



# **PHRF NS Performance Handicapping Manual**

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**Version 20; 3 August 2018**



Record of revisions

<u>Version Number</u>	<u>Date</u>	<u>Notes</u>
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17	25 April 2016	3.17 wording revised as per 23 Aug 2015 changes. (duplicate paragraphs)
18	20 June 2018	Update of PHRF-NS Adjustments
19	13 July 2018	Removal of Adjustments page from Manual. Replaced with hyperlink to adjustments posted on-line to avoid duplication
20	30 July 2018	Expanded PHRF to TCF chart on page 24

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## **1. PRINCIPLES OF HANDICAPPING**

### **1.1 Introduction**

For as long as yachts of different designs have raced together, skippers have searched for a fair method of handicapping. We will all be happier in our appreciation of handicapping if we begin by accepting the impossibility of achieving a perfect system. So many variables affect the speed of yachts that no formula can accurately predict, nor any assessment of race results accurately measure, their performance under all conditions that may arise.

Bearing in mind that good races are won by seconds, the order of accuracy we seek in a handicapping system is extreme. To be correct within ten seconds, say, in a three hour race, we would need to estimate relative speeds, and apply corrections, to an accuracy of better than 1 in 1000. In fact, we cannot hope to be better than 1 in 100, on average, and conditions in some races will inevitably cause larger errors. Hence there will always be grounds for complaint. Indeed it has been suggested that the ideal handicapping system would be one that caused every competitor to grumble equally.

The best that we can aim to do is to approximate conditions that would exist in one-design racing in average local weather, in order to provide enjoyable, albeit not completely fair, racing.

There is an important principle embodied in this aim, which is often misunderstood. In one-design racing, all yachts are of the same design and thus have the same potential speed. However, they will not all be equally well maintained; their sails will not be of the same quality, and the ability of their skippers and crews will vary widely. All the major handicapping systems similarly seek to equalize the potential performance of yacht designs, but not the individual performance of each yacht and her crew. In a properly handicapped race, the best maintained and best sailed yacht should always win, as in one-design racing.

For special purposes, to encourage newcomers to internal Club racing, for example, a golf-like handicap based on an individual's performance may be desired. We shall see in Section 4.5 that simple modifications can be made to do this, but the major handicapping systems all aim to allow the best crew to win.

It is important to appreciate that handicapping involves two distinct but related steps:

1. Rating the potential speed of a yacht,
2. Correcting her elapsed time.

### **1.2 Rating**

In principle, there are two methods of rating the potential speed of a yacht:

1. Measurement rating, according to some formula or rule,
2. Performance rating, according to the results of races.

Measurement rating was the traditional method, both for restricted class racing and for handicap racing, particularly in the ocean racing fleets. The main reason that measurement rating was favoured for most prestigious events is that rating judgment plays no part. A yacht's rating is uniquely determined by measurements that can (in theory) be taken as precisely as needed by the formula. For everyday racing, however, measurement rating has two disadvantages. First, the complexity of today's formulae demands many measurements and frequent updating, thus incurring a significant expense. Second, no formula can be fair to all possible designs, and a clever designer will be able to "beat the rule" by designing a yacht that will sail faster than the formula claims it should. Thus there is always the risk of finding oneself the owner of an obsolete yacht, despite ameliorating effect of age allowances and periodic revisions of the rule.

Although originally intended to rate all designs of yachts equitably, a measurement rule inevitably causes a particular style of yacht to evolve, as designers learn features that best exploit the rule. This is not a handicapping problem, but there is no guarantee that such development will lead to a style of yacht that is desirable except for racing under that particular rule.

Historically, there have always been one or two prestigious measurement rules in vogue, together with a wide variety of simpler local rating methods, less costly to owners. Because the simpler measurement rules have usually proved disappointing, local methods have increasingly turned to performance rating.

The first performance rating method to gain wide acceptance outside its local area of origin was the Portsmouth Number system, but with its growth came a lack of local control and delays in updating the numbers. To meet local needs in the US, with the rapid expansion of racing-cruiser designs coming on the market in the 1970s, a number of performance handicap racing Fleets (PHRF) evolved. As described in Chapter 2, the rating concept is common, but each Fleet has its own Handicap Committee, evaluating local race results and updating the handicaps periodically.

Today there are over 60 Fleets in US-PHRF, all operating independently but following agreed guidelines. The great advantage of this "federated" approach is that each Fleet has the guidance of the accumulated experience of all other Fleets. The complete listing of handicaps published annually by US-PHRF, with amendments circulated to member Fleets as they report them, is undoubtedly the most comprehensive database for keel-boat handicapping available.

It is important to appreciate, however, that PHRF is a concept rather than one specific method. In detail, each Fleet publishes its own rules and procedures, developed to suit the local racing scene. In this manual, principles followed by all Fleets are described in Section 2, and procedures are specified in Sections 3 and 4 for one particular Fleet, that of PHRF-NS.

### 1.3 Time Correction

There are two ways of applying ratings to the elapsed time of a yacht to obtain her corrected time:

- 1 **Time-on-time correction**, using "time correction factors",
- 2 **Time-on-distance correction**, using "time allowances".

These are fundamentally different and will not yield the same corrected times (unless the scratch yacht happens to sail the race at one particular speed). Either can be applied to any method of rating but most systems present us with either a time allowance (TA) or a time correction factor (TCF), suggesting that the rating method is tied to one or the other.

In the case of PHRF, TA = Rating, because the ratings are stated directly as time allowances in seconds per mile. They are, nevertheless, ratings and there is no reason why a corresponding TCF cannot be used for time-on-time correction in PHRF.

Time-on-time correction is the easier of the two to apply. We simply multiply the elapsed time of each yacht by its TCF to obtain the corrected time. Time-on-distance correction requires us to know the length of the course sailed. We first multiply the TA for each yacht by the course length in nautical miles, and then subtract the resulting total allowance from each yacht's elapsed time to obtain the corrected time.

This dependence on course length introduces an additional source of error in the time-on-distance method. Course length and actual distance sailed through the water will differ significantly, depending on the proportion of windward legs and on currents in tidal waters.

Controversy abounds as to which is the more accurate method of time correction, and will continue to do so, because the real answer is that neither of them is accurate, except under the very special set of circumstances when both produce the same result. Clubs and regatta officials are encouraged to experiment with both methods - and perhaps with combinations of the two - to determine which best suits the type of races they run and the prevailing local conditions. There is no need to follow tradition slavishly.

## 2. PERFORMANCE HANDICAP RACING FLEETS (PHRF)

### 2.1 Background

PHRF is a loosely federated system of regional organizations, each of which has its own constitution, regulations and procedures, but all working within the same principles and guidelines. A Committee of the United States Sailing Association (USSA), referred to as US-PHRF, lays down these guidelines but otherwise serves only as a promotional centre of communications, not as a decision-making body. Each regional organization, referred to as a "Fleet", has its own Handicap Committee responsible for establishing the handicaps used in its region. Hence there can be significant differences in PHRF ratings from Fleet to Fleet. The following sections describe the common principles and guidelines followed by all PHRF Fleets. Further details on US Sailing PHRF should be sought from the US Sailing Association, PO Box 1260, 15 Maritime Drive, Portsmouth, RI 02871-0907 (401) 683-0800. An annual list of PHRF handicaps covering all Fleets is available for purchase at that address.

PHRF NS is a contributing member of US-PHRF.

### 2.2 US PHRF Committee

The United States Performance Handicap Racing Fleet Committee (USPHRF) is a technical rule committee of US SAILING that promotes performance handicap racing for monohull and multihull sailing yachts applying the PHRF® rule. The Committee researches, develops, and distributes guidelines for performance handicapping using systematically applied empirical methodology to determine estimates of speed potential. The Committee maintains a database of critical dimensions for production boats and a database of handicaps assigned by local and regional fleets associated with USPHRF. It publishes these data, periodic bulletins, and handicapping guidelines that are mailed to member fleets associated with US SAILING. Three subcommittees have special tasks. The Executive Subcommittee deals with management and evaluates application of the rule. The Technical Subcommittee updates the procedures and methodology for performance handicapping. The National Appeal Subcommittee hears appeals of handicaps forwarded from associated local and regional fleets.

