

Recommendations for Use of ToD versus ToT Scoring Methods

Six years ago, in our 2019 Annual Meeting, a considerable amount of time was spent promoting the alternative scoring method of Time on Time (ToT) scoring for PHRF races. We agreed at that time to adopt ToT scoring as the FCSA recommended method for scoring PHRF races. FCSA provides PHRF ratings in both seconds per nautical mile (ToD ratings) and time correction factor (TCF) and the appropriate scoresheets so that clubs may use either ToT or ToD scoring. For many years, we have used the familiar Time on Distance (ToD) scoring method. Most of you are familiar with handicaps being expressed as seconds per nautical mile and the use of these handicaps to calculate corrected time based on the course length in nautical miles.

After six years of observing results, FCSA has changed its position on preferred scoring methods. We have seen large discrepancies in results calculated by ToT versus the traditional ToD method. As flawed as having a single PHRF rating for all wind conditions may be, our PHRF system remains the most popular system for handicap racing. And we cannot escape the fact that each boat is rated in seconds per nautical mile based on ToD observations.

To examine time correction methods, we performed a spreadsheet study covering the complete range of our PHRF fleet from ratings as low as 6 sec/nm to as high as 270 sec/nm. The goal of the study was to assess which method is best to achieve fair results in various wind conditions. The process consisted of evaluating a “standard” yacht in windward/leeward races of varying wind strengths to establish a performance yardstick. We used the performance of a “standard” yacht, a J-24 to calibrate the performance of the FCSA fleet using FCSA parameters and handicaps. We also used performance of other standard PHRF boats, the J-35 and C&C 35, as check data. All this data was taken from information published by US Sailing as part of the PHRF ToT Scoring Method description. Once the fleet performance was calibrated to the “standard” yacht, we evaluated results of the FCSA fleet in ToT and ToD scored races under varying wind conditions. The study evaluated the calculated results for the following:

- Closeness of finish places
- Distribution of finish places
- Overall differences (potential error) between ToD and ToT calculation results

The study also identified improvements in the selection of “A” and “B” factors used in the calculation of Time Correction Factors (TCF) used in ToT scoring.

Study Findings

1. Using ToD:

As one would expect, all boats in the fleet that are sailed perfectly to their ratings under all wind conditions yield the same corrected time using ToD scoring method. (This may not be fair in real life but that is how PHRF works.)

2. Using ToT:

- a. Under windy conditions of 20 knots, the faster rated boats have an advantage over the slower rated boats. This advantage may be as much as 1:12 on a 4 nm W-L course in our fleet.
- b. As wind speed decreases to 12 knots, the slowest rated boats in our fleet gain significant advantage. At 12 knots true wind speed the advantage for the slowest boat may be as high as 1:45 on a 4 nm W-L course. This advantage grows to 14:33 under 6 knot true wind speed conditions, and as much as 33:37 in a 3-knot drifter.
- c. We have found that the current “A” and “B” factors of 700 and 550, respectively are accurate at 15 knots of wind but woefully inaccurate at lower wind speeds that we often sail.

FCSA Recommendations

1. All distance races, and races around navigation marks and temporary marks that have been set to known locations should be scored using the ToD method. Anyone with a cell phone or GPS today can locate a mark and calculate a course length. Technology for establishing accurate course distance is much better today than decades ago. **ToD is recommended for all races where the course length can be accurately determined.** Keep in mind that in setting up a racecourse that all marks establish straight legs over navigable water. For example, a course containing a leg from Marker “5” to Marker “E” on the St. Johns River is not a straight line of navigable water and the course length is not exact. The Mug Race may have an “agreed course length” but the course length cannot be determined by straight line navigable distance between marks. There may be situations in which ToD is not possible because the actual course length is unknown. Course lengths for very long-distance races may also be corrected for curvature of the earth.
2. There are still some situations where ToT may be preferred: ToT scoring is much easier to manage from a Race Committee standpoint. If you are running a short-staffed race on a short course such as a club series race, with ToT scoring you don’t need to know the precise course length. To most PHRF racers this doesn’t sound like an important point. But it is a very important point and is one of the largest causes of unfairness in handicap racing. As the Race Committee, your only concern in setting up a course for ToT correction is making sure it is correct for wind and current. Exact course length is not a concern. Another advantage is shortening course. There is no longer the need to figure out what the “new” course length is after a course is shortened.
3. If an organization chose to use ToT scoring over a wide range of wind conditions, consideration should be given to modifying the “A” and “B” factors to suit the average wind conditions of each race. The following table is recommended.

Wind Condition	FAST	MODERATE	LIGHT
Avg Wind Speed	15	10	5
A Factor	700	870	1400
B Factor	550	720	1250

The ToT scoresheet available on the FCSA website has input factors for “A” and “B” that can be modified to suit the wind conditions for each race. Use of these factors would help to minimize discrepancies between ToT and ToD results.