SOUTH SHORE PERFORMANCE HANDICAP RACING FLEET

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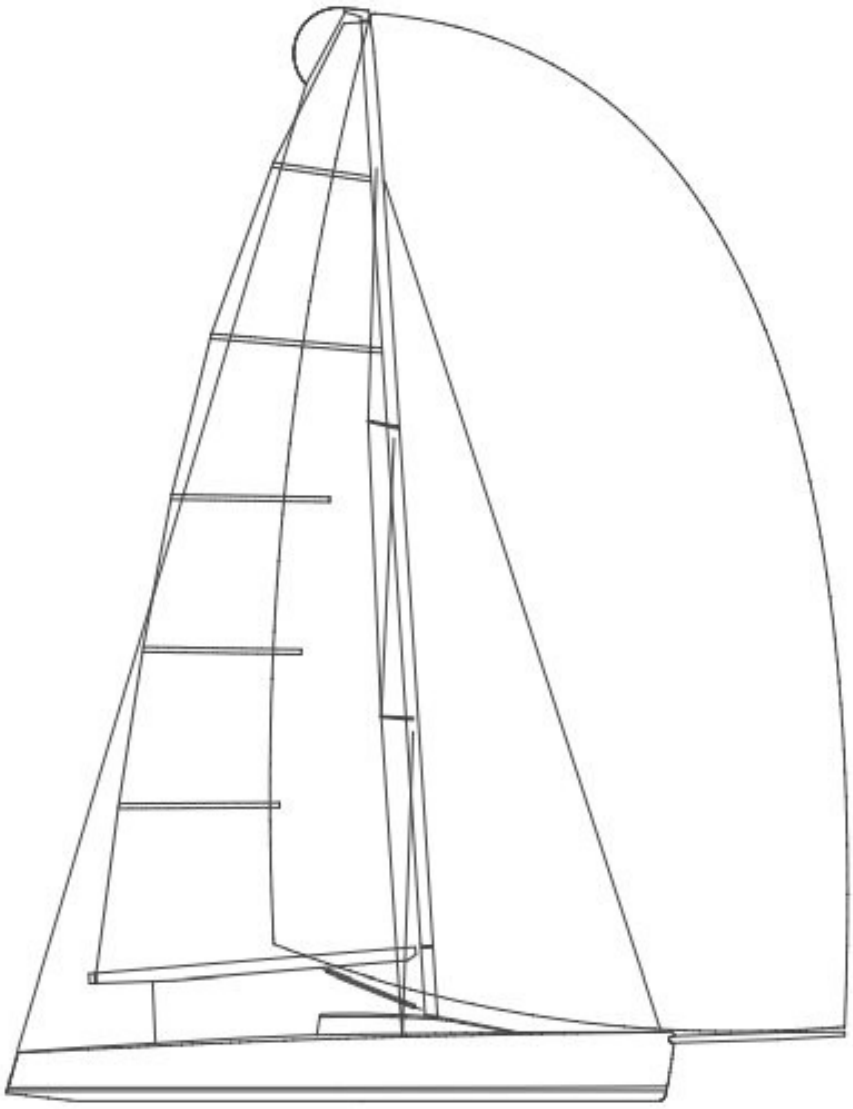
RULES and BYLAWS



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1. OBJECTIVES

1.1 The South Shore Performance Handicap Racing Fleet LLC, hereafter referred to as PHRF-SS, is established to promote competition and fair sailing between dissimilar boats by serving as a regional handicapping authority. It shall further be an objective of PHRF-SS to maintain an association with the United States Performance Handicap Racing Fleet (US- PHRF), as well as other individual performance handicapping groups, by actively supporting our mutual interests.

1.2 PHRF-SS does not act as, nor represent, any Organizing Authority (OA) for any event designated PHRF-SS and does not dictate which boats may or may not participate in any given event, nor does it dictate which safety features a boat must meet. A vessels safety preparedness must conform to federal, regional, and local laws, rules, and regulations for the body of water on which it operates and the rules under which it is sailing. Safety requirements are not part of these rules and are the responsibility of the organizing authority to specify.

2. INTRODUCTION

2.1 The Inter-Lake Yachting Association (I-LYA) in its capacity as the Regional Sailing Association (RSA) of USSA announced the Charter of South Shore Performance Handicap Racing Fleet (PHRF-SS) on June 28, 2017.

2.2 Handicaps are assigned to a given production class considering predominant local conditions and the handicapper's experience in handicapping similar boats. These ratings are based on either calculated values or observed performance of like boats.

2.3 Design characteristics of boats yield different performance results in various sea and wind conditions. This is especially true where design characteristics are extremely different as in light displacement planing hulls versus heavy displacement non-planing hulls. PHRF-SS calculates a performance prediction factor (PPF) for each boat which aids in managing the planing boat versus heavy displacement boat variable. Events designated PHRF-SS should first place boats in PPF ascending order, then create class splits after which ratings are applied to each class.

3. MEMBERSHIP

3.1 PHRF-SS desires to be a not-for-profit member driven organization and is organized as a Limited Liability Company (LLC) in the state of Ohio. PHRF-SS members pay an annual membership fee of $25.00 (U.S.) which is principally used to cover administrative expenses. Once issued, certificates remain valid for a period of one year providing no modifications are made to the standard boat configuration. The membership year runs from January 1st of each year to December 31st and certificates remain valid until March 31st of the ensuing year at which time they expire unless renewed.

3.1 Upon proper application (signed by the owner and PHRF-SS handicapper) accompanied by the annual membership fee, membership applications will be accepted from individual members of yacht clubs located along the South Shore of Lake Erie and will also include those from other regional PHRF locations. Those that have a certificate issued by another regional authority may have their standard boat rating adjusted at events designated PHRF-SS.

3.2 PHFR-SS maintains a member website at: http://phrfss.org. This site provides access to base handicap listzs, valid rating lists and measurement certificates.

4. STANDARD, CUSTOM, AND MODIFIED BOAT CONFIGURATIONS

4.1 A "Standard Boat" is one which must be equipped to the degree intended by the manufacturer, including those appointments and equipment supplied or intended by the manufacturer, such as joiner work, cushions, galley equipment, standing rigging, etc. Removal of any equipment supplied by the manufacturer will result in invalidating the assigned rating certificate and require an inspection of the vessel by a PHRF-SS Handicapper/Measurer to ascertain the potential impact. If the current US Sailing PHRF Fleet Handbook does not list a boat, it is not considered a "Standard Boat" by definition. (also refer to Section 16.1).

4.2 An "Open Cockpit Boat" having moveable ballast, trapeze, hiking boards, or any other hiking aid may only be eligible, at the discretion of the Handicap Review Board (HRB), for a "CLUB" certificate. These boats do not meet the standard boat assumptions as listed in Section 7.7.

4.3 A "Custom Boat" is reviewed as initially presented on a case-by-case basis, and handicapped as sailed. Subsequent changes will be treated as a modified boat. Sufficient data will be acquired by physical measurement and calculated using the Schell Regression Formula in the event there is no available rating information in the USSA PHRF database to assign a Handicap (HCP). The calculated rating may be adjusted based on empirical data derived from observed performance.

4.4 A "Modified Boat" is any standard boat that has been changed in some way that might affect its performance from the original design. Any such changes must be reported.

5. PERFORMANCE CLASSIFICATIONS

5.1 PHRF-SS has adopted the following performance classification definitions:

High Performance Racers - These boats are Racer Cruisers and are built lighter, with spartan accommodations. These boats generally have a sail area to displacement ratio (SADR) greater than 24.

Racer/Cruiser - This is a hybrid of the cruising boat built to accommodate overnight cruising but trimmed with equipment for competitive racing. They generally have a SADR greater than 20 but less than 24.

Cruiser/Racer – These boats have cabins for extended cruising and have standing headroom below. These boats generally have a SADR less than 20.

Sportsboat - The term **sportsboat** has become generally accepted to describe a high-performance trailer yacht with major compromises in accommodation and weight compared to traditional designs of the same size. They tend to be characterized by historically large sail areas for a given length (especially under downwind sails), light weight construction and a heavy reliance on crew weight to counterbalance heeling forces. They usually feature lifting keels (for easy trailerability) of a modern fin and bulb design and planing hull designs. Most sportsboats are self-righting as opposed to skiffs. PHRF-SS generally refers to these types of boats as **high-performance racers**.

6. PERFORMANCE PREDICTION FACTOR

6.1 The Performance Predication Factor (PPF) is a calculation used to predict the potential performance of a boat. The PPF is based upon the following speed producing characteristics of Sail Area (SA), Displacement (D) and Loaded-Length at the Waterline (LWL) which are used to calculate the PPF as follows:

PPF = DLR / SADR where: PPF is the performance predication factor
DLR is the displacement to length ratio
SADR is the sail are to displacement ratio

$$DLR = \left(\frac{D / 2240}{(0.01 * LWL)^3} \right)$$

Displacement in Long Tons / Cube of one one-hundredth of the waterline length

$$SADR = \left(\frac{SA}{\sqrt[3]{(D/64)^2}} \right)$$

Square feet of Sail Area / Cubic Feet of Displacement

6.2 For events designated PHRF-SS, it is recommended that the Organizing Authority should first place registered boats in order from the smallest to the largest PPF value. It should then determine class splits based on the PPF and finally apply the handicap ratings within each class. Because of large variances in design, class splits established by rating alone may not yield the best result.

7. HANDICAPS

7.1 PHRF-SS only issues handicaps for monohull sail boats.

7.2 Safety requirements are not part of this rule and are the responsibility of the organizing authority to specify them.

