

Rating System of the New England Multihull Association, (rev. May 2016)

1. **Introduction:** The handicapping of the NEMA multihull fleet must cope with: 1) boats that inherently have wide range in potential velocity, and 2) skippers that have a huge difference in skill in achieving optimum velocity. The Race Committee's goal is to provide handicaps that account for both boat speed differences and skipper skill level. We seek to achieve a system that will reward a boat and crew that adapts to the weather and course conditions, and their competitor's tactics and strategies, to make better judgments in order to exceed their "rated" potential.
2. **General Rating System Design**
 - 2.1. NEMA ratings are based on many factors. However, fundamentally they are based on the Race Committees analysis of performance of the boat/ skipper in past competitions and any changes that are made that may improve performance. Handicaps are adjusted so that each well-sailed boat has an equal opportunity to win.
 - 2.2. NEMA ratings are unique in that they handicap the helmsman as well as the boat. The intent is that each Principal Helmsman will have a good chance to win if they sail to the best of their ability. This feature of the Rule aims to encourage participation, but it does not intend to reward poor performance or unnecessarily penalize proficiency.
 - 2.3. The NEMA Rating Rule is open to any multihull of good design and construction.
 - 2.4. Existing boats will not be made obsolete by newer designs. Newer boat will be handicapped so that older designs can compete successfully.
 - 2.5. As modifications and equipment upgrades are made to a boat, the handicap will be reviewed to reflect the new speed potential.
 - 2.6. The handicap will not give undue credit to poorly prepared boats and / or to malfunctioning equipment.
3. **Basic Scoring System Methodology:**
 - 3.1. In general the handicap system uses the elapsed race time, (ET) and a rating to determine a "corrected time", (CT) of a competitor. The CT's for all competitors in a race are compared and ranked from smallest, (the winner), to the longest, (last place).
 - 3.2. NEMA uses Time on Time, (ToT), scoring to determine the results of a race and to establish ratings. (note: the RC has provided with some exceptions for local race scoring as described in Sections 4.5 through 4.7, but the Season Standings are all normalized to ToT.)
 - 3.3. The handicap in the ToT system is named the Correction Factor, (CF). The determination of the finish position for a race is based on the Corrected Time, (CT). The CT in ToT is calculated by multiplying the Elapsed Time, (ET), or the time taken by a boat to complete the race circuit, by the CF. (CT = ET x CF).
 - 3.4. The NEMA ToT Correction Factor can be translated into "seconds per mile" type handicap, (aka: ToD, Time on Distance), using the formula:
$$CF = 650 / (550 + \text{ToD rating}), \text{ or}$$
$$\text{TOD rating} = (650 / CF) - 550.$$
4. **Scoring of Races.**
 - 4.1. The order of finish for a race will be based on the NEMA ToT corrected time of each boat finishing the race.

