DEMYSTIFYING US HANDICAP RATING SYSTEMS

Introductions

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- Karl Felger, Quantum Sails, Loft Manager, Cleveland
- Nathan Titcomb – Offshore Director, US Sailing

Why are we here?

SAILING LEADERSHIP FORUM 2018 US SAILING

US Offshore Sailing – what are the problems?

- Declining participation - causes
  - Too much time & expense, maintenance hassle
  - Unable to get crew
  - Changing lifestyles, demographic shift towards cruising
  - Too complex for average sailor, game is out of reach
  - Not enough one-design sailing
  - Too much one-design sailing
  - *Unfair handicap ratings, too biased in favor of some boat types*
- Fleets declining for race organizers, difficult to organize classes of diverse boat types

US Offshore Sailing – what are the problems?

- Too many rating rule options in the US – why?

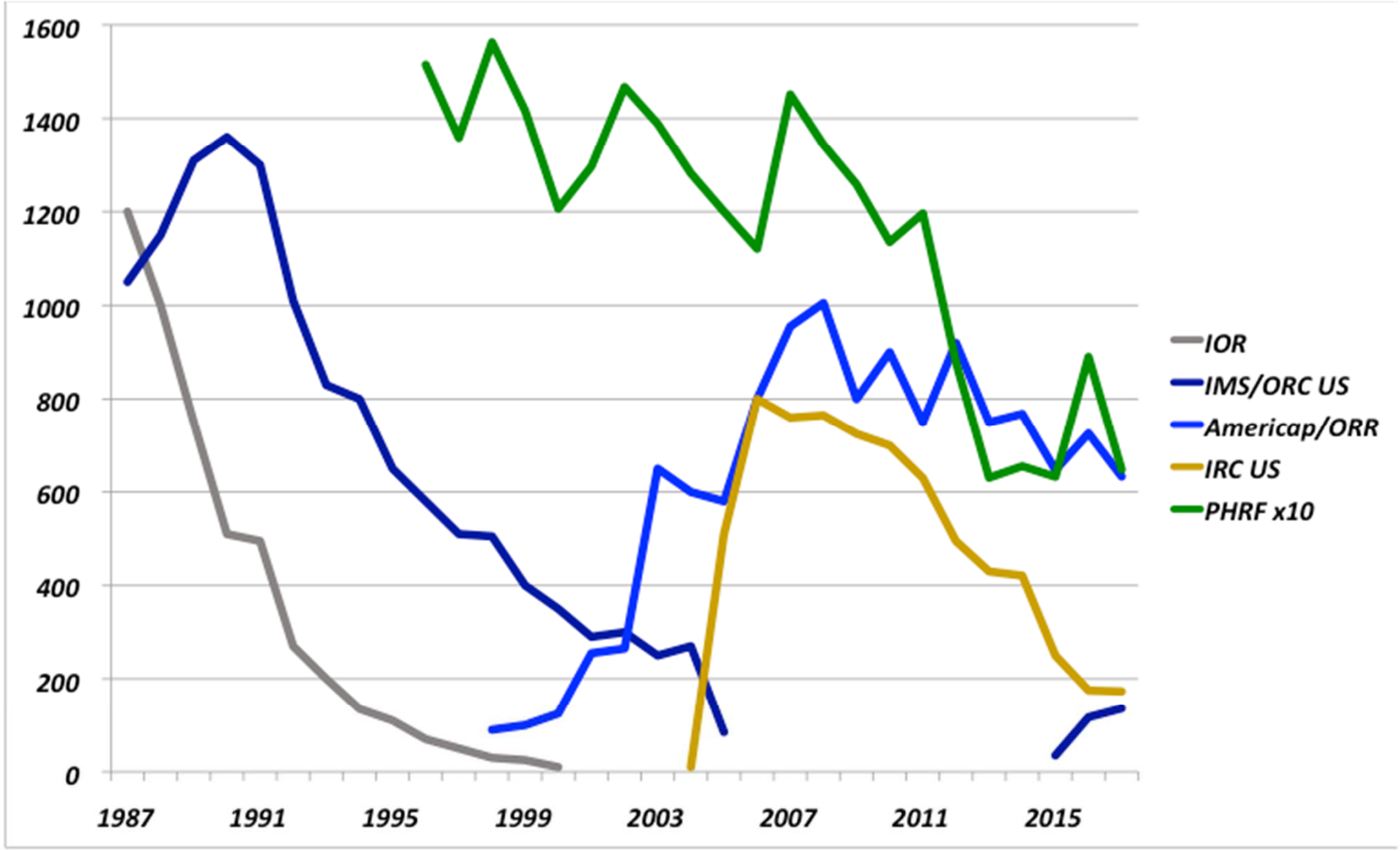
PHRF

IRC

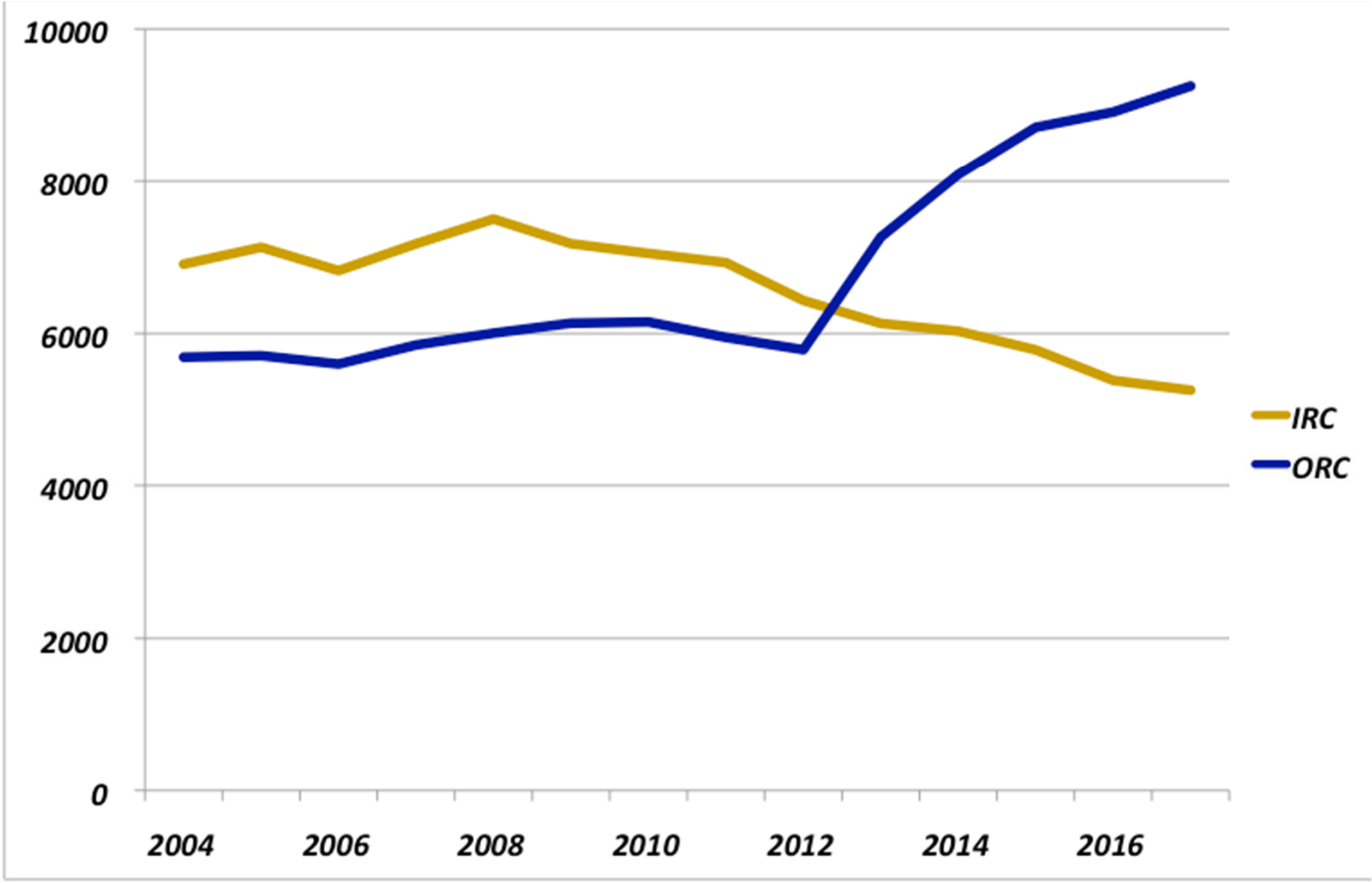
ORR
OFFSHORE RACING RULE

ORC
World Leader in Rating Technology

Rating rules statistics - USA



Rating rules statistics - World



Handicapping Rules

- MEASUREMENT RULES – Predict boat speed using fluid flow equations and boat and rig dimensions as inputs – the output is a VPP that can be converted into a rating for calculating corrected times. Requires either self or a certified measurer to take dimensions.

- EMPIRICAL RULES – Predict boat speed based on actual observed performance and/or simple formulas based on "Brochure" information vs actual measurement. Typically inexpensive but subject to inaccuracies in the brochure and observations as well as local bias.

Three Components of any Rating System:

1. A system for **speed prediction** or a statistical prediction of speed potential based on race result data
2. A **scoring system** that tells how to apply the rating to determine a corrected time
