OFFSHORE RACING CONGRESS

World Leader in Rating Technology

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ITC – INTERNATIONAL TECHNICAL COMMITTEE

Minutes of a meeting of the **International Technical Committee** of the Offshore Racing Congress held on 6th -9th October 2008 at Hotel Melia Castilla, Madrid , Spain

Present: Alessandro Nazareth (Chairman)
Andy Claughton
Rob Pallard
David Lyons
Kay Enno Brink
Axel Mohnhaupt (Research associate)
Nicola Sironi (Chief Measurer)
Davide Battistin (ORC Programmer)
Zoran Grubisa (ORC Technical staff)
Panayotis Papapostolou (ORC Technical Staff)

Observers: Peter Reichelsdorfer, US SAiling
Dan Nowlan, Offshore Director, US Sailing
Carlos Lopez Fernandez (RFEV)
Maria Spiridelli (Measurer , Greece)
Vasily Alexeev (Measurer, Russia)
Enrique Molinelli (RFEV)
Flemming Nielsen (Chief Measurer, DEN)
Hans Zuiderbaan (ORC, NED)
Jean Louis Conti, F.F.V. (France)
AB Pasman (NED)
Veiko Rosme, Estonian rating Office
Joakim Majander, Finnish Sailing Federation

Apologies for absence were received from
Philippe Pallu de la Barrière
Fabio Fossati (Research Associate)
Manolo Ruiz de Elvira
Fabio Fossati (Research Associate)
Lex Keuning (Research Associate)
Michael Richelsen (Research Associate).

1. General

The meeting was opened by an introductory speech of ORC chairman Bruno Finzi who thanked the committee for the work done in 2008, with 3 different meetings held.

Bruno reported that the new ORC INTERNATIONAL rule was widely accepted by sailing constituency without any big protest or drawbacks. The new rule did not have the disruptive effect on the IMS fleet that was feared and the results of the season with very tough competition in major regattas and very close results was a sign of the good quality of the new rule.

The ORC chairman closed his speech with a recommendation, coming from management Committee too, regarding the possible modifications to the 2009 VPP (that from ITC agenda seem quite a lot). He reminded the necessity of a good consistency in the handicap from one year to another to the sake of the rule acceptance. He recommended that the ITC would implement only those items (coming from the research performed or from the submissions received) that would have small impact on the fleet, postponing to 2009 those that would benefit from further development.

1.1. Minutes of the last meeting

The minutes of the previous meeting in Valencia were approved

1.2. Chief Measurer's report. 2008 season

Nicola Sironi reported about 2008 season.

The races held in the summer (like Copa del Rey, European ORC championship, Italian ORC Championship) confirmed a good participation and fair results and a very good feedback on the acceptance of the new rule.

At MAXI YACHT ROLEX CUP, where all the divisions were racing in IRC, the mini-MAXI division (that until last year used IMS as rule), re-scored with ORC INT showed at the first three places the same boats that were on top in IRC, that is NUMBERS. MONEYPENNY and ROSEBUD, that are all light , stiff and "sexy".

This is a very strong signal that new ORC INTERNATIONAL rule is working in a fair way with this kind of "modern" boats

He brought to the attention of the committee some strange behavior of handicaps when comparing boats.

In fact there is a sort of increasing and decreasing differences of handicaps in the range 6-20 kts TWS when comparing, e.g., the WW/LW rating of a fleet of boats, when the common perception would expect a sort of monotonic tendency (differences always increasing or decreasing or with only a maximum or minimum in the range of 6-20 kts of TWS).

The committee will try to study this problem next year.

Nicola showed also the way the new ORC MANAGER is working , how it can compare different codes, boat configurations and all the powerful tools included (stability certificate, performance package, drawing, offset viewer and editor). (see also 1.3.2 and chapter 7 below)

1.3. Submission review

The committee began his working session with the submission allocated to ITC full review.

Grouping various submissions according to the items they are referring :

1.3.1. CREW WEIGHT

DSV6	**Crew Weight Calculation**	IMS
FIV6	**Crew weight effect**	VPP
RFEV2	**Crew weight**	VPP

The committee already discussed this item in Valencia and is still convinced that the current treatment of crew weight is correct but is typeforming versus the default value, while it is difficult to explain to the sailing constituency that increasing the crew weight an increase in handicap is not always obtained.

