ORC

A tough job (but someone ought to do it)

During the last few years there has been a shift in culture in multihull design away from just casual sailing on tropical holidays towards higher and higher performance and the development of serious racing among teams intent on winning. This has been apparent in the marquee offshore classics and on the Caribbean racing circuit, where the Offshore Multihull Association has had a growing fleet.

Among those classics, including the Caribbean 600 and other RORC offshore events, the well-established MOCRA rating system remains the tool of choice, but recently Larry Rosenfeld and the OMA have developed a potentially more precise polar-based handicapping system. The polars employed by Rosenfeld's group are derived from logging boat performance and over time this has grown into a workable system, notwithstanding the backroom analysis required to maintain the consistent polar set among the diverse fleet.

As with all observed-performance based systems, they work well if the boats in the fleet stay largely the same and crews don't change much. Another problem is that when new boats arrive they have no observed polars. Adding further to the challenges is that when members of the fleet change configuration, say by racing with the dinghy onboard or with the fuel and water tanks at different levels, the polars will change. To deal with this the OMA looked at a VPP solution to provide a mechanism for adjusting polars accordingly.

PAUL MELLO/OUTSIDE IMAGES

Fortuitous perhaps? Work being done by ORC with the two main organisations for the amateur racing of multihulls – OMA and MOCRA – may be getting a timely Dutch boost. The TF10 foiling trimaran (*above*) was designed in California by Morrelli & Melvin in 2017 at the urging of several keen members of the New York Yacht Club who were less than stimulated by the new club fleet of racy-looking 37ft monohulls and wanted something more suitable for a gang of competitive septuagenarians (sic). Morrelli & Melvin turned to DNA Performance to build the new boats, the builders of those exquisite A-Class cats being based in the ORC-friendly Netherlands where a growing number of these foxy Corinthian racers present a useful testbed for exploring multihull rating improvements

Having started the process with KND Sailing Performance in Valencia, who were doing the polar work, it was apparent that the ORC already had an existing infrastructure that could be used, rather than OMA having to build a system from scratch. It soon became apparent that this offered a quicker way forwards so Larry started a conversation with the ORC.

To be clear the ORC don't spend their days scanning the horizon, like handicapping pirates, looking for booty. But we are always happy to apply our expertise and international infrastructure where it can help. In 2019 the ORC began folding the OMA VPP into our existing VPP. The force models were relatively straightforward given KND had a prototype system. More challenging was capturing hull and daggerboard shapes, and the beams and superstructure.

This was obviously impossible using the ORC's existing Lines Processing Program (LPP), which is firmly based on fixed-keel monohulls, so a new code was therefore written to capture the more complex geometry and for 2021 this new LPP will be used for all the ORC VPPs, multihull and monohull alike.

During this development we naturally found subject matter experts to help us, and the Multihull Offshore and Cruising Association (MOCRA) were keen to collaborate, with Simon Forbes being a great help building a database of the large MOCRA fleet. Thanks to the input from the OMA and MOCRA we have now built a good database of racecourse-observed polars against which to validate the VPP, to the extent that ORCmh handicaps will be offered in 2021.

One of the challenges for the performance-based handicap rules is that when crews improve the boat goes faster. This effect is particularly true in multihulls, which can go faster if you are braver to a much greater degree than is seen in monohulls. For example, a less risk-averse monohull skipper will go for smaller gaps at the marks and make closer crosses. Neither of these is reflected in a handicap. But with a catamaran by pushing and flying a hull more aggressively speed can increase a lot, to the extent that it's apparent in the observed polar curves. This could be the first time we contact a boat's insurance company for a claims history before publishing a handicap.

Happily for our main constituency, bringing the multihulls into the ORCi and ORCsy monohull VPP has accelerated the development of these codes. For example, calculating the effect of lifting foils that support some or all of the boat's weight was fundamental to the ORCmh project. It is also important to handle the fully foiling boats, for example the TF10 trimaran for which we have derived a full set of polar curves.

Having developed this feature it was straightforward to introduce these elements into the monohull code. There is no doubt that the multihulls present unusual demands on creating equitable handicaps that accurately reflect the performance potential of these boats, even as they became more complex themselves with varying degrees of high-tech solutions to hull, foil and rig designs.

But we are tackling the big issues first, with more work needed on canting rigs, headsails with multiple hoist and tack points, large bridge structures that make parasitic windage a very big player in the drag force, and wing masts. Not only is an accurate and calibrated VPP needed in this quest, but also the framework rules and software for measurements needed for its inputs.

VPP-based handicapping of multihulls has been, and will continue to be, a tough assignment, but fortunately we have a skilled and diligent staff to implement the process. There is no magic to a multihull, their performance relies on the same balance between aero and hydrodynamic forces. One hull or two hulls immersed, flying or not, we have the building blocks assembled to produce VPP-derived handicapping polars based on physical measurements.

We can also provide speed guides and Expedition polars for the teams so I'm hopeful that over time the product will improve and increase the appeal of handicap racing for the multihull community.

The multihull has a much greater variance of sailing speed with wind speed and, more importantly, wind angle changes. The ORCmh's ability to provide handicaps based on the predicted time around the course, based on known wind speeds and wind angles, could therefore be potentially very valuable in promoting close, fair racing across the fleet.

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