3. A formal document with the **rules, regulations & methodology** (eg, actual VPP formula of method of empirical derivation of the system – if not “secret”)

Features of each system - PHRF

- Local control
- Inexpensive certificates
- Rates any boat
- Simple ratings in ToD or maybe ToT
- Ratings adjust with observed performance and appeals
- Inconsistent ratings across fleets
- New or unusual designs have no data
- Often single number rating for all races
- Volunteer staff support

Features of each system - IRC

- International system, rates most boat types
- Simple ratings, ToT only
- Measurement-based, central processing, no appeals
- Professional staff support
- Secret unpublished rule formulations, no cert copies available to public w/o payment
- Single rating for all race types -> typeforming bias
- Processing not local, certificates expensive
- Measurements can be costly
- Trial certificates expensive and max 6/year

Features of each system - ORR

- Measurement-based, rates most boat types, no appeals*
- Certs processed by US Sailing
- Objective, VPP-based so multiple rating options
- Multiple rating options (eg, course and wind mix variations)
- Professional staff support
- Certificates expensive
- Secret unpublished rule formulations
- Trial certificates expensive ($200-1200) and max 12/year
- No online access to certificate copies
- Need for offset files, so <5% measurements could be costly
- Used in USA and MEX

*except for ORR-EZ

ORR
OFFSHORE RACING RULE

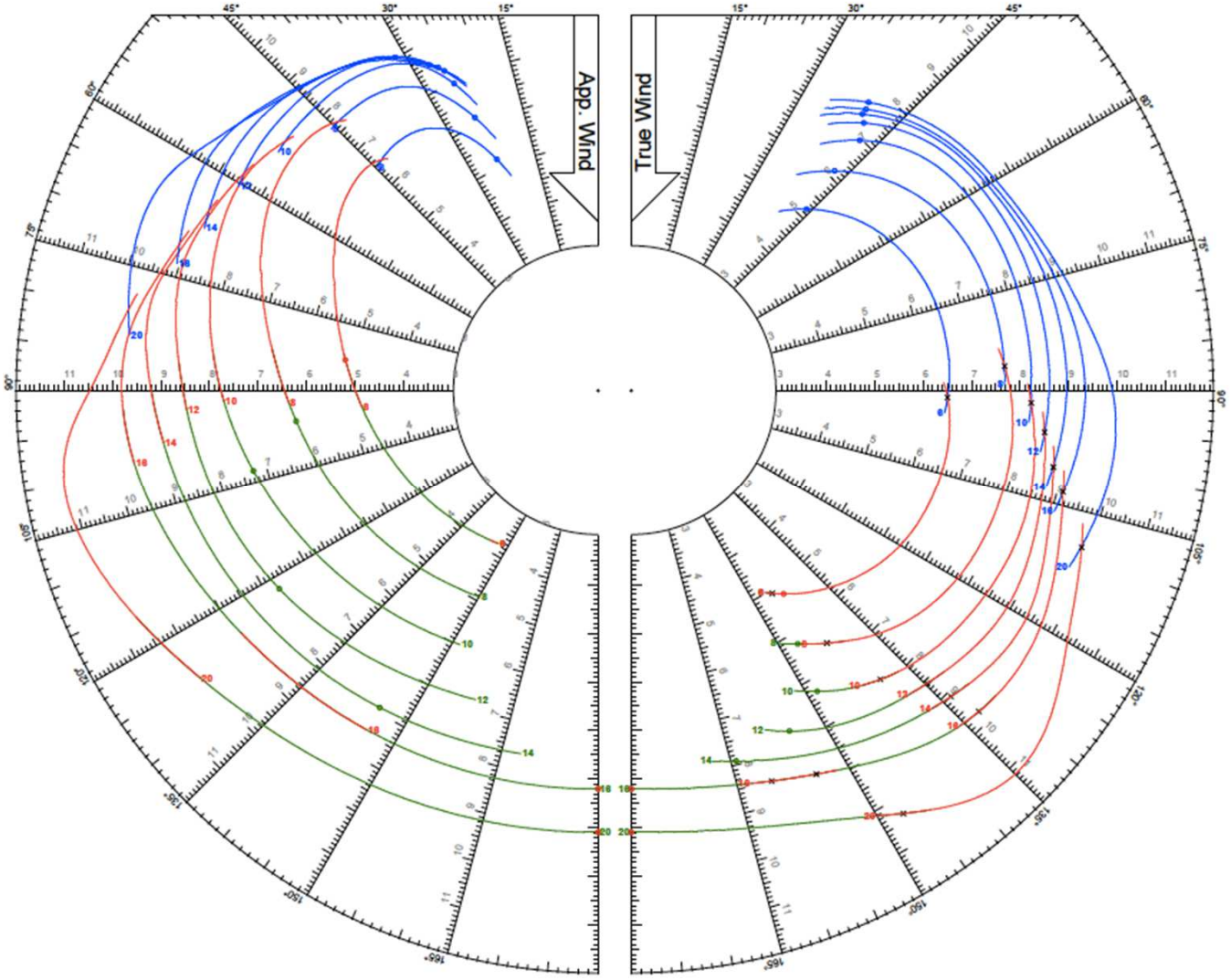
Features of each system - ORC

- International system, rates any boat, continually developed
- Measurement-based, certs processed by US Sailing, no appeals
- Objective, VPP-based so multiple rating options ToT or ToD
- Published transparent rule, all certificates public
- Unlimited test certificates, only $12/each
- Software provided for VPP and scoring
- Professional staff support
- Certificates expensive (ORCi)…or not (Club)
- Need for offset files, so <5% measurements might be costly