So the treatment in the VPP of the crew weight was changed according to this scheme :

- Sailing DSPL will be computed always with default crew weight, whatever will be the declared crew weight.
- Righting moment will be computed with added righting moment due to the declared crew weight on the rail

With this routine adding weight will not create any difference in sailing trim displacement, while the righting moment due to the crew will increase , returning a slight decrease of handicap (mainly with strong winds).

1.3.2. OFFSET EDITOR

DSV7	**Offset file visualization in ORC Manager**	VPP
SWS2	**Designer offset file converting program**	ORC Software
DSV8	**Offset editor software**	ORC Software

ITC is supporting these submissions. Manolo Ruiz de Elvira is working together with Panayotis Papapostolou to permit his NAUTATEC IWM software to be run from within the already powerful ORC manager, to enhance the capabilities of the ORC Manager through the addition of an Offset Editor.

The current beta version of ORC Manager has an Offset Viewer but the inclusion of IWM as the Offset Editor will allow offset files to be generated from the 3-d DXF file, that can be output by almost all CAD programs

More than this It will be part of the next year re-writing of the LPP (see chapter 6 below) the possibility of having a tools that could transform not only DXF files into Offsets files but also other 3D file formats (like IGES).

1.3.3. INFLUENCE OF CHECKSTAYS ON SAIL COEFF

DSV12	**Backstay and runners**	ORC Software

The configuration of fractionally rigged boats without backstays but with runners attached to the hounds has been examined by the committee with a thorough study.

It was decided to apply the following criteria (that will substitute F9.5):

- Running backstays and checkstays (according to ERS) shall be recorded as “runners”. The number of pairs shall be recorded.
- Secondary runner tension adjusters, fitted to the mast within 0,1*IG from the upper attachment points of the runners, shall not be counted as another pair of runners.

More than this the committee revised the current rule and code for the influence of checkstays on mainsail coefficients.and it was decided that the current increase of performance of mainsail (higher CL and lower Cd) when checkstays are present will be revised halving the difference between Cl and Cd coefficients of the mainsail in the two configurations.

A small test run on single bots was made showing correct behavior of new checkstay treatment that will be implemented.

1.3.4. LIGHT BOATS

FFV1	**VPP & Sportboats**	VPP

The committee believes that light boats (high LVR) are fairly treated by current VPP (the RR resistance has a corrector based on LVR that slow down high LVR boats).

Following the above submission the correction function has been revised giving a further slight advantage to high LVR boats.

In any case the committee doesn’t think that the speed of Sport boat is overestimated in windward conditions or underestimated in downwind conditions, there could be only surfing in waves effect in strong winds that for light boats are not precisely estimated by VPP.

1.3.5. WIND AVERAGE

FFV2	**TA calculations in offshore courses**	VPP

The ORC programmer has revised the wind averaging effect and how it is applied to handicaps and will modify OCEAN COURSE Time Allowances, that are the only where the wind averaging is applied twice.

1.3.6. TWIN RUDDERS

FFV3	**Twin rudders**	VPP

Twin rudders configuration was already in agenda for this year but was postponed to 2009 because there were other items more urgent to be implemented. Surely this configuration, that is becoming every year more diffused not only on ocean racing yachts, will be included in 2010 VPP.

The routine is almost ready , it must be only developed in the part that is computing the portion of windward rudder that is coming out of the water and the forces acting on the remaining part into the water.

1.3.7. MAINSAIL AREA

FFV4	**Mainsail sail area**	VPP
FIV3	**Mainsail - E correction**	VPP
FSF3	**Mainsail rated area**	VPP
KNWV4	**Rating of heavily roached mainsails**	VPP
SWS1	**Penalty on mainsail area**	VPP

Following 2005 and 2006 Wind Tunnel Tests in Milan , this year the revision of windward aero model was in ITC agenda (see below 2.1) and will be included in 2009 VPP.

Being the effect of hi-roach mainsails included in the formulation for Effective Height (Heff) and Center of Effort Height (CEH) that were derived from wind tunnel tests, the committee is almost convinced that the removal of E correction for high roached mainsails won't create any possible loophole or typeforming, adding the possibility to correctly handicapping this kind of sailplans.

So next year there will be no surface penalty in mainsails and so the rated sail area will be the same as the measured one.

The limits of HB and of the four girths (MGT, MGU, MG, MGL) will be kept only for ORC CLUB boats where those measures are not declared by owners.

1.3.8. SPINNAKER

FFV5	**VPP spinnaker treatment**	VPP
FIV5	**Spinnaker default area**	VPP
FSF2	**Spinnaker rated area**	ORC Rating Systems

These three submissions were all discussed together as part of a major item of revising the way downwind sail areas are measured, their default values and how VPP should address the various configurations that boats could have for downwind legs.

