tracking system supplier and in previous Olympic Games, WS Race Officials have been denied access to tracking data in any form.

### Reasons

1. Good decisions require good information. The quality and consistency of race officials' decisions will be significantly improved by the worldwide use of TRO, a standard tracking display tool designed and built to World Sailing requirements.
  2. The use of GNSS positioning devices to track competitors in sporting events is increasing. Most systems use trackers that provide real-time tracking information, but others simply record the positions in the trackers for download ashore. All of the systems are supplied with elaborate 2D or 3D animated visual graphical displays, even though the raw data does not support most of the augmented reality.
  3. For sailboat racing events, external information that is either calculated or obtained from third party sources enhances the graphical presentation. Some tracking systems allow interaction with the user, who can zoom, rewind, or even change the virtual 'camera' location and perspective. The result is a very rich user experience, almost all of which is derived and manipulated from the limited underlying GNSS position data. For the race official, the added enhanced graphics is clutter that makes the tracking system almost useless for running races or deciding protests.
  4. The information presented on the website can be very misleading. Sailors in a protest hearing will often point to the website presentation to prove that a boat tacked, gybed or changed course at some point during the incident. However, the trackers do not include a heading sensor, so derived data is used to display the course and heading. Sailors will also point to the website presentation to prove that an overlap existed at some stage. The inaccuracy of the scaling of the boat symbol and its placement 'over' the tracker position creates false impressions about the existence of an overlap. Most sailors, and even some race officials, have difficulty in separating the imaginary information from the real information.
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5. Tracking for race officials (TRO) proposals have been circulating since 2013 with broad agreement that the application is needed. The former ITTC investigated the idea with tracking companies and technology partners. The Race Officials Committee supported the concept and provided valuable input on the application's needed capabilities.
6. Reports from race officials attending recent Olympic Games reinforce the need for a way to obtain and use tracking data. Making decisions that impact the competition based on the graphical presentation of the race on the event website is not acceptable at high profile events.
7. World Sailing needs to support its race officials with a tracking information tool that is specifically designed for the race officials.

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**NOVEMBER 2017 COUNCIL**

**Decision**

**On a proposal from Marcus Spillane and seconder Cory Sertl, Council deferred Submission 009-17 to May 2018 (24 in favour, 16 against, 0 abstain)**

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