ORC
World Leader in Rating Technology ®

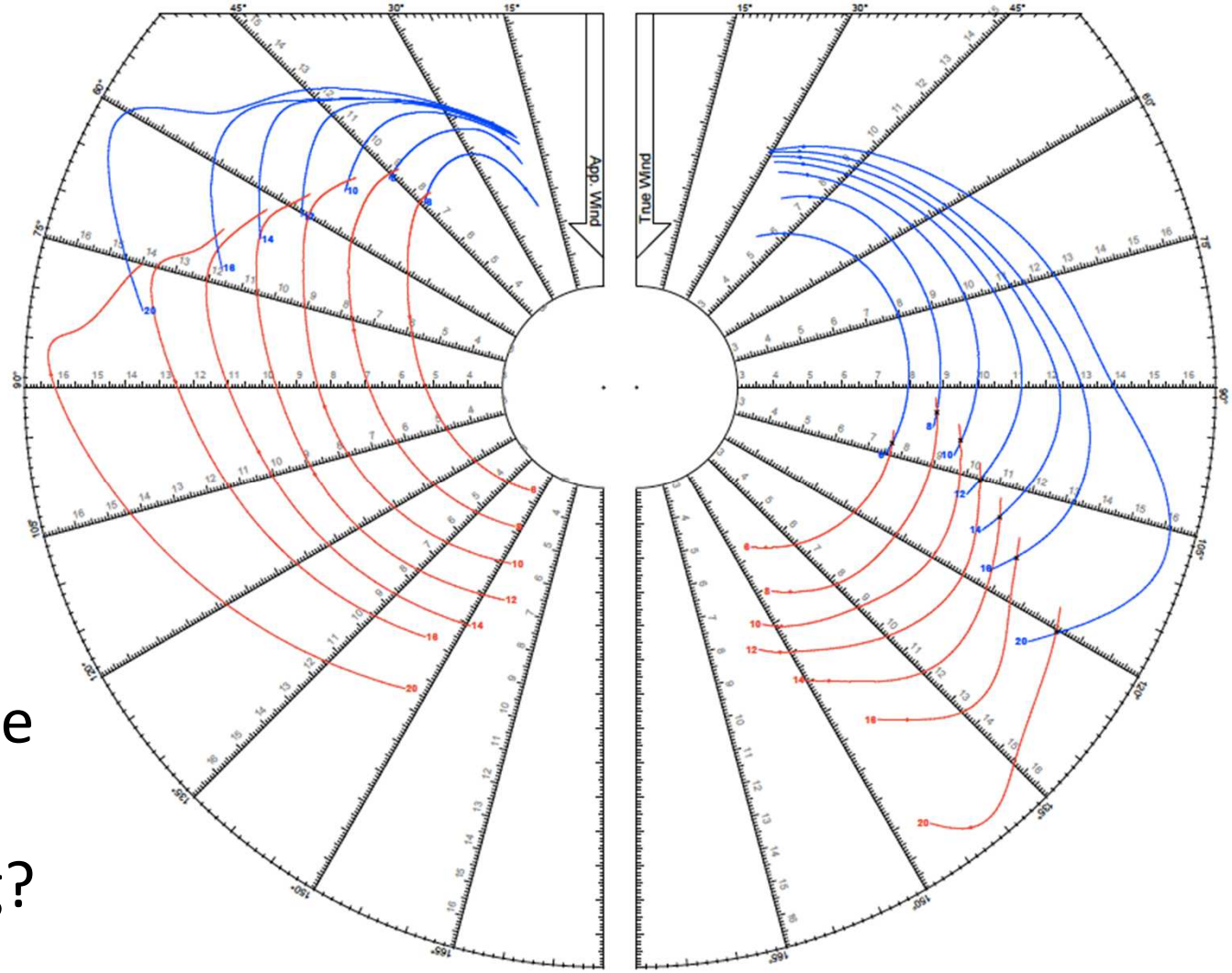
Performance prediction – typical R/C

XP 44 RIVAL



Performance prediction – race boat

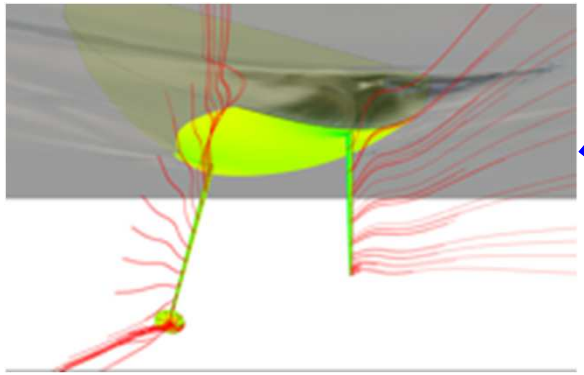
Botin 44 INTERLODGE



Are we sure we want a single number rating?

VPP rules – how do they work?

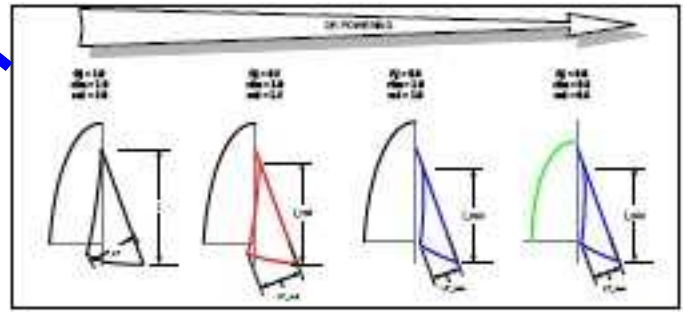
Drag force: hull, keel



Heeling force

VPP:

