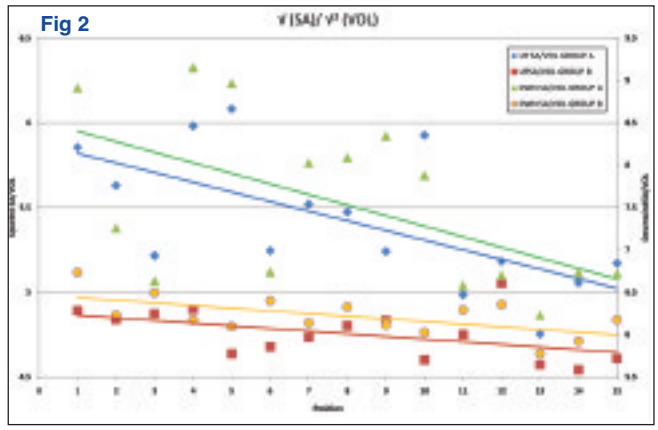
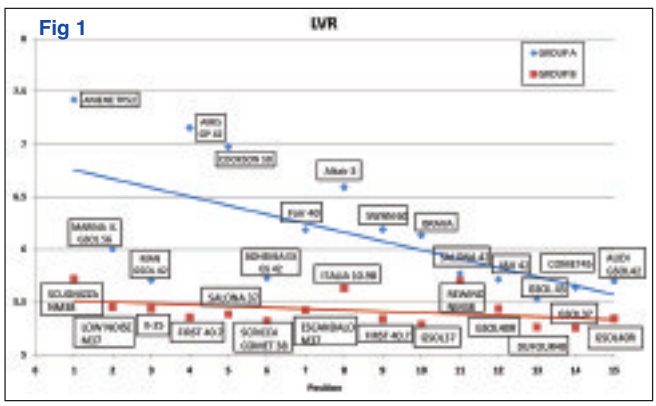
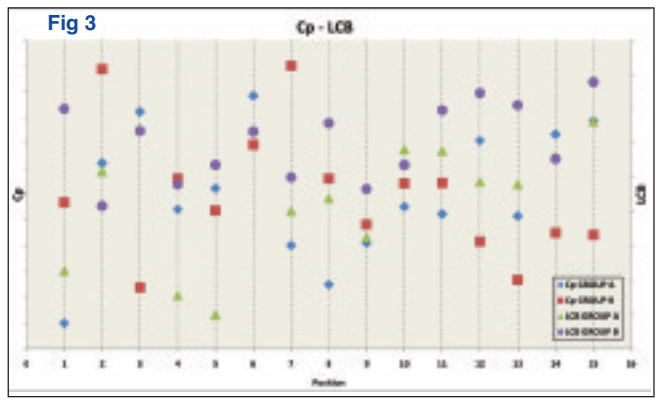
ORC

Positive vibe

DEAN MICULINIC







There have been many assumptions and speculations on what a favourable ORCi design would look like, so a parametric analysis of the 2011 ORCi world championships, at 120 entries the largest turnout to date, has been a useful exercise to understand what trends in design may currently be favoured under the ORC International rule… and why.

This exercise was performed starting from a re-scoring of the series excluding the offshore races that were run in very light or no-wind conditions. Boats with a DSQ or BFD were given instead their worst inshore result, and no discard was applied. The main parameters of the first 15 boats of Group A and Group B were then analysed, and the plots shown above made to correlate between the results and the boat characteristics:

- *Fig 1*: LVR = IMS L/(VOLUME)$^{1/3}$
- *Fig 2*: UPSA/VOL = (Upwind sail area)$^{1/2}$/(VOLUME)$^{1/3}$
- *Fig 2*: DOWNSA/VOL = (Downwind sail area)$^{1/2}$/(VOLUME)$^{1/3}$
- *Fig 3*: Cp LCB = prismatic coefficient and longitudinal position of centre of buoyancy

Where some correlation could be seen between results and the plotted parameter a regression line is added to visualise the trend better. What is immediately clear is the wide difference between the characteristics of the two groups:

– Three of the top five boats of Group A have a clear trend of high LVR, and four of the top five have higher than average UPSA/VOL figures as well (also higher DOWNSA/VOL). They are also quite stiff, since the ratio between the Righting Moment measured and the Default Righting Moment (the reference RM computed by the VPP) is well above 1 for almost all of these boats (this plot is not shown).

– In contrast, Group B boats have LVR, UPSA/VOL and DOWNSA/VOL values well below those of the larger group, and there is not such a clear trend of the winning boats being more powerful compared to the average.

Another interesting analysis is regarding the parameters Cp (prismatic coefficient) and LCB (longitudinal centre of buoyancy),

***Top left*: Class A start at the 2011 ORCi worlds. Rather theatrical! The big boat Class A was won by a Farr 40 from two Grand Soleil 42s while Class B was dominated by the Cossutti-designed M37s**

that were considered the fundamental parameters for the winning IMS boats of some years ago, when designs having high Cp and aft LCB were all the fashion. The distribution of top 15 boats in both groups shows, however, that there is now no trend favouring high Cp and aft LCB; in fact, the boat finishing sixth in Group A (the TP52 *Aniene*) has the lowest Cp and one of the most forward LCBs of both fleets. This is well represented by the scattered plot of both parameters seen together in Fig 3: Cp is related to the left vertical axis and LCB to the right axis. (Note that no actual Cp or LCB values are shown on this plot, as these parameters are the designers' proprietary information.)

That this plot seems to lack a clear trend suggests that among a wide variety of boats (from TP52 to GP42, from boxy designs to production boats, from lightweight to the canting-keel Cookson 50), to win under ORCi you are not obliged to design a boat with an extremely high Cp and aft LCB (as in IMS), and that different kinds of canoe bodies can all perform under the rule.

Another consideration is the so-called 'boxy' boats of the IMS era. These remain competitive (perhaps because in Group A at least boats of this type were mainly crewed by professionals), but they have to work harder. Some of them have made modifications to take advantage of today's ORCi rule that no longer penalises more powerful boats. For example, *Marina Kastela* (B&C Grand Soleil 56, 5th in Class A) increased sail area with a square-top main and was made stiffer with a new T-bulb keel, and *Bohemia Express* (B&C Grand Soleil 42, 2nd in Class A) increased her stiffness, also with a new T-bulb keel.

This indicates that if you have a good existing design (as those boats are), you can modify it to be more powerful and win, and not just exploit a rating advantage as in the past.

And that is surely a change for the better.

Alessandro Nazareth, ITC chairman ❑