7.3 PHRF-SS provides handicaps for all member yachts. It also provides a handicapping service for any other yachts requesting a handicap, providing a properly completed PHRF-SS Application Form is submitted with two signatures (the owner and PHRF-SS measurer), and the prescribed fee is paid.

7.4 Handicaps are generally determined in three-second increments. The use of one (1) second increments may be used for certain cases or for credits and penalties as determined by the Chief Measurer.

7.5 There are generally two types of handicap systems/schemes, calculated and empirical. World Sailing currently recognizes both schemes.

- Calculated Handicaps - are those in which a numerical measure of a boat's speed is determined by calculation using physical parameters of the boat - length, beam, displacement (weight), sail area, etc. This rating is wholly objective as it addresses the performance of just the boat. PHRF-SS uses the Schell Regression Formula for the calculation of ratings when appropriate.

- Empirical Handicaps - are those in which a numerical measure of a boat's speed is based on the past performance of the boat in previous races. An empirical handicap is thus a measure of the performance of both the boat and the crew. PHRF-SS typically uses empirical handicaps consisting of the best possible observed performance of a standard boat configuration.

7.6 PHRF-SS references the U.S. Sailing PHRF database as an aid in assigning handicaps which are adjusted as necessary by review of performance-based criteria and accumulated results. If a boat is not in the PHRF-SS database, then a median of the national ratings in the US Sailing database may be assigned. If a boat is not in either the US Sailing or PHRF-SS database, its initial base rating shall then be calculated using the Schell Regression Formula (see 10.1) and subsequently adjusted by observed performance.

7.7 To qualify for a Standard PHRF-SS handicap, the following base boat assumptions shall be met:

- Standard hull, interior, keel, rudder, and rig as originally designed and built.
- Single-hulled with a self-bailing cockpit
- An auxiliary propulsion system capable of propelling the boat at hull speed
- Fuel capable to maintain 90% hull speed for at least one hour of operation
- No trapezes, hiking straps, or other hiking devices are permitted
- Spars shall be banded (black band on white spars, white band on black spars) for the proper P (mainsail luff) and E (mainsail foot) dimensions. Ketch and Yawl rigs will have PY and EY banded
- All sails shall be cut in accordance with the latest ORC (refer to Appendix C)
- Jib overlap (LP) less than 155% of foretriangle base (J).
- Spinnaker pole length (SPL) no longer than J.
- Base spinnaker maximum width (SMW) no greater than 180% of SPL.
- Spinnaker luff (SL) is no greater than:

$$SL \leq 0.95\sqrt{I^2 + (J \text{ or } SPL \text{ if } > J)^2}$$

- The boat has a fixed propeller, folding propeller, feathering propeller, outboard motor or retractable propeller;

Base handicaps further assume that:

- The boat will have a spinnaker pole/sprit or whisker pole conforming to the base design for that boat
- For boats with symmetric spinnakers, the SPL is typically equal to J or manufacturers specifications. Spinnaker girths will be taken as 180% of SPL
- For boats with asymmetric spinnakers, TPS is typically greater than J. Spinnaker girths will be taken as 175% of TPS or manufacturer base boat specifications
- The hull and appendages are unmodified from the manufactured version, except that an owner may fair the hull, keel, and rudder to original design specifications without penalty
- Interiors are in the configuration that comes standard from the manufacturer.

7.8 The handicap rating of an individual boat is expressed in seconds per nautical mile (sec/nm). The smallest increment of performance used for rating is three (3) sec/nm.

7.9 Organizing authorities are specifically not permitted to issue temporary ratings for any event designated PHRF-SS unless done so under the oversight and concurrence of an authorized PHRF-SS Handicapper.

7.10 Temporary (TEMP) ratings may be issued in cases where the boat owner does not have a valid certificate from any regional PHRF organization. Standard boat ratings will be assigned where applicable and will be assessed a 6 sec/nm penalty. Temporary ratings will be issued once per year and limited to a single event.

7.11 Types of handicap certificates:

- STND – Issued to "Standard" production class boat in their original configuration as supplied by the manufacturer. Moving deck hardware to suit owner's preference is excepted.
- MOD – Boats that have been changed from their production configuration in some way so as to impact its performance, shall be individually handicapped as "Modified" (MOD).
- EXCL - Notwithstanding the requirements in 7.7, any boat may be declared "Exceptional" (EXCL). PHRF-SS reserves the right to declare any yacht "Exceptional" and either not provide a handicap or handicap it outside the normal class rules.
- ODR - May be assigned to a one design configuration recognized by US Sailing as a One Design Class. One Design Ratings (ODR) are a refinement of Base Boat Ratings and require ODR designated boats to carry only class legal sails and equipment.
- CLUB - Boats that do not meet the assumptions as stated in 7.7 may receive a "CLUB" rating at the discretion of the Handicap Review Board (HRB). Club ratings are typically issued to support local club race programs. However, at the discretion of the Organizing Authority (OA), the "Club" status may be waived for one or more boats for any event designated PHRF-SS. This action applies to a specific event only.
- TEMP – Issued only for a single event in cases where the boat owner is a non-member without a current measurement certificate. Standard boat ratings will be assigned where applicable and may be assessed a 6 sec/nm penalty.

8. HANDICAP ADJUSTMENTS

8.1 Any credit/s adjustments must be specifically requested by the owner and verified by an approved PHRF-SS measurer/handicapper by either physical measurement or visual inspection.

Fixed Solid Propeller

2-blade in an aperture (2BA)		0 sec/nm
3-blade or more in an aperture (3BA)	+	3 sec/nm
2-blade with exposed shaft and strut (2BX)	+	3 sec/nm
3-blade with exposed shaft and strut (3BX)	+	6 sec/nm

No credits are given for any propeller on a retracting outboard motor, 2 bladed solid propellers in an aperture, retracting propeller shaft or any 2 or 3 bladed feathering or folding propeller, whether installed on an exposed shaft or in a hull aperture.

Auxiliary Power

Outboard (retractable) (OB)	-	6 sec/nm
Bow thruster, non-retracting (BT)	+	3 sec/nm

Headsail

Max LP ≤ 155% of J		0 sec/nm

(Use of headsails with an LP greater than 1.55 times J are not permitted in PHRF-SS. Bloopers are considered headsails and will be used to ascertain the largest LP headsail carried.)

Roller Furled Genoa (RFG)

Standard production feature		0 sec/nm
A laminate sail with a luff between 97.29% – 95.5% of max luff length	+	3 sec/nm
A laminate sail with a luff less than 95.50% of max luff length.	+	6 sec/nm
A woven Dacron sail with a luff less than 95.50% of max luff length and an appropriate size and weight UV protection cover on the leach and foot.	+	9 sec/nm

(The declared roller furled headsail must be used at all times during the entire season. No other headsail may be deployed while racing. Credit for Roller Furling Genoas (RFG) are for above deck drum installations, only. *The adjustment is not awarded to boats that have a roller furled headsail as a standard feature of the production design.)* (Aftermarket Only RFG systems)

Mainsail (OSM)

One or more girth dimensions are exceeded	-	3 sec/nm
0.1% to 5% increase in sail area	-	3 sec/nm
Every additional 5% increase in sail area	-	3 sec/nm

Roller Furled Mainsail (RFM)

With no battens	+	6 sec/nm
With battens	+	3 sec/nm
In-the-boom furled mainsail	+	3 sec/nm

(The adjustment is not awarded to boats that have a roller furled mainsail as a standard feature of the production design.)

Reduction in Rig Measurements I, J, P or E

0 – 5%		0 sec/nm
5.0% - 10%	+	3 sec/nm
Every additional 5%	+	3 sec/nm

Carbon Rig Replacing Aluminum Rig (CR)

Boats 40 feet or less	-	3 sec/nm
Boats over 40 feet	-	6 sec/nm

Spinnaker Pole (SPL) and Base Spinnaker

0% increase in SPL (J) and up to 100% max Base spinnaker area		0 sec/nm - no penalty
5% increase in SPL and up to 105% max Base spinnaker area	-	3 sec/nm
10% increase in SPL and up to 110% max Base spinnaker area	-	6 sec/nm
15% increase in SPL and up to 115% max Base spinnaker area	-	9 sec/nm
20% increase in SPL and up to 120% max Base spinnaker area	-	12 sec/nm
25% increase in SPL and up to125% max Base spinnaker area	-	15 sec/nm
Each 5% increment greater than 25%	-	3 sec/nm per 5% increment

Asymmetric Spinnaker and Sprit (AS)

TPS equal to (J + 12in) Area same as symmetric max (+6AS)	+	6 sec/nm
TPS less than or equal to (1.25 x J) Area 125% of symmetric max (+3AS)	+	3 sec/nm
TPS less than or equal to (1.35 x J) Area 135% of symmetric max (0AS)	+	0 sec/nm
TPS greater than (1.35 x J) Area greater than 135% of symmetric		Not Allowed

*(**The sprit pole credit apples only to heavier displacement boats converting from a symmetrical spinnaker to asymmetric spinnaker and sprit tacked on or near the centerline of the boat.** Asymmetrical measurements by a PHRF-SS handicapper or a measurement certificate from the sail maker are required to receive a non-standard sprit boat credit. Area of an asymmetric spinnaker may not exceed 135% of a standard symmetrical spinnaker. Base spinnaker area appears on the measurement certificate.)*

Increase in Rig Measurement (OSR)

I&P increased between 0.1% – 3.0%	-	3 sec/nm
Every 2% incremental increase in I&P over 3.0%	-	3 sec/nm
Only P increased 0.1% - 6.0%	-	3 sec/nm
Every 6% additional incremental increase over 6%of P	-	3 sec/nm
Only I increased 0.1% - 5.0%	-	3 sec/nm
Every 5% additional incremental increase over 5% of I	-	3 sec/nm
Boom length E increased 0.1% - 10%	-	3 sec/nm
Every 10% additional incremental increase over 10% of E	-	3 sec/nm

Interior Fixtures (IFR)

Standard Interior fixtures removed	-	3 sec/nm

Undersized Sail Plan

Credit is not given for reduction from designed sail plan	0 sec/nm

9. ONE DESIGN RIG (ODR) RATINGS

9.1 PHRF-SS may, at its discretion, assign a one-design rating. The presence of a national or international Class Association does not guarantee a one-design rating will be assigned, nor does the assignment of a one-design rating constitute certification that the boat is Class-legal.