Drive force: Sails

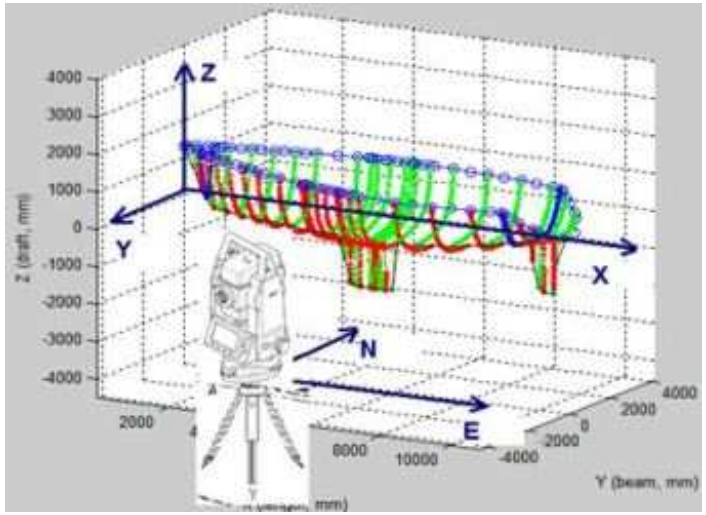


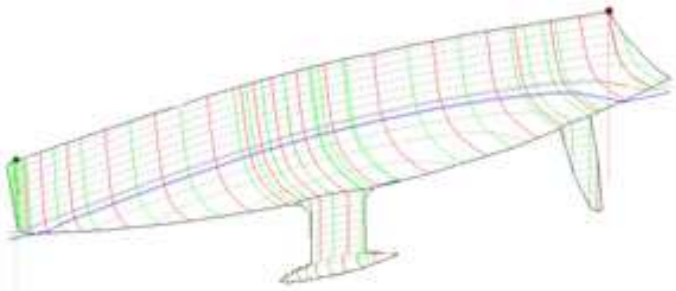
Stability force

Balance of forces

VPP rules – need measurements

Hull – measured or designer-provided

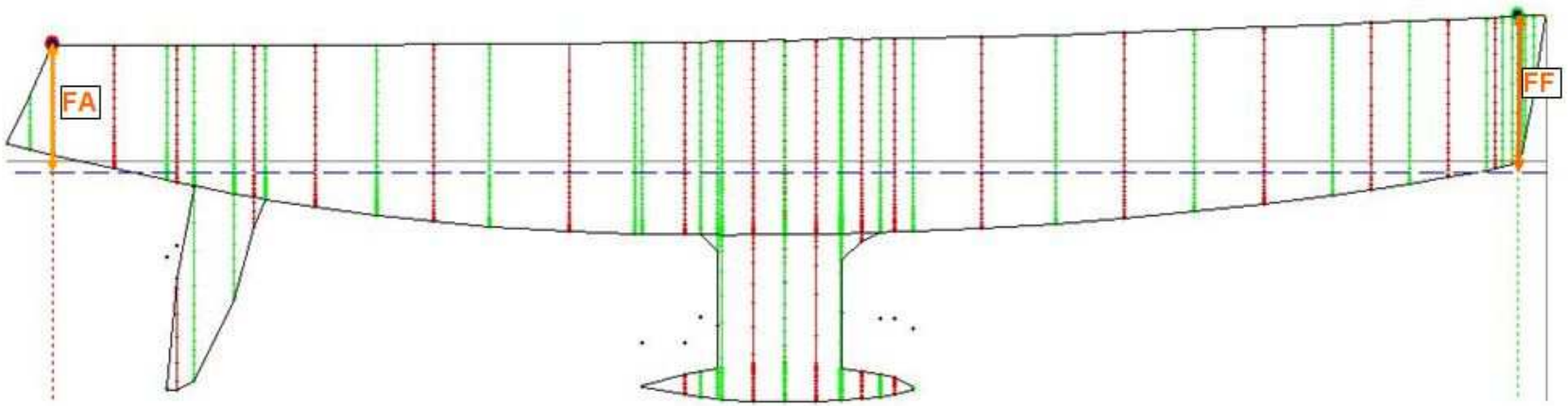




VPP rules – need measurements

Freeboards

- With hull Offset file, is used to calculate DSPL rather than crane scale weighing boat
- 1000's of OFF files in ORC/US Sailing database
- New or unusual boats may need to search for design files w/help from ORC or US Sailing

