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I M O C A

INTERNATIONAL MONOHULL OPEN CLASS ASSOCIATION
OPEN 60' ISAF INTERNATIONAL CLASS

YEAR BOOK
2011

Post AGM 05/05/2011
(English Version)

ISAF
WORLD SAILING

INTERNATIONAL MONOHULL OPEN CLASS ASSOCIATION
2011 YEAR BOOK

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A BLACK SIDE BAR INDICATES SIGNIFICANT CHANGES FOR 2011

PREAMBLE

Founder Members:

Isabelle AUTISSIER, FRANCE.

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Established on 1991 the Constitution of the Association:

INTERNATIONAL 50’ 60’ FEET MONOHULL OPEN CLASS ASSOCIATION

I M O C A

Non-profit making Association established under the French "law of 1901".

This Constitution was amended by the following Annual General Meeting of the Association, the 21st of May 1999, the 12th of June 2001, the 24th of January 2002, the 9th of July 2003, the 27th of October 2003, the 20th of February 2004, the 6th of October 2005, the 2nd of March 2006, the 15th of January 2007, the 10th of July 2008, 29 July 2009..

CONSTITUTION OF THE ASSOCIATION I M O C A

DEFINITION:

Open 60’ : In the present Constitution, the nomenclature ***Open 60'*** designates a single hulled sailing boat whose length is of 60 feet, and which meets the norms specified in the Class Rules as published by the Association.
International Class: The Open 60' Class, under the name “***International 60ft Monohull Class Association***” (60MO) has been approved as International Class by the INTERNATIONAL SAILING FEDERATION (ISAF) by 2001 November ISAF Annual General Meeting decision.
Both Open 60’ and Open 50’ were previously together ISAF Recognised Class since the 1st of November 1998 by agreement concluded between the ISAF and the IMOCA.
IMOCA: The ***IMOCA*** Association constituted by the present Constitution has received, on behalf of the ISAF, the responsibility for the administration of the Open 60' Class.
MNA: Member National Authority, of the ISAF in each country.

SECTION 1: FORMATION - AIMS - TITLE - HEADQUARTERS - DURATION

Article 1 - FORMATION
The undersigned and other interested parties consenting to accept the present constitution and other conditions appended to this document, declare the formation of an association, registered as non-profit making under the French law of 1901 relating to associations, together with the wording currently in force, which may have amended or complemented it, as well as under the present constitution.

Article 2 - AIMS
The aims of the Association are as follows:
- To bring together the skippers of Open 60' Boats, as well as any other parties interested in the development of these sailing boats.
- To administer and organise the activities of the Open 60' Class.
- To establish the Class Rules and to further their development in terms of technique.
- To manage and co-ordinate the international calendar of events for these boats.
- To apply and promote respect for all matters concerning rules, Regulations and prescriptions of the International Authorities (ISAF) and National Authorities (MNA).
- To promote navigation and competition with these boats.
- To encourage research into new techniques and their application in the domain of safety of navigation, but with particular reference to technological innovation in the domain of performance.
- And in a general sense to conduct any activity in the interest of its members and to contribute to the development of the Open 60'.

Article 3 - NAME
The name of the Association is:

INTERNATIONAL MONOHULL OPEN CLASS ASSOCIATION 60 FEET
I.M.O.C.A.

Article 4 - HEADQUARTERS
Its headquarters are established in Paris, France.
They may be transferred to any other part of the country by simple decision of the Executive Committee and to another country, by decision of an Extraordinary General Meeting as defined in the present Constitution.

Article 5 - DURATION
The duration of the Association is unlimited.

SECTION 2: COMPOSITION OF THE ASSOCIATION

Article 6 - MEMBERS
The Association is composed of Honorary members, Full members and Associate members.

6.1: Honorary members:
Honorary members are individuals who have made a noteworthy contribution to the realisation of the aims of the Association.
Honorary members may be invited to meetings of the Association in a consultative capacity. The title of honorary member does not in itself confer any voting rights, nor does it render them eligible for office.
They constitute a council which can be appealed on request of the Executive Committee to give his opinion on important questions concerning right way of the association. This council must be consulted for any notorious constitution’s modifications.
Honorary members are not required to pay a subscription to the Association.

6.2: Full members:
6.2.1 The status of "Full member" may be accorded to any individual who is currently the skipper (or co skipper on a double handed event not less than 2000 nm and registered as official in the IMOCA agenda) of an Open 60', or to any individual having placed with the Class Authorities a declaration of the placing under construction of a sailing boat of this type, with the intention of competing with it.
For events with legs and sailed with crew, the case of substitute skippers must be subject to a preliminary request to the Executive Committee, as described in 7.2.

6.2.2 In case of failure of being able to sail an Open 60' with a current valid measurement certificate any individual having been a Full member, as defined above, for a continuous period of at least three years, acquires the right to remain a "Full member by right" for a period of a year.
Full members are called to meetings of the Association, are entitled to 2 votes each, are eligible for office and are required to pay an annual subscription.

6.3: Associate members:
The status of "associate member" may be accorded to any individual or group of individuals master and/or owner of an Open 60', to any individual or group of individuals organising competitions open to Open 60', and, in a general sense, to any individual or group of individuals whose actions may further the aims of the Association.
Associate members are called to meetings of the Association. Only 2 associate members per Open 60' are entitled to 1 vote each, are eligible for office and are required to pay an annual subscription.
Each associate member shall renew his application annually, in accordance with the procedure set out in paragraph 7.3.

Article 7 - ADMISSION PROCEDURES

7.1: Honorary members:
Honorary members are elected by the Annual General Meeting by a majority vote on the proposal of the Executive Committee.

7.2: Full members:
Any individual wishing to acquire the status of Full member must submit to this effect a written request on plain paper for the attention of the Officers of the Association, accompanied by either a photocopy of documents attesting the existence of their Open 60', or of the declaration of the placing under construction of an Open 60', together with the subscription for the current financial year.
Instructed by the Officers in regard to the dispositions required by the present Constitution, the Officers shall submit this request to the Executive Committee for ratification.
In the event of this being refused, the candidate may lodge an appeal and ask for a vote to be taken on the matter of the refused admission to membership at the next Annual General Meeting.

7.3: Associate members:
Any individual or group of individuals wishing to be admitted to the status of associate member must submit to this effect a written request on plain paper for the attention of the Officers of the Association, supporting their reasons for wishing to be admitted to membership of the Association, together with the subscription for the current financial year.
Instructed by the Officers in regard to the dispositions required by the present Constitution, the Officers shall submit this request to the Executive Committee for ratification.

Article 8 - SUBSCRIPTIONS
The Annual General Meeting shall fix each year the level of subscription, as determined by the Executive Committee, which is due for each financial year as defined in Article 27 of the Constitution.

Article 9 – CANCELLATION OF MEMBERSHIP
The procedures for cancellation of membership are set down in the Regulations.

Article 10 - EXCLUSION
The Executive Committee has the right to enforce disciplinary sanctions.
The dispositions are set down in the Regulations.

Article 11 - DEATH OR DISAPPEARANCE
In the case of the death or disappearance of a member of the Association, those inheriting, or having legal claims on the estate, shall not have the right to Membership of the Association.

SECTION 3: GENERAL MEETINGS

Article 12 - COMPOSITION
The Annual General Meeting is open to Honorary members, Full members and Associate members.
Only Full members and Associate members are eligible for office and have the right to vote; the former having 2 votes each and the latter 1 vote each.
Voting by proxy is permitted. Only a member of the Association may submit proxy votes, to a maximum of 3 per member.
Postal votes are not permitted.
Only 4 votes per Open 60' are authorized, which means 2 votes for the skipper and 2 votes for a maximum of 2 associate members.
The additional associate members from the Open 60' are allowed to attend annual General Meetings but have not the right to vote and are not eligible for office.
The associate members who are not part of an Open 60' team are allowed to attend annual General Meetings, have the right to vote and are eligible for office.

Article 13 - FREQUENCY
The Annual General Meeting is called by the Executive Committee each year at a date fixed at the previous Annual General Meeting, or if the affairs of the Association require it, or at the request of at least half of the Members of the Association, no-matter to which section they belong.

Article 14 - NOTICE AND AGENDA OF MEETINGS
Notice of meetings shall be sent to each individual member by electronic mail with acknowledgement of receipt, at least 2 weeks before the date of the meeting, and shall be accompanied by the agenda for the meeting fixed by the Executive Committee. All documents relevant to items on the agenda must reach members in sufficient time to allow them to give all documents their due consideration.

Article 15 - CONDUCT OF THE MEETING
The Meeting is presided over by the Chairman of the Association, or in his absence by the Vice-Chairman, or by an Officer appointed to this function by the Executive Committee and belonging to the body of Full members. The role of secretary is carried out by the General Secretary or, in his absence, by a member of the Meeting appointed by the members present. Members of the Association shall sign an attendance list on entering the Meeting and this shall be checked by the Chairman and Secretary.

Article 16 - VOTES TAKEN ON INDIVIDUALS PRESENT
Votes concerning individuals present must be taken by secret ballot.

Article 17 - AUTHORITY
The Annual General Meeting shall hear the report of the Executive Committee of its conduct of the affairs of the Association and of its general and financial situation. It shall approve the accounts of the previous financial year and vote on the budget for the following session.

It is responsible for filling each year the positions of retiring officers.
It is responsible for the election of the Chairman of the Association, as proposed by the Executive Committee.
It decides the Class Rules by the majority of the Members present and represented.
It adopts and amends where necessary the Regulations of the Association and fixes a provisional date for the next Annual General Meeting.

As proposed by the Executive Committee, it selects the races to be included in the provisional calendar of the next year, the calendar of the current year having being fixed by the Executive Committee based on the provisional calendar discussed on the previous Annual General Meeting .

It discusses all questions of general interest and all matters as determined by the Executive Committee, as well as written questions submitted by the members, with the provision that such questions be received at Association headquarters in sufficient time for the Officers or the Executive Committee to give them their due consideration.

It authorises the acquisition of all property which is material to the realisation of the aims of the Association, all exchanges and sales of such property, the setting up of all mortgages and loans, and, in a general sense, it delegates to the Executive Committee the fullest powers in addition to those cited above to run the Association in the interests of its Members.

Decisions shall be taken by a simple majority of the members present and represented.
In all cases the total of votes cast by the Members present and represented must constitute at least 51% of the total number of votes available, otherwise any decisions taken are null and void.

Article 18 - MINUTES
The decisions taken by the Annual General Meeting shall be confirmed in the official minutes, published in the minute book and verified and signed by the Chairman and the General Secretary. A copy of these minutes, together with a copy of the current Constitution must be sent to each fully paid-up member.