[www.ussailing.org/phrf](http://www.ussailing.org/phrf)

### 2.3 Principles of Performance Rating

PHRF ratings are yacht performance handicaps. They are based on the speed potential of the yacht, determined as far as possible on observations of previous racing experience.

*It is the intent of PHRF handicapping that any well-equipped, well maintained, and well sailed yacht has a good chance of winning, and that any boat that wins a race is indeed well- equipped, well-maintained, and well-sailed. Handicaps are adjusted as needed on the basis of the yacht's performance so that each equally well sailed yacht has an equal opportunity to win. This is fundamental.*

PHRF ratings are not intended to reflect skippers' and crews' capability. Ratings are not adjusted to encourage an inexperienced or careless skipper, and conversely, no rating adjustment is made to penalize proficiency and preparation. Intensity of competition and the influx of new and aggressive sailors require each skipper to maintain consistently high performance in order to place well.

Doing well in a race, therefore, requires the exercise of skill, ability, and teamwork. Consistently poor performance, sloppy maintenance, or deliberately holding back will not result in a more favorable handicap. Conversely, if a skipper and crew sail the boat well and consistently place high, this will not, by itself, lead to a handicap that is less favorable than that of the actual performance potential of the boat. Assuring that the handicap is based on the performance potential of the boat, rather than sailing skill, is an important factor in preserving high morale and wholesome competition within the Fleet.



Well-designed and well-constructed yachts will not be made obsolete by newer designs under PHRF. As faster designs appear, they are handicapped accordingly. One of the major attractions of the PHRF system is that older yachts can race competitively with the latest designs.

PHRF discourages "rule beating". If a skipper modifies his yacht, PHRF will attempt to compensate for the new potential speed. The use of taller masts, longer spinnaker poles, extra ballast, gutted interiors or other modifications intended to increase speed will be taken into account by the rating assigned.

PHRF assumes that a yacht is equipped and tuned to race. It does not attempt to rate a yacht which differs from others in its class in that it is out of balance, has old sails, or has unusual windage (as from a dinghy on davits). However, if the basic hull and rig differ from others in its class, it will, of course be rated uniquely.

Because headsail size has so much influence on speed, PHRF uses this factor to adjust handicaps. Yachts are rated for having large or small headsails, an LP of 155% J being the dividing line in most Fleets. Once a yacht is rated with a large headsail, this rating must be used, even though wind conditions may preclude use of the sail. A skipper is not allowed to have his yacht re-rated frequently by choosing a headsail to suit race conditions.

## 2.4 PHRF Base Ratings

PHRF ratings are expressed directly as time-on-distance allowances measured in seconds per nautical mile, to be deducted from elapsed times to produce corrected times. A higher PHRF rating indicates a slower boat.

Most Fleets in North America recognize 6 sec/mile as the smallest increment of time-on-distance performance that can be assessed reliably, but use increments of 3 sec/mile in making adjustments for minor changes of equipment and sail size.

The "base ratings" which appear in nationally published lists apply to yachts for which the following "standard configuration" applies:

- (1) The spinnaker pole/whisker pole length is equal to "J"
- (2) The spinnaker maximum width is equal to 180% of "J"
- (3) The spinnaker maximum length is equal to .95 times the square root of ("I" squared + "J" squared)
- (4) The genoa "LP" maximum is equal to 155% of "J"
- (5) The yacht is in racing condition
- (6) The yacht has a folding or feathering propeller, a two bladed fixed propeller in an aperture, or a retractable outboard motor.
- (7) Hull and appendages are unmodified.

Adjustments made for deviations from standard configuration vary from Fleet to Fleet, because they are based on local racing experience. Each Fleet publishes its own list of adjustments.

## 2.5 Valid Race Results

The success of any performance rating system depends upon the quality of the data provided by Clubs to the Handicap Committee. This quality is determined by the use of good judgement on the racecourse, and Race Officers and local Handicappers must be aware of what constitutes a result that is valid for handicap analysis.

The principle is simple. Since we seek true relative measures of a yacht's speed, her elapsed time must reflect fair sailing over the same course and under the same conditions of wind and sea as her competitors. Times that are the result of luck, or even skill, in finding wind no other boat has found, for example, win many races fairly, but are not valid measures of boat performance.

More obvious examples are yachts clearly not sailing to their potential, with a fouled bottom, a jib half-hoisted, or a riotous party in progress on board. Race Officers and Handicappers should note such things on their race records, just as they would note violations of the rules. Incidentally, an error in tactics, becalming a yacht while others are not, may invalidate results more than gross violations of the racing rules. The elapsed time of a disqualified yacht may remain a perfectly valid measure of her potential speed.

PHRF ratings are intended to apply to day-time round-the-buoy races, and to offshore and overnight races in which there is a balance of windward, reaching and downwind legs, and when there is an opportunity to use all sails. The system works well provided that wind conditions affect all boats equally. It is not intended for extremely short races,

predominantly off-wind races, or when there is no opportunity to change of headsails. Consequently, results from such races are not used for handicap analysis.

PHRF ratings are being used for short evening races, but the prevalence of rapidly varying winds and restricted courses makes such results less reliable. Many Fleets do not include the results of evening races in their analysis.

PHRF ratings are also being used for long offshore races, but with mixed success. Such races frequently do not experience an appropriate mix of windward, reaching and downwind legs. Moreover, the spread of speeds often causes the leaders and stragglers to be sailing in quite different conditions towards the end of a long race. Again, results of such races should not be used to analyse handicaps, unless the conditions of round-the-buoy racing have in fact been experienced.

Appointed representatives in each Club are responsible for submitting valid race results to the Fleet Handicap Committee. They may or may not be members of that Committee. Frequency of Committee reviews and rating revisions varies from Fleet to Fleet, as does the method of notification. In some, owners receive individual certificates; in others, rating lists are circulated to the Clubs.

### **3. PHRF-NS FLEET PROCEDURES**

#### **3.1 PHRF NS Handicap Committee**

The PHRF NS Handicap Committee is governed by the Board of Directors of Sail Nova Scotia (Sail NS). The Chairman of the PHRF NS Handicap Committee is a member of the Sail NS Board and is appointed by the Sail NS Board on an annual basis.

The members of the PHRF-NS Handicap Committee are selected by the member clubs of the Sail NS. Each member club is entitled to appoint one member (one vote) to the PHRF NS Handicap Committee. Each member club follows its internal procedures to select its representative.

#### **3.2 Sail NS Yacht Database**

Sail Nova Scotia maintains a database of all PHRF rated boats in Nova Scotia. The PHRF NS Handicap Committee administers the content of the database. See Section 3.4 for more information on the Sail NS Yacht Database.

#### **3.3 PHRF NS Rating request**

Sail NS will accept yacht data that is submitted on paper using the PHRF NS Yacht Data Sheet found on the web at [www.sailnovascotia.ca](http://www.sailnovascotia.ca). Additionally, PHRF NS will accept data that is submitted through the web using the online yacht data entry tool found on the same web site.

#### **3.4 PHRF NS Base Ratings**

Section 2 identified the basic principles for establishing the base rating for a yacht or class that is new to the Fleet. This Section will build on those principles and describe the tools, process, and guidelines that the PHRF NS Handicap Committee uses when dealing with base ratings.

To establish an initial base rating, when considering changing a base rating, and when addressing any written appeals of a base rating, the PHRF NS Handicap Committee will consider the following data, publications, and information:

- Results from races deemed suitable for handicapping by the local Race Committee or the local Club Handicapper
- Declared inventory as presented by the owner.
- Any change to the “measurements” of the yacht
- Established PHRF NS ratings for similar yachts.
- Skipper Effect
- Published measurement and performance data for similar yachts;
  - US Sailing, PHRF Handicaps
  - US Sailing, PHRF Rig Dimensions
  - US Sailing , IMS Master File
  - US Sailing, Performance Characteristics Profiles for the North American IMS Fleet.
- Critical comparison to similar sized and type boats with existing PHRF NS rating
- PHRF NS Yacht Rating Process included as Attachment 6

### 3.4.1 Suitable Race Results

Race results will be reviewed giving careful consideration to the following:

- Wind conditions.
  - Was the wind reasonably steady?
  - Did all yachts sail in similar wind conditions?
- Suitability of the course.
  - Was there a reasonable mix of up-wind, down-wind, and off-wind legs?
- Were there enough yachts in the race to make the results statistically relevant?
- Was the yacht in racing condition?
- Was there sufficient and competent crew on board?
- Was the handicap spread across the Fleet within reasonable limits?
- How does the spread in corrected times compare with what one would expect from a “one design” fleet of the same size?