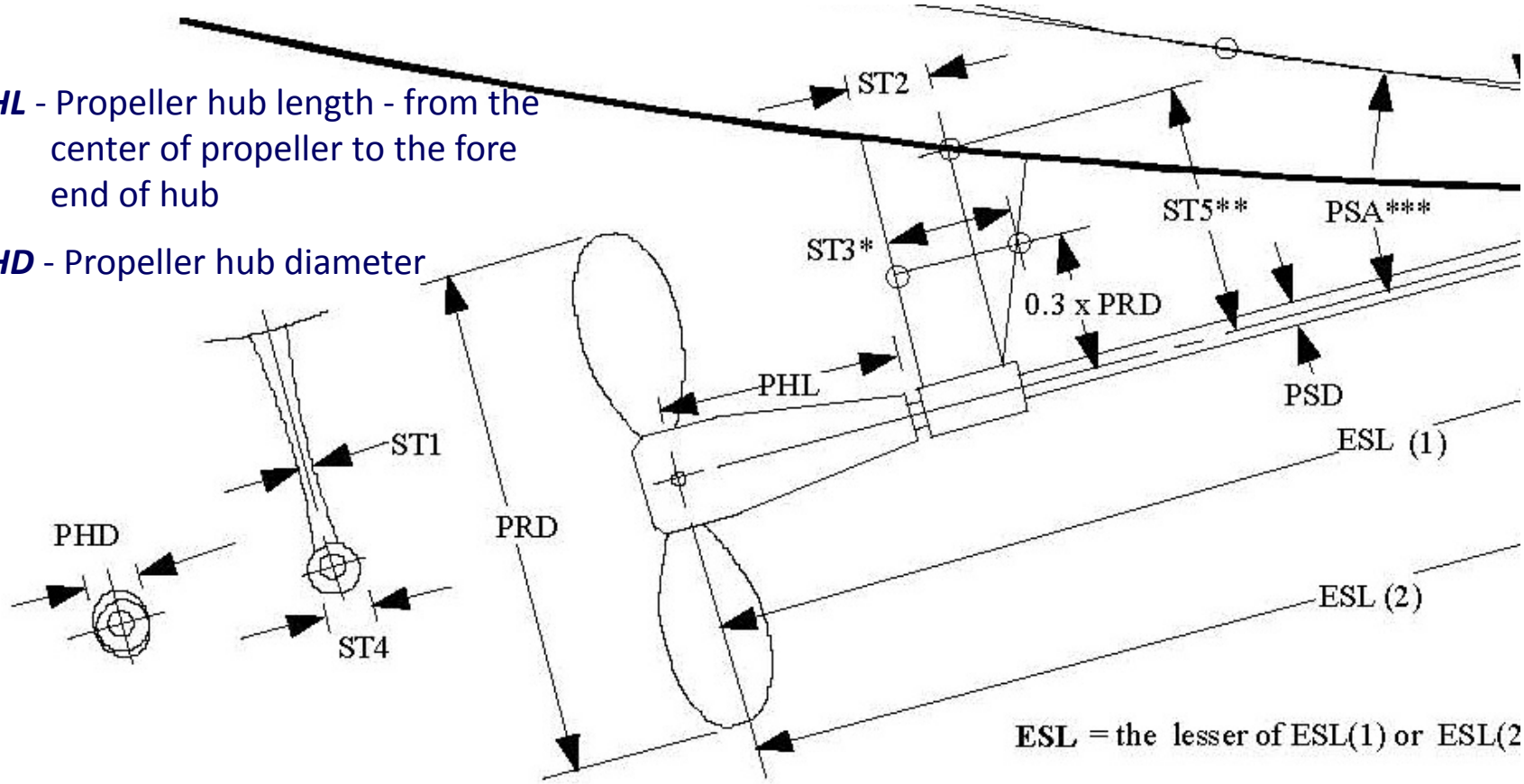


VPP rules – need measurements

Propeller – Hub dimensions

PHL - Propeller hub length - from the center of propeller to the fore end of hub

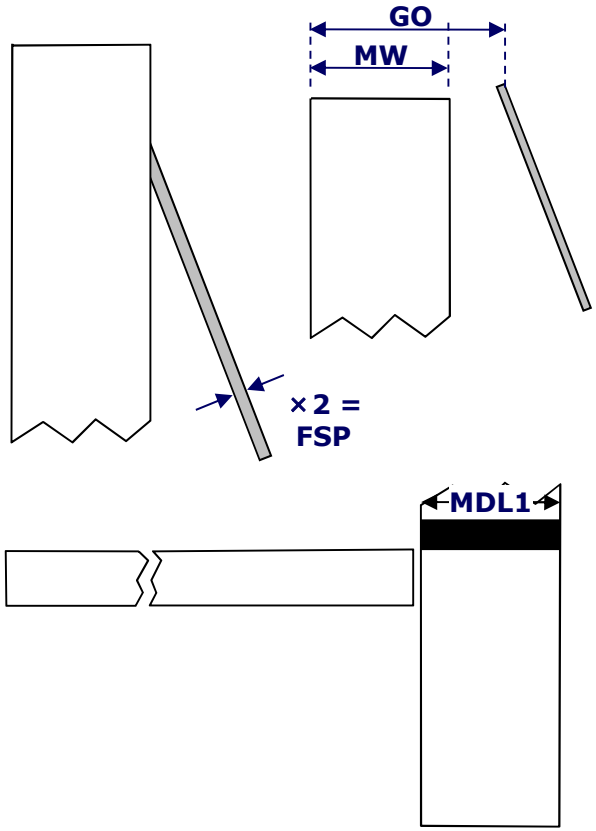
PHD - Propeller hub diameter

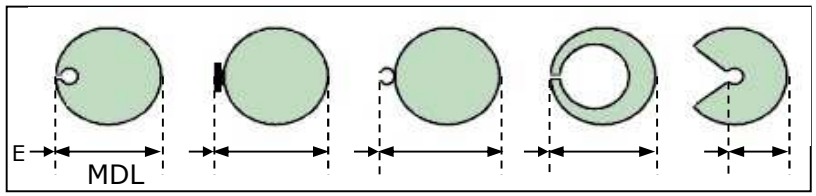


VPP rules – need measurements

- **MDL1** - maximum longitudinal mast cross section above 0.5·P from the lower black band
- **MDT1** - maximum transverse mast cross section above 0.5·P from the lower black band
- **MDL2** - minimum longitudinal mast cross section below the upper black band
- **MDT2** - minimum transverse mast cross section below the upper black band
- **TL** - distance from the point where the mast begins to taper to the upper black band
- **MW** - longitudinal mast cross section at the forestay's upper rigging point
- **GO** - longitudinal distance from forestay's upper rigging point to the aft side of the mast
- **FSP** - twice the maximum cross section of the forestay (if the forestay is wire, then FSP=0)

Rig – Mast profiles





Sail & rig measurements

Important for determining drive & heel forces in the VPP

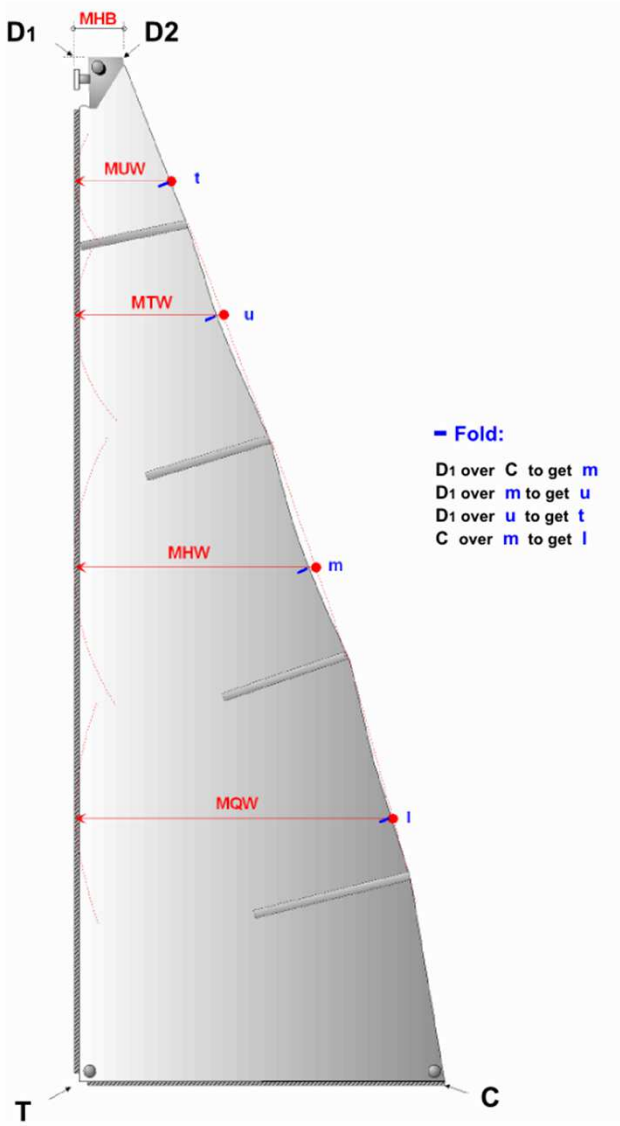
Sails – Mainsail and mizzen

Mainsail measurements

- **MHB:** headboard (head to aft head)
- **MUW:** from 7/8 of leech perpendicular to luff
- **MTW:** from 3/4 of leech perpendicular to luff
- **MHW:** from 1/2 of leech perpendicular to luff
- **MQW:** from 1/4 of leech perpendicular to luff

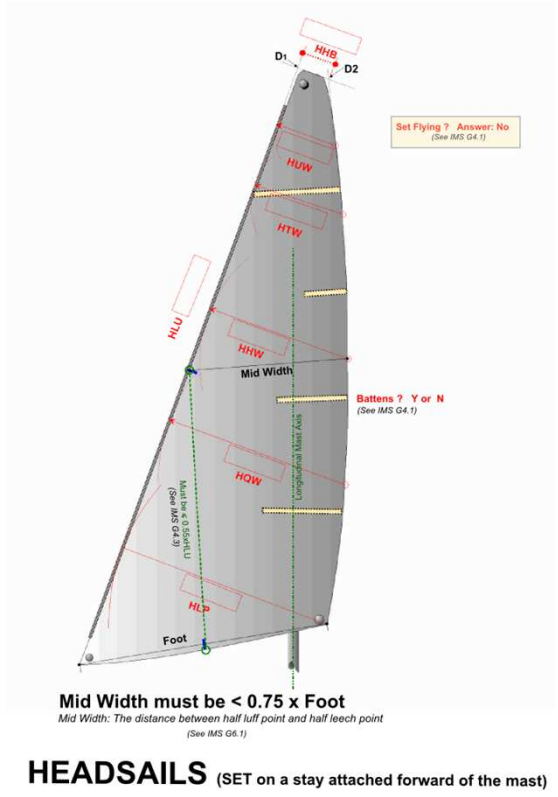
ORC	measurer: nr.	MNA
d / m / y	SIGNED:	
MHB	MHW	
MUW	MQW	
MTW		