SECTION 4 - EXECUTIVE COMMITTEE

Article 19 - COMPOSITION
Association is administered by an Executive Committee comprising 8 members with at least 5 from the body of Full members, elected by the Annual General Meeting. In the absence of candidates for office from the body of Associate members, the position of one or both administrators reserved for Associate members shall be filled from within the body of Full members.
The Officers so elected shall serve for a period of two financial years, as described in Article 27 of the Constitution.
The Executive Committee is partially renewed each year, with each member elected for a period of 2 years, in a rotational manner determined in the first instance by drawing lots and subsequently by the date of their election. Any retiring officer may be re-elected.
The procedures for the election of Officers are fixed by the Regulations.

Article 20 - VACANCIES
In the case of a position remaining vacant, the Executive Committee may appoint one of the Executive to the position until the next Annual General Meeting, at which elections shall be held to fill the vacancy, in addition to those for replacing retiring Officers. At the following Annual General Meeting, the three retiring members shall again be chosen by drawing lots.

Article 21 - POWERS OF THE EXECUTIVE COMMITTEE AND OF THE PRESIDENT

21.1 The Executive Committee is invested with the fullest powers to enable it to act in the name of the Association and to carry out or authorise any action and operation permitted by the Association and which do not have to be submitted for the approval of the Annual General Meeting. It fixes the event’s calendar of the next year, based on the proposals discussed on the previous annual general meeting. It is responsible to this latter for the sound running and financial stability of the Association. It is charged with scheduling questions to be addressed by the Annual General Meeting, and with preparing all documents, proposals or resolutions to be submitted for its approval.
It convenes and winds up at the instigation of the Officers, committees and working parties.
It delegates to the Officers, constituted according to Article 24 of the Constitution, the day to day running of the Association.

21.2 The President is responsible for the day to day running of the Association. He may hire or dismiss all employees and decide their salaries, take out mortgages on property necessary for the efficient running of the Association, carry out all repairs, buy and sell all deeds and securities, make use of the funds of the Association, represent the Association in a court of law, either as a claimant or in its defence.

Article 22 - MEETINGS AND DISCUSSIONS OF THE EXECUTIVE COMMITTEE

The Executive Committee shall meet immediately after its election at the Annual General Meeting, to propose a Chairman, to be accepted by the vote of the meeting, according to Article 17 of the Constitution and to plan the working of the Committee.

It shall then meet at the instigation of the Chairman, who fix the agenda, or of half of its members, as often as the interests of the Association shall require, at least twice during the financial year, either at its headquarters or at some other venue, given the agreement of at least half of the current Officers, or by conference call.

Absent officers may offer their opinion on matters arising on the agenda by letter, fax or electronic mail.

Absent officers may designate a representative to the meeting, on condition that the representative appointed is from the same body of members. The proxy may be given by letter, fax or electronic mail with telephoned confirmation. In such instances, such proxy votes must be annexed to the minutes.

The presence, or the representation, of at least four members of the Executive Committee from the body of Full members is required for the ratification of all decisions. Decisions shall be taken by a simple majority of votes of members present or represented, each officer having one vote. In the case of a split vote, the Chairman shall have the deciding vote.

Decisions taken by the Executive Committee shall be confirmed in the official minutes, verified and signed by the Chairman and the General Secretary. These shall be sent to each officer and to any fully paid-up member on request.

Article 23 – THE HONORARY NATURE OF EXECUTIVE POSITIONS

23.1 No payment shall be granted to members of the Executive Committee whose positions are entirely honorary and carried out without remuneration, except for the President.

Nevertheless, expenses and outlays occasioned in the furtherance of their duties may be reimbursed on production of an authenticated receipt.

23.2 The remuneration granted to the President and the daily compensation to the executive members are decided by the Annual General Meeting upon proposal by the Executive Committee.

SECTION 5 - WORKINGS OF THE ASSOCIATION

Article 24 – ORGANISATION OF THE EXECUTIVE COMMITTEE

Having been elected by the Annual General Meeting, the Chairman shall organise the running of the Executive Committee and shall nominate two Vice-Chairmen, a General Secretary, a General Secretary Deputy and a Treasurer.

In addition to the decisions that are within his remit, the Chairman is responsible for carrying out the decisions of the Annual General Meeting and of the Executive Committee, and for ensuring the workings of the Association, whose representative he is in both a legal and civil sense.

The President can be dismissed, at any time, without compensation, by the Executive Committee.

The Vice Chairmen support the Chairman in the exercise of his duties and replace him should the need arise.

The General Secretary and the General Secretary Deputy are responsible for sending out notice of committee meetings and general meetings, for the writing of minutes, for all correspondence, for the keeping of official records, and for supervising the application of decisions taken by the Executive Committee.

The Treasurer keeps the accounts of the Association and, under the supervision of the Chairman, ensures all payments and banks all funds on the account of the Association. He undertakes, with the authorisation of the Executive Committee, the purchase and sale of all deeds and securities.

Article 25 - COMMITTEES
To ensure the efficient working of the Association, the Officers shall propose to the Executive Committee the composition of committees and of working parties.
The procedures are fixed in the Regulations.

Article 26 - ANNUAL INCOME
The annual income of the Association is composed of:
- Subscriptions paid by its members;
- All revenue permitted by law and by Article 11.1 of the convention agreed between the ISAF and the IMOCA.

Article 27 - FINANCIAL YEAR
The Financial Year runs from the 1st of January to the 31st of December.

Article 28 – RESPONSIBILITIES OF OFFICIALS
The holdings of the Association may be used to honour commitments entered into in its name. Neither member nor administrator may be held personally responsible for any commitments entered into, subject to the conditional implementation of the relevant clauses of the French law of the 25th of January 1985 concerning the entering into receivership.

SECTION 6 - AMENDMENTS TO THE CONSTITUTION AND WINDING UP

Article 29 - EXTRAORDINARY ANNUAL GENERAL MEETING
The Annual General Meeting may, provided that it was called for such a reason, amend the Constitution in terms of its clauses, or parts thereof, and vote on the eventual winding up of the Association, or its amalgamation with other Associations.
In such cases, the Annual General Meeting shall be deemed Extraordinary.

To debate and resolve any submission at an Extraordinary General Meeting, at least half of all Full members must be present or represented. If this condition remains unfulfilled, the meeting must be reconvened after an interval of at least two weeks and with the same agenda as prescribed by Article 14 above. At this second meeting, submissions may be debated and resolved, whatever the number of Full members present or represented.
Resolutions at an Extraordinary General Meeting are carried by a majority of two thirds of the votes of members present or represented. The votes cast by the Full members present and represented must nevertheless constitute at least 51% of the total number of votes available; otherwise any decision taken may be null and void.

Article 30 - WINDING UP - LIQUIDATION
In the case of a winding up imposed or decided upon by an Extraordinary General Meeting, this latter shall designate one or several liquidators, who shall enjoy the widest possible powers in order to realise the assets and to settle the liabilities of the Association, after the possible recovery of any residual estate by creditors or their inheritors or any recognised claimant. The net product of the liquidation shall be distributed to an Association having broadly similar aims.

SECTION 7 - SUPERVISION - REGULATIONS - AFFILIATION

Article 31 - REPORTS MADE TO VARIOUS AUTHORITIES
The Chairman of the Association, or those acting for him, shall communicate, within three months, to the Préfecture of the Département in which it has its headquarters, all changes in its management and, should the need arise, in its Constitution.
He shall follow a similar process with the International Sailing Federation (ISAF), and the National Authorities (MNA) of whom IMOCA is member.
He shall, moreover, place at the disposal of the sports authorities (ISAF and MNA) the minutes of all meetings, together with all accounts.

Article 32 - REGULATIONS
The Class Regulations lay out the procedures for running the Association. These Regulations may be reviewed every year at the Annual General Meeting.
The text of the Regulations, together with the present Constitution and the Class Rules, shall be made available to each member on payment of the annual subscription.
These documents have the force of law and the members are obliged to conform to them.

Article 33 - AFFILIATION - OFFICIAL LANGUAGES
The IMOCA is a member of the International Sailing Federation, and must conform to the terms of the Agreement Relating to the OPEN 60' Class Boats, dated the 1st of November 1998.
The IMOCA, of which the headquarters are situated in France, is an Affiliate Member of the Fédération Française de Voile, ISAF MNA in France.
The IMOCA may affiliate to any other MNA, in accordance with the racing calendars and the development of the Open 60' fleet throughout the world (see annual regulations appendix).

English and French are the two official languages of the Class. In the case of any discrepancies about a translation, the Executive Committee will decide.

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INTERNATIONAL MONOHULL OPEN CLASS ASSOCIATION Open 60'
I.M.O.C.A.

REGULATIONS 2011

In accordance with Article 32 of the Constitution, the following Regulations are applicable for the year 2011.

A - THE ASSOCIATION

A - I - ELECTION PROCEDURES AT A GENERAL MEETING

In accordance with Article 19 of the Constitution, the Annual General Meeting shall elect four officers to replace the four retiring members of the Executive Committee and where necessary, shall elect other officers according to Article 20 of the Constitution.
It shall elect also the Chairman of the Association.
Elections shall be conducted under the scrutiny of two scrutinisers appointed by the Chairman from those honorary, full or associate members present.

A - I.1 - Eligibility for election to the Executive Committee

Any full or associate member, whose membership is in force for the current year shall be entitled to be nominated for election to the Executive Committee. However, to prevent holding too much representative, only one person by each boat, team or boat owner's society, shall be entitled to be nominated for election.
All nominations must be received by the Chairman of the Association at least three days before the date of the election by letter, fax or by electronic mail accompanied by suitable identification. Any such letter must stipulate the name, precise address and age of the candidate, together with a resume of the candidate's nautical experience, involvement in matters relating to the sea and an election address on behalf of the candidate.

A - I.2 - Voting Procedures

In accordance with Article 12, full members shall have two votes and associate members, one.
In accordance with Article 16, voting shall take place by secret ballot.
Members of the Executive Committee shall be elected by a relative majority of votes cast.
The votes shall be counted by the scrutinisers, who shall announce the result after the final count.

A - I.3 - Election of Chairman

In accordance with Article 22, the Executive Committee, once elected, shall convene immediately to nominate a candidate for the office of Chairman, who shall be elected by secret ballot of all members present at the Annual General Meeting.

A - I.4 - Executive organisation

In accordance with Articles 22 and 24 of the Constitution, the Chairman shall distribute, among the Executive and with its approval, the various functions.

A - I.5 - Composition of the Executive Committee

The list of the Executive Committee and the Officers for the current year shall appear in an appendix to the present Regulations.