### 3.4.2 Declared Inventory

The Sail NS Yacht Database will be reviewed to examine the declared inventory for the subject yacht.

- Is the yacht as-built or modified?
- If the yacht has been modified, what modifications have been declared?
- What are the declared sizes of the various sails carried on the yacht?.

Yacht owners are encouraged to visit the Sail NS web site to verify that the data entry for their yacht is correct. Any discrepancies should be promptly reported to Sail NS at [office@sailnovascotia.ca](mailto:office@sailnovascotia.ca)

### 3.4.3 Measurement Change

It is the intention of the PHRF-NS Handicap Committee to handicap boats using the yacht’s as-built configuration as a reference. The Handicap Committee will adjust the handicaps of boats that have been altered from their as-built configuration to completely compensate for any expected speed change, either positive or negative. Yacht owners are responsible to promptly report any measurement and sail inventory changes to the Handicap Committee.

As a minimum, the following changes shall be reported:

- Spinnaker/whisker pole length greater than J
- Spinnaker width (SMG) greater than 1.8 times J
- Spinnaker height greater than .95 times the square root of (I squared plus J squared).
- Rig height (I) changes

- Boom length (E) changes
- Rig cross section/weight changes
- Rig staying changes
- Sail measurement changes (P, E, SMW, SL, and LP)
- Keel/ballast weight changes
- Keel/rudder camber changes
- Keel/rudder chord changes
- Keel/rudder depth changes
- Propeller type/size/blade count/location changes
- Hull canoe body changes
- Changes to internal ballast
- Interior modifications including but not limited to the removal of significant fixed component(s), i.e. inboard engine, galley range, refrigeration unit, marine head, inside panels or floors, safety equipment, etc.
- Bow thrusters
- In-mast furling

#### **3.4.4 Similar PHRF-NS Yachts**

The existing PHRF NS Fleet will be examined to determine if there is an identical or similar yacht that has already been assigned a handicap.

#### **3.4.5 Published Data for Similar Yachts.**

The PHRF NS Handicap Committee has access to several authoritative publications that address the relative potential speed of various yachts (see Section 3.4). Some, like the annual US Sailing PHRF Handicaps book, are based on the assessment of various member fleet handicapping committees throughout north America. Others present empirical measurement data and may also present an associated time on distance handicap number (seconds/mile). The PHRF NS Handicap Committee will periodically review the available publications and services, and will update its library as required.

#### **3.4.6 Process**

A copy of the process followed by the PHRF NS Handicap Committee is included as Attachment 7.

### **3.5 Sport Boats**

As more modern designs work their way into the Maritimes' racing fleets the question of sport boats challenges many race committees. Including sport boats in the same class as displacement boats generally presents a disadvantage to either the sport boats or the conventional boats. The problem boils down to substantially different performance for each of the two boat types depending on the course configuration and wind conditions. If the trend continues, and we anticipate that it will, the problem will become more severe and will result in unhappy racers in both sport boats and conventional sailboats.

PHRF NS defines a 'sport boat' as follows: "Any boat where the Upwind Sail Area (100%)/Displacement + Downwind Sail Area/Displacement  $\Rightarrow$  105 shall be categorised as a sport boat." Details can be found in Attachment 5 to this manual.

### **3.6 The Ethics of Reporting Changes**

Assigning performance handicaps to racing yachts based on owners' declarations of configuration and inventory is strongly rooted in the premise that yacht owners are gentlemen and ladies of character.

The PHRF NS Handicap Committee will assign a handicap based, in part, on the declared inventory and configuration of the yacht. Unless the Committee is advised to the contrary, it will assume that the yacht is configured as it came from the factory. While it is not the intention of the PHRF NS Handicap Committee to discourage yacht owners from making performance enhancing changes to their yachts, the Committee does expect that owners will promptly and accurately report any such changes to PHRF NS at [office@sailnovascotia.ca](mailto:office@sailnovascotia.ca)

Common sense and reason must be applied when determining what constitutes a change that should be reported. Upgrading your rope clutches or relocating your genoa tracks will be considered "tuning". Changing the aspect ratio of your keel or replacing your rig with carbon fibre will be considered "modifications". If you are in doubt then report the change to your club handicapper or the PHRF NS Handicap Committee.

The PHRF NS Handicap Committee is not responsible to examine the Fleet looking for unreported modifications or undeclared inventory. Its role is to act as an impartial body for the purpose of assessing and quantifying the impact of any reported change on the potential performance of the yacht. In the event that a competitor suspects that a competing yacht has undeclared inventory, or that the yacht has been modified, it is up to that competitor to protest the offending yacht under the applicable Sailing Instructions.

### **3.7 Rating Reviews**

The PHRF NS guideline for determining if a yacht's handicap should be reviewed is set at +/- 12 sec/mile. This number is not 'carved in stone' but simply a guideline that is used by the Committee. It is important to note that exceeding the threshold only triggers a review; it does not necessarily mean that the handicap should be adjusted. The review will give full consideration to the items identified in Section 3.4.

When contemplating a rating change the Committee will give consideration to the "Skipper//Crew Effect" as described in Section 3.7. The Committee will also make an effort to eliminate any distortion of the data that may be generated by exceptional results. For greater clarity; if a yacht demonstrates extraordinary performance in a regatta or series of races, those results will be examined in the context of the yacht's recent performance over a large number of races. Exceptions abound in yacht racing, but consistency is the essence of sound handicapping.

When changing established ratings, the Committee will generally not exceed 6 sec/mile at any one time. Some lag in reaching a proper figure is better than the oscillations that can result from trying to precisely match current performance. Of course this normal limit does not apply to Provisional ratings that should be brought into line regardless of the amount of change needed.

Full PHRF NS Yacht Rating Review Process included as Attachment 7

### **3.8 The Skipper/Crew Effect**

When considering changing the handicap of a yacht type based on recorded performance, careful consideration to the Skipper/Crew Effect will be given.

A major problem in all performance handicapping is separating differences due to the true speed potential of yacht designs from those resulting from the skill of skippers and crews. When a Fleet has only one or two yachts of a particular type, judgement becomes especially difficult.

We can gain a good idea of the size of the skipper/crew effect from typical results of one-design races. Analyses reported by US-PHRF suggest that the average results of a 10-yacht race are distributed with the winner sailing about 15 sec/mile faster than middle finishers, the last yacht similarly slower. If the class includes a champion of national status, s/he can be expected to sail about 25 sec/mile faster than middle finishers. These figures vary with the number of starters. With 5 yachts a difference of 10 sec/mile, and with 15 yachts 20 sec/mile, would be typical for the winner.

The extra skill of a champion is likely to show less change; he will sail more consistently 10-15 sec/mile faster than the typical club winner.

We should expect to see variations like these among yachts properly handicapped for speed potential. If we try to "straighten the line", as application of a constant threshold would do, we will be handicapping winning skippers unduly and giving the rear-guard an unwarranted boost.

Clearly, these numbers are only representative; particular race conditions can produce wide variations in the skipper effect. No simple rule can be suggested, but the PHRF NS Handicap Committee will guard against rating revisions that would compress corrected times more closely than the spread of times to be expected in one-design racing.

### **3.9 Provisional Ratings**

When assigning an initial rating to a type of yacht new to the Fleet, the initial rating will be clearly identified as "provisional", to be reviewed as soon as valid race results provide significant evidence. The rating will remain provisional until the committee is satisfied that the yacht has reached its potential or that the potential of the yacht is clearly understood. The PHRF NS Handicap Committee will carefully review a provisional rating after 10 valid races have been recorded.

### **3.10 Rating Appeals**

The Committee will only consider written appeals.

Appeals may be of two kinds:

- 1/ An owner may appeal the handicap assigned to their yacht
- 2/ An owner may appeal the handicap assigned to a competitor's yacht.

