ORC

Finessing the offer

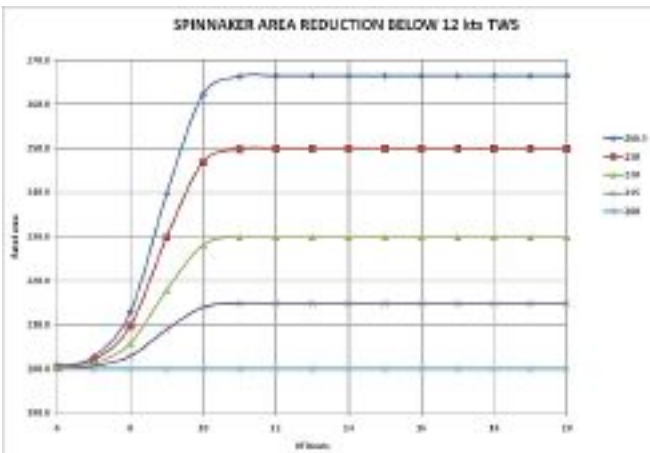
The latest annual meeting of the ORC saw 27 submissions this year, half the typical number – but with a five per cent increase in certificates for 2011. As for the technical work of the ITC, here is a list of the major new features.

AERODYNAMICS

Masthead spinnakers

To correct the trend that led to most serious ORC boats typeforming towards fractional spinnakers, the so-called Shape Function was improved so that under 12kt TWS the spinnaker surface considered by the VPP was gradually reduced to the reference area applied at 6kt. The reference area next year will also be computed as a function of IG and J, making it independent from the height of the spinnaker halyard (ISP). The VPP will thus always consider masthead spinnakers faster for the same area due to the effect of wind gradient with increasing height.

The plot below illustrates how spinnaker area is reduced (for a spinnaker reference area of 200m^2). Spinnaker areas below the reference area will not be reduced and the maximum reduction ratio is 0.75.



Sailplan depowering

The aerodynamic model of the VPP depowers the sails through a succession of operations that reflect the reality of how crews trim their sails:

1. Initially the sails are flattened and twisted without reducing area.
2. Then the jib is reduced from the original surface to a minimum depending on foretriangle.
3. Then the mainsail is reefed.

The depowering scheme is now based on new VPP variables working with a new optimisation parameter RED that replaces the traditional Reef parameter. During the first phase the centre of effort is lowered by twisting the sails, thus decreasing the heeling force. In the third stage when reefing the mainsail centre of effort is also lowered.

In contrast, during the second phase (when the jib size is reduced) the centre of effort remains almost constant in height and thus the depowering of the sailplan depends only on the reduction in jib size. For this reason, during the reduction of the jib a routine called TWIST JIB has now been introduced to reflect the twist of the jib during its reduction. The VPP previously did not consider this. As a result, boats in the ITC test fleet will now show less heel and consequently will 'speed up' between 14 and 20kt TWS.

HYDRODYNAMICS

Immersed transom drag

Some years ago the computation of immersed transom drag was introduced, which evaluates the resistance of modern light boats that often have limited overhangs aft and an immersed transom. Unfortunately, especially with smaller boats, this produced a tendency to exploit this formulation, measuring boats with extreme stern-down trims and then moving the crew forward while racing... To avoid this the ITC has introduced a maximum limit to the transom drag resistance, which obliges the VPP to move the crew further forward and allow the transom to gradually emerge from the water.

Residuary Resistance

Following the work of a focused ITC working group we expect to produce an entirely new formulation of Residuary Resistance for the 2013 VPP.

New offshore handicap

The ITC has developed a new single number handicap for long offshore races, more related to the reality of how offshore races are sailed, using more upwind and downwind VMG angles in light air and more reaching angles in stronger winds. This new Offshore Single Number Handicap will replace the current GPH figure for offshore single-number courses, except that GPH will be maintained in order only to identify boats and to divide classes.

The new OSN will be computed as a weighted average of polar speeds (not wind averaged); the resulting predicted boatspeeds at 8kt TWS will be accounted at 25%, the speed at 12kt TWS at 50% and the speed at 16kt at 25%.

Dynamic allowance

The DA allowance for cruising boats has also been exploited by aggressive competitors and so for 2012 the maximum allowance is reduced and will be applied only to those boats that the VPP will recognise as being genuine cruising designs.

Measurement trims

The ITC has put onto its 2012 agenda a study for a new procedure of measuring freeboards and heeling moment in light-ship (ie IRC-style) trim.

Currently boats are measured with safety equipment, anchors, sheets and other deck gear allowed under IMS. To facilitate measurement and to reduce inventory hassles it was decided to move completely to empty measurement trim by 2013. In the interim and to avoid having all boats remeasure flotation freeboards, the ITC will study how to use the weights currently recorded on the certificate to calculate a 'virtual' light-ship displacement.

Appendages

The latest version of ORC Offset Editor was presented, with a procedure being developed to interpolate the stations on a separate measured appendage in order to rebuild a correct Offset File. This will allow the acceptance of appendages measured with horizontal waterlines instead of vertical sections, a time-saving feature for boats being fitted with new foils.

Other

- pitch gyradius allowance for anchors within 30% LOA of the bow is deleted.
- boats of LOA>24m can now be floated with additional weight (sails and fuel and so on) onboard, and the VPP will remove the extra masses to identify the correct value.
- boats with LOA>24m may now incline with a minimum angle of 1° instead of the current 5.5°.
- Code 0 sails (and all spinnakers) shall now be set flying on a pole or prod only and not using any forestay luff-groove device.

Finally, co-operative work is underway with US Sailing to assist the New York YC's HPR initiative, in helping to define proposed rule parameters in terms of the ORC VPP. This is scheduled to be examined in more depth during a panel discussion at the World Yacht Racing Forum in Estoril.

Alessandro Nazareth, ITC chairman ❑