

Randy Goodman

Fleet Captain of Tidewater Region
of the

**Chesapeake Racer Cruiser
Association
(CRCA)**

CRCA is a user of the ORA Rating System

ORR-EZ

ORA-1

Randy Goodman

Fleet Captain of USCGC

**Chesapeake Bay Rowing Association
(CRCA)**
Cruiser

Plankowner

CRCA is a user of the ORA Rating System

ORR-EZ

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Comparing PHRF and VPP / ORA Ratings

Performance Handicap Racing Fleet (PHRF)

Velocity Performance Program (VPP) ... an algorithm
Offshore Racing Association (ORA)

Yacht Racing Handicap Systems

Allow dissimilar sailboats to Fairly race against each other

Using a system or methodology that

- Cancels out inherent advantages and disadvantages of each boat**

- Reflects crew skill rather than equipment superiority**

Major Rating Systems Used by Club Racers in the US for Big Boats

- **PHRF** - Performance Handicap Racing Fleet
- Velocity Performance Program (**VPP**) Based Rating Systems
 - **ORR** - Offshore Racing Rule
 - Rating System used by **Chesapeake Racer Cruiser Assn (CRCA)**
 - **ORC** - Offshore Racing Congress

VALID CERTIFICATE - PHRF of the Chesapeake, Inc.

Fleet	Sec / Mile	Exp. Code	Year	Num Boats
SABRE 38-2				
CHESAPEAKE	117	A	00	1
EAST LONG ISLAND	114	C	07	1
EASTERN CONN	114	C	05	1
GALVESTON BAY	111	B	99	0
LAKE ERIE	117	B	05	1
LAKE MICHIGAN	111	A	06	0
MID ATLANTIC	114	C	01	0
NARRAGANSETT BAY	117	A	96	1
NEW ENGLAND	114	C	99	1
NO CALIFORNIA	114	C	09	2
YRALIS-PHRF	117	B	05	0

SABRE 38-2 CB				
CHESAPEAKE	126	B	08	5
DETROIT	120	A	02	0
FLORIDA SUNCOAST	120	A	98	0
LAKE ERIE	123	B	06	1
MID ATLANTIC	123	C	02	3
NARRAGANSETT BAY	126	A	95	1
NEW ENGLAND	123	C	99	0
NORTH CAROLINA	123	A	08	0
SOUTH BAY CR	123	B	08	1
YRALIS-PHRF	126	B	05	0

SABRE 38-2 WK				
CHESAPEAKE	126	B	08	3
YRALIS-PHRF	126	C	01	0

RATING (Spin/NS):	138 / 138	CR Course RATING (Spin/NS):	138 / 138	Valid Date:	2020-09-25	
Sail #:	174	Equipment Category:		Certificate Invalid After:	2021-04-01	
Boat Name:	RED FROG			CBYRA #:		
Type/Model:	Sabre 38-2 WK		Max Crew:	11	Club:	BBSA
Owner/Skipper:	E. Randy Goodman		Home Phone:			
Address:	Virginia Beach, VA 23452-		Work Phone:			
			Cell Phone:			
			Email:			
Hull/Rig Dimensions			Rating Criteria			
Designer: Roger Hewson Year: 1990 Hull: 174			Base for this Model/Class is: 126			
LOA: 38' 8" Draft/Up: 4' 11"/4' 11" HB: -			Mast Ht: 0			
LWL: 31' 5" I: 49' 9" MGT: -			Rig: Aluminum/Masthead 0			
BEAM: 12' 4" J: 14' 6" MGU: -			Genoa Overlap: 135 % LP 3			
DISP: 16900 P2: P: 43' 6" MGM: -			RF Headsails/Drum: Yes/Above deck 9			
BAL: 6600 E2: E: 15' 1" MGL: -			Spin Pole: 0			
Sails/Rig			Sym Spin Size/Hoist: 0			
Main battens: 4 None 7			Asym Spin Size/Hoist: 0			
Genoa LP: 135 % LP None 155%			Engine: Inboard 0			
SS Pole (WKPL): None 14' 6"			Prop: 0			
SS hoist (IS): None 49' 9"			Keel: Wing/Spade 0			
SS girth (G): None 26' 1"			Rudder: 0			
SS luff (SL): None 49' 3"			Major Mods: 0			
AS hoist (I2): None 49' 9"			Handicapper Adj: 0 Main Furling: 0			
AS pole/sprit (BS): None 14' 6"			NS Adjust: 0 O.S. Spin Pole Luff: 0			
AS luff (ALU): None 0' 0"			SS/AS Adjust: 0 O.S. Spin Pole Girth: 0			
AS foot (AF): None 0' 0"			Carbon: 0 Random Leg: 0			
AS girth (AMG): 25' 2" None			O.S. Spin Pole: 0 Random Leg - NS: 0			
AS leech (ALE): None 51' 10"						
Code 0 luff: None None			* Adjustments show rating criteria's cumulative effect on the BRTG. Handicapper evaluation and adjustment may be necessary to correct some ratings. All adjustments will be reevaluated with any change to the hull, rig or sails that effect the rating criteria values above.			
Code 0 foot: None None						
Code 0 girth: 50-75% of foot						
Code 0 leech: None None						
UW SA/D	DW NS	DW SS	DW AS	D/LWL		
16.70	32.55	7.96	7.96	243.31		
History/Comments						

VALID CERTIFICATE - PHRF of the Chesapeake, Inc.