Measurement stamp (usually at the head)

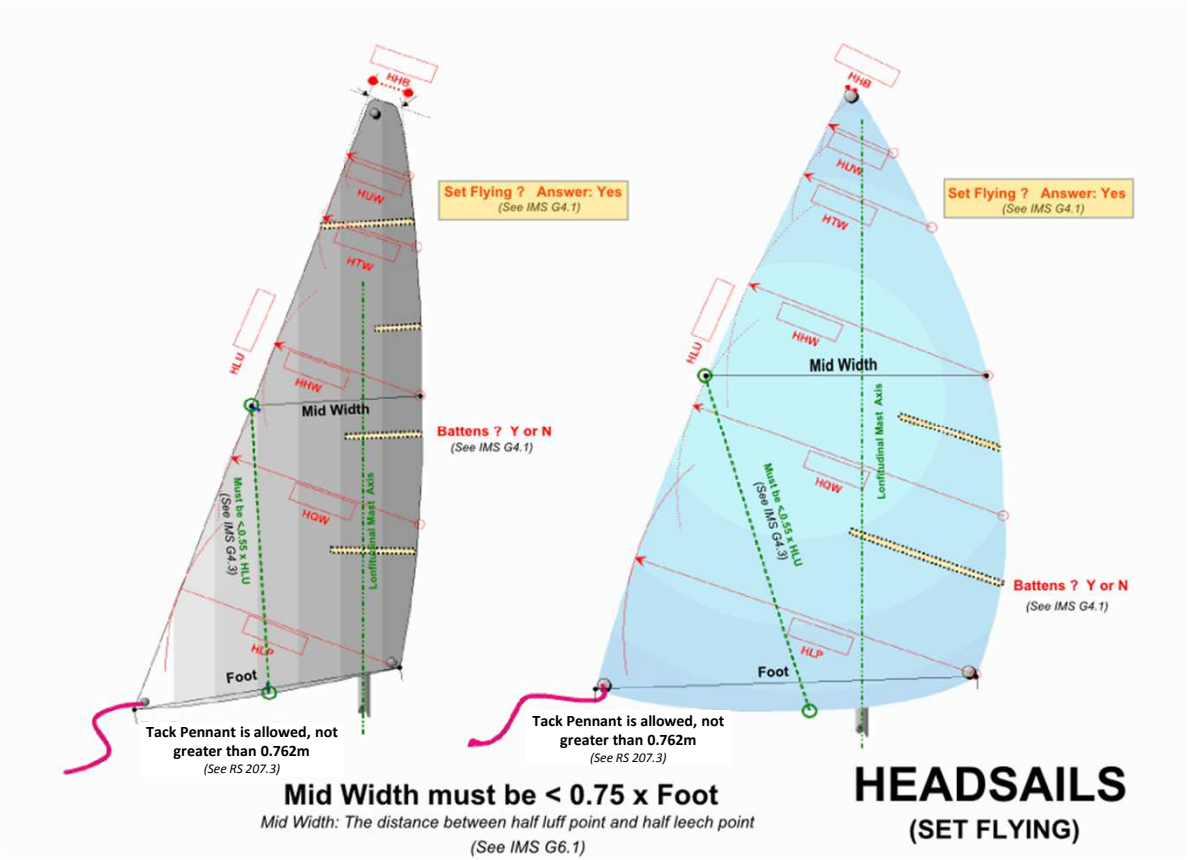


Sails – Headsails

- **Mid width** shall be less than 75% of the **foot length**.
- Headsails can be set **on the forestay** or **set flying**.
- Headsails may have battens.



HEADSAILS (SET on a stay attached forward of the mast)



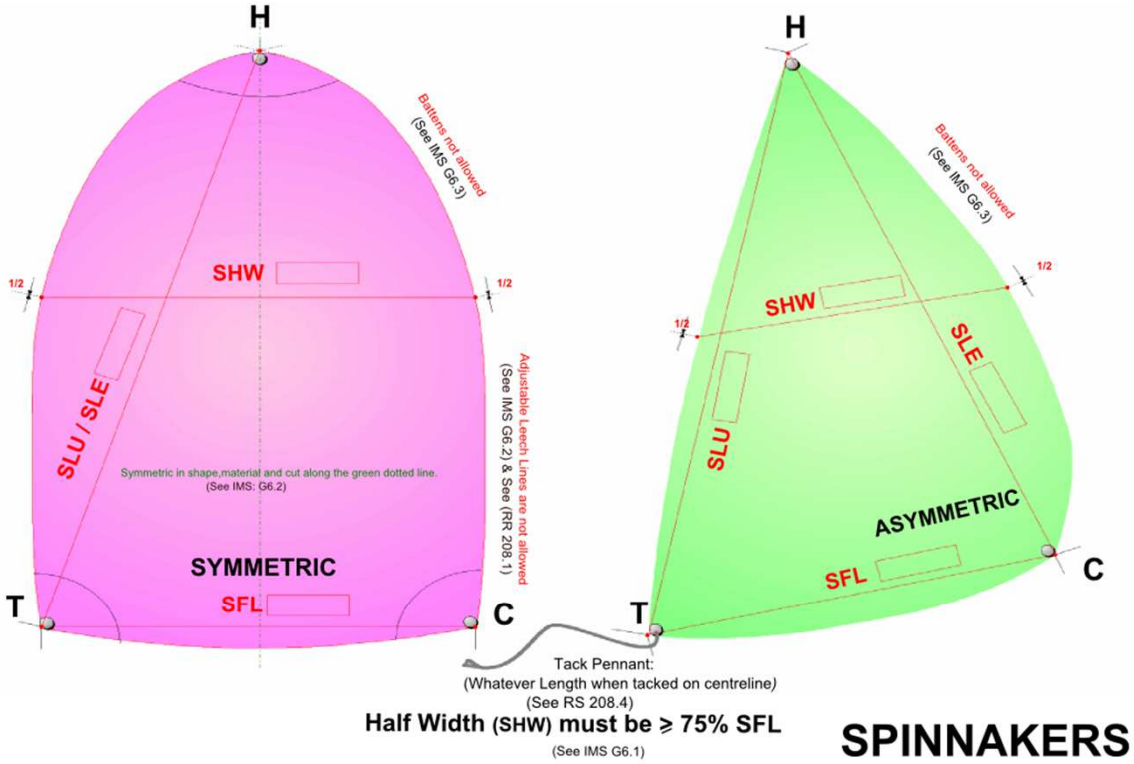
Sails – Spinnakers

- **Symmetric spinnaker**
  Symmetric in shape, material and cut

  SHW ≥ 75%·SFL

- **Asymmetric spinnaker**
  A spinnaker which is not symmetric

  SHW ≥ 75%·SFL



Accommodation, subjective elements

Typical Cruiser/Racer boat

Typical Performance boat

Measurements: who does this?