Spinnaker and default spinnaker area has been part of 2008 agenda with many decisions involved and the main one was to unify (for symmetrics and asymmetrics) the formulation adopted to measure the spinnaker area

With the following approach next year the following configurations will be allowed:

1. No spinnaker
2. symmetric spinnaker on pole only (with and without CODE 0)
3. asymmetric spinnaker on CL (with and without CODE 0)
4. asymmetric spinnaker on pole , asymmetric on CL and symmetric on pole (with and without CODE 0)

This will be possible as the current code can allow to rate any spinnaker configuration with the addition of CODE 0 (only in the case of no spinnaker condition the CODE 0 will not be allowed).

More than this boats will be rated according to the sails that are part of their inventory.

Regarding the spinnaker area calculation it was decided to use the current asymmetric formulation that was evaluated making some rounding to reach the final expression:

SPINNAKER AREA = SL * (SF + 4 *SMG) / 6

In the VPP, to return same forces from symmetrical spinnakers, a multiplier of the area will be introduced (areas with the new formula are 13-14% less than areas calculated with current symmetrical formula).

For asymmetrics and code 0, SL should be changed in **(SLU+SLE)/2**, SF with ASF and SMG with AMG.

For already measured symmetric spinnakers the statement **SMW=SMG** will be adopted and this will surely return bigger values for the surface as **SMW >= SMG**. It will be possible to re-measure spinnakers to obtain a correct SMG.

Regarding the default values that must be used for the default area (computed always with the above formulation) the same concept of asymmetric will be assumed, that is mid girth at 75% of foot length.

To better clarify these are the default values for symmetric spinnaker:
SL default = 0.95*√(ISP^2+J^2)
SF default = 1.8 * max (SPL; J)
SMG default = 0.75 SF default
If SPL is not recorded it will be set SPL=J

For the asymmetric spinnaker:
ASL default = 0.95*√(ISP^2+J^2)
ASF default = max (1.8 * SPL; 1.8*J; 1.6*TPS)
AMG default = 0.75 ASF default
In the case that the configuration is only asymmetric on CL and TPS is not recorded it will be set
TPS = J + SFJ

For the CODE0:
ASL default = 0.95*√(ISP^2+J^2)
ASF default = 1.6*TPS
AMG default = 0.55 ASF default
(minimum mid girth for Code 0 have been reduced to 55% of foot length).
If TPS is not recorded it will be set TPS = J + SFJ

For ORC CLUB boats that don't declare any spi measurement the default area will be computed with:
SL (or ASL) = SLdefault
SF = SMG =SFdefault
ASF=AMG= SFdefault

The default area will be compared with measured one to obtain (in symmetrics, asymmetrics and CODE0):

Rated sail area = measured sail area (if measured > default)

Rated sail area = average (measured, default) if measured < default.
(the 2% range that is now in the rule is cancelled)

Generally the default sail area for symmetrics could be around 20% less than current VPP.

So the number of boats that will be rated with their actual sail area will increase dramatically, as the default area is now well below the old value.

The very few that will still have their spinnaker area below the default area will be rated with an average of default and measured.

For the "no spinnaker"configuration the rated area of the virtual spinnaker will be set at 50% of the default area .

More than this in 2009 VPP there will be no run with poled jib, but poled jib coefficients will be used to produce the GPH for white sails racing (to be used only in no spi races).

With the adoption of a single formulation for spinnaker area calculation dynamic allowance routine will be slightly updated, mainly for asymmetrical, to have same kind of treatment of downwind sail area .

1.3.9. IMS REGULATIONS

FIV1	**Accommodation Regulations**	IMS
FIV2	**Accommodation Regulations - Racing Division**	IMS

The committee doesn't have any concern about relaxing the requirements for Racing division. As a first step the ITC would like to propose to align the racing division to GP class requirements and then next year cancel completely Racing Division requirements for 2010 season.

In any case the committee would prefer to have a feedback from sailing constituency about this possible complete removal, to be sure about the final deletion of Racing Division requirements.

More than this the sailing constituency (owners, race organizers, rating offices) should be advised of this future change that would not enable any more to race in a mixed fleet with Cruising Division those boats that don't comply with any Regulation.

So the rule IMS 202.2 should read:

Interior Height (IH): IH = 0.1143 * AL + 0.3171 (meters).