9.2 For boats rated as one-designs, base ratings shall assume that each boat being assigned the rating shall meet all applicable class standards and, where applicable, have a class royalty tag attached to the class legal sail(s). A sail maker measurement form may be required for some classes. The owner does not need to be a current member of the class association.

9.3 Class designated weight limits do not apply for PHRF racing. Individual Class Rules and measurements must be established and formally published by the Class Association prior to ODR rating assignment.

9.4 It shall be the responsibility of the Organizing Authority (OA) to determine which class or classes of ODR boats are permitted to race at any PHRF-SS designated event.

10. RATING PREDICTION PROGRAM (RPP)

10.1 When all the yachts in a race are not members of the same class, then a handicap is used to adjust the times of boats. The handicap attempts to specify a "normal" speed for each boat based on critical measurements taken of the boat. In the event no prior rating data is available, PHRF-SS will use the Schell Regression Formula to calculate and assign a base boat rating when empirical rating information is not available. This calculation is as follows:

$$RPP = 610 - 8.36\left(\frac{SA}{\sqrt[3]{D}}\right) + 0.0000511\left(SA^2\right) - 55\,(P/J+E) - 30.8\left(\sqrt[2]{LWL}\right) - 602\left(\frac{DR^2}{SA}\right)$$

where: RPP is the base rating expressed in seconds per nautical mile (sec/nm)
SA is sail area expressed in square feet (ft^2)
LWL is the loaded length at the water line expressed in feet (ft.)
DR is draft expressed in feet (ft.)
P is the distance between black bands on the mast in feet (ft.)
E is the distance between black bands on the boom in feet (ft.)
J or JSP is the length of the spinnaker pole (typically the same length as J) or the distance from the forward end of the bowsprit (fully extended) to the front face of the mast.

10.2 Since the handicaps are different, use of symmetric or asymmetric spinnakers must be declared in advance. Both may not be carried or indiscriminately used on a PHRF-SS boat.

10.3 This calculation includes the sail area (SA) limited to the foretriangle and the main alone. The spinnaker is not included in the calculation. In most cases, the empirical rating closely follows the calculated rating.

11. NON-SPINNAKER CLASSES (JAM)

11.1 The intent of non-spinnaker racing is that boats sail off the wind with the same sails they use to sail on the wind. The non-spinnaker handicap (JAM) is an auxiliary rating and should only be used when racing boats without spinnakers. ***It is not developed for use in racing against boats deploying spinnakers.***

11.2 Non-spinnaker ratings are stated on the measurement certificate. The following formulae are used to calculate the non-spinnaker rating based on the assigned handicap:

R = (P * E) / (I * J)
IF R < 2.23 then NSH = 29.4 - 9.8 * R
IF R >= 2.23 and R < 3.65 then NSH = 13.3 - 2.56 * R
IF R >= 3.65 and R <7.4 then NSH=8 - 1.08 * R
IF R >7.4 then NSH=0
JAM = HCP + NSH – 12

11.3 Ketches and yawls may not fly staysails off the wind unless such sails are used when sailing upwind.

11.4 All headsails must be attached to the head stay along the luff. Free flying any headsail is specifically prohibited.

11.5 Except when changing headsails, participating yachts rated as a sloop, may only fly one headsail at a time.

11.6 Any boat using a roller-furled headsail, unless the roller furled gear has been supplied as standard by the manufacturer, is eligible for a handicap adjustment. The furling system must be in use at all times, and the largest headsail, when used, must be set using the furling system, and must be able to be furled using the system.

11.7 Only roller-furling systems where the jib is tacked to an above deck-furling drum and raised on a furling system head swivel are eligible for a handicap credit.

12. MAXIMUM CREW WEIGHT LIMIT

11.1 Each measured yacht shall be restricted to a maximum crew weight based on the design characteristics and the base handicap (HCP) rating. It shall be the responsibility of the owner/skipper to ensure that the crew weight limit is adhered to. Maximum Crew Weight for each measured yacht is calculated from the following:

$$CWT = 200\left(\frac{\sqrt{400 - HCP}}{4} + \frac{LOA^{1.25}}{17.6} + \frac{(I * J) + (P * E)}{1000}\right)$$

13. SAIL AREA (SA) CALCULATION

$$SA = (J * I)/2 + (P * E)/2$$

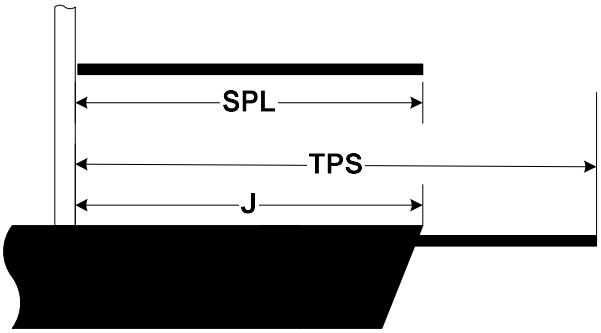
where: I is the highest sheave from the mast at sheer line and is the maximum height that the head of the headsail set flying can be hoisted.

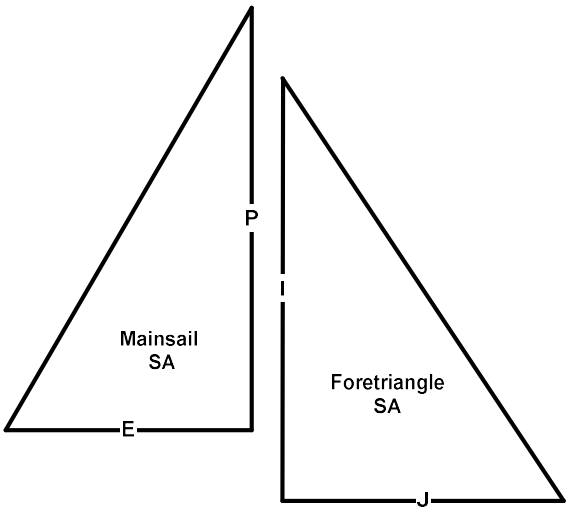
J is the length of the forestay attachment point to the face of the mast at sheer line.

P is the luff length of the mainsail, measured along the aft face of the mast from the top of the boom to the highest point that the mainsail can be hoisted or black band.

E is the foot length of the mainsail, measured along the boom from the aft face of the mast to the outermost point on the boom to which the main can be pulled or to the black band.

I, J, P and E are integral components used in the calculation of SA. SPL is the spinnaker pole length and in most cases, equals the J. TPS is the tack point of the spinnaker.





SA = Mainsail SA + Foretriangle SA

FIGURE 1.0 MEASUREMENT POINTS FOR J, SPL AND TPS

ISP is the highest sheave from the mast at sheer line and is the maximum height that the head of the spinnaker or headsail set flying can be hoisted.

SPL is the spinnaker pole length and is measured as the length between the extreme outboard ends of the fittings.

JSP is the length of the forestay attachment point to the face of the mast at sheer line, or the spinnaker pole (typically the same length as J) or the distance from the forward end of the bowsprit (fully extended) to the front face of the mast at sheer line.

TPS is the tack point of the spinnaker when tacked on the boat's centerline. It is the distance from the foreside of the mast to the foremost point on which the asymmetric spinnaker or any headsail set flying can be tacked. If the bowsprit is retractable TPS shall be measured with the bowsprit in its fully-extended position.

A Whisker Pole is considered a spinnaker pole (SPL) and cannot exceed J without penalty. An adjustable whisker pole must be visibly marked as to the maximum extended length.

14. TIME ON TIME (ToT)

14.1 Corrected time is calculated as follows:

*Corrected time = Time correction factor * Handicap*

14.2 With ToT scoring, the time allowance will increase progressively through the duration of the race. Course distance has no effect on the results and need not be measured. Corrected time will depend only on the elapsed time, and the difference between boats may be seen in seconds depending on the duration of the races. The longer the race in time, the larger the handicap.

14.3 If ToT scoring is used for an event designated PHRF-SS, the following A & B values below are recommended for calculating the TCF multiplier. These numbers currently assume a scratch boat rating of 123 sec/nm. The scratch boat represents the median (mid-point) of all ratings in the PHRF-SS database. It's time correction factor (TCF) will be 1.000. All boats with a rating lower than 123 sec/nm will have a TCF greater than 1.0. All boats with a rating higher than 123 sec/nm will have a TCF less than 1.0. Note that the scratch boat rating may change annually as the boat ratings in the database change.