Uhh…not many – only 10 certified in the US…

but:

- increasing demand for local ORC Club
- start of US Sailing ‘associate measurer’ training program
- training can lead to full certification for ORCi and ORR certificates

Measurements: are they necessary?

Maybe not: eg, ORC Club ($100)

- Declared measurements from designer, builder, sistership data (eg, Sailboatdata.com)
- ORC Sailor Services database
- Measurer inputs
- Sail Measurements (req'd for all)
- Principle: the more measurements, the more accurate (ie, better) rating because defaults are always conservative…eg, J/120's: w/o freeboard measures lightest default is chosen due to 100's kg variations

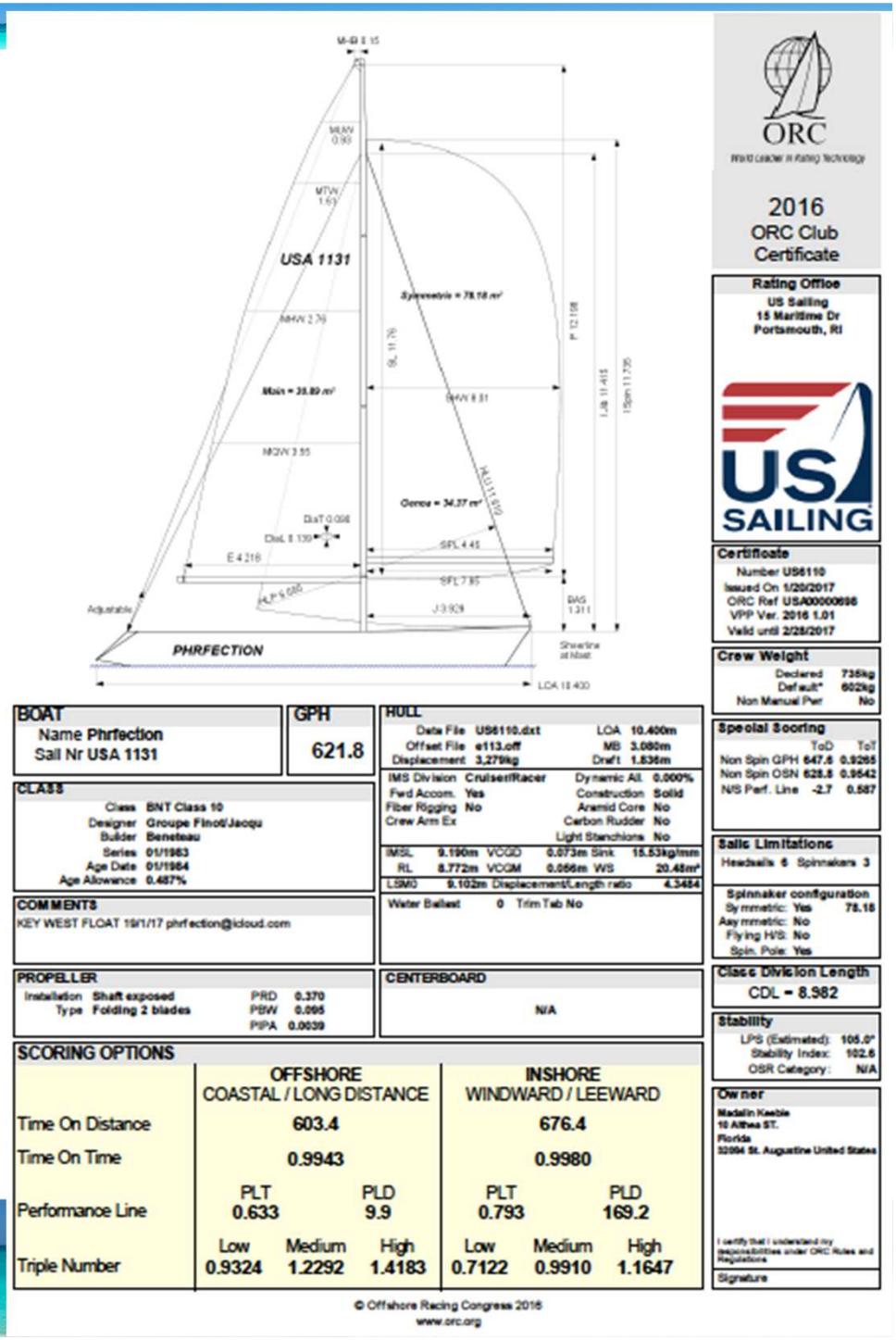
US Sailing certification process

UMS database -> UCS

- Submit Request for Rating online
- Prompt for more information
- Data selected for source type: Measurer needed for ORR and ORCi, ORC Club, IRC endorsed
- Club measurer or owner for ORC Club, some ORR and IRC standard certs

US Sailing certificate:

- Measurements
- Scale drawing
- Rating options
- Available online at www.orc.org/sailorservices



Rating certificate -> Scoring Options

Race managers: when to use each?

SCORING OPTIONS						
	COASTAL / LONG DISTANCE			WINDWARD / LEEWARD		
Time On Distance	613.3			702.5		
Time On Time	0.9784			0.9609		
Triple Number	Low	Medium	High	Low	Medium	High
Time on Distance	730.5	562.5	471.2	947.1	710.5	597.2
Time on Time	0.9240	1.2000	1.4324	0.7127	0.9501	1.1303

Scoring software: options

- Simple single number: any
- Triple Number: Yacht Scoring, Regatta Networks, ORC Scorer

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Scratch Sheets

ORC Time Difference Table - Triple Number W/L Low

	Sail no.	Boat name	Boat type	Rating	Elapsed times 1 Min	2 Min	5Min	10 Min	15 Min	20 Min	30 Min	45 Min	60 min
1	USA 60432	Cool Breeze	Mills 43	0.8476	0 : 0	0 : 0	0 : 0	0 : 0	0 : 0	0 : 0	0 : 0	0 : 0	0 : 0
2	USA 71221	Short Bus	Henderson 30	0.8336	0 : 1	0 : 2	0 : 4	0 : 8	0 : 13	0 : 17	0 : 25	0 : 38	0 : 50
3	USA 99	Sitella	XP 44	0.8125	0 : 2	0 : 4	0 : 11	0 : 21	0 : 32	0 : 42	1 : 3	1 : 35	2 : 6
4	USA 12282	Orion	J/122	0.7824	0 : 4	0 : 8	0 : 20	0 : 39	0 : 59	1 : 18	1 : 57	2 : 56	3 : 55
5	USA 74	Second Star	J/122	0.7813	0 : 4	0 : 8	0 : 20	0 : 40	0 : 60	1 : 20	1 : 59	2 : 59	3 : 59
6	GBR 5598T	Kenai	J/44	0.7795	0 : 4	0 : 8	0 : 20	0 : 41	1 : 1	1 : 22	2 : 3	3 : 4	4 : 5
7	USA 998	High Noise	Italia 9.98	0.7194	0 : 8	0 : 15	0 : 38	1 : 17	1 : 55	2 : 34	3 : 51	5 : 46	7 : 42
8	USA 1131	Phrfection	Beneteau First 10	0.7154	0 : 8	0 : 16	0 : 40	1 : 19	1 : 59	2 : 39	3 : 58	5 : 57	7 : 56
9	USA 673	The Asylum	J/105	0.7143	0 : 8	0 : 16	0 : 40	1 : 20	1 : 60	2 : 40	3 : 60	5 : 60	7 : 60

NOTE: Times are approximate and to be used for reference only!