IMS 202.3 should read:

Overhead Area at Full Interior Height: At a height IH above the level established in 305.1 there shall exist under the overhead a plane of length not less than 0.14 * AL and area not less than 0.006 * AL^2, ignoring deck beams and deck stringers. The aft extent of this area at the centerline shall lie not forward of a point
located 0.55 * LOA aft of the stem.

IMS 202.4 should read:

Overhead Area at 90% Interior Height: At a height 0.9*IH above the level established in 305.1 there shall exist under the overhead a plane of length not less than 0.19 * AL and minimum area 0.019 * AL^2. For a length of 0.15 * AL, found parallel to the centerline of the yacht, the outboard width of this plane shall be not less than 0.1 * AL. Deck beams and deck stringers may be ignored.

Accommodation. All Racing Division yachts shall comply with old IMS Regulations 203-211 inclusive, except as modified by :
IMS 207.1, .2 and .3 shall apply, but yachts need not comply with the general preamble in the opening paragraph of IMS Regulations 207. As an exception to IMS 205, no requirement for rigid bins is in place and soft bins for gear stowage are allowed.

For the cruising division ITC agrees that a revision of current regulations should be necessary in the aim of a general simplification of its requirements but a simple reduction of requirements is more difficult to achieve in short time.

For this reason the committee decided to appoint a working group that during next year will renew the Regulations for Cruising Division to be presented at next year AGM for final approval.

1.3.10. RATED JIB AREA

FIV4	**Default JL**	VPP

In 2008 VPP it could happen that boats with JL measured below JL default (0.95 * sqrt(IM^2+J^2)) have rated jib area > than measured one.

In the general aim of handicapping actual sail area removing all surface penalties, ITC decided to introduce the concept of default Jib/genoa area.

The default area for Jib/genoas will be :

Default Jib = (0.90 * √IM^2+J^2) * 0.90 *J /2

If measured area of jibs is above the default, rated sail area will be the same as measured one.
If measured area of jibs is below the default, rated sail area will be the same as default one.

Being the above default very small (about the 80% of the foretriangle) it will be very difficult to find boats rated with more sail area than actual one (above all for those with overlapping genoa).

With the default sail area concept the committee took into account also the cases of those genoas with negative leech. Being all the 4 girths available since last year also for non-overlapping jibs, it was decided that area will be calculated always with the 4 girths to cancel another penalty in jib area in the case of negative leech.

1.3.11. PROPELLER

HSF3	**Propeller definition**	IMS

The committee doesn't think that the difference between the resistance of a 3 blades fixed propeller with a 4 blades is so high to require the introduction of a new set of coefficients for the PIPA calculation. Generally 4 blades propeller have smaller blades than 3 blades so the percentage of disc area occupied by the blades is almost similar, hence there is no necessity of revising the 4 blades coefficients. In any case 4 blades propellers will be accepted (as they are now) in the group of "fixed 3 (or more) blades".

1.3.12. DEFAULT RIGHTING MOMENT

RFEV1	**RM Default**	VPP

Default Righting Moment has been evaluated for 2008 VPP with a regression based on more than 500 inclining test on a wide variety of boats that returned the best fit for the following formula:

RM@1deg = (a0 + a1*BTR + a2*(VOL^(1/3) / IMSL) + a3*(SA*HA / IMSB^3) + a4*(IMSB / VOL^(1/3)))*DISPL*IMSL

Generally there has been also some concerns about the smaller value of default righting moment compared to the formulation used in the past to obtain a RM for CLUB boats. In fact there has been in 2008 a large request of revising the default RM formulation because very often the value returned seemed not so high.

Regarding the small boats (up to 11 m about) a verification on the ratio of the default /measured righting moment revealed that this is higher than the same ratio for bigger boats (above 11 m).

So committee doesn't think to reduce the default overall value, on the contrary it's average value will be increased for implementation in 2009 VPP, running a new regression on the half of the fleet that has the higher ratio of measured/default RM. This will surely increase the evaluation of the default RM.

1.3.13. ORC INTERNATIONAL DEVELOPMENT

SWE1	**Further development of ORC International**	VPP

Sailing length has been thoroughly revised with the new formulation of "Fn transition" that computes the effective sailing length of the boat taking into account its overhangs and the wave generated by the hull.

This issue has been completely fixed but for the sake of robustness of processing offset files all over the world it has been postponed to next year when LPP problems will be solved (see below 3.1)

On the other hands committee thinks that current C/R gyradius adjustment fully accommodates the fully fitted boats with weight distributed all along the length of the boat.