RATING (Non-Spin):	186	CR Course RATING (Non-Spin):	186	Valid Date:	2020-09-12
Sail #:	TBD	Equipment Category:	NS	Certificate Invalid After:	2022-04-01
Boat Name:	ASPIRE			CBYRA #:	
Type/Model:	IRWIN 44 CC		Max Crew:	13	Club: BBSA

Owner/Skipper: Claude Speed Address: Norfolk, VA 23503	Home Phone: Work Phone: PRIVATE CONTACT INFORMATION NOT AVAILABLE ON THE PUBLIC VERSION OF CERTIFICATES Cell Phone: Email:
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Hull/Rig Dimensions	Rating Criteria	Adjustment *
Designer: Irwin Year: 1988 Hull:933386	Base for this Model/Class is:	162
LOA: 43.50' Draft/Up: 4.83'/ HB: -	Mast Ht:	0
LWL: 35.67' I: 50.00' MGT: -	Rig: Aluminum/	0
BEAM:13.33' J: MGU: -	Genoa Overlap: 135 % LP	3
DISP: 25000 P2: P: 44.50' MGM: -	RF Headsails/Drum: Yes/Above deck	9
BAL: 8000 E2: E: 15.50' MGL: -	Spin Pole:	0

Sails/Rig	Value	PHRF Min	PHRF Max		Adjustment *
Main battens:	3	None	7	Sym Spin Size/Hoist:	0
Genoa LP:	135 % LP	None	155%	Asym Spin Size/Hoist:	0
SS Pole (WKPL):		None		Engine: Inboard	0
SS hoist (IS):		None	50.00'	Prop:	12
SS girth (G):		None		Keel: Fin/Skeg	0
SS luff (SL):		None	47.50'	Rudder:	0
AS hoist (I2):		None	50.00'	Major Mods:	0
AS pole/sprit (BS):		None		Handicapper Adj: 0 Main Furling:	0
AS luff (ALU):		None		NS Adjust: 0 O.S. Spin Pole Luff:	0
AS foot (AF):		None		SS/AS Adjust: 0 O.S. Spin Pole Girth:	0
AS girth (AMG):		None	None	Carbon: 0 Random Leg:	0
AS leech (ALE):		None	50.00'	O.S. Spin Pole: 0 Random Leg - NS:	0

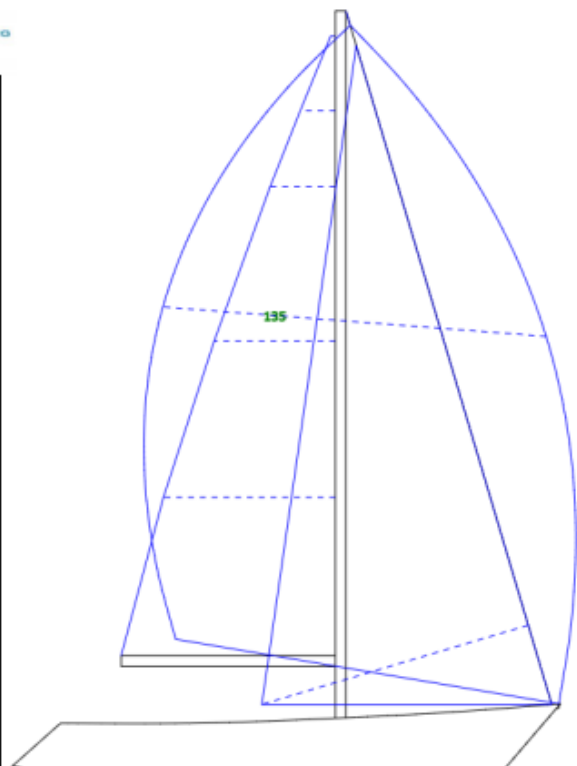
* Adjustments show rating criteria's cumulative effect on the BRTG. Handicapper evaluation and adjustment may be necessary to correct some ratings. All adjustments will be reevaluated

2020 ORR-Ez Cert

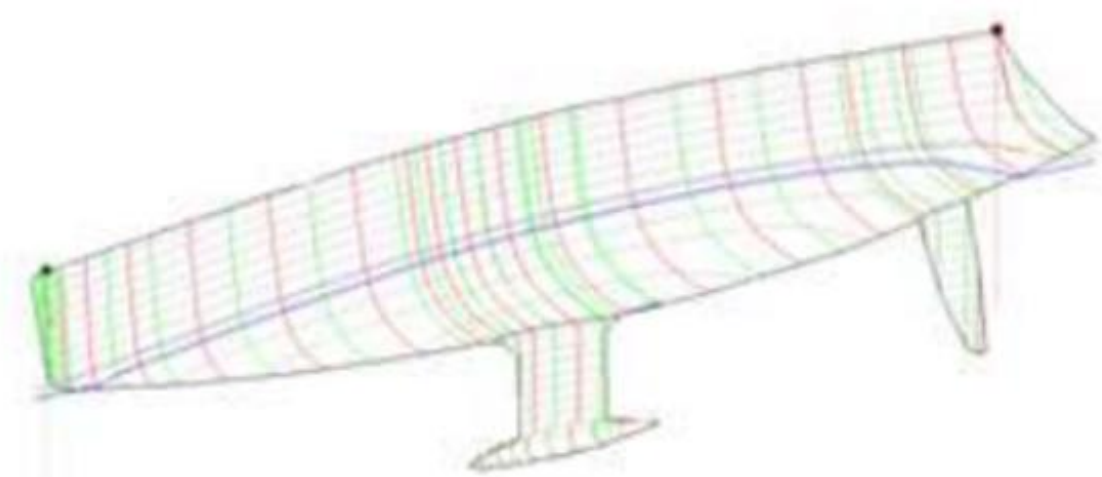
Sails drawn in RED are based on Default Values



Yacht Name:	Red Frog
Class:	Sabre 38-2 WK
Sail Number:	135
Builder:	SABRE
Owner(s):	Edward Goodman
Configuration:	
Certificate #:	EZ10776
Issue Date:	2020-03-25
Valid Year:	2020
Offsets file:	SBR382WK_JT.OFF
Cert Group:	ORR-Ez MIDATL
Rig Type:	Sloop
Forestay:	Masthead
Keel Type:	Wing
Prop Type:	Feathering
Prop Install:	Exposed
Prop Blades:	3
Spinnaker:	Asymmetrical tacked centerline on bow, sprit or prod
Genoa/Jib Leech:	No Roach - Leech is straight
Large Roach Headsail:	No
Jib Furler:	Yes Above Deck
Main Roller Furling:	No
LOA:	38.67 ft
LWL:	31.42 ft
Rated Length:	33.25 ft
Beam Max:	12.25 ft
Draft:	5.02 ft
Disp Empty:	17690 lbs
Disp Sailing:	19447 lbs
Crew:	1477 lbs
Water Ballast:	0 lbs
Wetted Area:	333.4 ft²
LPS:	113.1 deg.
RM20:	957.0 ft-lbs
Stab Index:	118 deg.
Upwind SA/D:	18.68
DL Length:	236
Dnwind SA/D:	32.58

