

The Special and Desirable Characteristics of Classic Swans as Offshore Yachts

Part 3

By
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S&S Swan and 1979 Fastnet Race

This is the 3rd and final of the three-part series of articles appearing in the Newsletter explaining many of the virtues of the [S&S Swans](#). [Part 1](#) dealt with Sea kindliness, and [Part 2](#) with Seaworthiness. Previously, [Part 2](#) mentioned [S&S Swan](#)'s performance in the [1979 Fastnet Race](#). What was not presented were the more in-depth reports from the owners of the Swans, be they finished the race, withdrew, lost at sea, or experienced failures. Hopefully [Parts 1 & 2](#) were informative. However, [Part 3](#) is where “the rubber meets the road”.

As the following information contains equations, mathematical data and concepts, the authors endeavored to present it in a way that could be readily understood, by experienced sailors who by osmosis would understand the information presented, and their consequences.

Some Statistical Outcomes and Analyses

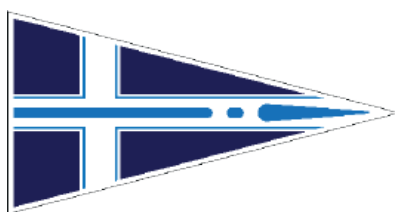
To put some numbers on the [Fastnet 1979](#), the [RORC](#) provided some additional information, beyond the reported 303 starters. Of the total yachts in the fleet 216 did not finish (DNF-includes withdrawals, sinkings), which leaves 87 finishing. Therefore, 28.4%

CLASS	RATING (Ft)	STARTERS	FINISHING YACHTS	% FINISHING
O	42.1-70.0	14	13	92.9
I	33.0 – 42.0	56	36	64.3
II	29.0 - 32.9	53	23	43.4
III	25.5 – 28.9	64	6	9.4
IV	23.0 – 25.4	58	7	12.1
V	21.0 – 22.9	58	1	1.7
TOTALS	-	303	87	28.4

Table 1 Fleet Results as Percent Finishing within their Class

of the starting fleet finished. With the weather conditions getting worse over time, it resulted in the smaller boats taking the brunt of the bad weather. This can be validated based on the percent of yachts that finished versus size (ergo CLASS). [Table 1 Fleet Results as Percent Finishing within their class](#) to the left, illustrates the point.

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The numbers don't lie.

By comparison, although 13 S&S Swans started, 4 finished, or 30.7% of the Swans. Once again, the Swan results confirm

CLASS	RATING (Ft)	STARTERS	FINISHING YACHTS	% FINISHING
O	42.1-70.0	3	2	66.7
I	33.0 – 42.0	2	1	50.0
II	29.0 - 32.9	3	0	0
III	25.5 – 28.9	5	1	20.0
IV	23.0 – 25.4	0	0	0
V	21.0 – 22.9	0	0	0
TOTALS	-	13	4	30.7

Table 2 S&S Swan Results as Percent Finishing

the trend in [Table 1 Fleet Results as Percent Finishing within their class](#), above. The longer the yacht was on the course the less the probability that it would finish. Refer to [Table 2 S&S Swan Results as Percent Finishing](#), to the left. Statistically, 13 data points are not enough to draw any meaningful quantitative conclusions. Hence any inferences drawn from the above are qualitative.

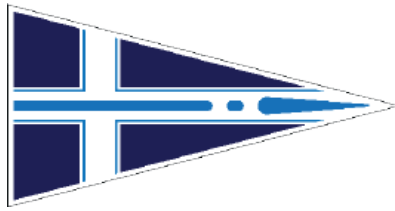
As part of the RORC's investigation each of the owners was asked to fill out a questionnaire covering their race experiences which included how the boat performed, the condition of the boat and crew, etc. Of the 13 S&S Swans in the race, 4 finished, and 7 of the 9 DNFs returned the questionnaire. Their responses are listed below by Class and Swan Model (Note: the responses have been edited for consistent formatting). [Refer to Table 3 Swan Causes of DNF](#), below. These responses only reinforced the perception that the S&S Swans are very rugged, and excellent blue water boats. Every one of the boats listed was able to make it to a safe harbor. The only damage reported was an engine failure, and a broken radio. In every case no rigging or hull damage was reported. Two of the boats had more serious experiences as a result of the prevailing conditions. To the point, a 38 was knocked down and reported only radio damage. And the 37 reported a 140° knockdown which resulted in no damage (note: *The authors are skeptical of this claim, although she did retire to Cork under her*

CLASS	SWAN MODEL	S&S SWAN RESPONSES TO RORC QUESTIONNAIRE
O	57	No significant damage reported, nor assistance needed; retired in Cork
I	48	Engine Failure; towed to Plymouth
II	411	No assistance needed; retired in Kinsale
II	411	No significant damage reported; retired to France
II	411	Retired by heading out to sea thence to Plymouth
III	40	No significant damage reported; retired in Crosshaven, Cork
III	38	No issues reported; retired to France
III	38	Lost radio due to a knockdown ; retired under tow to France
IV	37	140° roll , 2 crew retrieved from the sea, No damage; retired to Cork

Table 3 Swan Causes of DNF

own steam). It is interesting to note that the two boats that were knocked down, were in Class III and IV, which again is consistent with the findings in [Table 1](#) and [2](#). And to round out the Swan fleet, Kudos to [XARA](#) a [Swan 38](#) that finished 6th in Class III, with the remainder of [XARA](#)'s class retiring.