The appellant should work with their club handicapper in an effort to resolve the issue without involving the PHRF NS Handicap Committee. If the issue cannot be resolved at the club level, then the appellant must submit their appeal to the PHRF NS Handicap Committee using the prescribed form found on the Sail NS web site (see Attachment 2). All information requested by the form must be provided before the appeal will be heard. The Handicap Committee will provide a decision on any rating appeal within 60 days of the appeal being received.

A fee of \$50.00 will be charged for each appeal. If the appeal is granted then the appellant will receive a refund of \$50.00. If the appeal is denied then Sail NS will donate the \$50.00 appeal fee to the junior sailing program of the appellant's yacht club.

Challenges to rating facts, as opposed to rating assignments, should be handled by protests under the Sailing Instructions. For example, if a yacht is suspected of sailing with a headsail larger than she has declared, another competitor should protest. Presumably, the Race or Protest Committee would immediately call for the sail to be measured. The facts found in such protests should be reported to the Handicap Committee.

### **3.11 Sail Measurement**

In most Fleets, measurement is only required as a result of a protest, but voluntary measurement can sometimes prevent potential arguments and is simple to do.

An official measurer is not needed and an accuracy of an inch will suffice. The following notes cover likely rig measurements.

The definitions and rules presented in most current World Sailing Rules of Sailing shall be used to determine sail areas.

### 3.11.1 Definitions:

The following definitions are provided as a general guide only. **Where a conflict exists between the definitions presented in this manual and those presented in the most current World Sailing Racing Rules of Sailing the definitions presented in the World Sailing RRS publication shall apply.**

**"I".** The Foretriangle height measured along the foreside of the mast from the main deck "datum" to the top of the jib halyard sheave.

**NOTE:** The height of the deck used as datum for "I" shall be taken as 4% of beam above the shear line abreast of the mast. For flush deck boats i.e. TANZER 22-26, CAL 28 and MORG 27 whose cabin extends athwartships to the shear line, use the stripe along the hull which represents the shear line.

**"ISP".** Same as "I" but measured to top of spinnaker sheave, if same as "I" this measurement is not necessary.

**"J".** Distance is measured from the foreside of the mast to the point where forestay attaches to deck or bowsprit, in a direction level with the waterline.

**"P".** Luff length of mainsail from tack to head.

**"E".** Foot length of mainsail along boom from tack to clew of sail. In the event the clew of the mainsail is carried below the top of the boom where it intersects the mast (Boom Droop), measure the "E" along the slope of the mainsail.

**"MGM."** Mainsail Mid-Girth Measurement, the points of measurement are determined:

1. By folding the head of the sail to the tack and marking the midpoint of the Luff.
2. By folding the head of the sail to the clew and marking the midpoint of the Leach.

**"MGM"** is the measured distance between the Luff and Leach marks.

**"MGU."** Mainsail Upper-Girth Measurement, the points of measurement are determined by folding the head of the sail to the Mid-Girth measurement points and marking the three-quarter points for the Luff and Leach. "MGU" is the measured distance between the resulting Luff and Leach marks.

**"HB."** Headboard. Measure the maximum fore and aft dimension from the Luff of the mainsail to the aft edge of the Leach at the widest part of the Headboard.

**"LP."** LP is the distance from the clew of the jib to the luff line of the jib in a direction to cross the luff at 90°. If in doubt about clew location, project the leach and foot to the point of intersection.

**"LLJ."** Luff Length Jib is the measurement from the Tack to the Head of the Jib. If in doubt about the Tack and Head location, project the Luff, Foot or Leach to the point of intersection.

**"LLS."** Luff Length Spinnaker is the greatest length of Spinnaker Luff and Leach measured around the edges of the sail.

**"SLU"** Luff length of asymmetric spinnaker

**"SLE"** Leech length of asymmetric spinnaker

**"Max G."** Is the Girth of the symmetric spinnaker. This is the maximum width of the spinnaker measured from Luff to Luff with the spinnaker stretched flat; measured parallel to the Foot. (Same as SMW in IOR)

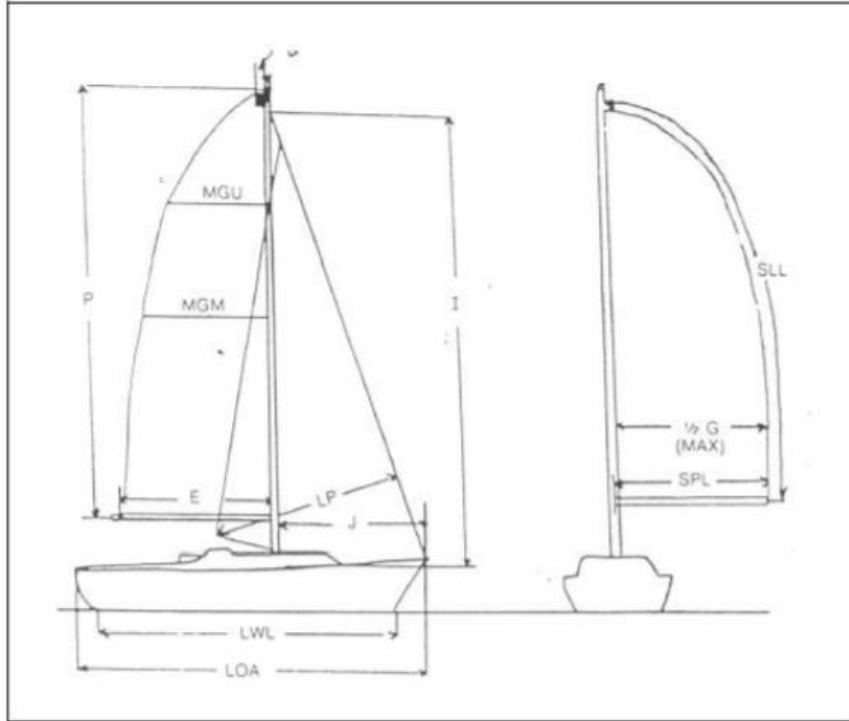
**"SL":** *Sprit = sprit length = distance between the forestay at the deck and the spinnaker tack. A physical sprit may or may not be present*

**"SMG"** Spinnaker mid girth for Asymmetric spinnaker. The distance between the midpoint of the luff and the midpoint of the leech.

**"SPL."** *For boats with conventional mast mounted poles SPL is measured from the fore side of the mast to the extreme end of the spinnaker pole. For boats in the normal configuration SPL = J. For boats with asymmetric*

*spinnakers and over length spinnaker poles SPL is measured horizontally from fore side of the mast to the point where the tack of the spinnaker attaches to the bowsprit or articulating pole in sailing position. For boats tacking an asymmetric spinnaker to their bow stem fitting, anchor roller or pulpit ahead of the forestay these will be considered bowsprits. For boats racing with both symmetric and asymmetric spinnakers SPL is measured for the largest spinnaker carried.*

“TSL” The total horizontal distance from the mast to the attachment point on a fixed sprit.



**NOTE:** Greater detail on the rules associated with equipment measurement can be found in the ISAF publication entitled “Equipment Rules of Sailing for 2005 - 2008”. Those rules can be found by following the link below:

<http://www.sailing.org/technical/ERS2005-2008.pdf>

**Figure 3**

### 3.12 Adjustments

The most recent chart of PHRF-NS Adjustments can now be found on the Sail Nova Scotia website here

<http://www.sailnovascotia.ca/sail/phrf-racing/handicapping-downloads/374-phrf-ns-adj-chart-july-13-18/file.html>

### 3.13 Calculating and Analysing Median Back Calculated Rating (MBCR)

One of the tools used by the PHRF NS Handicap Committee when determining the relative performance of boats in a race is the performance of the median boat. The process is based on the assumption that the median boat sails to its rating. Boats finishing with a corrected time less than that of the median boat will be deemed to have sailed faster than their rating, and boats finishing with a corrected time greater than the median boat will be deemed to have sailed slower than their rating.



The rating in sec/mile that each boat in the race would have required in order to finish with the same corrected time as the median boat will be calculated

First, we need to pick out the “median corrected time”. This is the corrected time of the yacht finishing in the middle of the fleet when ordered by corrected times.

The Median Back Corrected Rating (MBCR) of the median boat will be equal to its assigned rating in sec/mile.

The MBCR of those boats with a corrected time less than that of the median boat will be smaller (less sec/mile) than their PHRF NS rating.

The MBCR of those boats with a corrected time greater than that of the median boat will be larger (more sec/mile) than their PHRF NS rating.