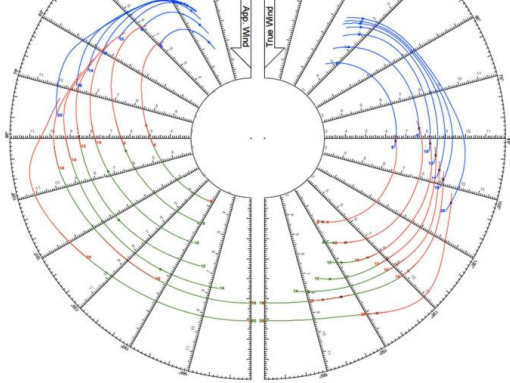


Rig Dimensions	Jib/Genoa Meas.	Asymmetric Spin. Meas.	Mainsail Meas.
IG: 49.75 ft	LP: 19.57 ft	ASLU: 51.82 ft	HB: 0.33 ft
ISP: 49.75 ft	LPG %: 135.0 %	ASLE: 46.88 ft	MGT: 2.46 ft
J: 14.50 ft	J Luff: 49.21 ft	AMG: 26.99 ft	MGM: 4.59 ft
P: 43.60 ft	Area: 481.7 ft²	ASF: 26.99 ft	MGM: 8.53 ft
E: 15.06 ft		Area: 1109.9 ft²	MGL: 12.10 ft
TPS: 15.00 ft			Area: 362.4 ft²



	TOT (Spin)				TOT (Non-Spin)				TOD (Spin)				TOD (Non-Spin)			
	V.Light	Light	Medium	Heavy	V.Light	Light	Medium	Heavy	V.Light	Light	Medium	Heavy	V.Light	Light	Medium	Heavy
RANDOM LEG	0.361	0.581	0.793	0.933	0.338	0.550	0.763	0.913	1,340.5	832.6	610.9	519.2	1,433.0	880.1	634.6	530.3
Closed Course	TOT (Spin)				TOT (Non-Spin)				TOD (Spin)				TOD (Non-Spin)			
W50/L50	0.339	0.556	0.777	0.940	0.325	0.541	0.770	0.938	1,736.2	1,058.0	756.8	625.6	1,806.9	1,086.0	763.6	626.7
W60/L40	0.344	0.559	0.771	0.917	0.334	0.549	0.767	0.917	1,744.1	1,072.4	777.8	653.8	1,797.7	1,093.3	782.3	653.8
Point to Point	TOT (Spin)				TOT (Non-Spin)				TOD (Spin)				TOD (Non-Spin)			
MOSTLY WW	0.368	0.581	0.762	0.864	0.364	0.576	0.760	0.863	1,638.2	1,039.0	792.2	698.9	1,658.3	1,047.2	794.5	699.4
MOSTLY LW	0.349	0.573	0.798	0.992	0.314	0.529	0.767	0.966	1,370.6	836.3	599.9	482.8	1,523.9	905.6	624.4	495.8

Benchmark Ratings					Custom Ratings	
	TOT (Spin)	TOT (Non-Spin)	TOD (Spin)	TOD (Non-Spin)	TOT (Spin)	
GPH	0.784	0.000	683.6	0.0	Bayview MAC Shore	0.777
IR#	0.784	0.771	685.4	697.7	So Cal Offshore	0.794
					So Cal Offshore Offwind	0.790



Equates to speed (knots)
 2.69 4.32 5.89 6.93 2.51 4.09 5.67 6.79

Standard Ratings																
	TOT (Spin)				TOT (Non-Spin)				TOD (Spin)				TOD (Non-Spin)			
	V.Light	Light	Medium	Heavy	V.Light	Light	Medium	Heavy	V.Light	Light	Medium	Heavy	V.Light	Light	Medium	Heavy
RANDOM LEG	0.361	0.581	0.793	0.933	0.338	0.550	0.763	0.913	1,340.5	832.6	610.9	519.2	1,433.0	880.1	634.6	530.3
Closed Course	TOT (Spin)				TOT (Non-Spin)				TOD (Spin)				TOD (Non-Spin)			
W50/L50	0.339	0.556	0.777	0.940	0.325	0.541	0.770	0.938	1,736.2	1,058.0	756.8	625.6	1,806.9	1,086.0	763.6	626.7
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Point to Point	TOT (Spin)				TOT (Non-Spin)				TOD (Spin)				TOD (Non-Spin)			
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MOSTLY LW	0.349	0.573	0.798	0.992	0.314	0.529	0.767	0.966	1,370.6	836.3	599.9	482.8	1,523.9	905.6	624.4	495.8

2.07 3.40 4.76 7.75 1.99 3.31 4.71 5.74
 Knots

Features of PHRF

- Most widely used sailboat rating system in the US
- Simple and Inexpensive
 - Each Boat has a Single rating for
 - All wind conditions (average performance across all wind speeds)
 - All Points of Sail
 - Owner provided measurements
- Very Easy to Score
 - A single Number based on Spin or Non-Spin
 - Option for Random Circular Course or Windward / Leeward Course for some boats
 - Master rating list online for PHRF of Chesapeake
- Ratings are Locally managed and assigned by Volunteers in a Region (PHRF Rater)
 - PHRF of Chesapeake
 - Each PHRF Region has a slightly different rating system
 - Same boat is rated different in different location
 - Ratings are typically not valid outside of your PHRF Region
- Often Difficult to accurately rate a New design or Unusual boats

Features of a VPP based Rating System

ORA and ORC

- **ORA is fastest growing** rating system in US
 - Predominantly used in US and Mexico, entering into Canada
- ORC is the **largest VPP based rating system Worldwide**
 - Historically European based, but gained a foothold in US & N. America
- Different levels of ratings available depending on needs of user / where they plan to race
 - Professionally measured - relatively expensive
 - High degree of Standardization and accuracy -- Often used in high end / expensive Regatta
 - Self measured by owner - much less expensive -- most applicable for Club Racing
- Professional staffs
 - Can Easily Rate any Boat

Levels of VPP Certificates

ORA

- ORR – Measured
- ORR-Ez
 - Hull – Sistership or Build A Boat
 - Other information – Owner reported
- ORA-1 Entry level introduction to VPP intended to support PHRF raters.

