

No broke no fix

This time-honoured expression is what nags me as ORC International Technical Committee chairman while guiding new research and advising on where that leads policy decisions ahead of each year's new slate of rules. With 2022 now on us and these rules now in effect it's of interest to see how this principle has been applied.

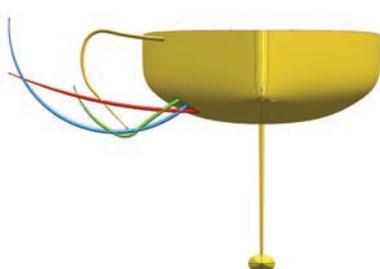
Stability in handicap rule management is of course a blessing and a curse: whether or not there are typeforming forces at work those boats with 'favourable' ratings will always be resistant to change. Stability also gives owners confidence that a rule system is not a moving target for them to chase with expensive optimisations or even a new boat. It also helps squelch endless speculations about rating effects on performance and results.

Yet for others in the fleet who feel their ratings are inaccurate or even unfair, improvements are welcome to help improve their (perceived) chance to be competitive. Even with measurement-based rule systems new boats with new features are often initially not treated well because rule development has not caught up with the latest boat type. With big boats sprouting all manner of appendages these days, this is a more obvious reality today – and for all rating systems – than we have seen before in our lifetimes.

Historically this plays out in the opposite direction too: the ORC's



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Complex Chemicals Kill was the outstanding name of Cam Lewis's 1979 Gold Cup-winning Finn... and complex rules always fail. Juan K's IMS 50-footer Krazy K (left), with its unstayed semi-wing mast, smashed through the ridiculously complex IMS rule in 1999. The boat was so fast that the powerful Italian lobby threatened to boycott that year's Admiral's Cup series unless it was banned... it was (the Dutch beat them anyway). But the rulemakers' task can be unenviable – this (above) was a study of some foil options for what became VPLP's Figaro 3 one-design

new task of rating hundreds of boats in the US midwest for the annual Mackinac races has brought in dozens of 30-40 year-old designs that have not been part of its fleet in decades yet still deserve fair ratings.

While ORC has done a creditable job in the past few years of rating the old and the new more fairly against one another (today there are no more *Sunstones*, the heavy-displacement 1965-built scourge of IMS in the 1990s), these older designs still often appear as outliers when fine-tuning a modern VPP for the largest possible range of boat types.

An example is the long, narrow and light ULDB sleds that regularly compete in the big Great Lake events: their ratings in the 2021 races were probably 1-2% out of line, but there was no time to study them before needing to finalise last year's VPP because the decision to use ORC ratings was not taken until the end of 2020 (fortunately this group is big enough to have plenty on just focusing on their class competition). These boats will be reviewed through targeted performance analysis and they will probably fare better in their ratings – and results – in the future.

More broadly, however, in recent years ORC GPH ratings year to year have not changed for most boats by more than 0.5%. I believe that we've done a pretty good job of finding the balance between

where science wants to take us and looking at the realities of the fleet performance. So the ORC system is in rude health, having recovered back to pre-pandemic levels with some 10,000 certificates worldwide and very competitive championship regattas; so we want to be careful not to upset this balance.

Nonetheless, research in both aero and hydrodynamic modelling continues, and we do our best to apply the findings of this research into VPP improvement right across an increasingly diverse fleet.

Our system is one where users can also have a significant impact on our research agenda, through a submissions process that guides how we apply new research findings each year.

Some examples of what to expect in 2022:

- Adjustment of sail force coefficients across downwind configurations that use symmetric-only spinnakers, asymmetric spinnakers set on the pole and/or asymmetric spinnakers tacked on the centreline. It is apparent that the design of the asymmetric sails set on centreline has improved enormously in the 10 years since these coefficients were last updated.
- Research on mould shapes of Headsails Set Flying – headsails that are 55-75% mid-girth and are not flown on the headstay – has prompted new, more accurate force coefficients accounting for the fact that on some boats at low wind speeds these sails also become suitable for upwind VMG sailing.
- An adjustment to the simulated wind gradient (vertical velocity profile). The change to the wind gradient was prompted by a better knowledge of 'real' conditions which has come from the offshore power-generating industry. It became clear that the wind gradient in our VPP lay a long way from what is more typical in coastal waters. A small adjustment was also made to relatively reduce wind speeds close to the water surface. Doing this favours smaller boats with shorter masts, and is a move to address a longstanding concern that small boats in a class are disadvantaged relative to the bigger competitors.
- Cat-rigged boats will have their sail area more accurately defined with better force coefficients, and thus more suitable ratings for 2022. Prior to this the VPP needed a fictitious small headsail to achieve force balance, now none is needed. Quadrilateral sails are also now measurable and rated.
- In hydrodynamics there is an update of the keel viscous resistance calculation, plus there is a new force model for partially and fully foiling boats based on new CFD studies (this will be watched with interest!).
- ORC Double-handed certificates will now include all the effects of a reduced 170kg crew weight. The new model will also more accurately consider the effects of crew placement on righting moment as well now as displacement.
- The effects of deploying a whisker pole to leeward for headsail reaching is now better modelled again using new force coefficients.

Another significant development is the addition of several new research associates to our talent pool, including Doyle Sails' Stu Bannatyne, Adolfo Carrau from Botín Partners, Jez Elliott and Chris Williams from North Sails, Antoine Lauriot Prévost from VPLP and Adam Scott-Mackie from Malcom McKeon Design in Lynton. I see the role of the research associates as similar to that of a focus group – you give the ITC feedback on how our product is working in the field, and how we should prioritise to best serve constituents. For example, should we focus on better force models, or better race management, or a better measurement process?

For the ITC the start of 2022 has been marked by improvements in the VPP without undue disruption, and a growing technical interaction with owners and designers through the development of a wider performance database.

The ORC rules stand firmly on a tripod of VPP speed predictions, scoring and measurement procedures. The research associates keep us honest, ensuring we keep all three bases covered...

Andy Cloughton, ITC