The difference between a boat’s PHRF NS rating and its MBCR will be one measure of its relative performance. These rating differences will be brought to the meetings of the PHRF NS Handicap Committee.

### **3.14 Scoring races using PHRF**

Sail NS yacht clubs are encouraged to ease the burden of scoring races by using suitable scoring software such as Sailwave [www.sailwave.com](http://www.sailwave.com)

### **3.15 PHRF NS Handicap Committee**

Because of the need for judgement in deciding which race results are valid for handicap assessment, the active and regular participation of individual Clubs is most important. Each Sail NS yacht club appoints one member to the PHRF NS Handicap Committee, but Clubs are asked to name alternative members. Both the Handicappers and their deputies are encouraged to attend all meetings so that continuity of Club participation is assured.

Most Committee discussions eventually reach a consensus but if a vote is needed, each Club has one vote and the Chairman may cast a deciding vote. The Sail NS Executive Director acts as secretary of the Committee, his attendance facilitating the prompt updating of the Sail NS Yacht Database at [www.Sail NS.ns.ca](http://www.Sail NS.ns.ca).

During the first meeting of each year, normally held in January, a firm schedule of meeting dates is agreed to, so that Clubs can plan their attendance well in advance. Meeting dates are chosen to allow the committee to address current issues, to assign handicaps to new yachts, and to review race results. The total number of meetings to be held during a given year will vary depending on the agenda that the Committee establishes for itself. At a minimum five meetings will be held; two meetings during the winter months to address procedural issues, two meetings during the racing season to review race results, and one annual review.

To encourage attendance by Clubs outside the Halifax-Dartmouth area, Sail NS is prepared to cover travel expenses for Clubs more than 25 km away from the Club hosting a meeting. AYC, BBYC, DYC, RNSYS, SMSC, and SYC are regular hosts. One meeting a year is usually held at a South Shore club.

### **3.16 PHRF Revision Process**

An inevitable shortcoming of performance handicapping is the implicit assumption that the best performing yachts in each class have reached a comparable level of tuning and skill. Obviously this is not true, particularly when there is only one yacht in a class, which may well be owned by a novice. Despite allowances for the skipper effect and other judgements based on the Committee’s knowledge of the people and yachts involved, a tendency to favour the inexperienced owner of a one-off yacht will remain. This is, however, in the right direction for encouraging fun and enjoyment.

Only in exceptional circumstances will a revision of more than 6 sec/mile be decided on the basis of one set of race results. If it is, the evidence supporting this special revision is recorded in the minutes. Reasons for revisions of one point are minuted only if the evidence comes from a source other than local race results, or if that revision takes the yacht type more than 3 points away from the PHRF mean. Provisional handicaps are excepted.

This caution against movements larger than one point may cause temporary frustration. However, experience shows this to be less disruptive than the oscillations that can result from reacting too precisely to short-term trends.

If a Club Handicapper happens to be the owner of a yacht in a class being discussed by the committee, s/he excludes themselves from that discussion, unless asked for specific evidence by the Chairman.

Full PHRF NS Yacht Rating Review Process is included as Attachment 7.

### **3.17 Provisional and Inactive ratings**

When the Committee first assigns a rating to a new class of yacht, that rating is designated "Provisional" in the database. This indicates that the Committee has not yet established the performance of that class relative to other classes in the Fleet, and serves as an indicator that the number may be inaccurate.

Since any Race Committee has the right to refuse entry to any yacht, it may be superfluous to point out that a Club need not accept yachts with Provisional ratings for open regattas. The Handicap Committee would prefer to see Clubs accept them, unless a prestigious trophy is at stake, simply because regattas afford the best opportunity for good performance data. What is important, however, is that each Club determines what its policy will be, and publishes a clear statement in the Notice of Race. A similar policy statement should be made regarding yachts not registered in the Sail NS Yacht Database.

The normal practice of limiting revisions to one point at a time does not apply to Provisional ratings. The Committee simply does its best to bring the rating in line whenever race results become available, and the "Provisional" notation is not removed until the Committee is satisfied with the extent of the data on which the rating is based.

At the last meeting of each year, classes that sailed fewer than three races during the season are transferred to an "inactive" list. All inactive ratings are checked against PHRF data, and any class rated more than 12 sec/mile away from the PHRF mean for that type are either revised or the reason for not doing so is minuted, to explain the discrepancy.

Inactive ratings are treated the same way as Provisional ratings. When the Committee learns that an inactive yacht has started to race regularly, its rating will be designated as Provisional, to be reviewed as soon as results become available.

### **3.18 Sail NS Yacht Database**

All revisions made by the PHRF NS Handicap Committee are entered into the Sail NS Yacht Database. The database is available to all by following the links on the Sail NS web site at [www.sailnovascotia.ca](http://www.sailnovascotia.ca). Yacht owners, the PHRF NS Handicap Committee, and the Sail NS Executive Director, work together to keep the database current.

***Once a boat is rated and entered into the system a certificate is automatically generated and e-mailed to the owner.***

## Attachments

- 1/ Crew Sizes
- 2/ Handicap Appeal Form
- 3/ Skipper Effect
- 4/ PHRF – ToT Conversion Table
- 5/ Sport Boat Definition; Final Report
- 6/ PHRF NS Yacht Rating Process
- 7/ PHRF NS Yacht Rating Review Guidelines

**ATTACHMENT 1 CREW SIZES**

PHRF NS has no desire to limit the number of crew sailing on any yacht. However, Race Committees of prestigious events should be aware that the relative performance handicap numbers provided in this manual have been derived from the results of races sailed with normal crew sizes. They may wish to control the possibility of a yacht gaining unfair stability by embarking abnormal "movable ballast". For their guidance only, when writing an appropriate Sailing Instruction, the following table suggests the maximum crew size considered applicable to these performance handicap numbers based on 160 lb. adults.

<b>LOA, feet</b>	<b>Max crew</b>		<b>LOA, feet</b>	<b>Max crew</b>
Below 20	4		39, 39	11
20, 21, 22	5		40, 41	12
23, 24, 25	6		42, 43	13
26, 27, 28	7		44, 45	14
29, 30, 31	8		46, 47	15
32, 33, 34	9		48, 49	16
35, 36, 37	10		50 and up	17

**ATTACHMENT 2 HANDICAP APPEAL FORM (SEE FOLLOWING PAGES)**

## PHRF NS Rating Appeal Form

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*Appellant's name*

---

*Appellant's Street Address*

---

*Appellant's City/Town, Postal Code*

---

*Appellants Telephone Number*

---

*Appellant's Email Address*

---

*Appellants Signature*

---

*Club Handicapper' Signature*

*The above signature attests and acknowledges that the relevant sections of the PHRF NS Handicapping Manual have been read and understood, the appellants boat has not been modified since the date the handicap under appeal was last assigned, and that the appellant agrees to abide by the decision of the hearing committee for a period of no less than two years from the date of decision.*

<b><i>Yacht Handicap Data</i></b>	
<i>Yacht name</i>	
<i>Type/Class</i>	
<i>Manufacturer and hull date</i>	
<i>Sail Number</i>	
<i>Current Base Handicap</i>	
<i>Current Adjusted Handicap</i>	

<b><i>Bottom Preparation</i></b>	
<i>When was bottom last treated?</i>	
<i>What type of bottom paint is applied?</i>	
<i>How is the bottom paint applied?</i>	
<i>How often is the bottom cleaned?</i>	
<i>How is the bottom cleaned?</i>	

<b><i>Sail Inventory</i></b>					
<i>Sail</i>	<i>Sail Maker</i>	<i>Material</i>	<i>Ozs.</i>	<i>Condition</i>	<i>Age (months)</i>
<i>Main</i>					
<i>1<sup>st</sup> Genoa; LP%=</i>					
<i>2<sup>nd</sup> Genoa; LP%=</i>					
<i>3<sup>rd</sup> Genoa; LP%=</i>					
<i>1<sup>st</sup> Spinnaker; SMG%=</i>					
<i>2<sup>nd</sup> Spinnaker; SMG%=</i>					
<i>3 Spinnaker SMG%=</i>					
<i>Other</i>					
<i>Other</i>					

<b><i>Skipper and Crew Experience</i></b>	
<i>Number of years racing experience for the skipper/owner</i>	
<i>Number of persons in the racing crew including the skipper/owner</i>	
<i>Number of crew members racing with the skipper/owner more than 50% of the time</i>	
<i>How many years experience do you have racing the boat in question?</i>	

**Races and Performance**

Briefly describe the number and type of PHRF races sailed annually.