- 4.2.** Each race will have a NEMA Representative that will act as a liaison between the Local Race Committee and the NEMA competitors. The NEMA Rep will provide race information to competitors, and verify with the Local RC that multihulls are welcome and advocate that NEMA ratings and scoring will be used for the NEMA fleet. Spreadsheets for scoring, tailored to include each NEMA racer in the race, can be supplied by the NEMA RC. The NEMA Rep is responsible for transmitting the ET's for each race to the NEMA RC within 2 days after the race finish.
- 4.3.** In cases where a local RC does not use the NEMA ToT scoring system, the NEMA representative is responsible for obtaining the elapsed times, (or start and finish times), for each competitor. Either the NEMA Rep can calculate the finish positions, or the ET's can be sent to the NEMA RC for calculation. In either case the NEMA RC should receive each elapsed time within 2 days after the race finish.
- 4.4.** Only race results using the NEMA ToT system will be used for NEMA Season Standings, NEMA Awards, and for NEMA Boat/Helmsman handicaps.
- 4.5.** The NEMA fleet competes in regattas where the local Race Committee insists on using its own scoring system. For example, the Off-Soundings regattas use a ToT system, but with a different formula, and they impose an additional handicap in the 2nd race for the winner of the 1st race. Although not particularly numerous, there are occasions when the Off-Soundings standings are different than the NEMA Standings.
- 4.6.** Pursuit races are another exception. By definition, these stagger the start time of each boat based on a time on distance, (ToD), rating. The basis of a pursuit race is that since the distance each boat has to travel is the same, and the difference in speed of the boats is offset at the start, the order of crossing the finish line determines the finish order. Pursuit races can be accommodated as long as the start/ finish times, or the elapsed time for each contestant is recorded.
- 4.7.** The finish positions for the Season Trophy are determined by the ToT corrected time. For the Black Dog Dash, a pursuit race, race prizes given out on the beach will continue to be awarded based on the order of crossing the finish line. This is the historical practice. It's fun, but unfortunately it falsely represents the true performance of the fleet. For example, in 2015, the BDD had 14 boats cross the finish line. 8 of the top 10 finishers, including the 1st, 2nd, and 3rd boats all finished in different positions in the standings. This occurred because the race was fast, (average speed of all boats was 8.3 knots), and high speed races favor slower rated boats under ToD scoring.
- 5.** Protests: see NEMA Race Rules and Section 6.0 below.
- 6.** Handicap Determination
 - 6.1.** Each boat and principal helmsman combination in the fleet will be assessed a rating based on observed on-the-water performance, on changes in the equipment, and on changes to the principal helmsman of the boat.
 - 6.2.** Each rating will be approved by a majority of the Race Committee.
 - 6.3.** Comparative performance analysis is performed for each separate race that a boat/helmsman participated in and finished, and is based on the data supplied by the NEMA Representative for each regatta/ race.

- 6.4. The comparison of boat performance is based on a “sailed to” analysis. “Sailed to” ratings are the rating that a boat actually *sailed to* in a particular race.
- 6.5. For each race a reference boat is determined. The reference boat will be the boat whose corrected fleet placing is equal to the number of finishers times .4, (as an example, if 10 boats finished, the reference boat will be 10 x .4 or the boat that finished 4th). The .4 boat is used because it is expected to be a well sailed boat which likely sailed to its pre-assigned NEMA rating. The sailed to rating for the boats that finished better than the .4 boat will have “sailed to” ratings faster than normal. The .4 boat has a rating equal to its normal rating. The sailed to ratings of boats that finished slower than the .4 boat are slower than normal.
- 6.6. “Sailed to” handicaps will be tabulated compared to the reference boat by calculating the CF rating that each boat/ helmsman in the race would need in order to have the same corrected time as the reference boat. So, for any single race, the “sailed to” CF for Boat X equals (the corrected time of the .4 boat) / (elapsed time of Boat X).

$$(CF_{\text{Boat X}} = CT_{.4 \text{ Boat}} / ET_{\text{Boat X}}).$$

Since most sailors understand “seconds per mile” ratings instead of CF’s, the sailed to CF’s for each boat are converted to ToD sailed to values using the formula in Section 3.4. The “sailed to” ratings for the racing season will be averaged and compared to the assigned rating to indicate whether a boat routinely sailed faster or slower than its assigned rating.

- 6.7. While the “sailed to” results can be valuable tools, they are but one factor and the Race Committee will also use its experience to weigh their value. For a single race, abnormally high, or low, “sailed to” values that were caused by a specific or assignable cause, (such as failure to start on time, wind dying at the end of a race, equipment failure, etc.) may likely cause the Race Committee to discount those results.
- 6.8. Information in the Rating Application indicating changes to a boat’s equipment, (such as adding a bow sprit and large downwind sail, not sailing with a spinnaker, etc.) will be judged by the Race Committee based on their experience, and may cause a boat’s rating to be adjusted.
- 6.9. If the Principal Helmsman is changed to someone of greater skill, or is not specified, the Race Committee can likewise adjust the assigned rating as it feels is warranted.
- 6.10. A new boat of unknown potential will be given a rating based on submitted data compared to that of known performers. The intent of the Race Committee will be to favor the fleet when issuing original ratings to new boats and helmsmen.

7. Rating Review

- 7.1. Although all ratings are subject to review at any time, generally the NEMA Race Committee will review ratings prior to each season and after the Buzzards Bay Regatta.
- 7.2. Any skipper may appeal his own, or another boat/ helmsman rating at any time. Such appeal must be made in writing to the Chairman of the NEMA Race Committee.