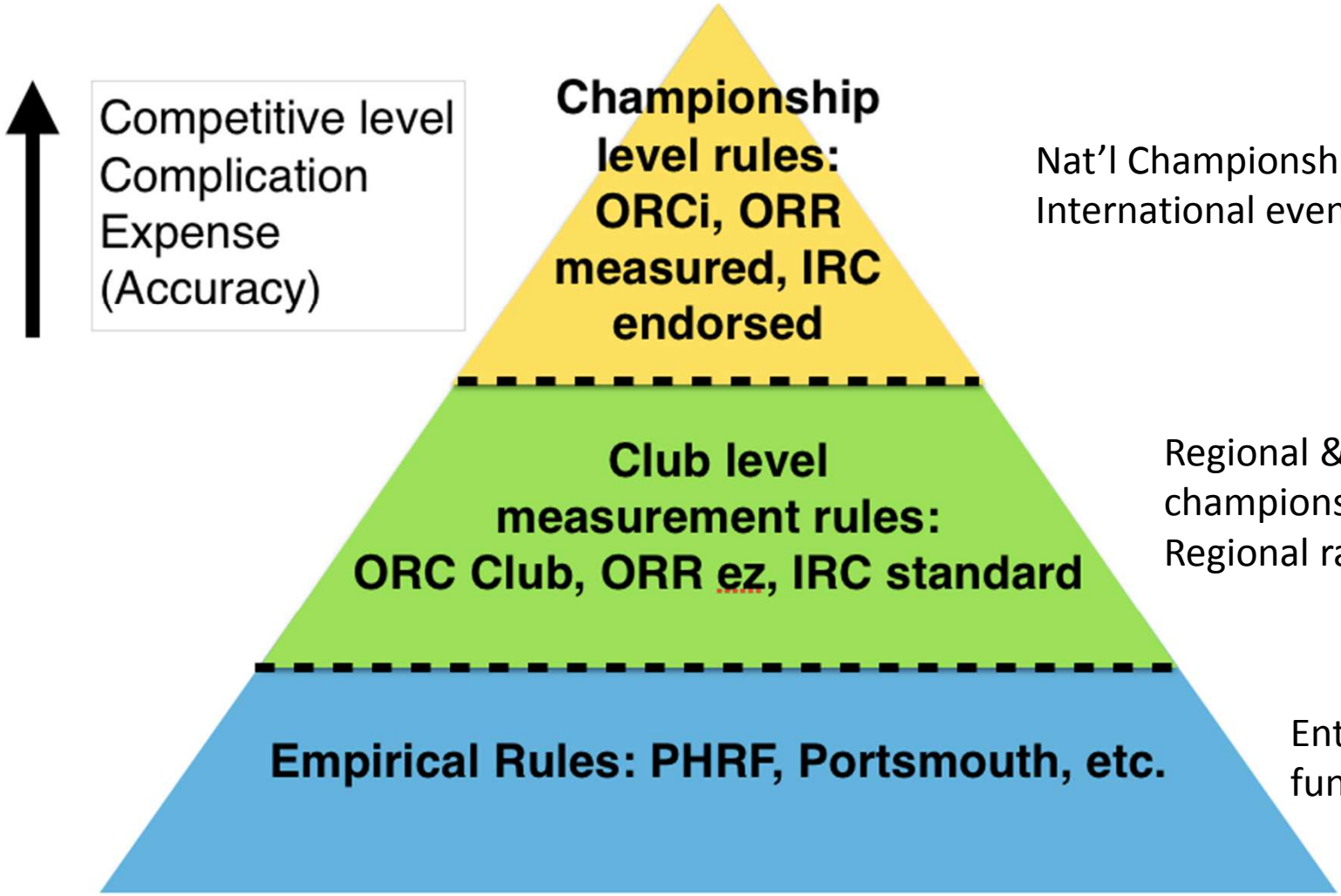
Close Results

Yacht Name	Yacht Design	Owner/Skipper	Elapsed Time	Corrected Time	Class
Racing					
Cool Breeze	Mills 43 Custom	John Cooper	0:00:57:27	0:00:48:42	**1**
Second Star	J 122	J.D. Hill	0:01:04:06	0:00:50:05	**2.5**
High Noise	Italia Yachts 9.98	Alex Sastre	0:01:09:37	0:00:50:05	**2.5**
Kenai	J 44	Chris and Karen Lewis	0:01:05:07	0:00:50:46	**4**
Sitella	XP44	Ian Hill	0:01:02:53	0:00:51:06	**5**
Short Bus	Henderson 30	Hawk Caldwell	0:01:08:32	0:00:57:08	**6**
Phrfection	Beneteau First 10	Madalin Keeble	0:01:20:26	0:00:57:17	**7**
The Asylum	J 105	Jon Weglarz	0:01:20:21	0:00:57:24	**8**
Orion	J 122	Paul Milo			**10**

Other US events and fleets adopted ORC Club from PHRF

- Harvest Moon Regatta, Lakewood YC, TX
- BBYRA, Miami, FL
- Sperry Charleston Race Week, SC
- Annapolis YC, Governor's Cup, Down Bay Race, STC Fall Regatta
- Bermuda Ocean Race (Annapolis > Bermuda)
- Block Island Race Week, RI
- NYYC Annual & Rolex Race Week, Newport, RI
- NOOD's: St Pete, San Diego
- Seattle YC
- Canada: Vancouver, BC: Vic-Maui Race & VARC races

Pyramid of Competition



Nat'l Championships, International events

Regional & Club championships, Regional races

Entry-level fun races

Pathway to use of measurement rules:

1. Get consensus among sailors, RC and clubs that a measured, objective (and transparent?) system is desired
2. Identify a local leader to advocate and educate on steps needed to help the fleet gather boat and sail measurement data with help from US Sailing (or ORC)
3. If desired, ask US Sailing to conduct a measurer training seminar
4. With basic data, go to Request for Rating website: www.ussailing.org/racing/offshore-big-boats/request-for-rating.
5. Get sail measurements from sail makers for largest Headsail, Main and largest Spinnaker
6. Review other inputs to rating application: rig, sail configuration, max crew weight, propeller type, etc
7. Review certificate data from US Sailing to be correct
8. Submit to race organizers for racing
9. Race organizers: review ORC Race Management Guide (coming soon online at www.orc.org) for scoring guidelines

Bottom line: are the sailors satisfied they won using a system that is fair and transparent?

For more information and help:

US Sailing: offshore@ussailing.org

ORC, Dobbs Davis: dobbs@orc.org

IRC: info@rorcrating.com

ORR: info@offshoreracingrule.org

PHRF: PHRF@ussailing.org

Thanks and Good Luck with your fleet!

Your Opinion Matters

Please open the Sailing Leadership Forum app and complete the session survey found in the menu bar for a chance to win a free drink ticket!

Thank you for attending this session

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