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<b>Results for the last five races with the best finishes</b>						
Race Name	Handicap	Number of starters	Handicap Spread	Corrected finish position	MBCR	Rating required to be first in class

How many races did you finish this season? \_\_\_\_\_ How many races did you finish last season? \_\_\_\_\_  
 What percentage of the time did you finish in the top third of your class? \_\_\_\_\_  
 What percentage of the time did you finish in the middle third of your class? \_\_\_\_\_  
 What percentage of the time did you finish in the bottom third of your class? \_\_\_\_\_

<b>Boats that regularly beat the appellant's boat on corrected time</b>					
Class/Type	Handicap	Class/Type	Handicap	Class/Type	Handicap
1		4		7	
2		5		8	
3		6		9	

<b>Boats beat or sailed equal to on corrected time</b>					
Class/Type	Handicap	Class/Type	Handicap	Class/Type	Handicap
1		4		7	
2		5		8	
3		6		9	



<b><i>Boats the appellant considers incorrectly handicapped</i></b>					
<b><i>Class/Type</i></b>	<b><i>Handicap</i></b>	<b><i>Class/Type</i></b>	<b><i>Handicap</i></b>	<b><i>Class/Type</i></b>	<b><i>Handicap</i></b>
<i>1</i>		<i>4</i>		<i>7</i>	
<i>2</i>		<i>5</i>		<i>8</i>	
<i>3</i>		<i>6</i>		<i>9</i>	

*The appellant may add in addition to this page with no more than five (5) double spaced typewritten pages of continued or other relevant information.*

***Other relevant information***

### ATTACHMENT 3; SKIPPER EFFECT

An analysis of One Design races was undertaken in an effort to validate the assertion that first place finishers in a properly handicapped race should sail from 15 sec/mile to 25 sec/mile faster than the median boat.

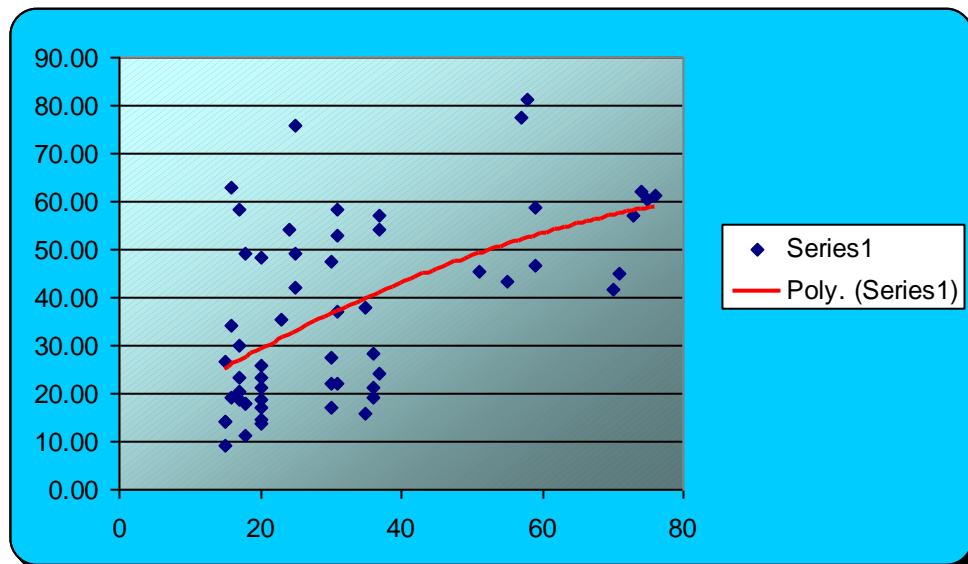
Data from fifty-seven races sailed during the 2001 and 2002 Key West Race Weeks were gathered from public web sites. Data from the flowing fleets were used:

- 1D35
- Farr 40
- J/29
- J/80
- J/105
- Melges 24
- Mumm 30

For each race the difference in seconds/mile between the first place boat and the median boat was calculated.

Figure 1 shows the results with the x-axis showing the number of boats in the race, and the y axis showing the difference in sec/mile between the first place boat and the median boat. Each data point represents a race.

The continuous line represents a smoothing of the data using a mathematical procedure (least squares fit; polynomial) for finding the best-fitting curve for a given set of points.



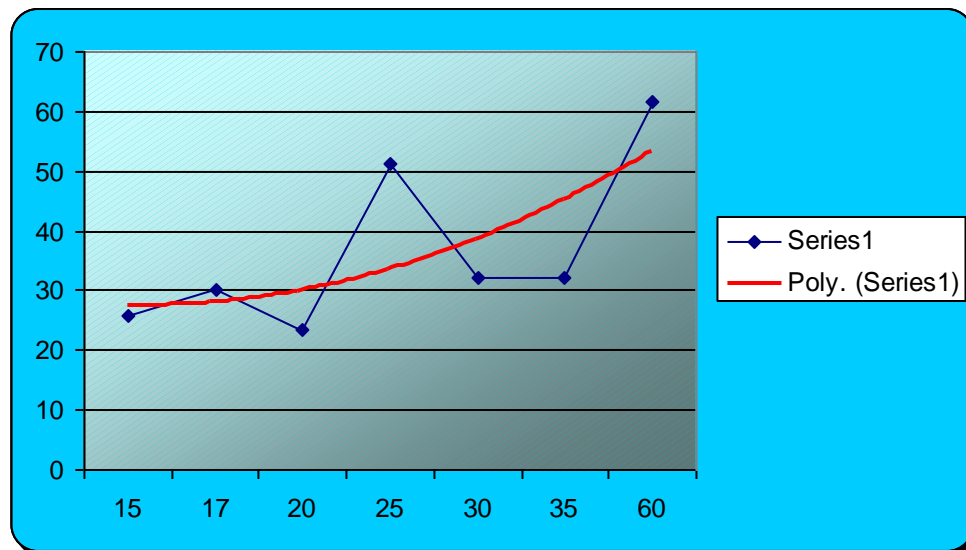
**FIGURE 1**

The data were further analyzed by taking the average difference in speed for fleets of various sizes. Data from Figure 1 above were grouped into the following fleet sizes:

- 15
- 17
- 20
- 25
- 30
- 35

- 60

Figure 2 represents the results of the analysis. Once again the number of boats in the race is shown on the x-axis, and the speed difference in sec/mile between the first place boat and the median boat is shown on the y-axis. The seven data points represent the average difference in speed between the lead boat and the mean boat for the respective fleet sizes. The smooth line through the data represents a mathematically generated best fitting curve.



**FIGURE 2**

An examination of the smoothed curves in both Figure 1 and Figure 2 suggests that in a fleet of 15 boats we should expect the first place boat to sail the course 25 sec/mile faster than the median boat. In a fleet of 25 boats we should expect to see a difference of 35 sec/mile. As the size of the fleet grows, so should the difference in speed between the lead boat and the median boat.

Handicappers should be aware that the above analysis is intended to be a general guideline only. The results from Key West clearly indicate that the difference in speed between the lead boat and the balance of the fleet varies widely from race to race. However, the results also clearly indicate that within a one-design fleet, where the only differentiators are the skipper/crew and the condition of the boat, there will be a significant difference in speed within the fleet.

This analysis serves to support the assertion made by Michael Ames in the 1993 edition of the Sail NS Performance Handicapping Manual.

Jan 24, 2005  
mpp

**ATTACHMENT 4; PHRF – TOT CONVERSION TABLE**

**NOTE:** The conversion table presented on the following page is based setting on A to 695 and B to 525 in the formula:

ToT Correction Factor =  $A/(B + PHRF)$ .

Race Committees are encouraged to change either or both factors to suit local sailing conditions and fleet make up.