A =543.33 B = 420.33 TCF = 543.33 / (420.33 + HCP) Scratch Boat = 123 (ToT = 1.000)

15. TIME ON DISTANCE (ToD)

15.1 Corrected time is calculated as follows:

*Corrected time = Elapsed time – (HCP * Distance)*

15.2 With Time-on-Distance (ToD) scoring, the coefficient of time allowance of one boat will not change with wind velocity, but will change with the length of the course. One boat will always give to another the same handicap in sec/nm, and it is easy to calculate the difference in elapsed time between two boats needed to determine a winner in corrected time. This scoring method is generally not preferred since it ignores many variables other than distance. ToD does not take into consideration the actual distance sailed by a boat but only the liner distance between marks.

16. BOAT MODIFICATIONS

16.1 Yachts shall race with at least all the equipment and furnishings supplied as standard by the manufacturer. A yacht that has altered or has removed bulkheads, permanently attached furniture, or structural interior components shall be considered a custom or modified yacht. Removal of a table, v-berth cushions and all but one interior cabin door is permitted.

16.2 Drawers, headliners, cabinet and locker doors, steps, ladders, and engine enclosures shall remain in place as supplied as standard equipment. If they do not so remain, then the yacht shall be considered a modified yacht and rated accordingly. The HRB shall adjust the boat's total displacement estimating the weight of equipment removed which was installed by the manufacturer.

16.3 Lifting keels must be fixed and locked in the lowered position while racing.

16.4 Unreported changes in rig, sails, rudder, hull, keel, ballast, or spinnaker pole is a serious breach of the rules and will result in immediate suspension of the PHRF-SS Certificate. Reinstatement of rating will be done only after inspection and/or re-measurement by an authorized Measurer or Handicapper.

16.5 PHRF-SS must be notified in writing of any changes to a boat which modifies its designed weight, trim, underwater shape of hull, keel or rudder and any modifications to the standing rigging or spars. The only work exempt from the reporting requirement is the repair of grounding damage or filling and fairing of the magnitude associated with batten sanding. Placement of deck hardware and other control or running rigging is unrestricted.

17. CRUISING CREDITS

17.1 To obtain a roller furled headsail credit, the roach of the roller furled headsail shall not exceed 2% of the LP when measured perpendicular to the foot at mid-point. This parameter must be verified for compliance by a measurer or certificate issued by the sail maker. There are no restrictions on the type of material used to construct the sail.

17.2 The PHRF-SS measurer shall sign and date the measured sail in close proximity to the tack. No other headsail may be substituted at any time for the roller furled headsail without losing the credit. You will receive a roller furled headsail credit if your furling headsail is:

- Short hoist (i.e., its luff length is at least 2.5% of the I measurement shorter than the headstay length where headstay length is measured from deck sheer line to attachment point on the mast);
- Attached to a bottom drum and top swivel;
- Regularly used as the primary racing headsail;
- Can be roller furled during racing;
- Is regularly stored on the headstay when the boat is not racing or sailing;
- Is regularly used as the primary headsail

17.3 To be eligible to apply for a 3 or 6 second credit, the owner shall agree that the boat will carry on board only two (2) headsails with a LP greater than 110% for the racing season. To be eligible to apply for the 9 second credit the owner shall use one and only one roller reefing headsail >110% for the racing season.

17.4 The bottom of the roller furling drum must be above deck and it must be able to furl all qualified headsails in a normal manner

17.5 Qualified roller furling sails must be in the luff groove for the full luff of the sail, attached to a swivel at the head of the sail and to the drum swivel at the tack.

17.6 No battens of any kind are allowed in qualified roller furling headsails.

17.7 Boats equipped with Roller Furling Mains (RFM) are allocated a maximum 6 sec/nm adjustment to their base handicap rating. If the mainsail has no battens and a negative roach, then a 6 second per mile credit is given. If there are battens and/or a positive roach, then the credit is reduced to 3 seconds per mile.

17.8 No credit is given if the roller furled headsail was supplied with the original production yacht as equipped by the manufacturer

18. RIG AND SAIL MEASUREMENTS

18.1 The verification of rig and sail dimensions by physical measurement is considered by PHRF-SS to be necessary to assure the uniform application of handicaps. Measurement is a requirement for obtaining a full base handicap. A provisional certificate and rating may be issued but must be verified by an approved measurer before a full certificate will result.

18.2 PHRF-SS uses published as-built manufacturers measurement data as the basis for calculating base handicaps when necessary. These measurements may be augmented or replaced using data sources such as http://sailboatdata.com. In any case, critical dimensions shall be verified by an approved measurer.

18.3 In general, sailmakers are familiar with the International Measurement System (IMS) rule concerning the design of sails. Sails used in PHRF-SS races must meet the IMS requirements (refer to Appendix C). There is no restriction on the number of sails carried for events designated PHRF-SS.

18.4 Mainsail battens may be any layout consistent with the IMS Specification (battens of any desired length and angle). Mainsail penalties shall be calculated per the following: Where one or more of the following mainsail girth dimensions are exceeded:

MHB > 0.04 * E (Headboard)
MUW > 0.22 * E (7/8 point)
MTW > 0.38* E (3/4 point)
MHW > 0.65 * E (1/2 point)
MQW > 0.90 * E (1/4 point)

18.5 Mainsails shall be penalized by 3 seconds per mile, plus an additional 3 seconds per mile for each 5% increase of sail area calculation per the following:

$$MSA = P/8\ (E + 2*MQW + 2*MHW + 1.5*MTW + MUW + 0.5*MHB))$$

18.6 A jib is defined as any sail, other than a spinnaker, which is to be set in the fore triangle. In any jib the mid-girth, measured between midpoints of luff and leach, shall not exceed 50% of the foot length nor shall the length of any intermediate girth exceed a value similarly proportionate to its distance from the head of the sail.

18.7 Tack Points of Jibs - The LP line is defined as a line abaft of and parallel to the foremost head stay and separated from it by the LP dimension declared in the rating certificate. The foremost head stay is defined as the line joining the upper measurement point of "I" and the forward point of "J".

18.8 Bloopers are measured as jibs, and must be included in evaluating the LP of the largest jib for handicapping purposes. A blooper can be flown in a spinnaker race if it is declared as one of the allowed headsails. It must have an LP no larger than the largest declared genoa LP and have a mid-girth no greater than 50 percent of the foot in length. A blooper cannot be flown in a non-spinnaker race as no free flying sails area allowed.

19. SYMMETRICAL SPINNAKERS:

19.1 The allowed area for a symmetrical spinnaker, hereafter referred to as the "Base Spinnaker" shall be calculated using SL = $0.95(I^2 + J^2)1/2$ and SMW = 1.8 * J, regardless of the actual spinnaker pole length (SPL). Any increase of SPL > J will incur a penalty per Section 8.1.

19.2 The "Base Spinnaker" must have the following characteristics:

- The sail must be symmetrical about a line joining the head to the center of the foot.
- The mid-girth shall not be less than 75% of the foot length
- Spinnakers shall be sheeted from only one point on the sail.
- Battens shall not be used in spinnakers.
- Luff or leech shall not exceed $0.95(I^2 + SPL^2)1/2$
- Maximum width (SMW) shall be 1.8 times the SPL

20. ASYMMETRIC SPINNAKERS

20.1 The PHRF-SS asymmetric spinnaker rule allows a heavier displacement boat to convert from a symmetrical spinnaker and pole configuration to a centerline tacked asymmetrical spinnaker to the deck or to a non-articulating sprit or pod. Under this configuration the symmetrical spinnakers and poles are eliminated and no asymmetrical spinnaker may be tacked to a pole while racing. No whisker or spinnaker poles may be used to fly the asymmetrical spinnaker.

20.2 The asymmetrical spinnaker tack must be attached to a tack point (or is attached to a tack line that is led to a tack-point) that is as specified below forward of the head-stay on, or as near as possible to the centerline of the hull. There is no restriction on the length of the tack line, but it is strictly prohibited to divert the tack line by any means such as, but not limited to, through or around an after-guy, pulpit, cleats, Turks head, bow chock or other outrigger before it reaches the spinnaker tack block.

20.3 Under this configuration the symmetrical spinnaker is treated as a "base spinnaker" with an area calculated from:

$$SL = 0.95\sqrt{I^2 + SPL^2} \text{ and an SMW of 1.8 SPL}$$

The base spinnaker assumes SPL to be equal to J which is the measured distance from the forward face of the mast to the stem head fitting along the sheer line at deck level.

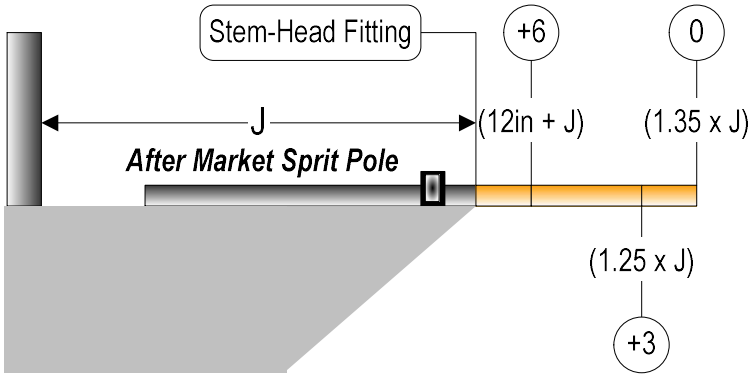
20.4 The sprit calculation below uses the J dimension even if the boat carries a longer pole.

- **Configuration 1 -** An asymmetrical spinnaker no greater than the base spinnaker area and the tack point no greater than 12" from the jib tack will receive a 6 second credit.

- **Configuration 2 -** An asymmetrical spinnaker no greater than 125% of the base spinnaker area and the tack point no greater than (1.25 x J) in front of the jib tack will receive a 3 seconds credit.