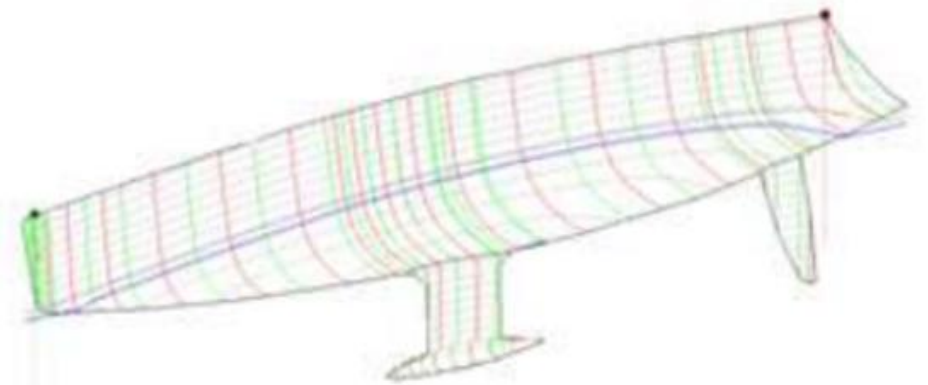
ORC

- ORCi – Measured
- ORC-Club same as ORR-Ez

Features of a VPP based Rating System

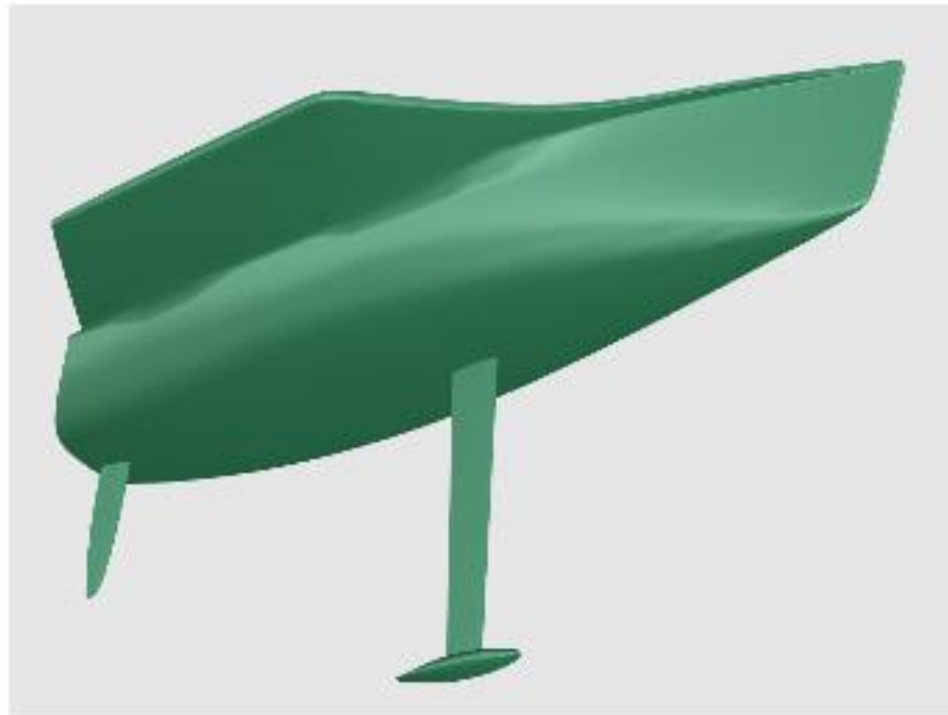
ORA

- Ratings are based on Math & Engineering
 - Based on Hydro and Aero dynamics principals
 - Much less subjective than PHRF
 - More accurate than PHRF across all wind conditions
 - Typically Medium Wind rating comparisons are close to PHRF
- Each boat requires an “Offset file” / 3D model of their boat (Autocad like drawing)
 - Inputs Hull shape; Sail shapes & sizes; prop type; mast height and more
- This model’s performance is evaluated by an Algorithm
 - to provide Boat performance expectations in a variety of wind conditions and heading
 - A polar table / chart is developed for each boat
 - Ratings based on these polar charts
- Large inventory of Offset files exist for a wide variety of boats
 - If a boat hull is not on file, then “Build a Boat” file must be created
- Results in Multiple Wind speeds and Multiple Race Course options (predominant points of sail)
 - Scoring - Increased complexity over PHRF