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PHRF	TCF		PHRF	TCF		PHRF	TCF		PHRF	TCF
-127	1.7462		12	1.2942		150	1.0296		291	0.8517
-124	1.7332		15	1.2870		153	1.0251		294	0.8486
-121	1.7203		18	1.2799		156	1.0206		297	0.8455
-118	1.7076		21	1.2729		159	1.0161		300	0.8424
-115	1.6951		24	1.2659		162	1.0116		303	0.8394
-112	1.6828		27	1.2591		165	1.0072		306	0.8363
-109	1.6707		30	1.2523		168	1.0029		309	0.8333
-106	1.6587		33	1.2455		171	0.9986		312	0.8303
-103	1.6469		36	1.2389		174	0.9943		315	0.8274
-100	1.6353		39	1.2323		177	0.9900		318	0.8244
-97	1.6238		42	1.2257		183	0.9816		321	0.8215
-94	1.6125		45	1.2193		186	0.9775		324	0.8186
-91	1.6014		48	1.2129		189	0.9734		327	0.8157
-88	1.5904		51	1.2066		192	0.9693		330	0.8129
-85	1.5795		54	1.2003		195	0.9653		333	0.8100
-82	1.5688		57	1.1942		198	0.9613		336	0.8072
-79	1.5583		60	1.1880		201	0.9573		339	0.8044
-76	1.5479		63	1.1820		204	0.9534		342	0.8016
-73	1.5376		66	1.1760		207	0.9495		345	0.7989
-70	1.5275		69	1.1700		210	0.9456		348	0.7961
-67	1.5175		72	1.1642		213	0.9417		351	0.7934
-64	1.5076		75	1.1583		216	0.9379		354	0.7907
-61	1.4978		78	1.1526		219	0.9341		357	0.7880
-58	1.4882		81	1.1469		222	0.9304		360	0.7853
-55	1.4787		84	1.1412		225	0.9267		363	0.7827
-52	1.4693		87	1.1356		228	0.9230		366	0.7800
-49	1.4601		90	1.1301		231	0.9193		369	0.7774
-46	1.4509		93	1.1246		234	0.9157		372	0.7748
-43	1.4419		96	1.1192		237	0.9121		375	0.7722
-40	1.4330		99	1.1138		240	0.9085		378	0.7697
-37	1.4242		102	1.1085		243	0.9049		381	0.7671
-33	1.4126		105	1.1032		246	0.9014		384	0.7646
-30	1.4040		108	1.0979		249	0.8979		387	0.7621
-27	1.3956		111	1.0928		252	0.8945		390	0.7596
-24	1.3872		114	1.0876		255	0.8910		393	0.7571
-21	1.3790		117	1.0826		258	0.8876		396	0.7546
-18	1.3708		120	1.0775		261	0.8842		399	0.7522
-15	1.3627		123	1.0725		264	0.8809		402	0.7497
-12	1.3548		126	1.0676		267	0.8775		405	0.7473
-9	1.3469		129	1.0627		270	0.8742		408	0.7449
-6	1.3391		132	1.0578		273	0.8709			
-3	1.3314		135	1.0530		276	0.8677			
0	1.3238		138	1.0483		279	0.8644			
3	1.3163		141	1.0435		282	0.8612			
6	1.3089		144	1.0389		285	0.8580			
9	1.3015		147	1.0342		288	0.8549			

**ATTACHMENT 5: SPORT BOAT DEFINITION; FINAL REPORT**

**SAIL NS SPORT BOAT DEFINITION FINAL REPORT  
Prepared by Sport Boat definition Sub-committee  
March 21, 2012**

**A. Background**

As more modern designs work their way into the Maritimes' racing fleets the question of sport boats challenges many race committees. Including sport boats in the same class as displacement boats generally presents a disadvantage to either the sport boats or the conventional boats. The problem boils down to substantially different performance for each of the two boat types depending on the course configuration and wind conditions. If the trend continues, and we anticipate that it will, the problem will become more severe and will result in unhappy racers in both sport boats and conventional sailboats.

**B. Mandate:**

Our mandate is to develop a definition of a sport boat for use in PHRF NS. Such a definition will allow similar boats to be raced together when race committees decide that it is the best interests of the racers and the race committee given the number of boats and the measured wind conditions.

**C. Methodology**

1. The sub-committee reviewed several PHRF areas and selected the five definitions for a sport boat that seemed most appropriate for our review PHRF NE/US Sailing, PHRF Galveston Bay, PHRF Chesapeake Bay Lake Norman Keelboat Council (LNKC) and the industry definition of a sport boat generally used by sail-makers and boat builders.
2. The sub-committee selected 14 boats, 13 from the PHRF NS database, of which some are, we believe, sport boats, and some are not. In addition, we picked a Melges 32 (true modern sport boat) that is not based here and included it for comparison purposes.
3. Spreadsheets were developed to capture and organize the required specifications for the selected boats.
4. The Excel spreadsheet was then expanded to integrate the data and calculate the values required to do the analysis and determine which of the subject boats met the definition of a sport boat under each of the five definitions mentioned above.
5. Opinions were also solicited from **Subject Matter Experts (SME)** in industry and other PHRF areas where there are active sport boat classes.
6. Once the various inputs were obtained, the sub-committee reviewed the information and developed a definition for a sport boat that we believe is most suitable for our area.

**D. Points to be noted:**

1. Each of the selected PHRF representatives and SMEs used in this analysis has considerably more experience in dealing with the sport boat issue than does PHRF NS.

2. Guidance and advice was obtained from Bruce Bingham of PHRF CB, and John Collins of PHRF NE. Both Bruce and John have been involved with the US Sailing PHRF handicapping system and are considered Subject Matter Experts (SME).
3. In addition to PHRF personnel input was sought from SMEs who have experience in sail-making, boat design and as Principal Race Officers at various locations around the world but particularly in North America and here in Nova Scotia
4. With respect to the data used to complete the calculations, the data was obtained in order of priority from:
  - a) Class association if available; if not
  - b) Sail-makers; if not
  - c) manual calculations using IMS/ORR data

Note: For this project, only the data gathered from (a) and (b) was utilized.

## **E. Rationale**

The reasons we have undertaken this exercise, and devised this methodology, are as follows:

1. To provide fairer racing for sport boat and non-sport boat racers alike.
2. To recognize that there is a dramatic change in the number and type of sailboats racing in the Maritimes, which, we anticipate, will continue into the future.
3. By partitioning boats into conventional and sport boat fleets, race committees will be better able to set fairer/more appropriate courses for both type of boats when numbers and weather conditions warrant.
4. To recognize that a considerable amount of work has already been done by sister PHRF areas in North America and to build on that work.
5. We recognize that designers and builders of today's sport boats are acutely aware of all the design parameters required to get the performance required and expected of a modern sport boat and that expertise needs to be integrated into our process.
6. It is recognized that PHRF NS does not run races; that responsibility rests with the race committees. PHRF NS is providing another tool and a base of information in support of yacht racing in Nova Scotia.
7. A comparative analysis of definitions in place by various areas along with that of the industry in all probability will produce the best result.

## **F. Observations and Conclusions**

1. There are a variety of definitions or sport boats in place across North America and in most cases, they use a combination of displacement, length and sail area to define a sport boat.
2. Each area has developed their definition to suit the needs in their particular area and to reflect the composition of their racing fleet and the type of conditions in their particular area.
3. There does not appear to be a "one size fits all" solution to defining a sport boat.
4. Five definitions were selected for this exercise and a detailed comparative analysis was done against 14 different boats.
5. Each definition required separate calculations to conduct the comparative analysis.
6. Through the detailed analysis it became apparent that two definitions were not appropriate: one because it did not have a large enough database and one because it did not include downwind sail area in its calculation. Although both of these definitions had, some merit they were unanimously rejected by the sub-committee for the reasons stated.
7. The three remaining definitions were further scrutinized by the sub-committee and the PHRF NS definition, which is based upon the industry-accepted standard, was selected as the most appropriate definition. The definition is as follows: **Any boat where the Upwind Sail Area (100%)/Displacement + Downwind Sail Area/Displacement => 105 shall be categorised as a sport boat.**
8. Regardless of the definition of a sport boat, there will still be the difficulty of handicap spread and the sail configuration within a sport boat fleet (sprit, asymmetrical, symmetrical, etc.)