A - II - COMMITTEE

In accordance with Article 25, the Executive Committee shall decide on the composition of the following committees:

A - II.1 - TECHNICAL COMMITTEE

The Technical Committee is composed of Imoca members appointed by the President of the association, the latter being a member by right of this committee.
This Committee shall operate under the supervision of the member of the Executive Committee, who shall be responsible for presenting the deliberations of the Committee to the Executive Committee at any time as they may so request, and for presenting the Class Rules to the Annual General Meeting for ratification, in accordance with paragraph 4 of Article 17 of the Constitution.

This Committee shall meet whenever necessary. It may at any time draw upon the advice of outside experts.
A list of the members of this Committee for the current year is to be found in an appendix to these Regulations.
The functions of this Committee are laid out in Part C of the present Regulations.

A - II.2 - EVENTS COMMITTEE
The Events Committee is composed of Imoca members appointed by the President of the association, the latter being a member by right of this committee.
This Committee shall operate under the supervision of the member of the Executive Committee, who shall be responsible for presenting the deliberations of the Committee to the Officers and to the Executive Committee, as well as to the Annual General Meeting to discuss about the provisional racing calendar, in accordance with paragraph 6 of Article 17 of the Constitution.
This Committee shall meet whenever necessary. It may at any time draw upon the advice of outside experts.
A list of the members of this Committee for the current year is to be found in an appendix to these Regulations.

The functions of this Committee are as follows:
- To establish and to disseminate a register of the responsibilities of race organisers.
- To examine all suggestions for the organisation of races.
- To institute a comprehensive international calendar of events limited to Open 60'.
- In order to encourage the participation of owners, to establish a planning cycle of up to 2 or even 3 years comprising: one year in advance - firm date and course, the deposit of guaranteed funds on behalf of the organisers, approval of the MNA, dissemination of the Notice of Race; two years in advance - firm date and course; three years in advance - provisional date and course.
- To manage the organisation of the World Championship on points.
- To develop in number and in quality competitions limited to Open 60'.
- To promote the Class to organisers and owners.
- To examine any sporting event which might contribute to the development of the Class.
- To schedule Annual General Meetings on two or three years, according to the events calendar.

A - III - FINANCIAL YEAR
In accordance with Constitution article 27, the financial year runs from the 1st of January to the 31st of December. The Annual General Meeting must be held, if possible, at the end of January.
However, the year of the two principle events in the Class Boat calendar, namely the round the world races registered in the Imoca Championship, arrangements shall be found, in such a way that members racing could participate or be represented.

A - IV - ISAF APPROVAL
In accordance with Article 3(a) of the ISAF / IMOCA Agreement, the Association undertakes to submit any change to its Constitution for approval by the ISAF.
The Association further undertakes to communicate to the ISAF, and to any MNA of which it is a member, the minutes of its AGMs.

B - MEMBERSHIP

B - I - ANNUAL SUBSCRIPTION
Annual subscriptions form the basic income of the Association.
Apart from Honorary Members, who are exempt from the payment of membership dues, all full or associate members are bound to the payment of an annual subscription and shall not be considered as members, and thus enjoy the benefits and privileges of membership of the Association, unless and until all fees and subscriptions for the current year are fully paid up to date.

Annual subscriptions are due on the 1st of January each year and must be paid at the latest by the 30th of June of the current year. Beyond that date, any defaulting member shall be subject to the sanctions outlined in the present Regulations.

Anyone requesting membership during a calendar year shall pay the full annual subscription.

The current rate of annual subscription shall be appended as an appendix to the present Regulations.

B - II - DISCIPLINE

The Organising Authorities are responsible for the enforcement of the Class Rules and shall not in any way alter or modify the Articles dealing with basic structure and appendages.
Only skippers in possession of a valid measurement certificate for their boat shall be allowed to compete.
The Executive Committee of the Association is responsible for adherence to its Constitution, its Regulations and annual appendix, and the World Championship Regulation and its annual appendix.
Each member full or associate of the Association undertakes to:

- Adhere to its Constitution, its Regulations and annual appendix, and the World Championship Regulation and its annual appendix, and the Class Rules.
- Accept any checks on the boat requested by any recognised Class Measurers or National or International Authorities
- Accept any checks which are part of the fight against drugs
- Promote the objectives of the Association and support any actions undertaken by it.

B - III - DISCIPLINARY SANCTIONS

The Executive Committee has the right to impose disciplinary sanctions on any member of the Association (warning notice, suspension of membership) for subscription arrears or other serious matter.
The Executive Committee must permit any person under threat of disciplinary sanction the opportunity in the first instance to appeal and to provide whatsoever explanations deemed to be necessary as a defence.
In the case of suspension, the excluded member may lodge an appeal and request a vote on the exclusion at the next General Meeting. Any such appeal shall entail the lifting of the suspension until the next General Meeting.
That said, any cancellation of membership which is ratified by a General Meeting of the Association shall be reported to the ISAF and to the MNA under whose jurisdiction the excluded member operates.
Excluded members are nevertheless responsible for the payment of any subscription outstanding for the current year and if necessary for preceding years.

B - IV - RESIGNATION OF MEMBERSHIP

Any member wishing to leave the Association must address a registered letter (with acknowledgement of receipt) of resignation for the attention of the Chairman of the Association. However, the resignation shall only become effective with the payment of any subscription outstanding for the current year and if necessary for preceding years.

C - CLASS RULES

C - I - FUNCTIONS OF THE TECHNICAL COMMITTEE

This Committee is responsible for:

- Establishing the Class Rules and examining all necessary developments, whilst remaining aware that any change in the wording of the Class Rules must be approved by the ISAF and adopted by the Annual General Meeting;
- Defining and implementing the procedures for measurements and checks;
- To delegate to the Chief Class Measurer the establishment of the Measurement Certificate and he will validate them annually on condition of the subscription payment;
- Under control of the Technical Committee, the technical secretary is to keep a register and an index of the hull registration numbers of Open 60', and is checking that such numbers are clearly marked on transoms, is allocating sail numbers and supplying self-adhesive Class insignia which all Open 60' are obliged to display on the mainsail, as defined in the Class Rules.
- Managing the placing under construction, in collaboration with the General Secretary, and managing, in collaboration with the Treasurer, the issue of measurement certificates, subject to the payment of the cost of Measurement Procedure and ISAF Registration Fee for new boats to the Class.
- And in a general sense, encouraging all research into new techniques in the field of safety of navigation, but with particular reference to technological innovation in the domain of performance.

C - II - REGISTRATION FEE
In accordance with Article 9.1 of the agreement reached by the ISAF and IMOCA, IMOCA shall collect a fee on behalf of the ISAF for each boat manufactured after the 1st of January 1999. This fee shall be forwarded to the ISAF as specified in 9.3 of the agreement.

The amount of this fee is established by ISAF, for 2011, it is £ 1147.05 (plus VAT where applicable) for Open 60'.
This Class fee must be entirely paid in a single time when requesting a first measurement certificate.

C - III - OFFICIAL CLASS MEASURERS
Official Class Measurers alone are authorised to carry out checks and tests with the aim of awarding a measurement certificate for an Open 60'.
A list of the Official Measurers is fixed in an appendix to the current Regulations.

C - IV - ADMINISTRATIVE, TECHNICAL AND FINANCIAL PROCEDURES

C - IV - 1 - Declaration of placing under construction:
Any person wishing to build, or have built, an Open 60' with the intention of racing her, must make a declaration on plain paper of the placing under construction, describing the principle characteristics of the boat with regard to the Class Rules.
In accordance with Article 7.2 of the Constitution, this declaration shall allow the declarer to submit an application for membership of the Association.

C - IV - 2 - Registration Fee:
The registration fee as described above shall be due at the completion of construction, when requesting a first measurement certificate.

C - IV - 3 - Award of the first measurement certificate:
The new boat shall undergo all the checks and tests as decided upon by the Technical Committee, under the jurisdiction of one of the Official Class Measurers.
The measurement procedures, as well as the configurations at the time of the tests, are fixed by the Class Rules in the protocol measurement.
The cost of a complete measurement process is fixed by the Executive Committee.

C - IV - 4 - Award of a measurement certificate after modifications to the boat:
The boat must undergo all the checks and tests decided by the Technical Committee and which the Class Measurers deem to be necessary, taking into account the declarations of the owner.
The measurement procedures, as well as the configurations at the time of the tests, are fixed by the Class Rules in the protocol measurement
The cost of such a procedure is fixed by the Executive Committee.

C - IV - 5 - Annual validation of the measurement certificate without modifications to the boat:
In the light of a declaration of no modification, the checks and tests shall be deemed unnecessary.
The cost of such validation is fixed by the Executive Committee.

C - V - INTERPRETATION
Any request for interpretation of any section of the Class Rules must be made in writing to the Chief Class Measurer who will pass it on to the Class Rule Committee (Article A.7 and A.8 of the Class Rules).
All interpretations shall be made public. After consultation with the ISAF if necessary, the reply shall be addressed to the enquirer and, if it is likely to set a legal precedent, to be communicated to all members.
In such a case the matter raised could lead to a modification or clarification of the text at the next Annual General Meeting.

C - VI - DATE OF COMING INTO FORCE / DURATION OF VALIDITY OF TEXT
The Class Rules validated by any Annual General Meeting shall come into force starting from the date specified during this General Meeting.

C - VII - LIMITATION TO THE ISSUING OF MEASUREMENT CERTIFICATES

No Open 60' may be issued with a measurement certificate if the request does not originate with a full member of the Association wishing to enter the boat into competition.

On the other hand, any full member who requests the issue of a measurement certificate for an Open 60' without intending to enter the boat into competition, but on behalf of a third party, who is not a member of the Association, shall be liable to disciplinary sanctions.

A measurement certificate shall be issued only in the name of a yacht, whose skipper shall be a fully paid-up member of the Association. In the event of hiring of the boat, the tenant skipper shall join the Association.

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INTERNATIONAL MONOHULL OPEN CLASS ASSOCIATION
I. M. O. C. A.

NOTICE OF WORLD CHAMPIONSHIP REGULATION

CHAMPIONSHIP REGULATION ON MAY 5 2011

Article 1: Aim
In application to article 2 of the IMOCA status, this Championship is organised in order to principally promote single handed ocean racing onboard Open 60' monohulls, and by organising a variety of races, single-handed, double-handed and occasionally crewed.

Article 2: Definition
This championship is an annual one, ranking skippers, in association to their sponsors or ship owners.

Article 3: Timing of the championship
The ranking is established at the end of each year, and the title is awarded every year, on the basis of the full amount of points won during the events of the year, in addition to the points gained in the events of the previous year.
The aim of this periodicity is that there will always be a round the world race taken into account for the attribution of the title.