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Additional information provided by the [RORC](#) further demonstrates the severity of the conditions. 23 yachts were either abandoned or never seen again. Of the 23 listed, 18 were recovered, and 5 were lost at sea. And not a single Swan sank nor was abandoned, nor had any loss of life.

[Part 2 Seaworthiness](#), introduced the importance of stability, specifically the righting moment one degree (RM_1°), the calculation used to determine the righting moment, and the angle at which the yacht reaches their [Limit of Positive Stability \(LPS\)](#). The rating rule that was used for the Fastnet was the [IOR Rule](#). The way that it was written encouraged some designers, in pursuit of a lower rating, would increase the beam, and/or reduce the displacement. It would seem that there was little or no consideration as to how these changes would impact the [Limit of Positive Stability \(LPS\)](#).

In addition to the [RORCs](#) official analysis, in 1980 the [Cruising Club of America \(CCA\)](#) independently analyzed the Fastnet results. They identified several attributes which affect a yacht's survivability in severe conditions. It was their intention to evaluate whatever was learned from the Fastnet and apply it to races that they sponsored. Some of the findings are new, and some are intuitive, but are all worth repeating. They are listed below.

1. Large yachts are less prone to capsize.
2. A dismasted sailboat is more likely to capsize.
3. [Beamier](#) boats are more likely to remain inverted.
4. Boats with an [LPS less than \$120^{\circ}\$](#) could remain inverted for up to 2 minutes.
5. Boats beam to the sea/wind are more likely to capsize.
6. Boats that are actively sailed are less likely to capsize.

As a result of their analysis [CCA](#) came up with a screening equation which they emphasize should be used as a guide, due to the fact that it doesn't consider a myriad of other variables. In short, it is one of several indicators for survival. The equation in imperial units as follows:

[Capsize Screening # =](#)

In Imperial Units: Max. Beam (feet)/Cube Root (Gross Displacement (lbs)/64)

Constant (C) = 64 lbs/ft³ for salt water at 59° F, and 3.5% salinity

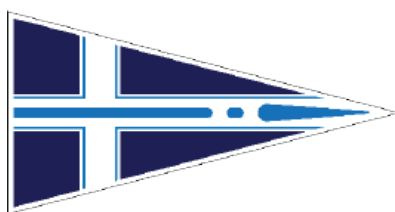
Or in words it is a function of beam, displacement and C

= f (Bmax/Disp) to be <2

The litmus test is if the above formula exceeds 2 then the boat fails.

If you consider the trends that the [IOR](#) favored for lowering a rating, namely increase in beam and decrease in displacement, it is apparent by visual inspection that either or both trends would increase a yacht's Capsize Screening #. Which means it is less likely to pass the litmus test of not exceeding "2". We are of the opinion that there are two parts to the

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situation we find ourselves in.

MODEL SWAN	CAPSIZE RATIO		MODEL SWAN	CAPSIZE RATIO		MODEL SWAN	CAPSIZE RATIO
36	1.60		411	1.66		48	1.65
37	1.72		43	1.73		55	1.59
38	1.76		431	1.80		57	1.73
40	1.63		44	1.66		65	1.58
41	1.66		47	1.73		76	1.65

Table 4 S&S Swan Capsize Ratios

designers took advantage of these loopholes in the rule without considering their impact on LPS. The S&S Swans, and all S&S sailing yachts were, for the most part, reviewed for their range of positive stability. We can't recall if "the magic" number for the several yachts measured was 120°. It should also be noted that the LPS for any given yacht will vary depending on how the yacht floats and is fitted out. Refer to Table 4 S&S Swan Capsize Ratios, above.

The majority of this presentation has been devoted to a yacht's stability for good reason. With the exception of structural integrity, and possibly sailing skills, we as sailors, qualitatively understand the importance of stability. But better, the CCA study identifies a specific characteristic (LPS) and quantitatively assigns a limiting value to it of 2.