Minor quantities of lead inside the bilge are not reducing the overall gyradius of the boat more than the increase obtained adding a windlass on the bow.

So with the demonstrated typeforming of the current fleet versus stiffer boats , the big quantities of lead into the bilge will soon disappear as designers will prefer to put lead into the bottom of the keels or lightening the boats.

1.3.14. DSS

SWS3	**Dynamic Stability System**	VPP

The ITC studied thoroughly the DSS to return a fair handicap to the boats that will adopt this system.
A scheme for measuring the system was established based on:

- Span of the extended wing measured along the curvature (if any curvature is present)
- Maximum chord length (usually this system has constant chord length)
- Maximum thickness
- Angle of the wing with the horizontal axis (if the wing is curved the angle will be measured with a line connecting root chord to tip chord)
- Distance of the root chord from the centerline of the boat.

With the above measurement it will be possible to asses at all boat speeds:

- Added dynamic righting moment due to the lift generated by the wing
- Resistance of the wing (sum of Viscous, induced and residuary resistance)

First test returned a fair handicap for this kind of system , so next year ORC INTERNATIONAL and CLUB will be able to rate DSS.

In any case the committee expressed some concerns about the static stability of the boats fitted with DSS, as they rely a lot on the added stability due to the wing, so initial stability could be low (may be also below LPS and Stability Index minimum values) and dynamic stability could suddenly drop when the boats will stop.

1.3.15. ORC MANAGER

RFEV3	**ORC Manager Comparison Tool**	ORC Software
DSV11	**ORC Manager - Boats Comparing Tools**	IMS

As said before in par 1.2 the new ORC MANAGER is a very powerful tool.

It can compare same boats with different codes for better studying modifications to the code (this will be very useful for ITC work) and also compare characteristics of fleet of boats, or compare modifications to the same boats.

The output generated can be customized with the inclusion of all possible parameters in comparing tables that could be easily transferred in EXCEL or XML files.

1.3.16. RMS FILE

KNWV1	**RMS file**	ORC Software

The present RMS file that is generated by ORC software for the scoring software , has a single format and is generated in the same way and format for the boats either if it has an International or Club certificate.

In particular TOT Offshore handicaps will be checked . See Minutes of the Race Management Committee.

2. Aerodynamics

2.1. New Depowering scheme, overlap reduction and following main reefing. - EC removal. Limits for ORC CLUB. Analysis of final test runs and formulations

This year the VPP depowering scheme has been thoroughly revised.

The proposed depowering scheme (that reproduces the way boats reduce sails while racing) , is based on a proposal by Andy Claughton and Fabio Fossati with Milan wind tunnel results.

The approach was to establish a model that begins to reduce only the genoa (or jib) overlap and luff without reducing mainsail area. Only when the foresail is reduced to a minimum dimension the mainsail begins to be reefed. With this new reefing procedure, the minimum value of FLAT parameter (that reduces the lift force, so decrease the heeling moment) has been fixed to 0.5 while in the current model it could mistakenly reach 0.0.

In the full sail area condition and during the jib reduction step new CEH (center of effort height, necessary to compute heeling moment) and Heff (effective height needed for induced resistance of sailplan) , are computed

Following Milan Wind Tunnel Tests the above formulation for the Heff have been revised to correctly address the increase of efficiency of high roached mainsails.

More than this, this kind of mainsail have a higher CEH so they will benefit of more AWS for the gradient distribution, so the drive force generated will be slightly higher and the resistance slightly lower than a main with normal IMS roach having the same surface.

For measurement purposes the way HB is measured when battens are placed over MGT should be retained to avoid any exploitation in this area, but no penalty will be applied if HB exceed the limit.

All HB, MGTL, MGUL, MGML, MGLL limits will be retained for ORC CLUB boats (with normal roached mainsails) that don't declare any mainsail measurement.

Next year the committee will go on analyzing the wind tunnel test data to develop an even more robust aero model.

2.2. Code 0 AMG limit revision. Possibility to move it down to 60-55% ASF

The committee after one year since the introduction in ORC rule of Code0 sails, doesn't have any concern about lowering the limit of middle girth AMG to a minimum of 55% of ASF. This because the coefficients currently used in VPP to rate this kind of sails were derived also from the smaller code0 tested in the wind tunnel that had a 58% mid girth.

The default values for the default area calculation of code 0 will be changed accordingly (see above submissions FF5, FIV5, FSF2.