Article 4: Official skipper
The official skipper of a boat for the championship will be the one who has been sailing the boat in the programmed race around the world (see § 3), or, failing that to the programmed solo transatlantic, or if failing again these two previous, the race with the highest coefficient.
For the double-handed races, both people onboard will be each accredited with the total amount of points, provided that the co skipper is full member of the Class.
For the crew events, ocean or trophy, only the official skipper, named as it, will be accredited with the points calculated on the basis of the final result of the boat in the event, except if specified differently in appendix A-1. This skipper will have to have competed in at least 70% of the legs or races of the program noted in the Notice of Race, round down to the nearest whole number.
Failing that, the points earned will be attributed to the other skipper, who will then become the official skipper.
Every skipper or substitute skipper enrolled in an event counting for the championship has to be a full member of the IMOCA in order to be ranked in the championship.
Except with contrary advice notified by writing to the Executive Committee, every skipper, co skipper, or substitute skipper accept to be integrated in the championship ranking.

Article 5: Organisation authority
According to the present rules, the Organiser of this Championship is the International
Monohull Open Class Association (IMOCA), a Class which is recognised by the
International Sailing Federation (ISAF), and which is in charge, per convention with the ISAF, of the general management of the 60 foot in the world.
According to the Racing Rules of Sailing (RRS), article 87.1, the Organiser of each event figuring on the official program stays the Organisation Authority of his own event.

Article 6: Types of races and standards coefficients
The two major events scheduled by the IMOCA are the two races around the world, the Vendée Globe and the Barcelona World Race.

- Single-handed around the world races, coef. 10.
- Double-handed around the world races, coef. 8.
- Single-handed Transatlantic races, coef. 4.
- Double-handed Transatlantic races, coef. 3.
- Crew Ocean races, depending on distance, coef. from 2 to 4.
- 1000 or 2000 miles crew races, coef. from 1 to 2.
- Trophy like Grand Prix during 3 or 4 days, coef.1 (for the trophy which program hasn't been realised properly, because of meteorological reasons, the Race committee and the Jury of the race will have to estimate if the results are significant enough to count for the championship).

Article 7: Distribution of the race points
Points are distributed regard to the number of starters of each race. 1st: number of starters, 2nd: number of starters less 1, 3rd: number of starters less 2...etc.
Referring to Appendix A of RCV, §A11, boats classified as DNC, DNS, BFD, DNF, RAF, DSQ cannot be considered as having finished in the ranking.
However, boats classified as DNF and RAF shall be granted 1 point.

Article 8: Ranking – Equality
The ranking is calculated with all the points won during the two years. The winner is the one having earned the more points, and so on.
If there is a point-equality on the championship ranking, this will be resolved as below:
Predominating is the one that had the best ranking during the round the world race. If the equality persists, the race with the biggest coefficient will have to determinate the winner and so on.

Article 9: Applicable rules

- IMOCA Class Rules
- Racing Rules of Sailing, eventually modified by the here stated rule when it can apply.
- The here stated regulation and its annual appendix.
- The Notice of Race and Sailing Instructions of each event, which can modify these rules with the approval of IMOCA Executive Committee and Technical Committee. Only additional appendixes could be provided, subject to the IMOCA Executive Committee approval.
- No routing allowed in the events of the IMOCA World Championship: Routing shall mean any specially prepared information and/or indication, whether personalized or for a group of competitors, coming from the outside, with the exception of weather information sources authorized by the race regulations, and providing assistance in the understanding of the various weather situations and the choice of course(s) to be followed or not to be followed

Article 10: Sailors obligation
The sailors engaged themselves:

- To pay regularly the subscription fee to the Class and to have a valid certificate of measurement for the year being, and so from the start of the first event of the Championship.
- To respect the rules of the IMOCA Class, notably the articles regarding the nationality letters, the sail number, the Class Insignia. ,
- To respect the specific instructions regarding the communication that are quoted in the annual appendix, notably the articles regarding the branding of the logo of the Class's partners.
- To give the Class every necessarily elements in order to update the website of the Class.
- To be involved as much as possible in the public relations operations organised by the Class and its partners.
- To be part of the official prize giving. Except in case of exceptional situation, approved and made valid by the Executive Committee, the presence of the sailors is compulsory.
- If the absence is not justified, the Committee has the right to take all measures. In any case, except in case of exceptional situation approved and made valid by the Executive Committee, prizes cannot be handed to a representative of the skippers.
- To generally promote the IMOCA Class and its partners.

- The co-skipper, in double-handed races, must be IMOCA member

Every obvious and voluntary fail to these rules could be followed by disciplinary measures, like the one quoted in the regulations of the Class under B-2 and B-3.

Article 11: Obligation from the IMOCA

The IMOCA commits itself:

- To program only races organised by credible organisers, notably regarding the respect of the schedule of conditions for the security questions, the communication and the financial engagement.
- To do the best if an organiser is failing, either on replacing him on the technical part of the organisation and communication, excluding prices in cash, or on finding a solution of replacement.
- To guarantee the sport equity on the races, notably regarding the respect of the rules of the Class.
- To implement a communication plan for the Championship in collaboration with its or their partners, including public relations for the sailors.
- To keep the website updated regarding the communication of the championship, of each boat and also to create links with the sailor's website who are asking for it.
- To hand over the prices planned in the annual annex to the stated regulation.

Article 12: Obligation from the organiser of each race

Each race organiser commit himself to respect the schedule of conditions given by the Class, and agreed by him under the convention made with the Class.

Article 13: Grant of the Championship in prices

Every year, the total amount of prices and its repartition are fixed in the appendix.

Article 14: Official program

Each year, the official program with the coefficient of each race is fixed in the appendix.

Article 15: Appendix to the regulation

The appendix to the regulation will fix each year the official schedule, coefficients of every race, the total amount of the prices, their repartition as well as every other point that would be judged necessarily by the Executive Committee. This appendix counts for the official regulation.

Article 16: Dispute / Discipline

In case of dispute dealing with the application of the here stated regulation, only the Executive Committee of the Class will be in charge to bring solutions. In case of serious failing, the sanction could be the withdraw of the championship and of the Class, in accordance to articles B–II and B–III Class Regulations. The skippers commit themselves to not resort to any other instance, court or tribunal.

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INTERNATIONAL MONOHULL OPEN CLASS ASSOCIATION
I. M. O. C. A.

APPENDIX TO THE WORLD CHAMPIONSHIP REGULATION FOR THE 2011 WORLD CHAMPIONSHIP

A - 1: Schedule and coefficients – amended by Rider n°1 (page 90)

2011: (total of coefficients: to be defined)
- Europa Race, Coef 4
- Transat Jacques Vabre, Coef 3
- B to B Transat, Coef to be defined by the Executive Committee

A - 2: Full Amount of Prizes Money
The amount of Prizes Money for the 2010 Championship will be communicated by an amendment when the sponsor will be known.

A - 3: Sharing of the prizes (% of the total amount)

Ranking of the Open 60' World Championship:

1st	26%
2nd	20%
3rd	15%
4th	11%
5th	8%
6th	6%
7th	5%
8th	4%
9th	3%
10th	2%

A – 4: SPARE NUMBER

A – 5: SPARE NUMBER

A – 6: Communication
It is reminded to the sailors that they commit themselves to respect the Class Rules concerning the nationality letters, the sail numbers, and notably:
- Put the promotional official logo combining the Class main sponsor logo and the IMOCA insignia on top and each side of the main sail, above the sail numbers and letters of nationalities (CR A-4).
- Put dodgers at the back on the lifelines on each side, in harbour and when racing during the Trophy, at the start and arrival of oceanic races. On this dodgers, will be put the promotional / official logos in accordance with the IMOCA Executive Committee.
- The Class will provide this material.

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AGREEMENT RELATING TO THE OPEN 60' CLASS BOAT

AGREEMENT dated 1st November 1998,

PARTIES:

1. International Sailing Federation Limited (ISAF).
2. International Monohull Open Class Association (Association).

RECITALS:

OPERATIVE TERMS:

1. Definitions.

1.1 "Open 50'/60' Class boat" means a boat built to conform to the Open 50/60 Class Rules and Regulations.

2. The Open 50'/60' Class boat shall be accredited with Recognised Status from the date of this Agreement within the Rules and Regulations of the ISAF, and shall hold such status unless and until it shall be revoked in accordance with the Rules and Regulations of the ISAF.

3. The Association shall perform its obligations and administer its affairs in accordance with the ISAF Regulations for Recognised Classes and acknowledges that:
(a) any amendments to the Association's Constitution, shall be subject to approval of the ISAF in accordance with ISAF Regulations for Recognised Classes;
(b) any amendments to the Open 50' 60' Class Rules shall be subject to approval of the ISAF in accordance with ISAF Regulations for Recognised Classes.

4. Spare number

5. Spare number

6. Any amendment to the Class Rules shall be proposed by the Technical Committee to the Members at the AGM, or when an immediate amendment is required, to the Executive Committee. Any rule amendments shall be ratified or altered by the Members at their AGM and thereafter submitted to the ISAF for consideration and ratification.

Rule interpretations shall be made by IMOCA in consultation with the ISAF.
Interpretations shall be requested in writing and shall be distributed to the members, as necessary. Interpretations shall be ratified or amended by the IMOCA up and distributed by IMOCA and shall be included in the Class Rules.

7& 8 Spare numbers

9.1 On behalf of ISAF, the IMOCA shall collect a registration fee from the Owner, in respect of each boat manufactured after the date of this Agreement, a sum equal to 0.4% on first 20,000 pounds sterling, 0.2% on next 70,000 pounds sterling and 0, 1 % on the amount over 90,000 pounds sterling of the builder’s selling price of a standard equipped boat less sails as agreed to by the ISAF. IMOCA shall forward such fee to ISAF as specified in 9.3.

9.2 Such sum shall be increased by 2% annually, The 2% increase to be reviewed on 1st January 2003. For this purpose IMOCA shall provide the ISAF with information about current prices upon request. It is agreed that the sum payable to ISAF in respect of each boat built for 1999 shall be £870.

9.3 IMOCA shall prepare a quarterly statement of the amount due to ISAF and submit the said statement and payment to ISAF within six weeks of the end of each quarter, ending on 31 March, 30 June, 30 September and 31 December in each year. ISAF shall have the right through its duty appointed agents to cause any audit or other investigation to be undertaken in normal business hours with the prior mutual agreement of IMOCA as may be necessary from time to time to verify such statements.

9.4 IMOCA shall ensure that ail such quarterly statements include a unique hull number for each boat built and that such numbers are moulded into the transom of each boat. IMOCA will take ail reasonable steps to ensure that it receives the appropriate payments from Owners from which to pay ail sums due to ISAF and shall withhold Measurement Certificates of any new boats in default of payment.
Open 50'/60' boats certificated prior to the date of this agreement are not subject to a retrospective building fee payable to ISAF.