**G. Recommendations**

1. SAIL NS Handicap committee accept the PHRF NS definition of a sport boat recommended by the Sport Boat Definition Sub-Committee on a trial basis for the 2012-racing season.
2. The PHRF NS database be reviewed and all boats meeting the definition of a sport boat be identified with an SB identifier in the notes section of the database.
3. Race Committees be encouraged by SAIL NS to create sport boat classes where there are sufficient participants.
4. Class splits for sports boats will be at the discretion of the Race Committees.
5. Race Committees that run races that have sport boat classes be encouraged to provide feedback/suggestions to the Handicap Committee.
6. The PHRF NS sport boat definition be reviewed prior to the 2013 sailing season and amended as required.

<b>PHRF NS Sport Boat Definition Comparison Table</b>					
<b>TYPE</b>	<b>PHRF NE</b>	<b>PHRF GB</b>	<b>PHRF CB</b>	<b>LNKC</b>	<b>PHRF NS</b>
<b>1D35</b>	SB	SB	SB	SB	SB
<b>Beneteau 36.7</b>					
<b>J/105</b>				SB	
<b>J/120</b>					
<b>J/80</b>		SB	SB	SB	SB
<b>J/92PHRF</b>			SB	SB	
<b>Melges 24</b>	SB	SB	SB	SB	SB
<b>Mumm 30</b>	SB	SB	SB	SB	SB
<b>Rocket 22</b>	SB	SB	SB	SB	SB
<b>Soto 40</b>		SB		SB	SB
<b>Viper 640</b>	SB	SB	SB	SB	SB
<b>J/27</b>					
<b>Melges 32</b>	SB	SB	SB	SB	SB
<b>Olson 30</b>		SB			

Rod Stright  
 Chair  
 Sport Boat Definition Sub-committee  
 SAIL NS Handicap Committee



**ATTACHMENT 6; PHRF NS YACHT RATING PROCESS**



PHRF NS YACHT RATING PROCESS																		
STEP	EVENT	CLUB HANDICAPPER ACTION	REMARKS	INITIALS														
1.	Member submits yacht for rating	Check dimensions/options. Look for PHRF-NS sister ship/base rating  Note: Club Handicapper responsible to insure proper information is submitted prior to submitting.	Maximize current knowledge of the applicant. Recommend base rating similar to sistership. Proceed to Step 6															
2.	No sistership/based rated yacht in PHRF-NS	PHRF regions for sisterships <table border="1"> <tr><td>PHRF NE</td><td></td></tr> <tr><td>PHRF LO</td><td></td></tr> <tr><td>PHRF NC</td><td></td></tr> <tr><td>PHRF SE FLORIDA</td><td></td></tr> <tr><td>PHRF LM</td><td></td></tr> </table> If similar boats not available us other areas <table border="1"> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </table>	PHRF NE		PHRF LO		PHRF NC		PHRF SE FLORIDA		PHRF LM						Base ratings and conditions considered similar to PHRF NS Check benchmark base ratings to PHRF NS base boats (e.g. J 35, J 29, J 44 etc.) Recommend Base Rating Proceed to Step 6	
PHRF NE																		
PHRF LO																		
PHRF NC																		
PHRF SE FLORIDA																		
PHRF LM																		
3.	Nothing similar in PHRF preferred areas	Review IMS data	Check benchmark base ratings to see how IMS compares to PHRF-GB (e.g., J-35, J29, Tartan 10, J-24). Recommend base rating or go on to Step 6 or go to next step.															
4.	No IMS data	Review IRC rating and/or PHRF ratings from other areas	Check benchmark base ratings to see how IMS compares to PHRF-GB (e.g., J-35, J29, Tartan 10, J-24). Go on to Step 5 or 6 based upon outcome.															
5.	No IMS data and no IRC data	Look up near sisterships, compare dimensions including configuration and sail areas to yachts already rated by PHRF NS and/or PHRF preferred area.	Consider Provisional Rating good for specified number of races. Assign base rating or go on to Step 6															
6.	Apply adjustments to BASE RATING to develop PHRF-NS rating	Check for oversize/undersize rigging, sails, etc.	See PHRF NS Adjustments Proceed to Step 7															
7.	Develop non-spinnaker rating based upon above information.		Compare to similar yachts for fairness Present to NSYA HC Step 8															
8.	<b>PRESENT TO NSYA HANDICAPP COMMITTEE FOR REVIEW AND RATING</b> Date:	<b>PHRF NS PROVISIONAL RATING</b>	<b>PHRF RACING</b>	<b>PHRF NON-SPIN</b>														

Handicap Committee Notes:

**ATTACHMENT 7; PHRF NS YACHT RATING REVIEW GUIDELINES**



**PHRF NS YACHT RATING REVIEW GUIDELINES**

**Feb 15, 2011**

These guidelines have been developed and approved to provide the SAIL NS Handicap Committee with a consistent and approved process for reviewing PHRF handicaps of yachts under its administration. They are intended to be guidelines and are not necessarily all inclusive.

**A.** The rating of any yacht in the SAIL NS handicap system may be reviewed at any time by the SAIL NS Handicap Committee for any of the following reasons:

1. By the Committee in the process of reviewing the provisional rating of a yacht after 5 races.
2. There is performance data from PHRF NS that clearly demonstrates that an adjustment to the handicap is warranted.
3. A change in a boat's equipment or modifications to the boat, its sails and/or its equipment.
4. An appeal by the holder of the PHRF NS rating.
5. An appeal by a competitor if he feels the other boat's rating is unfair.
6. Additional information that has come to the light of the SAIL NS Handicap Committee concerning a particular yacht.
7. There is written evidence that there have been unreported modifications made to a boat subsequent, or prior to the assignment of the current handicap. This type of appeal is usually the result of a successful protest to a race committee for initial and ensuing action under the current published racing rules.
8. At the discretion of the SAIL NS handicap Committee.

**B.** Triggers for activating a Rating Review: There are three triggers that activate the PHRF NS Rating Review Process::

1. **An appeal** – a formal appeal may be raised by the owner of the affected yacht or by a fellow competitor who is also an owner of a PHRF NS rated yacht. If a handicap is raised as an appeal the appellant must complete the PHRF NS Handicap Appeal Form contained at Annex A and on the Download Section of the SAIL NS Handicap site. Appeals must be submitted by December 15 of each year to be heard over the winter months.

Appellants need to distinguish between protest of a handicap that is more properly filed with race committees and the appeal of a handicap that is properly filed with PHRF NS. Protests deal with a boat sailing in a race with hull and rig specifications other than specified on the currently held handicap certificate. Hence protests are made to the authority for a race not to PHRF NS.

Appeals deal with a request to modify an assigned handicap based upon complete, reliable, documented, and valid evidence. It is the responsibility of the appellant to supply the evidence.

2. **Performance** – when a well prepared, well sailed, well equipped boat is sailing above or below its current rating on a consistent basis. Repeated performances in areas events are used to monitor performance. Club races are not factored into the rating nor the performance.
3. **Inactive** – when a boat in the SAIL NS system has been inactive and has not raced for a period of 5 years. Rating procedures for a yacht new to the area would be applied.

<b>PHRF NS YACHT RATING REVIEW PROCESS</b>		
<b>STEP</b>	<b>ACTION</b>	<b>REMARKS</b>
1.	Review rating using approved PHRF NS Rating Process	
<b>2. PERFORMANCE REVIEW OF RACE RESULTS</b>		
a)	Gather all the applicable race data for area races.	
b)	With the data sorted by boat, review the quality of the races, i.e. A, B, C, and re-sort the data with this in mind	
c)	Determine the number of races to consider in the evaluation	
d)	Remove the races not to be considered.	
e)	Sort the data on placement in the races and what ESPN (Back Corrected Rating) they raced to.	
f)	A minimum of five good quality races should be considered in reviewing a Provisional rating. With an established rating it should be a minimum of 7 races	
g)	Determine how far off the PHRF (Back Corrected Rating) the boat is sailing.	
h)	If the boat data indicates a boat's performance is not consistent with our expectations and not sailing to their rating it should be flagged for closer analysis	
3.	At this stage focus on the boats that need addressing	
4.	After the committee has discussed the boats performance, crew effect, revisit the boat's theoretical performance, local winds and the impact a rate change would have on the whole fleet, an appropriate change is considered and assessed. In considering a change the committee will examine the differential between the boats existing rating and the mean rating assigned to the yacht type in selected fleets.	

Handicap Committee Notes

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