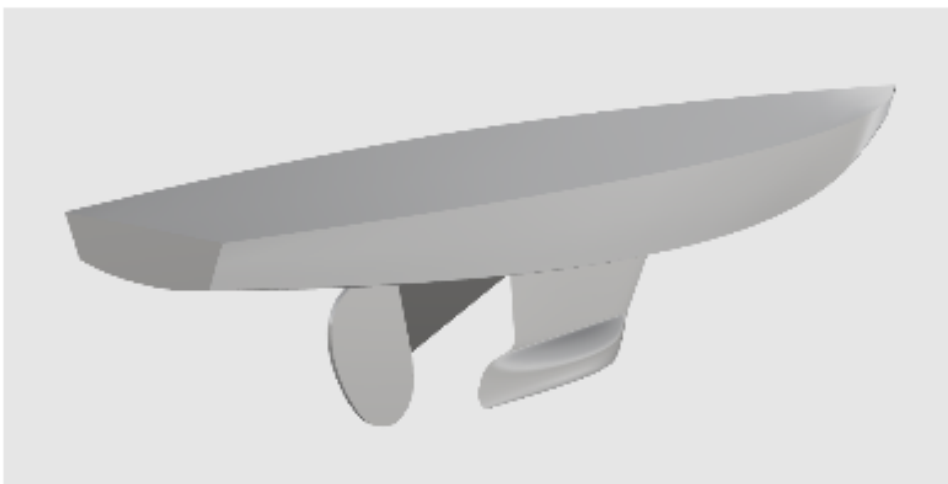
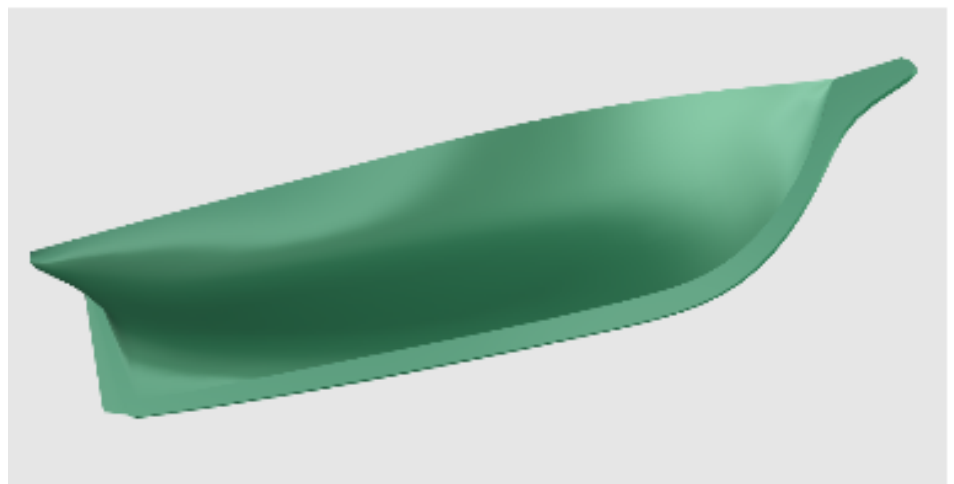


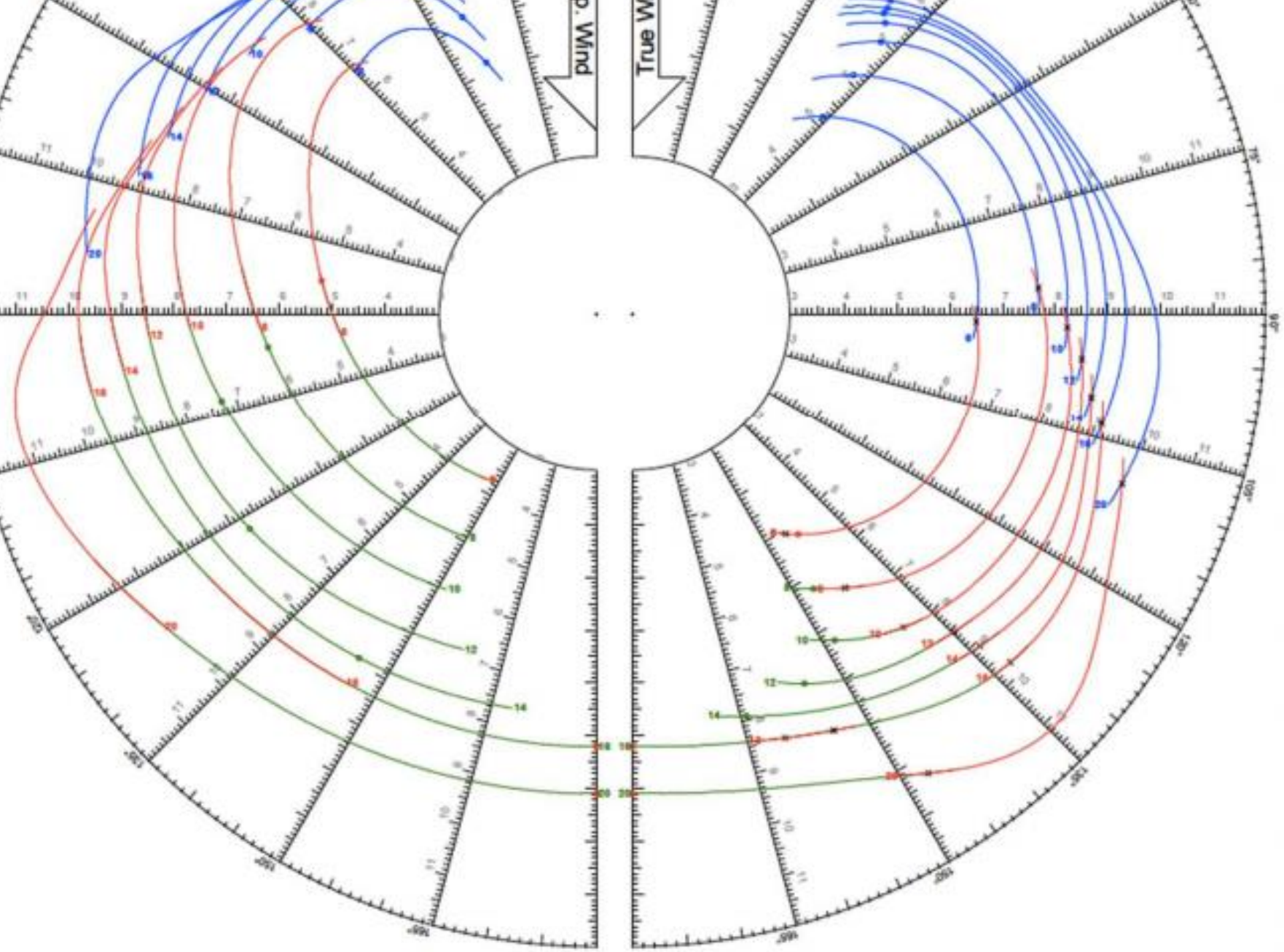


PRIDE OF BALTIMORE 2



STAR





PHRF of Chesapeake - Propeller credit =12 sec/nm

W/L	38	23	15	10	6	5
CR	26	13	8	5	3	3

SEC/NM OWED BY FOLDING PROP

	6	8	10	12	16	20
VMG Up	37	24	16	12	9	8
52	20	10	5	4	3	3
60	19	7	4	4	3	3
75	14	6	4	3	2	2
90	13	5	3	3	2	2
110	17	6	4	3	2	0
120	21	8	4	3	2	1
135	31	17	7	4	2	2
150	34	18	12	6	3	2
165	38	21	13	9	3	2
VMG Dn	39	21	14	9	4	2