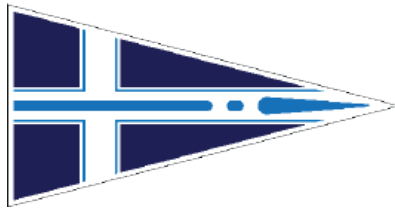
In conclusion, with the robust construction, as dictated by the Lloyd's Register Rules, knowledgeable and experienced sailors, and last demonstrable qualities of shape, and stability, we have validated the obvious. The S&S Swans are excellent performing blue water yachts!

Authors Closing Observations & Remarks

The above content makes use of some qualitative, and quantitative explanations. In the case of the quantitative explanations several mathematical computations and formulas were used. Again, the authors tried to keep them as readily understandable as possible but welcome any questions or additions that would add to Part 3 or the two previous Parts 1 & 2.

Not unlike a poor workman, no matter how good his tools are the results will be compromised. In the case of Swan owners, we believe they were given better than a good tools, and in combination with their sailing skills ended in a good result, under trying conditions. So, kudos to all the S&S Swan skippers and crews that participated in the 1979 Fastnet Race. Whether you completed the race or withdrew, you and your yacht performed admirably, in perhaps a once in a lifetime conditions.

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If you are still curious about the circumstances surrounding the 1979 Fastnet Race, YouTube.com has some interesting articles, interviews, and movies which contain additional information and other's perspective on the Race. In addition, the 1998 Sydney Hobart Race was also a trying race, and its YouTube.com coverage would add to the story.

Epilogue

Aside from the rating rules and characteristics of a yacht, the 1979 Fastnet has reawakened the philosophical debate; should yacht racing be considered a Corinthian (highest level of sportsmanship), or a "no holds barred" competition. The definition of each and the distinction between the two is difficult to define and will vary with each person asked. For the purpose of providing additional clarity, and to stimulate debate, the authors offer their preliminary thoughts to define the two competing scenarios, as they see them.

- **Corinthian event:** The yachts should be crewed by amateurs, meet the highest of scantling standards (including rigging) promulgated by a regulatory body. The rating rule should incorporate all quantitative findings as they relate to survivability. Safety and survivability should preempt speed. The sponsoring race organization should state the limits of wind and sea conditions which would trigger cancellation of the start of the race, and even after it is underway.
- **No Holds Barred event:** The yachts can be crewed by a mix of amateurs and professionals, meet scantling standards that will allow for experimental construction methods and materials. While safety and survivability are extremely important, they should not always be at the expense of speed. The race sponsors can, at their discretion, put limitations on wind and sea conditions, which would trigger cancellation of the event.

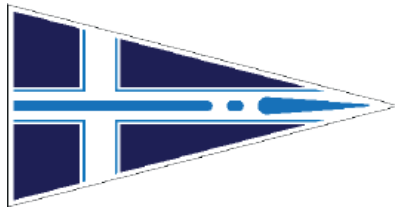
The two approaches outlined above, for yacht racing events, are intended to describe two different levels of risk, as it relates to the participants expectations. To shine some light on the differences, perhaps a sport's analogy would be helpful. In comparing risk in professional soccer to Formula 1 racing, all would agree there is a substantive difference. In soccer one can expect various kinds of leg issues, with occasional trauma. While in formula 1 racing, there is the real risk of suffering substantial physical damage or even death.

A couple of the post Fastnet interviews of participants expressed the view, and we are paraphrasing, "... if you want to win, you must accept the risks". In the context of the interview as it relates to events during the Fastnet, the response would imply that the risk of loss of life is built into the sport of yacht racing. While there is room for yacht racing on the "edge", the sport should be two tiered. We would opine the average yachting has every expectation of returning home at the end of a race, perhaps with a bruised ego, but not with long-lasting physical impairments.

And on the other side of expectations, the very avid competitive type A personality who is willing to take almost any risk in pursuit of winning, should be able to do so. The answer may very well be in the race organizers defining which of the two categories they are promoting. And most important, the participants can then decide for themselves what risks they are willing to assume.

It will be interesting to see if this approach gets some traction in the future.

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Last Words

As admirers of S&S designs, particularly the S&S Swans, we would be remiss in not praising another successful S&S design that participated in the 1979 Fastnet Race. Even allowing for rendering assistance to others in distress, the overall winner, albeit in Class 0, was the S&S custom yacht “[Tenacious](#)” skippered by Ted Turner, a successful America’s Cup skipper. [Tenacious](#) covered the course in 79 hrs, 52 min, and 22 sec. And by comparison [Xara](#) the S&S Swan recorded an elapsed time of 145 hrs, 34 min, and 19 sec. Which means [Xara](#) spent 82% more time on the course. While the overall winning yacht was [Tenacious](#), the crew of [Xara](#) should be applauded for being **TENACIOUS** by staying the course!



The Sea and Skies Often Know No Mercy - Always Be Alert & Prepared. 1998 Sydney-Hobart Race, 44 of 155 finished, 7 abandoned, 5 sank, 6 died

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