Hydrodynamics

2.3. L assessment and Fn Transition

Axel Mohnhaupt presented an updated version of this study on length, overhangs and truncated sterns.

This scheme , as described in previous meetings minutes, could accommodate a Fn transition as overhangs decrease, taking into account additional hull parameters with a scheme for an estimation of the dynamic sailing length with consideration of the speed and generated wave in which the yacht is sailing.

The speed of the boats with short overhangs and immersed transom will be closer to reality, taking into account the different behavior with aft turbulence and separation.

The study was based on tank test data coming from IOT and Delft made on models with different stern position.

This is the description of new Fn transition procedure:

1) L is computed as a weighted average of LSM1 and LSM2 only (LSM4 is no longer used)
2) The multiplier in L will be increased from the current 0.3194 to a value that will return an average value of L comparable with present formulation
3) Residuary Resistance curve will be computed with a Fn correction for smaller and greater overhang ratios than the standard overhang ratios of the tested Delft models (15%). The overhang ratios are taken as LSM5/LSM1. This correction will be effective in the Fn-range from .275 to .625.
4) LSM5 is the integrated L for the boat sunk to the end of the transom, removing the tail effect
5) New LSM5 will be used only for overhangs evaluation with a value that better reflects when transom begin to be immersed.
6) The drag due to excessive wake at low or immersed transoms is added as a viscous component to the total resistance based on the ratios of immersed transom/ASM1 areas and relative wave height (Hwave at transom/LSM1). This will be effective in the Fn-range from .125 to .425.
7) A pretty strong correlation between LVR and the wave height at the transom as well as at the end of the WL was found. The wave profile follows pretty closely the overhang profile for Fn>.375, and is approximately linear from the end of the WL to the wave intersection with the overhang profile.
8) All the wave heights of all boats are calculated for the end of static WL and at the transom at the overhangs of .15LSM1, which is about Delft standard. The wave heights at the actual transom is then found by interpolation between the two points.
9) For the drag calculation the Hoerner formula for the base drag of a tridimensional body is used. It works perfectly if AMS1 is used for the reference area..
10) the drag due to the immersed transom is computed at Fn=.375, where at the standard overhang the wave is reaching the stern. At higher Fn's the constant drag calculated for Fn=.375. is added

The test runs presented were almost satisfactory except for some particular boats with offsets file that presented some problems in evaluating the stern immersed area. This was due mainly to :

1. aft rudder extending aft of the transom is not always correctly assessed by clipping procedure that separates appendages (and so the rudder) from canoe body.
2. Last station is sometimes represented by 1 single point, hence the impossibility to compute the immersed area of this kind of station

For the sake of robustness of the code it was decided that this routine for Fn transition and for assessing the resistance due to transom immersion will be frozen until next year when a LPP revision of the aft end of offset file and correct addressing of problems listed above will be set. This will be part of the LPP re-writing project.

2.4. Heeled drag based on IOT data. Revision with Delft tests data

Since 2004, the committee is devoting part of its meetings in discussing how the heeled drag formulation should be improved in accuracy.

Rob Pallard's data on measured heeled drag increment in 9 USSA models tested in IOT tank facility was the base dataset used to evaluate a new approach for the formulation.

Rob started with the 2005 IMS expression including the boxy boat corrector. He didn't attempt to make any changes in the coefficients for the boxy boat portion of the algorithm as the IOT dataset doesn't have enough variation in the applicable variables Lxx/L00 and WPAxx/WPA to do something that is sensible.

He worked on various terms and parameters assessing current heeled drag formulation (FnCurve expression for example was used in an attempt to capture the trend for heeled drag to dip around Fn=0.30 to .325)

Combining the various variables he used SOLVER to compute different (a total of 6) possible new formulations with their related coefficients.

The one with better sum of residuals squared (SRS) was chosen to prepare test runs on ITC test fleet.

In September Lex Keuning sent to Axel Monhaupt tank test data of almost all Delft models (including the last two ORC boxy models) tested at 20° heel, so the new formulation for assessing Heeled Drag has been checked and the coefficients updated including this huge amount of new data.

The test run based on the above formulation presented during the meeting looked promising and the committee quite unanimously decided to update the heeled drag formulation for 2009 VPP.

The committee in any case wishes to add a subset of the Delft models with appendage next year if test and subsequent data will be available.