J/35 - 2 BLADE FOLDING

	6	8	10	12	16	20
Up Angle	44.7	43.7	40.3	37.8	35.2	34.2
VMG Up	1016.3	841.0	752.7	707.7	665.5	649.2
52	654.9	554.5	520.0	502.9	485.8	478.5
60	607.5	532.1	502.6	487.8	472.0	464.7
75	570.1	513.3	483.8	468.8	452.1	443.4
90	566.1	510.0	476.9	458.9	437.1	426.2
110	590.7	519.3	483.3	457.2	422.8	408.1
120	628.3	536.9	497.1	468.6	423.7	393.6
135	758.4	598.8	531.2	494.9	444.1	400.8
150	921.2	715.6	591.2	529.6	467.6	423.7
165	1027.5	798.2	658.9	572.0	490.3	443.4
VMG Dn	1063.7	826.4	682.1	592.2	503.8	454.6
Dn Angle	141.1	149.2	151.7	163.4	173.3	174.3

J/35 - 3 BLADE FIXED

	6	8	10	12	16	20
Up Angle	45.4	44.3	41.1	38.6	35.8	34.7
VMG Up	1053.3	865.3	768.5	719.6	674.3	657.0
52	675.1	564.3	525.4	507.1	489.2	481.5
60	626.4	539.0	506.9	491.3	474.8	467.3
75	583.7	518.8	487.3	471.7	454.5	445.7
90	579.3	515.0	480.2	461.8	439.4	428.3
110	607.4	525.2	487.1	460.0	424.4	406.7
120	649.5	544.7	501.5	471.7	426.0	394.9
135	788.9	615.5	537.8	499.0	446.5	403.0
150	955.0	734.0	602.9	535.3	470.3	425.8
165	1065.1	818.7	672.2	580.5	493.6	445.6
VMG Dn	1102.7	847.6	695.9	600.9	507.4	456.8
Dn Angle	143.4	148.5	151.4	162.4	173	174.2

VPP – Prop Credit

Before March 1:
 1-season Certificate: \$20
 2-season Certificate: \$35

PHRF

On or After March 1:
 1-season Certificate: \$25
 2-season Certificate: \$40

ORA-1	35*	3 years
*100. if no model of the boat's hull is on file with ORR, or if the boat is heavily modified		

ORR-EZ	100	First year
	80	each year thereafter

Every ORA-1 and ORR-EZ rating is custom made for an exact boat based on Hull shape and sail inventory

Boat owners can purchase polar charts for their boats, based on their ORA-1 or ORR-EZ rating

PHRF

1 wind speed / 2 courses	
Circular Random Course	Windward / Leeward
Spin / Non-spin	Spin / Non-spin
1 Wind speed - (0 to 20 kts +)	1 Wind speed - (0 to 20 kts +)

ORA-1

2 wind speeds / 2 standard courses	
Random Course	Windward / Leeward (W50/L50) Course (50% UpWind; 50% DnWind)
Spin / Non-spin	Spin / Non-spin
Light - (6 to 10 kts wind)	Light - (6 to 10 kts wind)
Medium - (10 to 16 kts wind)	Medium - (10 to 16 kts wind)

ORR-EZ

4 wind speeds / 5 standard courses				
Random Course	Windward / Leeward (W50/L50) Course (50% UpWind; 50% DnWind)	Windward / Leeward (W60/L40) Course (60% UpWind; 40% DnWind)	Mostly WW (80% UpWind; 15% 90 reach; 5% DnWind)	Mostly LW (50% DnWind, 40% 120, 10% UpWind)
Spin / Non-spin	Spin / Non-spin	Spin / Non-spin	Spin / Non-spin	Spin / Non-spin
Very Light - (0 to 6 kts wind)	Very Light - (0 to 6 kts wind)	Very Light - (0 to 6 kts wind)	Very Light - (0 to 6 kts wind)	Very Light - (0 to 6 kts wind)
Light - (6 to 10 kts wind)	Light - (6 to 10 kts wind)	Light - (6 to 10 kts wind)	Light - (6 to 10 kts wind)	Light - (6 to 10 kts wind)
Medium - (10 to 16 kts wind)	Medium - (10 to 16 kts wind)	Medium - (10 to 16 kts wind)	Medium - (10 to 16 kts wind)	Medium - (10 to 16 kts wind)
Heavy - (16 kts + wind)	Heavy - (16 kts + wind)	Heavy - (16 kts + wind)	Heavy - (16 kts + wind)	Heavy - (16 kts + wind)