10. Spare Number

11.1 The Association shall be funded by:
(a) Membership Dues.
(b) Revenue from sail buttons which shall be paid ta the Association by in accordance with Clause 10.
(c) Other sources of revenue as accepted by the Association Executive Committee.

11.2 The Association's subscription year for Membership Dues shall run from 1 January to 31 December.

11.3 The Membership Dues shall be decided from time to time at a General Meeting, the implementation of such dues shall take place from 1 January following the General Meeting.

11.4 All other fees, such as those for services provided at events, professional or other, shall be decided by the Association Executive Committee,

12. The Association shall pay en annual subscription to the funds of the International Sailing Federation of such amount as the ISAF Council may from time to time determine. For 1998 the fee shall be £200. All subscriptions shall be due on the first day of January for each ensuing calendar year.

13. Spare Number

14. Spare Number

15. Any dispute arising out of, or by virtue of, this Agreement regarding the Manufacturing Specification shall be submitted to a single arbitrator to be appointed in default of agreement by Lloyd's Register of Shipping and this shall be a submission to arbitration under the provisions of the Arbitration Act 1950 or any re-enactment, modification or extension thereof for the time being in force.

16. The Agreement shall be construed in accordance with the laws of the Isle of Man.

17. This Agreement shall continue to be to the benefit of and be binding upon the parties hereto, their successors and assigns, provided that IMOCA may not assign its rights and obligations under this Agreement without prior approval of ISAF.

18. Spare number

19. This Agreement may be terminated by either party at any time upon giving to the other at least one year’s notice in writing or immediately upon notice of breach or insolvency. Subject thereto, it shall continue in force so long as Recognised Status shall be accredited to the Class by the ISAF,

Signed by Arve Sundheim
For and on behalf of
International Sailing Federation Limited

Signed by Christophe Auguin
For and on behalf of
President IMOCA Class Association

IMOCA
OCEAN RACING
WORLD CHAMPIONSHIP

INTERNATIONAL MONOHULL OPEN CLASS ASSOCIATION
I.M.O.C.A.

OPEN 60' ISAF INTERNATIONAL CLASS

Class Rules 2011

Post AGM du 05/05/2011

ISAF
WORLD SAILING

CONTENTS

INTERNATIONAL MONOHULL OPEN CLASS ASSOCIATION
IMOCA

OPEN 60' CLASS RULES 2011

PREAMBLE:

The Monohull Open 60' Class gained INTERNATIONAL SAILING FEDERATION (ISAF) "Recognised Class" status in 1998.
In 2001, the Open 60' Class gained INTERNATIONAL SAILING FEDERATION (ISAF) "International Class" status.

The aim of these rules is to establish the restrictions, the exclusions and obligations which shall be respected by Open 60 foot monohulls when taking part in ocean racing events. This is to ensure that, with respect to safety, standards are to an acceptable level and at least identical for all competitors.

However, these rules are always in evolution, and must be developed in such a way to encourage technological innovation in terms of performance, as well as the research and application of new techniques in terms of safety at sea.

In general, where there are changes to the Class Rules which would be costly and require major technical modifications to existing boats, the grandfather rule shall exempt them from conforming to the new rule.
Nevertheless, boats that benefit from this grandfather rule are not allowed to make modifications which contradict the aim of the new rule.

SECTION A - FUNDAMENTAL RULES

A.1: TYPE OF CLASS RULES

The Class Rules for Open 60'Monohulls are of open type, which means that anything not specifically prohibited, limited or imposed is permitted.

A.2: ABBREVIATIONS

ISAF	International Sailing Federation
MNA	ISAF Member National Authority
IMOCA	International Monohull Open Class Association
ERS	Equipment Rules of Sailing
RRS	Racing Rules of Sailing
OSR	ISAF Offshore Special Regulations
COLREG	International Regulations for the Prevention of Collision at Sea
ISO	International Organisation for Standardisation

A.3: AUTHORITY

A.3.1: THE INTERNATIONAL AUTHORITY

The international authority of the Class is ISAF

A.3.2: IMOCA

IMOCA has been granted in agreement with ISAF the responsibility for administering the Monohull Open 60' Class, and for developing and publishing their Class Rules in collaboration with ISAF.
All Class procedures are defined in the IMOCA Class Regulations.

A.4: IDENTIFICATION

The Class logo shall be placed on both sides of the mainsail, between the headboard and the sail number.
The layout is available from the Class Secretariat (contact@imoca.org).
IMOCA shall allocate sail numbers.
The size of nationality letters and sail numbers – Helvetica font in full letters - shall be not less than:

Height:	500 mm
Space between letters:	100 mm.

A.5: ISAF ADVERTISING CODE

In accordance with rule 20 of the ISAF Advertising Code, boats belonging to the IMOCA Class are permitted to carry advertising.

However, a 2.30m diameter circle on each side of the bottom third of the mainsail shall be free of any advertising. In line with the agreement passed by the IMOCA Executive Committee, this diameter can be increased to 3.00m, or a maximum surface of 7m², within dimensions to be defined.

A.6: LANGUAGE

A.6.1: OFFICIAL LANGUAGES:

English and French are the two official languages of the Class. In case of any discrepancies in translation, The French text shall prevail.

A.6.2: OBLIGATION AND PERMISSION:

The words "shall" and "must" are mandatory, the words "should" and "may" are permissive.

A.7: CLASS RULES COMMITTEE (called CRC° in the whole text)
This committee is comprised of 3 people. (see appendix C):
- The Chief Measurer
- A designer not involved in an Open 60 project
- An ISAF representative, specialising in rules

The role of this committee is defined in article A.8. Decisions made by this committee cannot be appealed, and cannot be contested by an event jury, including an international jury

A.8: INTERPRETATION
Any request for interpretation of the Class Rules shall be made in writing and shall be dealt with as defined in the ISAF Rules and the Class Regulations Section C - 5.
In the case of any doubt about the conformity of a new system or about the application of any new process, or an interpretation, the question can be put to the IMOCA Chief Measurer. He shall convene a meeting of the Class Rules Committee (CRC), which shall be bound by the strictest confidentiality. The answer to the request shall be made by post, or by e-mail, as soon as possible. All answers given by the CRC shall be posted on the IMOCA website. The origin of the questions shall remain confidential.
The CRC alone can sign interpretations.
Application procedures under these Class Rules may be clarified by the CRC.

A.9: IMOCA CERTIFICATE
A.9.1: To participate in a race in the IMOCA calendar, boats shall have a valid annual IMOCA certificate.

A.9.2: Any certificate may be withdrawn at any time by the IMOCA Chief Measurer.
Any checks can be requested at any time by the IMOCA Chief Measurer.

A.10: Spare number

A.11: DATE OF APPLICATION / DURATION OF VALIDITY OF TEXT
These Class Rules are applicable until the next AG.
Except in the matter of proven extreme urgency, no modification to the rules relating to essential structures and appendages (mast, keel, etc…) shall be made before the Annual General Meeting which closes the financial year 2012 (AGM April 2013)

SECTION B – HULL AND DECK

B.1: DEFINITION

Under this rule, a monohull is defined as a boat whose:

- Having one sole flotation plane at rest or under sail in normal sailing trim.
- Of which hull depth in all transversal sections shall not decrease towards the centreline of the boat. For this definition, the hull does not include its appendages (article b.8).

At the keel-hull join: in this area, non-conformity to Rule B 1 above is allowed solely for technical reasons relating to the functioning of the appendage. This area shall be limited (500 mm maximum width and 40 mm maximum depth) and the written agreement of the Chief Class Measurer is compulsory.

The boat is symmetric.
Boats which have been given a certificate prior to the 1st of July 2009 are subject to the grandfather rule, but cannot increase hollows in the hull which have been previously authorised.

B.2: HULL NUMBER – MODIFICATION

B.2.1: HULL NUMBER – ISAF REGISTRATION:

The hull number allotted by the Chief Measurer shall be moulded or engraved into the transom of the boat.

B.2.2: MODIFICATION:

Any modification to the boat made after the Measurement Certificate issue date, shall be declared in writing to the Chief Class Measurer, who will decide if new measurements are necessary or not.
Any modification made without following this procedure will invalidate the Measurement Certificate.

B.3: LENGTH OVERALL

B.3.1: The boat has been issued with a measurement certificate prior to the 1st of July 2009
LOA shall be greater than 59 feet (17.983m) but not exceeding 60 feet (18.288m).

The measure of overall length excludes (except for items specified in B.3.3) all appendages and all fittings.
To be excluded from LOA, an appendage (a rudder for example) shall not have parts outside of the overall length of the boat, aimed at artificially extending the waterline length, whose total area would be greater than $0.12m^2$.

B.3.2: Boat obtaining its first measurement certificate after the 1st of July 2009
LOA shall be greater than 59 feet (17.983m) but not exceeding 60 feet (18.288m), including the complete hull and deck, hardware and all appendages except for those specified in B.3.3.

B.3.3: All boats: items not included in LOA:

The combined length of spars fore and aft shall not exceed the overall length of the hull by more than 6 feet (1.829m).
A boom, with or without sail, protruding aft, is considered to be a spar which shall be measured on the centreline of the boat and in the most disadvantageous position.
A bowsprit protruding beyond the bow is considered to be a spar which shall be measured horizontally from the bow of the boat to the vertical point of its overall extremity when it is extended to its maximum point beyond the bow, on the centreline of the boat.
Antenna mounts, wind generators and hydro generators, if the boat is equipped with them, shall not be included in the overall length of the boat.

B.4: DRAUGHT

B.4.1: DRAUGHT FOR OPEN 60s:

Draught is limited to 4.50m in light equipment measurement trim.
Light equipment measurement trim is defined in article A.10 of the measurement protocol.

B.5: STRUCTURE OF BOAT

B.5.1: BUILD SPECIFICATIONS
The boat shall be constructed in such a way as to be able to withstand, without irreparable damage, the forces of nature which it is expected to face in the course of races classified by the OSR as category 0.

B.5.2: REPAIRS / MODIFICATIONS
Any significant repairs or modification of the boat shall be declared to the Chief Class Measurer.

B.5.3: COCKPITS
ISO norm 11812 applies (Watertight cockpits and quick-draining cockpits, design Category A).
Furthermore, the following shall be respected:
A semi-permanent sill is allowed but it must conform to article 8.2.4 (Other requirements) of ISO 11812, and if it has hinges, it must only open towards the outside.

