



## Peak VPP!

Each new year the ORC's VPP and rules change according to what is discussed and approved in the autumn annual meeting of the various ORC committees. Much of this work will have been done by the International Technical Committee throughout the year, following a predefined research agenda along with new requests made by users of the system.

This group of designers and technologists from around the world is chaired by Andy Cloughton, who has summarised the major changes to expect in the latest 2023 version of the rule...

**Seahorse:** We may as well start with the 64 million dollar question... will the ORC fleet be happy when they see their 2023 ratings?

**Andy Cloughton:** As usual 50 per cent of the boats will feel OK and the other 50 per cent less so... to a lesser or greater degree! Altruism is not much in play when it comes to managing any handicap system. As a general policy ORC tries not to change ratings for the bulk of the fleet by more than 0.5% with each new iteration. This overall goal helps to stabilise changes year to year while still steadily improving rating accuracy based on our research. While it's naive to think anyone will be cracking open the champagne, many design types that hitherto have sat some distance from the mainstream are more realistically treated in 2023 than in previous years.

The three major improvements to this year's VPP are: a further upgrade to the Residuary Resistance force model; full implementation of the CFD-based aero depowering model; and a further refinement of sail force coefficients for flying headsails. Taken jointly these refinements have got us to the point where there are no longer any 'subjective' elements left in our VPP code – a weakness in any system and an obvious target for customer complaints.

Every force model is now based on plausible and appropriate physics, with no areas left where we need to develop new concepts. With these tools and improved software we are now able to generate speed predictions for an enormous variety of raceboat types:

everything from sportboats to superyachts, foiling and non-foiling, and now multihulls too. In this sense I think we've reached 'peak VPP' in terms of what is and isn't possible with current technology.

**SH:** Peak VPP... what happens as new design innovations inevitably come into play?

**AC:** I am simply referring to having done the heavy lifting in the research and modelling. We now have a VPP that could be refined further but it is doing a good job for the majority of the boats that we rate. To spend more time and treasure now on more refinements may not pay off in significant improvements in ratings. To borrow a phrase from Formula One, we have reached a 'hygiene level' for all parts of the VPP code; it's not perfect, and is more perfect for some boat types than others. But there is nothing in there that is really holding us back.

But it's a good point to flag up around real innovations, because new ideas are popping up all the time. I think because our VPP is complex and able to characterise the performance of our existing fleet reasonably well there is much less typeforming pressure and few avenues for work-arounds that are not already covered.

For example, flying headsails: these sails with mid-girth to foot ratios above 55% are very cost-effective for the owner who is both racing and cruising. We have worked hard to get the VPP to set these sails at the appropriate apparent wind angles so that the owners can build the sails that suit the boat, without taking an inappropriate handicap hit.

**SH:** Can ORC overcome its reputation for being over-complex? There is still an awful lot to measure, plus the multiple options in scoring continue to confuse sailors and race managers...

**AC:** The ORC system must necessarily be complex to predict the performance of any boat, on any point of sail in winds between 6 and 20kt. ORC measurements are complex because the more details we know the better we are able to model performance. For





**Man of many parts... family of many parts.** While 18ft skiff and everything else sailor Sean Langman was busy at the front racing his Reichel/Pugh 69 *Money Penny* to Hobart (*opposite*) taking first in IRC Division 0 and ninth overall, his son Peter was busy astern plugging down the track on *Maluka* (*left*) to win IRC Division 5. The family's little 90-year-old gaff cutter will shortly be going on a ship to England in order to compete in this year's Fastnet Race

boats race all season in a variety of conditions; some days are Farr days, some are Class40 days, and so it evens out.

This is how things started out with the RORC rule and CCA rules. Yet in the 1970s US Sailing opened Pandora's box and began research to score races based on predicted boat speeds, the actual wind speed and the points of sail encountered on the course; the goal was to use science to more equitably rate boats in any conditions. In 2023 the ORC are guardians of this faith and 50-odd years later we like to think we now have the tools to deliver it to those who want it.

**SH:** And making it work in real life...

**AC:** Strangely the boat speed predictions are the easy bit. The difficult part is how to decide what conditions the boats have raced in.

Post-race Polar Curve Scoring uses the boats' times around the course, the course geometry and an observed wind direction – to intuit what the wind speed must have been for the boats to match their recorded elapsed time. But even writing this sentence makes my head hurt!

It's hard to get your head around this concept, but a great many competitors manage this on a weekly basis and are happy with the approach. To get the wind speed you must sail the course, and because the relative handicaps change with wind speed the placings are only finally confirmed once the race is completed.

But this makes getting your 'live' position during the race, well, complicated – it's like Schrodinger's Podium, you don't know exactly how you were doing until after you've done it. And for new fleets not brought up with the necessary psychological mechanisms to deal with this level of uncertainty, it is frequently too big a change in mindset. But we'll get there one day...

*Dobbs Davis*

ANDREA FRANCOLINI/ROLEX

example, it's naive to think sailing performance can be modelled without having a measurement of each boat's righting moment.

I make no apology for this complexity. We all operate complex tools day in day out: cars, mobile phones, computers, espresso machines. The enemy is not complexity, this should be behind the scenes – the enemy is complication. Why do I need two remotes to turn on my TV and sound bar?

Unfortunately ORC measurement, and race scoring, can get complicated very quickly, yet it doesn't have to; but there is no doubt that a few bad experiences quickly obscure the good things that ORC offers. But we know this and from now on it is as important that we apply our group experience not just to the VPP but to the user experience. We can and must improve this.

**SH:** And scoring...

**AC:** The position with race scoring is a bit different. It's not complex but it has certainly become awfully complicated – the road to hell is paved with good intentions. Again looking ahead we are aiming – in particular – to address the following situation...

Imagine a Farr 40 racing a Class40. Upwind in the light the Farr 40 would climb away, downwind in 20kt the Class40 would be up and gone. A single number can only deliver equitable scoring if the

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