		PHRF of Ches (CR) Non- Spin	Non-Spin V.Light (0 to 6 kts wind)	Non - Spin Light (6 to 10 kts wind)	Non- Spin Medium (10 to 16 kts wind)	Non- Spin Heavy (<16+ kts wind)
Melantho	Beneteau First 36.7	75	1263.9	787.3	580.2	493.7
Flight Risk	BENE OCN 473 SD	120	1467.1	874.5	601.7	476.4
		-45	-203.20	-87.2	-21.5	17.3
Coeur 'd Alene	Crealock 37	189	1532.5	944.4	684.2	575.2
Luna Blu	Bristol 39 CB YWL	195	1506.8	941.4	697	607.6
		-6	25.7	3	-12.8	-32.4
Wind Dancer	C&C 37	120	1,354.30	841.5	616.8	524
Coeur 'd Alene	Crealock 37	189	1532.5	944.4	684.2	575.2
		69	178.2	102.9	67.4	51.2
Virginia Lee	C&C 36-1 CB	141	1346.9	858.8	641.2	557.1
Red Frog	Sabre 38-2	138	1433	880.1	634.6	530.3
		3	-86.4	-21.3	6.6	26.8
Coeur 'd Alene	Crealock 37	189	1532.5	944.4	684.2	575.2
Quickie	J/24 OD	171	1,474.20	921.2	679.9	571.2
		17	61.3	23.2	4.3	4
Red Frog	Sabre 38-2	138	1433	880.1	634.6	530.3
Flight Risk	BENE OCN 473 SD	120	1467.1	874.5	601.7	476.4
		18	-34.1	5.6	32.9	53.9

PHRF

Before March 1:
 1-season Certificate: \$20
 2-season Certificate: \$35

On or After March 1:
 1-season Certificate: \$25
 2-season Certificate: \$40

PHRF

		PHRF of Ches (CR) Non- Spin
Melantho	Beneteau First 36.7	75
Flight Risk	BENE OCN 473 SD	120
		-45
Coeur 'd Alene	Crealock 37	189
Luna Blu	Bristol 39 CB YWL	195
		-6
Wind Dancer	C&C 37	120
Coeur 'd Alene	Crealock 37	189
		69
Virginia Lee	C&C 36-1 CB	141
Red Frog	Sabre 38-2	138
		3
Coeur 'd Alene	Crealock 37	189
Quickie	J/24 OD	171
		17
Red Frog	Sabre 38-2	138
Flight Risk	BENE OCN 473 SD	120
		18

ORA-1

ORA-1	35*	3 years
*100. If no model of the boat's hull is on file with ORR, or if the boat is heavily modified		

Melantho	Beneteau First 36.7
Flight Risk	BENE OCN 473 SD
Coeur 'd Alene	Crealock 37
Luna Blu	Bristol 39 CB YWL
Wind Dancer	C&C 37
Coeur 'd Alene	Crealock 37
Virginia Lee	C&C 36-1 CB
Red Frog	Sabre 38-2
Coeur 'd Alene	Crealock 37
Quickie	J/24 OD
Red Frog	Sabre 38-2
Flight Risk	BENE OCN 473 SD

Non - Spin Light (6 to 10 kts wind)	Non- Spin Medium (10 to 16 kts wind)
787.3	580.2
874.5	601.7
-87.2	-21.5
944.4	684.2
941.4	697
3	-12.8
841.5	616.8
944.4	684.2
102.9	67.4
858.8	641.2
880.1	634.6
-21.3	6.6
944.4	684.2
921.2	679.9
23.2	4.3
880.1	634.6
874.5	601.7
5.6	32.9

ORR-EZ

ORR-EZ	100	First year
	80	each year there after

Melantho	Beneteau First 36.7
Flight Risk	BENE OCN 473 SD
Coeur 'd Alene	Crealock 37
Luna Blu	Bristol 39 CB YWL
Wind Dancer	C&C 37
Coeur 'd Alene	Crealock 37
Virginia Lee	C&C 36-1 CB
Red Frog	Sabre 38-2
Coeur 'd Alene	Crealock 37
Quickie	J/24 OD
Red Frog	Sabre 38-2
Flight Risk	BENE OCN 473 SD

Non-Spin V.Light (0 to 6 kts wind)	Non - Spin Light (6 to 10 kts wind)	Non- Spin Medium (10 to 16 kts wind)	Non- Spin Heavy (<16+ kts wind)
1263.9	787.3	580.2	493.7
1467.1	874.5	601.7	476.4
-203.20	-87.2	-21.5	17.3
1532.5	944.4	684.2	575.2
1506.8	941.4	697	607.6
25.7	3	-12.8	-32.4
1,354.30	841.5	616.8	524
1532.5	944.4	684.2	575.2
178.2	102.9	67.4	51.2
1346.9	858.8	641.2	557.1
1433	880.1	634.6	530.3
-86.4	-21.3	6.6	26.8
1532.5	944.4	684.2	575.2
1,474.20	921.2	679.9	571.2
61.3	23.2	4.3	4
1433	880.1	634.6	530.3
1467.1	874.5	601.7	476.4
-34.1	5.6	32.9	53.9

		PHRF of Ches (CR) Non- Spin	Non-Spin V.Light (0 to 6 kts wind)	Non - Spin Light (6 to 10 kts wind)	Non- Spin Medium (10 to 16 kts wind)	Non- Spin Heavy (<16+ kts wind)
Melantho	Beneteau First 36.7	75	1263.9	787.3	580.2	493.7
Flight Risk	BENE OCN 473 SD	120	1467.1	874.5	601.7	476.4
		-45	-203.20	-87.2	-21.5	17.3
Coeur 'd Alene	Crealock 37	189	1532.5	944.4	684.2	575.2
Luna Blu	Bristol 39 CB YWL	195	1506.8	941.4	697	607.6
		-6	25.7	3	-12.8	-32.4
Wind Dancer	C&C 37	120	1,354.30	841.5	616.8	524
Coeur 'd Alene	Crealock 37	189	1532.5	944.4	684.2	575.2
		69	178.2	102.9	67.4	51.2
Virginia Lee	C&C 36-1 CB	141	1346.9	858.8	641.2	557.1
Red Frog	Sabre 38-2	138	1433	880.1	634.6	530.3
		3	-86.4	-21.3	6.6	26.8
Coeur 'd Alene	Crealock 37	189	1532.5	944.4	684.2	575.2
Quickie	J/24 OD	171	1,474.20	921.2	679.9	571.2
		17	61.3	23.2	4.3	4
Red Frog	Sabre 38-2	138	1433	880.1	634.6	530.3
Flight Risk	BENE OCN 473 SD	120	1467.1	874.5	601.7	476.4
		18	-34.1	5.6	32.9	53.9

Summary

PHRF

- Widely used
- Subjective
- Easy to score

- Less accurate, in light and heavy air
- Credits not consistent across all wind ranges (prop, R/F, 135% Jib, etc)
- Big boats (low rating) get hammered in Light air

ORA -1 / ORR-EZ

- Objective
- More accurate across all Wind speeds
- Big boats can fairly compete in light air
- More Portable / transferable
- Can race Spin vs Non-Spin

- More complex to score
- Race Officer must use the correct wind speed to ensure accuracy

Questions ?