B.5.4: WATERTIGHT BULKHEADS
All required watertight bulkheads shall be solidly built to resist direct water pressure without the slightest ingress into the adjacent compartment.

a) Watertight bulkheads:
They shall:
- divide the boat into several compartments from stem to stern
- be transverse, 5 in number to create 6 watertight compartments with access for a person
- be not more than 5 metres apart
- be watertight. The passage of various cables, pipes or ducts shall not compromise the watertightness of the compartments.

The forwardmost watertight bulkhead shall be located within 15% of overall boat length (2.74m) and aft of the forwardmost point of the waterline.
To be transverse means that a bulkhead intersects the hull in totality (from port to starboard sides of the hull) and deck.

For boats being given their first measurement certificate after the 1st of July 2009, a watertight bulkhead must not stop at a ballast tank, a daggerboard case or any other part other than the hull and the deck.
The transom is not a bulkhead.
Special provisions
Notwithstanding article B.5.4, boats launched before the 1st May 2000 may be equipped with only 3 watertight bulkheads, provided that in this case the boat has a buoyancy volume of 145%; or with only 4 watertight bulkheads, provided that in this case the boat has a buoyancy volume of 137.5%.

b) Crash box:
A watertight box, filled with closed cell foam, capable of being destroyed in a frontal collision without endangering the integrity of the boat, shall be fitted at the bow.

B.5.5: HATCHES IN WATERTIGHT BULKHEADS
The boat shall be accessible from bow to stern via watertight hatches, whatever the position of the boat.
These hatches, where not permanently installed, shall be stowed immediately adjacent to their place of use, and be able to be rapidly installed.
Once closed, these hatches must provide a watertight seal to the bulkhead regardless of where the water is and how much pressure it exerts.
The hatches and their closing mechanisms must be able to withstand the pressure generated by water in a flooded compartment (see the study in Appendix F of the current rules, undertaken by BV on pressure generated by liquid sloshing in a compartment).

B.5.6 ESCAPE HATCHES
All boats obtaining a first measurement certificate after the 1st of July 2009:
The boat shall have at least two emergency exits of a minimum aperture of 0.20m² and of a geometry enabling the inside liferaft and a crew member in an immersion suit to go trough:

B.5.6.1 One exit shall be located forward of the foremost mast,

B.5.6.2. The second one shall be located entirely 500mm in from the aftmost point of the boat and allow a person to get in and out through it whatever the position of the boat.

B.5.6.2.1 The position of the aft escape hatch shall meet the requirements of paragraph B.7.3.

B.5.6.2.2 This hatch shall be equipped with a closing system with interior and exterior handles operating the same locking mechanism.

B.5.6.2.3 The material of this hatch and its locking mechanism must be able to resist water pressure no matter what the state of the sea.

B.5.6.2.4 There shall be appropriate holds fixed to the boat to facilitate exiting from the boat onto the deck or the hull in the event of capsize, and equally to get back inside.

B.5.6.3 An area or some areas of the hull which can be pierced to enable people to get in and out shall be distinctively marked on the inside and outside of the hull (See F.25.2 and F.25.3).

B.5.6.4 In the case where the transom is less than 900mm above the waterline when the boat is inverted in the conditions defined in article B.7.3.3, it is mandatory to install an escape airlock at the bottom or on the topsides of the hull. This device must allow the skipper to go out without damaging the float. For example, it could be made of a watertight blind door at the bottom of the hull and the necessary tools to pierce it. Another solution would be a completely watertight panel at the bottom or on the topsides of the hull.
- This escape hatch shall be big enough to let a crew member and the life raft go through.
- This device is meant to enable the skipper, in a critical situation (inverted and damaged boat), to actively prepare his evacuation waiting for assistance.

Boats issued with a measurement certificate before the 1st of July 2009 shall either:
- Comply with article B.5.6, applicable to boats issued with a first measurement certificate after the 1st of July 2009

or
- Present the Executive Committee with a detailed and well-argued proposal of escape hatch device. The Executive Committee shall validate this device and allow its implementation.

B.5.7: COMPANIONWAY HATCH
A companionway hatch shall be fitted with a solid and watertight closing arrangement which shall be operable by one person from the exterior and the interior, including when the yacht is inverted.

B.5.8: HATCHES
No hatch forward of the maximum beam station shall open in such a way that the lid or cover moves into the open position towards the interior of the hull (except hatches having an area of less than 0.071m²).

Hatches shall be arranged as to be above the water when the hull is heeled at 90°. They shall be permanently attached, and capable of being firmly shut immediately and remaining firmly shut in a 180° capsize.

The hatches, closing mechanism and hinges must be capable of resisting water pressure when the boat is inverted.

B.6: LAYOUT / EQUIPMENT

Working deck definition: a working deck is a safe area, where any crew member is obliged to stand, or to cross frequently, or to go frequently in the aim of going about the usual manoeuvres necessary for sailing the boat. There can be several working decks, providing that the passage between them does not exceed 0.50 m.

From 1st January 2010 the following paragraphs will apply and replace the above one:
ISO norm 15085 – Prevention of man overboard and recovery, design Category A applies as a minimum, and is complemented by the following specifications until paragraph B.6.4 included.

Working deck definition: a working deck is an area defined by pulpits, stanchions and lifelines, where any crew member is obliged to stand, or to cross frequently, or to go frequently in the aim of going about the usual manoeuvres necessary for sailing the boat and maintaining it
The working deck cannot be situated more than:

- 0.30 metres inside a line defined by the extension of the flotation plane of the sheerline.
- 0.50 metres inside a line defined by the extension of the flotation plane of the aftmost points of the hull including each sheerline.

One break only in the lifelines of 0.50 metres on each side of the boat, measured at the lifelines, is permitted on condition that there is overlap of at least the amount of the gap.

B.6.1: PULPITS, STANCHIONS AND LIFELINES

a) General requirements:
Pulpits and lifelines shall be at least a minimum height of 600mm.
There shall be at least two rows of lifelines.
Pulpits, stanchions and lifelines shall not contain carbon fibre.

b) Pulpits:
Boats shall have a pulpit (bow) and a pushpit (stern).
The bow pulpit may be in 2 parts and open on condition that the opening between the pulpit and any part of the boat (a fixed non-removable forestay is a part of the boat, removable forestays are not considered for this part of the rule) is never more than 360mm.
The pulpit must have at least 4 points where it is permanently structurally joined to the deck of the boat. Where a pulpit is split into two separate sections, each side of the pulpit shall have at least 2 points where it is permanently structurally joined to the deck of the boat.
The pulpit shall enclose all forestays, (including detachable ones and subject to rule B.6.1.b) whose attachment point is on the deck of the boat.

Lifelines installed on stanchions may be used in part as a substitute to the pushpit.

Upper rails of pulpits and lifelines where they replace a pushpit shall be at no less height than a level of 600mm above the working deck. This level is defined in the area of the upper lifeline at the side aft part of the cockpit.
Lifelines shall be entirely supported on stanchions and pulpits/pushpits.

Diameters, required material:
Lifelines can be stranded stainless steel wire of minimum diameter of 5 mm. Lifelines shall be uncoated and used without close-fitting sleeving. Grade 316 stainless wire is recommended.

Lifelines made of synthetic materials (Spectra or Dyneema) are allowed and shall be sleeved through the stanchions.

A taut lanyard of synthetic rope may be used to secure lifelines at each end provided the gap it closes does not exceed 100 mm.

All wire, fittings, anchorage points, fixtures and lanyards that together comprise a lifeline enclosure system must at all points have at least the breaking strength of the required lifeline wire.

B.6.2: JACKSTAYS / CLIPPING POINTS

a) General requirements:
Jackstays together with attachment points and harness tethers shall:

- Enable a crew member to clip on before coming on deck and unclip after going below.
- Allow whilst continuously clipped on, to move readily between the working areas on deck and in the cockpit(s), including being able to cross the deck from one side to the other, with the minimum of clipping and unclipping operations.
- Enable two-thirds of the crew to be simultaneously clipped on without depending on jackstays.

Warning regarding U bolts as clipping points - as they can lead to accidental unclipping of certain snaphooks.

b) Jackstays:
Jackstays shall be:

- fitted on deck, port and starboard of the yacht's centreline.
- firmly attached to the deck
- made of, stainless steel 1x19 uncoated wire of minimum diameter 5 mm without any sleeving, or webbing of equivalent strength (20kN breaking load), or of UHMWP – Ultra High Molecular Weight Polyethylene rope (Dyneema or Spectra) with a breaking load greater than or equivalent to 20kN.

c) Clipping points:
Must be attached to through-bolted or welded deck plates or other suitable and strong anchorage points adjacent to stations such as the helm, sheet winches and masts, where crew members work for long periods.

B.6.3: TOE RAIL / FOOT STOP

A toe rail of minimum height 25 mm shall be permanently installed around the working deck, except around deck hardware fittings and at the vertical of the transom. The toe rail shall be fitted as close as practicable to the vertical axis of stanchion bases and not further inboard than 1/3 the local half-beam.

Special provisions
For boats built before the 1st of June 2004, the toe rail may be installed only around the foredeck from abreast of the mast.

B.6.4: HAND HOLDS / HAND RAIL

The boat shall be equipped with:
1. Adequate hand holds in the interior so that crew members may move about safely at sea.
2. The boat shall be equipped with a fixed handrail all the way along the skirt or the hull/transom join, which acts as a grab-rail to facilitate climbing back on to the boat in the event of falling overboard.

B.6.5: BOW FAIRLEAD

A bow fairlead, or equivalent device, closed or closable and a cleat or other securing arrangement, suitable for towing, shall be permanently installed.

B.6.6: NAVIGATION LIGHTS
Navigation lights shall comply with the 1972 COLREGs covering light requirements for sailing vessels under sail, motoring and at anchor.

Navigation lights for sailing shall:
- be mounted so that they will not be masked by sails or by the heeling of the yacht
- be mounted above deck level and at least at the height of the lower lifeline.

The reserve navigation lights for sailing shall have the same specifications as the above-mentioned lights (which comply with the 1972 COLREGs) and be permanently installed.
They shall have a separate wiring system from the one used for the normal navigation lights.

Spare bulbs for navigation lights shall be carried, or for lights not dependent on bulbs, appropriate spares.

For boats with a rotating mast, masthead navigation lights are forbidden, except if they remain in conformity with the 1972 COLREGs when the mast is rotated.

B.6.7: EMERGENCY STEERING
Boats equipped with a single rudder shall carry an emergency tiller.
Crews must be aware of alternative methods of steering the yacht in any sea condition in the event of rudder loss.

B.6.8: SPARE NUMBER

B.6.9: SEA COCKS AND VALVES – THROUGH HULLS
Sea cocks or valves (quarter turn valves or guillotine valves) shall be permanently installed on all through hull openings below the water line except integral deck scuppers, shaft log, speed indicators, depth sounders and the like, however a means of closing such openings shall be provided.