- **Configuration 3 -** An asymmetrical spinnaker no greater than 135% of the base spinnaker area and the tack point no greater than (1.35 x J) in front of the jib tack will receive a 0 second credit.

20.5 The asymmetric sprit pole credit will always be rounded up for extensions between credit points.



Asymmetrical Spinnaker Credits
+6 sec/nm credit (ASM Area = SYM Area) Sprit fwd 12in max
+3 sec/nm credit (ASM Area ≤ 125% SYM Area) Sprit fwd ≤ 1.25xJ max
0 sec/nm credit (ASM Area ≤ 135% SYM Area) Sprit fwd ≤ 1.35xJ max
Not allowed (ASM >135%) Sprit fwd > 1.35xJ

20.6 The sprit pole credit does not apply to boats that were so designed and equipped by the original manufacturer, i.e., a production yacht. The credit only applies to heavier displacement boats that convert from a symmetrical spinnaker to a centerline tacked asymmetrical spinnaker.

20.7 Asymmetrical spinnakers shall have the following characteristics:
- Luff and leech of unequal lengths where SLU/SLE ≥ 1.1
- $(SLU+SLE)/2 \leq 0.95(I^2 + SPL^2)^{1/2}$
- If the tack point is forward of the forestay, it must be reported.
- SHW is between 1.6 and 1.8 times the greater of J or SPL, and ≥ 75% of the foot length of the sail.
- SHW is the asymmetrical spinnaker mid-girth and is the distance between the midpoints of SLU and SLE measured in the shortest path on the surface of the sail.
- SP is the foot length of spinnaker or asymmetrical spinnaker and is measured in a straight line from clew to clew or tack to clew.
- SLU is the spinnaker or asymmetrical luff length and SLE is the asymmetrical spinnaker leech length.
- Code Zero (Code 0) sails are asymmetrical sails with a mid-girth of > 55% and < 75% of the foot length of the sail. Minimum penalty for a Code 0 sail will be 3 sec/nm adjusted for sail area.

20.8 An asymmetric spinnaker MAY NOT be flown from a standard spinnaker pole in any position which would be normally used to fly the symmetrical spinnaker.

20.9 A standard spinnaker pole MAY NOT be lashed to the deck with an attempt to have it serve as a sprit pole. The sprit pole must be mounted to the deck and may be extendable, but must be clearly marked as to its maximum extension consistent with the credit issued.

20.10 A local club fleet may declare an exception in the interest of promoting experimentation and development by allowing a symmetrical spinnaker pole to be lashed to the deck. This configuration is only temporary and cannot be used for extended periods and is not allowed at PHRF-SS designated events. The spinnaker pole in this configuration MUST be attached/fixed to the base of mast. The asymmetric credit will not apply to this configuration.

20.11 Once the asymmetric credit is taken, the symmetrical spinnaker may not be flown at any event designated PHRF-SS unless a rating change has been formally requested, approved, and issued.

20.12 The asymmetric spinnaker rule is unique to PHRF-SS and may not be accepted by other PHRF regions without penalty.

21. ABREVIATIONS

ASM	Asymmetric
CLUB	Club only
DLR	Displacement to length ratio
EXCL	Exceptional
FXD	Fixed
HCP	Handicap
HRB	Handicap review board
MOD	Modified
ODR	One design rating
ORB	Outboard
PPF	Performance predication factor
PROP	Propeller
RPP	Rating Prediction Program
SADR	Sail area to displacement ratio
SPL	Spinnaker pole length
STND	Standard
SYM	Symmetric
TEMP	Temporary
TPS	Tack point of spinnaker

22. RANDOM LEG COURSE (RLC) HANDICAP – TRIAL HANDICAP

22.1 Random Leg Course (RLC) handicaps are designed for large fleets such as those encountered in pursuit races where boats of dissimilar design and performance characteristics may be competing against each other. RLC handicaps have minimal to no impact for small classes (6-10 boats) where boats are similar in design and performance characteristics.

22.2 A random leg course, also known as a 'fixed mark course' or a 'point-to-point course' may require beating, reaching, and running. The rounding marks may be chosen by the race committee without considering the actual wind direction or weather conditions.

22.3 Variances in boat design allow high performance boats to exceed their theoretical hull speeds on offwind legs of a course. To compensate for the variance, the PPF (Section 6.0) is a calculated estimate of performance potential allowing an adjustment to be made to the base handicaps according to the following table.

PPF	ADJUSTMENT	PPF	ADJUSTMENT
0.00 to 1.50	-9 sec/nm	15.01 to 16.50	+1 sec/nm
1.51 to 3.00	-8 sec/nm	16.51 to 18.00	+2 sec/nm
3.01 to 4.50	-7 sec/nm	18.01 to 19.50	+3 sec/nm
4.51 to 6.00	-6 sec/nm	19.51 to 21.00	+4 sec/nm
6.01 to 7.50	-5 sec/nm	21.01 to 22.50	+5 sec/nm
7.51 to 9.00	-4 sec/nm	22.51 to 24.00	+6 sec/nm
9.01 to 10.50	-3 sec/nm	24.01 to 25.50	+7 sec/nm
10.51 to 12.00	-2 sec/nm	25.51 to 27.00	+8 sec/nm
12.01 to 13.50	-1 sec/nm	> 27.01	+9 sec/nm
13.51 to 15.00	0 sec/nm		

REVISION HISTORY

Rev	Date	Section	Description
1.09	11/1/2017	-	Initial release of PHRF-SS Rules and Bylaws
1.10	12/5/2017	Appendix A	Update bylaws to include the Technical Advisory Committee (TAC)
1.11	12/18/2017	10.0	Change HCP to RPP in Section 10 to avoid conflicting terms
1.12	12/26/2017	8.0 & 22.0	Add Random Leg (RLC) handicaps; Add sportboat definition
1.13	3/19/2018		Change SADR variable from 64.0 to 62.4 to account for fresh water; increase granularity of RLC handicaps
1.14	3/30/2018	22.0	Update RLC handicap section

APPENDIX A: PHRF-SS BYLAWS

A1 OBJECTIVES:

A1.1 The South Shore Performance Handicap Racing Fleet, hereafter referred to as PHRF-SS, is an organization established to promote competition and fair sailing between dissimilar boats by serving as a handicapping authority issuing measurement certificates. It shall further be an objective of this organization to maintain an association with the United States Performance Handicap Racing Fleet (US- PHRF), as well as other individual performance handicapping groups, by actively supporting our mutual interests

A2 INTRODUCTION:

A2.1 PHRF-SS was chartered by Interlake Yachting Association (I-LYA) on June 28, 2017. PHRF-SS does not act as, nor represent, any Organizing Authority (OA) for any event designated PHRF-SS and does not dictate which boats may or may not participate in any given event, nor does it dictate which safety features a boat must meet. A vessels safety preparedness must conform to federal, regional, and local laws, rules, and regulations for the body of water on which it operates and the rules under which it is sailing.

A3 ORGANIZATION:

A3.1 PHRF-SS is established as a Limited Liability Company (LLC) chartered by the Inter-Lake Yachting Association (I-LYA) to act as a regional handicapping authority and to develop rules and by-laws.

A3.2 The organization shall consist of an Executive Committee (EXC), a Handicap Review Board (HRB) and a Technical Advisory Committee (TAC). and as such, it's owner shall be a permanent member of the Executive and Handicapping Review Boards.

A.3.2.1 The Executive Committee (EXC) shall consist of the Chairman, Vice-Chairman, Secretary, and Treasurer. The Secretary and Treasurer positions may be combined and represented by a single individual.

A3.2.2 The Handicap Review Board (HRB) shall be established under the oversight of the Chief Measurer and consist of a minimum of three selected active racing sailors at large with sufficient experience to be conversant in boat design and performance characteristics. The Executive Board shall be defacto voting members of the Handicap Committee.

A3.2.3 The Technical Advisory Committee (TAC) shall be formed to assist the HRB as required to evaluate measurement methods, techniques and to ensure alignment with industry standards. The TAC is a permanent non-voting member of the HRB.

A3.3 PHRF-SS shall be administered by a Chairman who assumes organizational responsibility for PHRF-SS. The Vice-Chairman shall serve as Chairman in the absence of the Chairman.

A3.4 The Chairman shall be elected by a simple majority of the EXC and HRB serving a 2-year term subject to re-election. There shall be no term limits. A Chairman Emeritus status may be granted by a majority vote of the HRB. A Chairman Emeritus shall be a permanent non-voting member of the HRB. The Chairman will also serve as the Chief Measurer. The LLC owner is a permanent member of the EXC and serves no term limits.

A3.5 The members-at-large of the Handicap Committee shall be elected/appointed from each member club. Election or appointment is subject to the acceptance by the EXC. The committee member(s) shall serve overlapping 2-year terms on the PHRF-SS HRB. Representative elections/appointments shall be held every year

A3.6 A simple majority at any scheduled meeting is required to establish a quorum. No business may be conducted without a quorum present. Meetings are held monthly except June through August.

A3.8 One or more sail makers and/or industry experts may be included on the HRB to ensure consistency and accuracy in the measurement of sails and interpretation of design characteristics. PHRF-SS is committed to transparency for all boats.

A4 HANDICAP ADJUSTMENTS:

A4.1 Handicaps may be adjusted no less that annually based upon observed performance and/or analysis of available performance data by the HRB. In all cases, a simple majority of the HRB is required to approve any change.