2020 FOUNDERS RACE

SOURCE	SPINNAKER		NON-SPIN	
	W/L LIGHT	W/L MED	W/L LIGHT	W/L MED

2020 FOUNDERS RACE																							
NM	VMG	ELAP	PHRF - TOD					PHRF - TOT				ORR-Ez TOT											
			W/L	ALLOW	CORR	POS	SPM	TCF	CORR	POS	SPM	w/l LIGHT	CORR	POS	SPM								
										1:38:37					1:55:43				1:13:50				
PHRF A	Myrage	A11017	0.625	0.856	0.598	0.840	HOBIE 33 ODR	9.02	4.6	1:58:08	96	0:14:26	1:43:42	2	34	1.006	1:58:51	2	21	0.625	1:13:50	1	0
PHRF A	Rif Raff	OD	0.747	0.964	0.662	0.920	Melges 32 ODR	9.02	5.3	1:42:13	24	0:03:36	1:38:37	1	0	1.132	1:55:43	1	0	0.747	1:16:21	2	17
PHRF A	Virginia H III	10247	0.648	0.879	0.604	0.855	Tartan 101 UCAS	9.02	4.51	2:00:06	72	0:10:49	1:49:17	3	71	1.045	2:05:30	3	65	0.648	1:17:49	3	27
PHRF A	Voodoo 2						TRIPP 38	9.02	4.9	1:50:02	60	0:09:01	1:41:01		16	1.066	1:57:18		11				
PHRF A	Remedy						J-36	9.02	4.53	1:59:36	84	0:12:38	1:46:58		56	1.025	2:02:35		46				
PHRF A	Feather						J-36	9.02	4.45	2:01:33	84	0:12:38	1:48:55		69	1.025	2:04:35		59				
										1:08:22					1:18:09				0:48:20				
PHRF B	Cool Change	OD	0.582	0.797	0.572	0.794	J-30 ODR	6.06	4.4	1:23:03	141	0:14:14	1:08:49	2	4	0.941	1:18:09	1	0	0.582	0:48:20	1	0
PHRF B	Rumble	OD	0.608	0.828	0.593	0.821	J-29 OB MH	6.06	4.6	1:19:35	111	0:11:13	1:08:22	1	0	0.983	1:18:14	2	1	0.608	0:48:23	2	1
PHRF B	roundabout	OD	0.536	0.740	0.529	0.736	J-24 ODR	6.06	4.0	1:31:52	171	0:17:16	1:14:36	5	62	0.902	1:22:52	5	47	0.536	0:49:14	3	9
PHRF B	Knot Hunter	OD	0.621	0.825	0.565	0.796	VIPER 640 ODR	6.06	4.6	1:19:33	102	0:10:18	1:09:15	3	9	0.997	1:19:19	3	11	0.621	0:49:24	4	10.5
PHRF NS	Incentive III	Z10493	0.500	0.718	0.495	0.717	O'DAY 34	6.06	3.7	1:38:57	171	0:17:16	1:21:41	6	132	0.902	1:29:15	6	110	0.500	0:49:29	5	11.3
PHRF B	Bad Habit	Z10830	0.601	0.806	0.588	0.801	PEARSON FLR	6.06	4.2	1:25:38	139	0:14:02	1:11:36	4	32	0.943	1:20:45	4	26	0.601	0:51:28	6	31
PHRF NS	Seeker	Z10090			0.547	0.770	Ericson 34t	6.06	3.7	1:39:33	165	0:16:40	1:22:53	7	144	0.909	1:30:29	7	122	0.547	0:54:27	7	61
PHRF NS	Pisces	Z10881	0.542	0.752	0.541	0.752	J-28	6.06	3.4	1:46:36	192	0:19:24	1:27:12	8	186	0.876	1:33:23	8	151	0.541	0:57:40	8	92
PHRF NS	Rhumb Line	Z10505-OD	0.582	0.797	0.572	0.794	J/30	6.06	3.6	1:41:50	144	0:14:33	1:27:17	9	187	0.937	1:35:25	9	171	0.582	0:59:16	9	108
PHRF B	Excelsior	A10526	0.530	0.734	0.522	0.727	BENE 305 SD	6.06	3.1	1:56:56	186	0:18:47	1:38:09	10	295	0.883	1:43:15	10	249	0.530	1:01:58	10	135
PHRF NS	Luna Blu	2020	0.519	0.708	0.506	0.699	BRIS 39 CB YWL	6.06	2.9	2:06:51	192	0:19:24	1:47:27	11	387	0.876	1:51:07	11	326	0.506	1:04:11	11	157
PHRF B	Wham Bam						ANDREWS 27 Mod	6.06	4.3	1:23:47	126	0:12:44	1:11:03		27	0.962	1:20:36		24				
PHRF B	Callinectes						CAL 30-3	6.06	4.0	1:30:23	165	0:16:40	1:13:43		53	0.909	1:22:10		40				
PHRF NS	Pegasus						FARR-DKRSN 37	6.06	3.9	1:34:14	87	0:08:47	1:25:27		169	1.020	1:36:07		178				
PHRF NS	Recovery						HUNTER 30	6.06	3.4	1:47:34	210	0:21:13	1:26:21		178	0.855	1:31:58		137				
PHRF B	Ali-Ru						MORGAN 36T	6.06	3.8	1:34:55	132	0:13:20	1:21:35		131	0.953	1:30:27		122				