All boats must have at least 2 through hulls in compartments of the boat which are accessible when the boat is inverted, through which to fit antennas for safety transmissions as per rule F.15.

B.6.10: BUNKS
Two bunks shall be installed on board.

B.6.11: COOKING FACILITIES
A cooking stove permanently installed and accessible and securely fastened with safe accessible fuel shutoff control capable of being safely operated in a seaway

B.6.12: DRINKING WATER
B.6.12.1 A water maker capable of being operated electrically and manually shall be on board.
B.6.12.2 It is the skipper's responsibility to ensure that there is enough drinking water for the length of the race and number of people on board.
B.6.12.3 For the races exceeding 5000 nm, two water makers capable of being operated electrically and manually shall be on board.

B.7: INSUBMERSIBILITY

B.7.1: FUNDAMENTAL RULE
In the event of all compartments being completely flooded, the boat shall remain unsinkable

B.7.2: BUOYANCY VOLUME
The boat shall possess a total buoyancy volume, expressed in m3 equal or greater than 130% of the boat displacement.

B.7.3: LONGITUDINAL DISTRIBUTION OF BUOYANCY VOLUME
B.7.3.1 These fixed volumes shall be distributed approximately proportionally in each watertight compartment.
B.7.3.2 The skipper, or his/her representative, shall supply a diagram of the distribution of buoyancy volume.
B.7.3.3 There shall be sufficient buoyancy for the aft escape hatch to be above the waterline when the boat is inverted, with the companionway hatch open, without the whole keel, with empty ballasts and with 400kg of equipments simulated in the longitudinal axis of the boat, 1500mm in from the aftmost point of the boat.
B.7.3.4 In light configuration, with the boat upright, the aft escape hatch shall allow to go in and out of the boat.
B.7.3.5 A study covering the various scenarios for the waterline shall be given to the Chief Measurer.

B.8: APPENDAGES - BALLAST, KEEL and DAGGERBOARDS

B.8.1: <u>Hull appendage definitions:</u> in conformity with ISAF's ERS (**Section E – Hull appendage definitions**).
Any item of equipment wholly or partly below the sheerline or its extension when fixed or when fully exposed if retractable, attached to the hull shell or another hull appendage, and used to affect: stability, leeway, steerage, directional stability, motion damping, trim, displaced volume.

B.8.2 Generalities:
The use of any material with a density greater than 11,4 (keel and/or bulb) is prohibited for boats built after the 1st of January 2006 (launch date, boat ready to sail) and for boats built before this date when they change their bulb.

Only one axis of rotation is authorised for keels.

One axis of rotation means that the keel can only be moved on one plane, ie no combined movement (helicoidal movement, etc…)

Trimtabs as well as deformable surfaces are prohibited for keels and daggerboards, except for fixed keels which can have a trimtab.

Symmetrical central daggerboards can be moveable on two axes.
Only one axis of movement is authorised for asymmetrical daggerboards.

B.8.3: Limiting the number of appendages:
- 5 for a boat obtaining its first measurement certificate after the 1st of July 2009
- The number of appendages at the time of the last certificate issued by the time limit for the 2008 Vendee Globe for an existing boat defines the maximum number of appendages for that boat.

B.8.4: CANTING KEEL
When the boat is equipped with a canting keel, this shall be manually operable from the inside of the boat, whatever her position in the water.
Appropriate external end stops shall be in place on both sides to limit the cant of the keel to the angle found when performing the initial heel test (10°). These end stops shall be sealable. Stopping the keel hydraulically and/ or electrically is not considered an end stop. Where there is a mechanical end stop at the end of the ram, supporting evidence shall be provided prior to the 10° test (drawing, measurements taken by the measurer prior to assembly etc…) Failure to do so will result in the Chief Measurer requiring a further visible end stop to be mounted.

For boats equipped with only one hydraulic ram, a specific locking device allowing the keel to be locked in position on the centreline of the boat shall be permanently installed.

B.8.4.1 Postpone the set up of this system with the objective to be ready for the next Vendée Globe: From the 1st December 2010, when the boat is at a large angle of heel, the keel must centre automatically.

B.8.4.2 For all keels built from the 1st of July 2009, the following text applies:

B.8.4.2.1 Design rules:

Designers shall respect the design rules in appendix A

B.8.4.2.2 Design evidence document (DJD)

The designer shall provide the Class Chief Measurer with a certificate of conformity that the keel meets the design rules, and a document with supporting evidence, including :

- The calculations for the loads in the different parts which make up the keel and its attachment for the different load configurations and the safety factors incorporated in the design have been respected
- The properties of the materials used have been factored in
- The calculations of the flexion and torsion frequencies of the keel
- The position of the CG of the bulb and the axis of torsion

The document shall be sent in a sealed envelope, which shall only be opened if the keel breaks or if there is a keel problem which forces the skipper to retire from a race. It shall be used to analyse and understand the problem, the aim being to improve knowledge and experience in this area.

B.8.4.3: Keel inspection

Before the first launch, a non-destructive material test (CND) shall be done, by ultrasound for carbon keels, and x-ray for steel keels.
A test of the flexion and torsion frequencies shall be carried out.

The results (CND and frequencies) shall be sent to the Class Chief Measurer.
A mechanical bench test to check the stiffness and quality of the manufacture is not compulsory, but is recommended.

Frequency tests shall be carried out annually and the report shall be sent to the Class Chief Measurer.

B.8.5: DAGGERBOARD(S)

Centreboard and daggerboard trunks and the like shall not open into the interior of a hull except via a watertight inspection/maintenance hatch of which the opening shall be entirely above the waterline of the yacht floating level in normal trim.

B.9: WATER BALLAST

The boat may be equipped with water tanks and associated permanently fitted plumbing. All ballast tanks shall be integral to and within the hull. This movable ballast shall be of sea-water only, to the exclusion of any other liquid.
It must be possible to fill, empty and transfer manually the water in the ballast tanks, whatever the position of the boat in the water.

SECTION C – RIGGING / SAILS

C.1: FUNDAMENTAL RULES

Boats must be properly rigged.
Shrouds shall never be disconnected.

C.2: AIR DRAUGHT AND MAST

C.2.1: AIR DRAUGHT

For boats obtaining their first measurement certificate after the 1st of July 2009, air draught is limited to 29 m.
For all boats obtaining a measurement certificate before the 1st of July 2009 and which air draught is superior to 29 m, any change on the mast shall not increase this air draught.
For all the boats obtaining a measurement certificate before the 1st of July 2009 and which air draught is inferior to 29 m, any change on the mast shall not increase this air draught to more than 29 m.

C.2.2: LATERALLY CANTING MASTS

Masts that cant laterally are forbidden.
The mast must never cant to windward of the boat's centreline.

C.2.3: MAST INSPECTIONS

All masts shall undergo an annual ultrasound inspection prior to being used.
An inspection certificate shall be given to the Chief Measurer in order to obtain a certificate.

C.2.4: MAST MATERIAL

Fibres permitted in the construction of a mast are limited to an upper longitudinal module.
M46J and HS40 fibres are permitted and represent the upper limit.
The average target value of M46J fibre is 436GPa, measured using the method of norm ASTM D4018.
The average target value of HS40 fibre is 455GPa measured using the method of norm JISR 7601.
All fibres whose average longitudinal modulus target value is greater than M46J or HS40 are banned.
Certificates of the batches of fibre used must be kept by teams and available to the class measurers.
Boats issued with a certificate prior to the 1st of July 2009 are not limited for the materials used in their mast, except in case of the construction of a new mast, after the 1st of July 2009.

C.3: SPARE NUMBER

C.4: SAILS

C.4.1: NUMBER OF SAILS ON BOARD

The number of sails on board for racing is limited to 10.

C.4.2: STORM and HEAVY WEATHER SAILS

a) Materials:
Aromatic polyamides, carbon and similar fibres shall not be used in a storm jib but spectra/dyneema and similar materials are permitted.

b) The following equipment is mandatory:
A foresail of area inferior to 20m² made of strong, highly visible coloured material. This sail shall have:

- Sheeting positions on deck.
- A strong securing method, which does not comprise or depend upon a luff groove device, for attachment to a stay. The use of a sail with a free luff is authorised.

C.5: ADDITIONAL RULES

C.5.1: SPINNAKER POLES
When fixed at their forwardmost position, they shall not extend beyond the vertical of the overall extremity of the authorised bowsprit.

C.5.2: RIGGING ATTACHMENTS
C.5.2.1 The forestays, backstays, runners, lower shrouds, permanent or temporary, shall be connected to the boat within the area delimited by the sheer line on the sides (as defined by the ISAF OSR), at the bow by the stern and at the stern by a line joining the aftmost points of the sheer line on port and starboard.

C.5.2.2 There must be a fixed and structural forestay, non-removable and non-releasable, whose attachment point on the mast is situated in the top third of the mast.

C.5.3: TACK AND SHEET FIXING POINTS
The fixing points of the tacks and sheets of hoisted sails shall not be rigged outside and beyond the overall extremity of the authorised spars.

C.5.4: DECKSPREADERS AND OUTRIGGERS
In a change to rule 50.3 of the RRS, the use of deckspreaders and/or outriggers is allowed, solely to support the rig and/or sail trim, and not for anything else under any circumstances

C.5.5: BOOMS
The gooseneck shall be on the deck, or have a pin which can be easily removed in the case of dismasting.
Where this is not the case, a 6m long tube (2 – 3 metres sleevable) must be on board and be usable for building a jury rig.

SECTION D – MINIMUM NORMS OF STABILITY AND LIMITING POWER

The first sentence of rule 51 of the RRS is replaced as follows: “Any moving of ballast with the aim of altering control or stability is permitted within the limits fixed by the current rules.”

Inside the boat, all heavy items capable of damaging the boat or injuring a crew member must be securely fastened to the boat.
Food supplies, water jerricans and one jerrican of fuel with a capacity of 20 litres, deck hardware and spares can be packed in boxes and moved around if securely fastened to the boat.
Sails can be moved around freely. Sail bags shall not be watertight.

Rule 52 of the RRS is replaced as follows: “With the exception of the manoeuvring and trimming of running rigging and spars, an energy source other than manual power may be used to manoeuvre the movable appendages of the hull, and for emptying, filling and transferring the water of the ballast tanks.”

Boats shall satisfy the following minimum norms:

D.1: SELF-RIGHTING
During the measurement process, the skipper must physically demonstrate that the boat, once inverted, is capable of self righting without outside help.
This test is mandatory for the issue of the first measurement certificate.
It is not mandatory for the renewal of the measurement certificate, unless significant modifications which would affect the outcome of the test have been made. This is left to the judgement of the Chief Class Measurer.
The Class Measurer shall issue for each test a detailed report describing the relevant operations necessary for self-righting. In the case of a change of skipper, a copy of this report shall be supplied to the new skipper.
The measurement protocol specifies the various operations to be done at this test.