A4.2 If a change is made to a standard boat, then all registered boats of the same base configuration shall be adjusted. Under no circumstance will a rating change be applied to a single standard boat unless she is a custom or a one-off configuration. PHRF-SS will not, to the best of its ability, adjust any handicap based on skipper, crew, sails or lack of proper boat preparation.

A4.3 The base boat rating will not be changed or reviewed unless a rating appeal is submitted. Handicaps are not adjusted without actual results and the preference is for the results of as many standard boats as possible.

A5 RATINGS APPEAL:

A5.1 The appeal process is initiated by proper completion of the Appeals Form which can be downloaded form the PHRF-SS web site. Members may appeal the rating of their own boat or the boat of a competitor. If an appeal is granted to a standard boat, all like standard boats shall be assigned the new rating. PHRF-SS attempts to objectively assess each rating change request and tries its best to avoid any circumstances where the result is handicapping the skipper or crew.

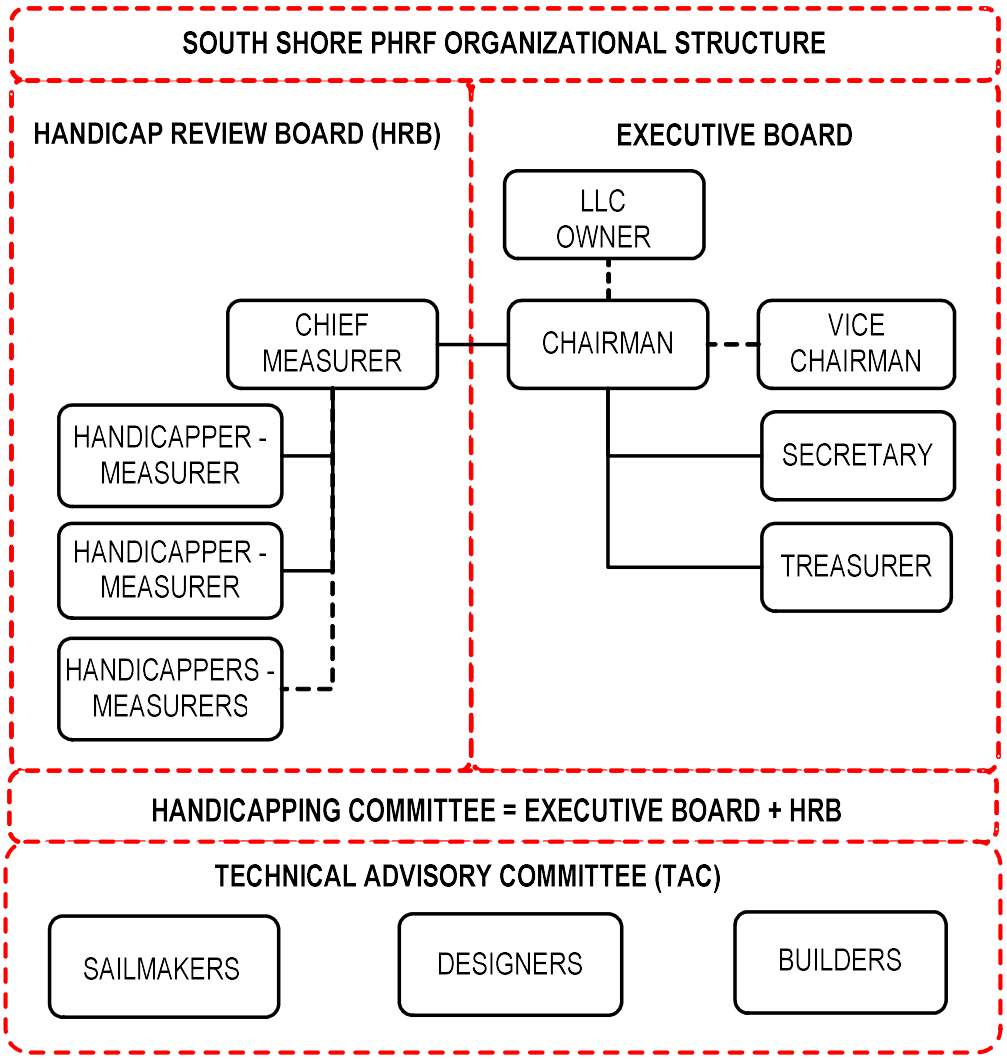
A5.2 An appeal will not be accepted until results are available for at least the (10) Invitational Races or fifteen (15) club races in the year during which the appeal is made. No more than one appeal will be accepted per racing season.

A5.3 The Bylaws of the PHRF Committee of the United States Sailing Association (US Sailing) permit appeals of ratings issued by a local HRB to the US Sailing PHRF Committee. Such appeals may only be filed with the permission of the PHRF-SS HRB.

A6 CLASS SPLIT GUIDANCE:

A6.1 At any event designated PHRF-SS, all registered boats should first be placed in the order of their performance predication factors (PPF) first and then separated in classes by the organizing authority. Because of the variance in design and performance characteristics, boats should never by divided into classes based solely on the handicap. PPF is offered as a tool and not a requirement. The Organizing Authority is ultimately responsible for the final class splits.

A6 EXECUTIVE BOARD DUTIES, RESPONSIBILITIES, AND ORGANIZATIONAL STRUCTURE



A6.1 CHAIRMAN

A6.1.1 The Chairman, typically the Chief Measurer, shall be the chief executive officer of PHRF-SS and shall preside at all meetings of the Executive Board and serve as Chairman of the HRB, represent PHRF-SS to other yachting organizations, and promote the best interests of the organization. The Chairman:

- Shall vote in the instance of a tie or the absence of an Executive or HRB member to achieve a quorum.
- May appoint additional members of the HRB who have a technical interest. No member of the HRB may take part in discussions about the handicap of a boat that he/she has an interest in, either financially or by sailing on it.
- May direct and prepare information for distribution to the membership at large and/or other related PHRF-SS Committees, Fleet Handicappers and resource persons.
- May initiate discussions beneficial to PHRF-SS for the Executive Board to consider. Regarding these discussions, if a consensus is not reached, the Chairman may have the option to present directly to the membership at large for further review and discussion.

A6.2 VICE-CHAIRMAN:

A6.2.1 The Vice Chairman shall assist the Chairman in the discharge of his duties. In addition, the Vice-Chairman will:

- In the Chairman's absence, act in his stead.
- Act as a voting member of the Executive Board and HRB.
- Promote growth of the membership

A6.3 SECRETARY

A6.3.1 The Secretary shall act as the recording member of the Executive Board and PHRF-SS.

A6.3.2 The Secretary shall also have the following duties:

- Maintain membership and fleet rosters.
- Act as a voting member of the Executive Board and the HRB.
- Record certificates processed for year, keep historical record
- Manage and support email communications generated by fleets,
- Generate monthly invoices, collect/record payments sent to treasurer.
- Coordinate and schedule the Fall and Spring meeting at the request of the Chairman.
- Act as the official contact for Member Fleets.
- Collect images/messages from fleets to be posted on website and distributed via email.

A6.4 TREASURER

A6.4.1 The Treasurer shall be responsible for the funds of PHRF-SS and act as a voting member of the Executive Board and the HRB. These responsibilities include:

- Maintain a checking account for PHRF-SS expenses
- Deposit monies into this account sent to PHRF-SS from the Secretary who collects the membership fees.

- Pay any bills as authorized by the PHRF-SS Chairman.
- Provide accounting at the Fall Meeting for income and expenses.
- Recommend any changes need in dues to offset increased expenses.

A6.5 CHIEF HANDICAPPER

A6.5.1 The Chief Handicapper shall:

- Maintain the performance handicapping records.
- Recommend, to the HRB, handicaps for newly-registered yachts and handicap changes for yachts whose race results indicate a need for adjustment.
- Conduct independent investigations of alleged measurement irregularities.
- Act as a voting member of the Executive Board and the HRB.

A6.5.2 In the event of a vacancy in this position, duties will be assumed by the HRB.

A6.6 FLEET HANDICAPPER

A6.6.1 The Fleet Handicapper shall:

- Appoint Fleet Measurers that are experienced racers and can interpret design characteristics of boats. There are no term limits to the appointment.
- Screen all Renewal Certificate Applications for changes from the last issued certificate
- Assist boat owners in preparing New Certificate Applications for ratings and review by the HRB by verifying the data provided by owner using internet resources (Sailboatdata.com, US Sailing, manufacturer's website, previous certificates, other sources).
- Consult with the boat owner to resolve any discrepancies before submitting to the HRB for review and handicap designation.
- Provide liaison between HRB and owner during review process.

A6.7 ELECTIONS AND MEETINGS

A6.7.1 PHRF-SS will hold an annual meeting open to all members. Reports by the Chairman (State of the Fleet), Treasurer (Balance Sheet), Secretary (Proposed Bylaw Changes) Chief Handicapper (Certificate and Ratings Report).

A6.7.2 An open forum discussion will be held to solicit input form the membership to aid in the development and improvement of competition and/or rating adjustments.

A6.7.3 Election of Officers will be held in executive session before the annual meeting. Voting members are limited to the HRB.