2.5. Keel/bulb characterization improvement. Analysis of last test runs with updated code

The coding of the new procedure introduced in Estoril for detecting bulb/winglets configurations (and corresponding decrease or increase of effective depth) was completed prior of this meeting.

Now it will be possible to:

1. Locate maximum width point also in poor precision offset files.
2. Have a fair transition from normal keel/bulb to bulb/wing, that in 2008 VPP was too sharp.

The updated criteria that takes into account the shape of the upper part of the bulb and that smoothes the transition between fin keel, bulb and winglet seem to work well , it finds not only maximum width of bulb (or winglet) but also the width at the intersection between fin keel and bulb (or winglet).

The ratio of the sectional area of the bulb between those two points and the rectangle that has its opposite corners at max width bulb point and at ending upper bulb point is used to judge if the bulb acts as round bulb or as a end plate or as lifting part and the corresponding decrease or increase of effective draft is computed.

The test run presented on a small systematic variation of keels (from fin to winglet) on the USSA5 model was working in the expected direction and committee approved the inclusion of this refined routine into 2009 VPP.

In any case the scheme that Andy Claughton drafted during Valencia meeting with a different approach that could solve the problem of bad measured offset files will be further inspected during next year.

2.6. Influence of keel strakes on appendage resistance. Possible modifications to 2008 VPP

The presence on many boats of excessive keel strakes at the intersection between the keel root chord and the canoe body has been an item discussed during the whole 2008 by the ITC.

The committee thinks that this is still making an unwanted advantage that could be created by an over-predicted viscous resistance or wave drag.

The committee and Manolo Ruiz de Elvira worked on a new formulation (based on a Hoerner formula about viscous interaction drag at the junction between lifting surface and wall which takes into account relative thickness and chord length of keel at the junction) that could account interference drag reduction for long chord keels with strakes.

Due to the limited time and some results not exactly in the direction expected the Committee decided to postpone this study for next year

2.7. Revised RR up to 0.75 fn with light and boxy models added and denser station spacing

In September Lex Keuning sent to Axel Mohnhaupt tank test data of almost all Delft models (including the last two ORC boxy models) upright resistance re-tested.

All the models have been tested at the highest speed possible. This implies some 47 models up to Fn 0.60 and some 23 models up to Fn 0.75 as in the trimmed condition the high speed tests posed problems due to excessive bow down trim.

The two ORC boxy models have been tested

Axel worked on this data to return an updated formulation of the current Residuary Drag based on:

- Current model set and newly added Models 60,61,62,63, ORC Box1, ORC Box2 (all weight 2)
- IMS-data for the models based on the denser station spacing for LPP calculations.
- Current polynomial terms
- Resistance data with trim moment applied and high speed data were available (high speed testing was only with trim moment applied)
- Fn's higher than 0.75 are modified as in the coefficient table to reach to .9
- Limits of terms are as current ones

Being part of the full package of hydrodynamic (with Fn transition and truncated sterns), it was decided to further develop the RR analysis on the new data coming from Delft for possible implementation in 2010.

3. ORC CLUB issues.

3.1. LPS<103 for ORC club boats without inclining

Next year with the revised default RM calculation it will be more difficult to find some CLUB boats, whose RM is derived from default formulation, that don't reach the minimum LPS of 103°, that is necessary to obtain a valid certificate.

The committee suggests that if this happens the certificate should be issued with a warning that the certificate is not valid for racing, until the boat won't be inclined to verify actual RM and LPS.

Another solution that could be taken into account is a corrector to default RM that could be introduced to issue a certificate that would increase LPS to the minimum of 103°, but in any case the certificate should be issued always with the warning about the very low theoretical LPS of the boat limiting its possibility of racing to category 4 races.

4. Table of prohibited materials and procedures

The Table of prohibited materials and procedures presented by David Lyons at Valencia meeting will be included with correct wording into 2009 IMS rulebook

This is the draft of the list of prohibitions:

- In hull and deck structures and rudders, High Strength (HS) carbon fibre with modulus exceeding 250GPa.
- In spars with the exception of booms, cored sandwich construction. Cored sandwich construction in spars exists where the core thickness at any section exceeds the thickness of the two skins.
- Any metal alloys containing titanium with the exception of generally available production hardware items. Titanium is not permitted in lifeline elements (stanchions, pulpits, pushpits etc.)
- No material with density greater than 11,340kg/m3
- Pressure applied in the manufacture of hull and deck structures greater than 1 atmosphere
- Temperature applied in the manufacture of hull and deck structures greater than 80°C.
- Aluminium honeycomb cores in hullshell and deckshell structures.
- In hull and deck structures, plastic foam core of nominal density less than 70kg/m3.