APPENDIX B: SAIL MEASREMENT

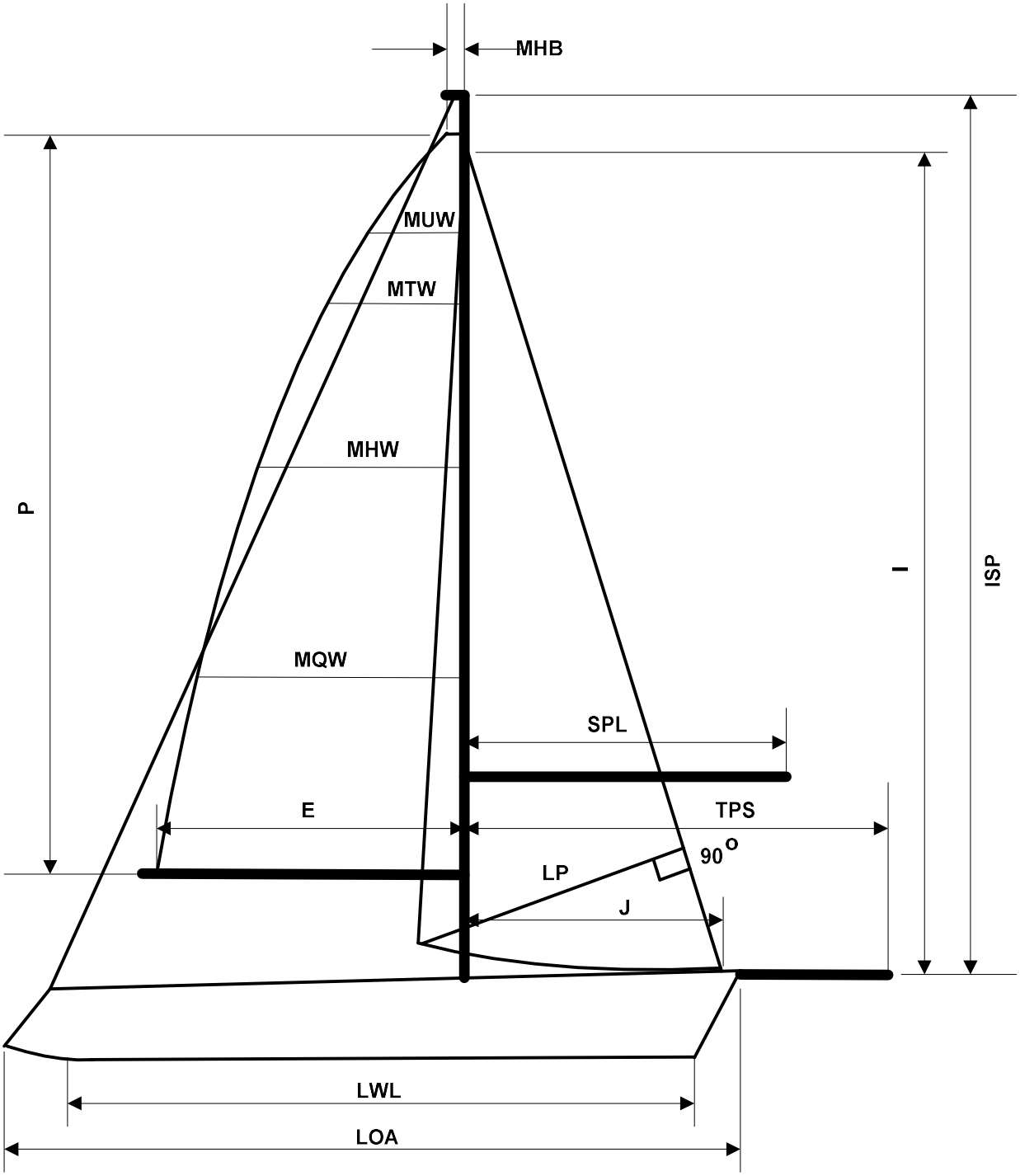


FIGURE B.1 CRITICAL MEASUREMENT DIAGRAM

B1 MAINSAIL MEASUREMENTS – PHRF-SS

The mainsail is measured with width at the top (***MHB***) and four widths found on the leach between head and clew: at 1/4 (***MQW***), 1/2 (***MHW***), 3/4 (***MTW***) and 7/8 (***MUW***) leech heights. Points on the leech are found by folding the sail to find equal distances between clew and head or between two adjacent measurement points. The height of the mainsail luff (***P***) and mainsail foot (***E***) are measured on the mast and boom as part of the **rig measurements**.

The mainsail measured area is calculated by the simplified trapezoid formula above, dividing the luff in amounts of 1/4, 1/2, 3/4 and 7/8. However, the mainsail rated area is calculated by using the actual heights on the luff from the tack point to the points where mainsail widths are measured. The amount of roach will therefore proportionally increase the rated area from the measured one by giving the exact area and center of effort height for square top and other high roach main sails.

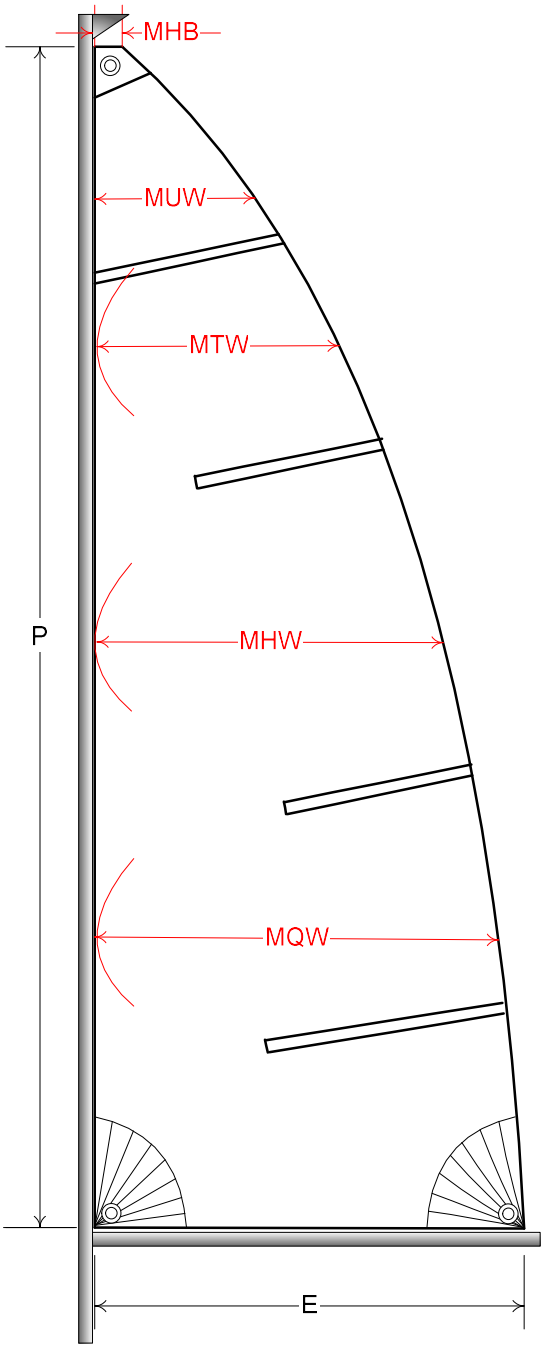
If there is a batten above the 7/8 (***MUW***) leech point, then the top width (***MHB***) measurement is increased taking in account effect of a batten positioned this high on the mainsail.

Mizzen measurements are the same as for the mainsail, with all corresponding measurements abbreviations having "Y" as a suffix.

The basic formula for mainsail area is shown below.

Reference Offshore Racing Congress (ORC) Sail Measurement requirements.

Square Top or Fat Head Mains must be declared and will incur an automatic 3 second penalty.
Any excess beyond the above stipulations may result in a penalty and must be reviewed by the HRB.



$$Area = \frac{P}{8}\left(E + 2 \cdot MQW + 2 \cdot MHW + 1.5 \cdot MTW + MUW + 0.5 \cdot MHB\right)$$

B2 HEADSAIL MEASUREMENTS – PHRF-SS

Headsails shall have the distance between ***half luff point*** and ***half leech point*** of less than 75% or the foot ***length***.

Headsails may be used on a furler system. In such a case, a rating credit will be given if the furling system is used in association with one headsail only.

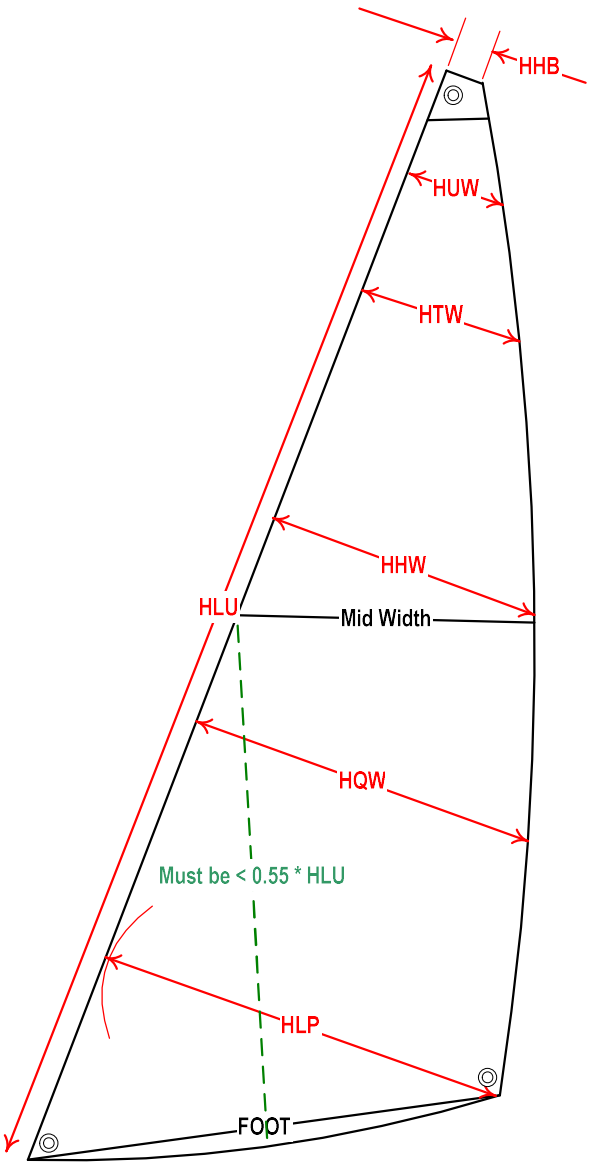
Headsails may be set on the forestay or set flying, i.e. with no sail edge attached to the rig such as a Code 0. As a part of measurement process, headsails shall be flagged when set flying and/or having battens.

Headsail measurements are similar to those of the mainsail, including the top width (***HHB***) as well as four widths found on the leach between head and the clew: at 1/4 (***HQW***), 1/2 (***HHW***), 3/4 (***HTW***) and 7/8 (***HUW***) leech heights. Points on the leech are found by folding the sail to find equal distances between clew and head or between two adjacent measurement points.

Additional measurements for headsails are: luff length (***HLU***) and luff perpendicular (***HLP***) as the shortest distance from the clew point to the luff. Headsail area is then calculated as follows

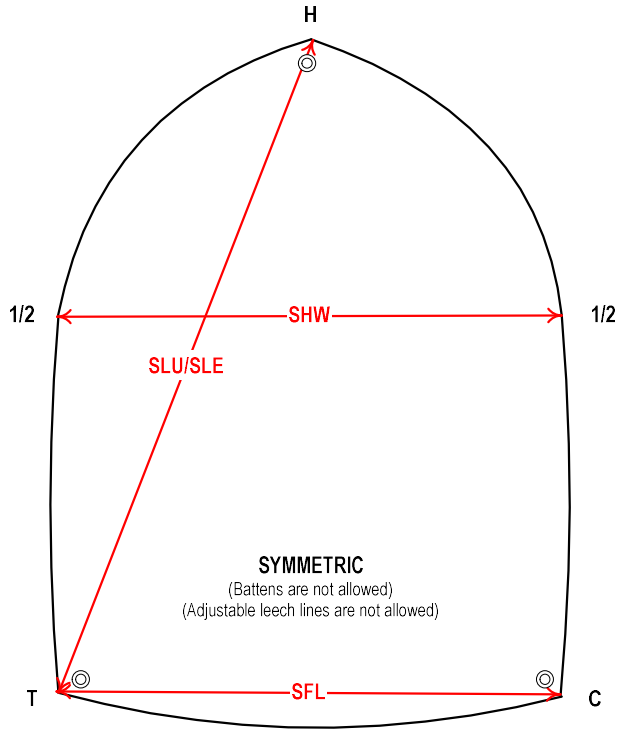
When the leech has a clear hollow or the headsail is not the largest in the sails inventory, measurements can be reduced to ***HLU*** and ***HLP*** only.

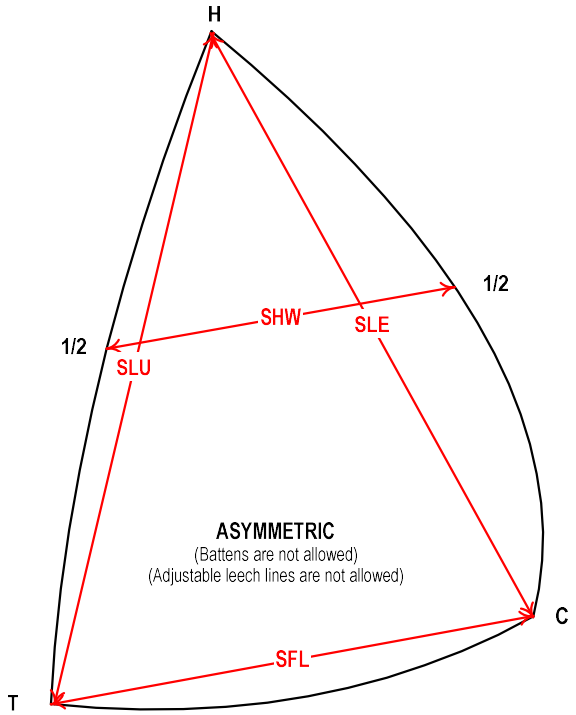
Mid-width must be < 0.75 * FOOT



$$Area = 0.1125 \cdot HLU \cdot \left(1.445 \cdot HLP + 2 \cdot HQW + 2 \cdot HHW + 1.5 \cdot HTW + HUW + 0.5 \cdot HHB\right)$$

B3 SPINNAKER MEASUREMENTS – PHRF-SS





The half width of any spinnaker shall be ***75 %*** or more of the foot length.

The ***symmetric spinnaker*** shall be symmetric in shape, material and cut, about a line joining the head to the center of the foot. The symmetric spinnaker shall not have adjustable leech lines.

Any spinnaker not qualifying as symmetric shall be considered as ***asymmetric***. Where the asymmetric spinnaker is tacked on the centerline, tack pennants of any length may be used.

Battens are not permitted on any spinnaker. Spinnaker measurements include: leech length ***(SLU)***, luff length ***(SLE)***, half width (***SHW***) as the distance between midpoints on the luff and leech and the foot length (***SFL***). The asymmetric spinnaker luff ***ASL*** is then calculated as the average of the luff length (***SLU***) and the leech length (***SLE***) making it possible to use the same formula for spinnaker area.

Symmetric Spinnaker Area:

$$Area = \frac{SLU \cdot (SFL + 4 \cdot SHW)}{6}$$

Asymmetric Spinnaker Area:

$$Area = \frac{ASL \cdot (SFL + 4 \cdot SHW)}{6}$$

APPENDIX C: IMS Rule © 2018 PART G - SAILS

An excerpt to supplement the PHRF-SS Measurement Manual. All sails used in PHRF-SS shall be constructed in compliance with IMS requirements. What follows is a reprint from the IMS 2018 Measurement Manual.

G1 GENERAL

G1.1 A sail shall not be constructed in such a manner that any portion may be completely detached.

G1.2 No device other than a normal leech line shall be used to adjust the curvature of any batten.

G1.3 Sails shall be measured according to the ERS except otherwise prescribed by the IMS, in which case IMS shall prevail.

G1.4 If a seven-eighths leech point cannot be found on the leech, the aft head point shall be taken as the seven-eighths leech point

.

G1.5 If mainsail and all headsails are made of woven polyester, this shall be recorded as “YES and if not as “NO”.

G1.6 ERS H5.4 does not apply.

G1.7 ERS definition of Set Flying is changed to: “A sail set with no sail edge attached to the forestay.”

G2 MAINSAIL

G2.1 The following measurements shall be taken:

MHB shall be the top width except as defined in G2.2
MUW shall be the seven-eights width.
MTW shall be the three-quarter width.
MHW shall be the half width.
MQW shall be the quarter width.

Measurements of MUW, MTW, MHW and MQW shall be equal or greater than the closestmeasurement above it.

G2.2 If the centerline of a batten pocket is situated above seven-eighths leech point, a straight line shall be taken through seven-eighths leech point and the centerline of a batten on the leech situated above this point. The intersection of that straight line and the line through the head point at 90º to the luff shall be taken as the point from which MHB shall be measured to the head point.

G3 MIZZEN

MHBY, MQWY, MHWY, MTWY, MUWY shall be taken as corresponding measurements defined in G2

G4 HEADSAIL

G4.1 The distance between half luff point and half leech point of the headsail shall be less than 75% of the foot length. The following measurements shall be taken:

HHB shall be the top width.
HUW shall be the seven-eighths width.
HTW shall be the three-quarter width.
HHW shall be the half width.
HQW shall be the quarter width.
HLU shall be the luff length.
HLP shall be the luff perpendicular.

The measurements can be reduced to the last two items for headsail measurements before 01/01/2009 or when the leech has a clear hollow and the headsail is not the largest in the sails inventory. Headsails with distance between half luff point and half leech point of 55% or more of the foot length (formerly known as Code 0) measured before 01/01/2014 may have SLU, SLE, SFL and SHW measured. If there are battens on the headsails, this shall be recorded as "YES" and if not as "NO". If headsail is set flying, this shall be recorded as "YES" and if not as "NO".

G4.2 Any device or sail construction used to artificially shorten a luff shall be removed for the HLU measurement.

G4.3 The distance between half foot point and half luff point on the headsail shall be not greater than 55% of HLU.

G5 MIZZEN STAYSAIL

Mizzen staysails shall be three-cornered. The longest side edge shall be taken as a luff, the shortest edge shall be taken as a foot, and third edge shall be taken as a leech. The following measurements shall be taken:

YSHF shall be the shortest distance that can be measured from head to foot.
YSHW shall be the half width.
YSFL shall be the foot width

G6 SPINNAKERS

G6.1 The half width of any spinnaker shall be 75% or more of the foot length.

G6.2 The symmetric spinnaker shall be symmetric in shape, material and cut, about a line joining the head to the center of the foot. The symmetric spinnaker shall not have adjustable leech lines. Any spinnaker not qualifying as symmetric shall be considered as asymmetric.

G6.3 Battens are not permitted on any spinnaker.

G6.4 The following measurements shall be taken on symmetric spinnaker:

SLU shall be the luff length.
SLE shall be the leech length.
SHW shall be the half width.
SFL shall be the foot length.

G6.5 The following measurements shall be taken on asymmetric spinnaker:

SLU shall be the luff length.
SLE shall be the leech length.
SHW shall be the half width.
SFL shall be the foot length

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