A statement will be included into the rule saying that the list of prohibited materials is normally subject to annual review but interim rulings. The overall intent of any material prohibitions is to promote safety, address cost and allow materials that are readily available while prohibiting materials and processes that are not readily available.

ORC staff will refine the above wording and list.

5. LPP re-writing.

ORC program for 2009 is the LPP re-writing.

In the event to utilize the consultancy of Wolfson Unit as possible supplier of the new LPP (Wolfson has already a LPP in its products to be used in conjunction with WIN DESIGN VPP), Andy Claughton made a short presentation of the features of this LPP.

The Committee discussed briefly about this, some suggestions were made (like treatment of IGES files or possibility to have offsets for canoe body and appendages like Wolfson LPP has).

ORC staff will get in touch with Wolfson Unit people to discuss further details.

6. Stability certificate status. Performance package

ORC staff presented the last version of Stability Certificate.

Some corrections to the stability curves for moveable ballast boats should be made.

More than this all useful data coming from both IMS trim (measurement and sailing) should be completed to return the best possible information for the owners.

The committee suggested also that for legal matters that could arise the name should be changed into:

HYDROSTATIC AND STABILITY DATA SHEET"

taking off the word CERTIFICATE.

For this reason also all the information for ISO 12217 STIX calculation should be deleted.

Regarding the new Performance Package. With polars (without dynamic and age allowance) plotted in all configurations derived from sail inventory plus an all .effects polar. Splining of the plotted polars should be refined to avoid big bubbles into the final polar plot.

The committee gave already in the past its availability to ORC staff to give all necessary inputs and know how to increase the quality of ORC product available for the sailing market, so ITC is at disposition to clarify any technical problem should arise in preparing these documents.

7. Completion of recommendations to the Congress

This is the summary of proposals for 2009 VPP

- New Heeled drag
- New wing keel detection scheme
- New RM regression
- New LVR (Length/Volume ratio) corrector in RR
- New Crew Weight Evaluation
- DSS assessment
- New aero model with different reef system and removal of EC
- New spinnaker area computation
- New Default Jib area concept
- New Checkstays treatment
- New Code 0 minimum mid girth at 55% of foot length
- Correction to Wind Averaging calculation for Ocena Handicaps
- New Racing Division Regulations
- New Table of Prohibited Materials

The aim of the chairman and all the committee is to prepare a beta VPP as soon as possible after this meeting to immediate release after final approval of the Congress.

8. Next year Research program

ITC would like to inspect the possibility to carry on both aerodynamic and hydrodynamic research for next year.

Wind tunnel tests could be performed for updating downwind sail models and complete upwind sail model too.

Andy Claughton and Fabio Fossati prepared a scheme of possible tests with the main aim of assessing crossover of jib/genoa with spinnakers (both symmetric and asymmetric).

It could be possible also to explore correlation with mainsail and spinnaker dimensions and position (with masthead halyard or longer poles).

Tank test availability is under verification with Lex Keuning and a possible construction of light boats models has been discussed.

Final decision will be taken when the Congress will fix the budget for 2009 research.

9. Next year agenda

This is a draft of next year agenda:

A) Length assessment with Fn transition
B) Residuary Regression formulation development
C) Immersed transom added resistance . New more robust routine in LPP to assess external rudder and clipping problems in the aft sections
D) Refinement of new upwind aero model
E) Twin Rudder
F) Revision of Cruising Division Regualtions
G) Development of new aero model
H) Different approach for keel/bulb characterization
I) Keel strakes resistance evaluation
J) LPP re-writing

10. Any other business

The committee discussed also a submission that was not allocated to IT.

FSF1	**Tack pennant limitation**	ORC Rating Systems

The committee fully believes that ORC 208.4 could be modified inserting a more strict prohibition of moving on windward side the tack with the help of afterguys and outriggers.

The new rule could read:

208.4 Where the asymmetric spinnaker is tacked on the centerline, tack pennants of whatever length could be used . Spinnaker should be sheeted on the same side as the boom, except when gybing or maneuvering.

In any case it will be prohibited to move on the windward side the tack of the spinnaker with the help of afterguys and outriggers

11. Next Meeting

The next ITC meeting has not been scheduled as many of members were not present in Madrid. The chairman will circulate very soon a form to locate best date and location for the first meeting in February –March 2009.

Observers are welcome