D.2: INITIAL HEEL ANGLE
From the vertical axis, due to the displacement caused by movable ballast: the amplitude on one side shall not exceed 10° off vertical.

D.3: ANGLE OF VANISHING STABILITY (AVS)
This angle shall not be less than 127.5°.
This angle is calculated from the theoretical stability curve, derived from measurements taken during the stability test and from information provided by the designer.

Buoyancy of the spars is not taken into account.

D.4: AVS WORST CASE (AVSwc)
The value of the AVSwc in the worst case (worst configuration of ballast and keel, in light measurement trim) shall be greater than or equal to 108° for boats issued with a measurement certificate before the 1st of July 2009.

For a boat obtaining its first measurement certificate after the 1st of July 2009 the value of the AVSwc shall be greater than or equal to 110°.
All boats issued with a measurement certificate before the 1st of July 2009 and which AVSwc is inferior to 110°, any change shall not degrade her AVSwc.
All boats issued with a measurement certificate before the 1st of July and which AVSwc is superior to 110°, any change shall not degrade her AVSwc to less than 110°.

The worst case for AVS is the angle at which the boat capsizes when its keel and ballast (filled) is in its least favourable combination, the boat otherwise being in measurement trim (light measurement trim apart from the relevant ballast tanks filled).
Buoyancy of masts and spars is not taken into account.

AVSwc must be measured by the Imoca Chief Measurer based on the theoretical stability curve drawn from the measurements taken during the stability test, information provided by the designer, measurements taken by the Measurer as outlined in the measurement protocol. The AVSwc is recorded on the measurement certificate.

D.5: STABILITY CURVE AREA RATIO

The positive area under the stability curve shall be at least 5 times greater than the negative area.
Measurements must be done in light measurement trim.

Special provisions:

Dispensation for article D.5, for boats launched before the 1st of January 1999, the positive area under the stability curve may be only 4 times greater than the negative area instead of the 5 times required by the Class Rules.

D.6: RIGHTING MOMENT

Boats obtaining their first measurement certificate after the 1st of July 2009:

The maximum righting moment (RM) (all ballast tanks full on one side, including central ballasts tanks if they exist, and movable equipment in extreme configuration on the same side, keel fully canted on the same side) shall be less than or equal to 32 tons*meter.
For boats obtaining a measurement certificate before the 1st of July 2009 and having a RM greater than 32 tons*metre, any modification to a boat shall not increase her RM.
For boats obtaining a measurement certificate before the 1st of July 2009 and with a RM less than 32 tons*meters, any modification to a boat shall not increase her RM greater than 32 tons*metres.

SECTION E – NAVIGATION EQUIPMENT

E.1: ENGINE

E.1.1 Requested performance

When motorized, the boat must achieve the following performance:

- The traction value of the engine shall be equal to 280 daN (the boat is docked with a quay, the traction value is measured with a dynamometer) for 15'.
- Generate a 5-knots speed for at least 5 hours.

E.1.2 Description

The engines can be either of internal-combustion or electric.

E.1.2.1 Internal-combustion engines

The engine is exclusively a diesel one with a « manufacturing standard » power of 37HP minimum.

General requirements for diesel engines:

1. The engine shall be securely covered.
2. The engine shall be permanently installed in the boat and cannot be moved.
3. The exhaust, fuel supply systems and fuel tanks shall be permanently installed.
4. The engine shall have adequate protection from the effects of heavy weather.
5. When an electric starter is the only method for starting the engine, a separate battery, the primary purpose of which is to start the engine, shall be provided.
6. Each fuel tank shall be provided with a shutoff valve.
7. Flexible tanks are not permitted as fuel tanks.
8. All the required fuel shall be stored in fixed tanks (with the exception of 20 litres, see section D). The transfer of fuel between tanks is strictly forbidden.
9. The use of petrol or any other volatile fuel requesting a specific ventilation system is forbidden.

E.1.2.2 Electric engines

Electric engines are allowed. They can be prototypes.

General requirements for electric engines:

1. The engine shall be securely covered.
2. The engine shall be permanently installed in the boat and cannot be moved
3. The batteries used for electricity supply of the engine shall be attached to the boat and cannot be moved.
4. The engine shall have adequate protection from the effects of heavy weather.

E.1.3 Propulsion unit

It shall be located below the waterline, as close as possible to the centreline of the boat, and shall neither retract nor foldaway, nor be located on a movable appendage. It shall be positioned permanently in the water flow running along the hull.

E.1.4 The engine controls (gears + power) shall be within reach of the helming station on deck.

E.2: BATTERIES / GENERATOR

a) Batteries:

Shall be waterproof or electrolyte gel type and shall not be moved during navigation. They shall be fixed in such a way as to be held fast, whatever the position of the boat in the water. They may be sealed into their compartments at the start of a race.

All types of battery charger are allowed, except those relying on fissionable materials.

b) Generator:
A separate generator for electricity can be installed. However, when a separate generator is carried it shall be permanently installed, securely covered, have adequate protection from the effects of heavy weather. It shall have permanently installed exhaust and fuel supply systems and fuel tank(s), with shutoff valve(s). Flexible tanks are not permitted.
A portable generator shall never be operated inside a yacht.

E.3: COMPASS
A marine magnetic compass, independent of any power supply, shall be permanently installed and correctly adjusted with deviation card.
A compass in addition to that required above shall be carried on board.

E.4: INSTALLATION AND NAVIGATIONAL EQUIPMENT

E.4.1: ANTENNA MOUNTS
It is strongly recommended to see to it that the antennas are mounted in one of the following ways:
1) Either with an antenna mount outside of the working deck at the back of the boat. The height above the waterline shall not be less than 2 metres. It shall not be used for anything other than an antenna mount for satellite positioning and communication equipment, VHF etc… It shall not structurally integral to the hull, the deck or the transom.

2) Or located in a protected zone on the roof or deck, elevated, and secured by a protection device fabricated with a material permeable to satellite waves, radar and radio.

E.4.2 The following, in good working order shall be on board:
a.1) A 25W VHF marine radio transceiver, equipped with a fixed antenna,

a.2) Active AIS and navigational software which displays AIS targets.

a.3) A masthead VHF antenna which, by means of a switch near the companionway, can be used alternately for transmitting and receiving on the VHF or AIS.

a.4) An emergency antenna for the VHF

b) A Sat Com transceiver.
c) A radio receiver capable of receiving weather forecasts.
d) A GPS.
e) A SAT C interfaced with GPS and equipped with the relevant software for polling and data reporting.
Its antenna must be on a mount at least 55 cm above the deck and unobstructed within a radius of 60 cm.
f) An echo sounder.
g) A speedometer.

E.5: NAVIGATION EQUIPMENT
Navigational charts (not solely electronic), light list and chart plotting equipment shall be provided and appropriate to the specific race entered.

E.6: ANCHORS AND TOW-LINE
There must be two sets of anchoring gear on board.
The total weight of the 2 anchors and chains shall be greater than or equal to 75 kgs.

E.6.1: Each set of anchoring gear shall consist of an anchor and chain.

E.6.2: Tow-lines: each boat shall be equipped with two 18 mm pre-stretched polyamide warps of 50 m length. These warps are to be used as anchor warps or tow-lines.

E.6.3: Location and sealing: the anchoring gear must be ready to use: the anchor, chain and warp shall be sealed in the same location so that each part can be carried separately on deck. The skipper, with the agreement of the event measurer, shall decide the location and sealing position, in such a way that the anchor can be deployed within 3 minutes at the most (anchoring gear ready on deck). A demonstration for each set of anchoring gear may be requested.

E.7: FLASHLIGHTS

Shall be carried on board:

- A watertight high-powered flashlight or spotlight capable of flashing with spare batteries and bulbs.
- A watertight flashlight capable of flashing with spare batteries and bulb.

E.8: TOOLS and SPARE PARTS

Tools and spare parts, including effective means to quickly disconnect or sever the standing rigging from the hull shall be provided.

SECTION F – SAFETY EQUIPMENT

F1: SAFETY EQUIPMENT LOCATION CHART
A durable safety equipment location chart shall be provided and shall be displayed in the main compartment where it can be best seen, clearly marked with the location of the key items of safety equipment.

F2: BILGE PUMPS
The boat shall be equipped:
F2.1: With a system of two permanently installed manual bilge pumps, one operating from above, the other from below the deck, with a minimum capacity per pump of 1.3l/cycle,

F2.2: With a system of electric draining with a minimum capacity of 2400 litres per hour.

F2.3: Both systems shall allow the emptying of each watertight compartment from outside it, whatever the position of the boat, except the compartment containing the batteries, which shall be emptied with a manual system.

F2.4: Bilge pumps and strum boxes shall be readily accessible for maintenance and for clearing out debris.
Unless permanently installed, each bilge pump handle shall be equipped with a lanyard or strop or similar to prevent accidental loss.

F2.5: Two buckets of stout construction each with at least 9 litres capacity shall be carried on board. Each bucket to have a lanyard.

F3: EMERGENCY WATER
F3.1: A supply of drinking water for emergency use stored in one or several containers shall be on board and sealed.
F3.2: It shall not be moved. It won't be mobile and will be sealed.
F3.3: The quantity will depend on the length of the race and the number of people on board.
F3.4: It shall be specified in the Sailing Instructions of each race.

F4: EMERGENCY ATTACHMENT POINTS
External solid anchorage points shall be provided in the immediate vicinity of the escape hatches allowing the attachment of:
F4.1: the liferaft
F4.2: the watertight containers
F4.3: individual grab bags
F4.4: distress beacons

F5: LIFERAFTS
F5.1: Two liferafts shall be carried on board
F5.1.1: One built to SOLAS norms, outside in a container. It shall not be stacked and will be sealed.
F5.1.2: One inside, conform to the ISO 9650-1-A norm. It shall be able to pass through all openings in the watertight bulkheads and all escape openings, including the transom escape hatch. It shall not be stacked and will be sealed.
F5.1.3: When racing with crew, the total capacity of the two liferafts shall be sufficient for the evacuation of the entire crew.

F.5.2: Stowage:
The SOLAS liferaft shall be:

- Stowed either in a purpose-built compartment, opening into the cockpit, the working deck, or the transom, and containing nothing but this liferaft.
  In the case of a compartment, it must be watertight or self-draining and have a cover capable of being opened under water pressure.
- Or in the cockpit, but not forward of the companionway hatches of the cockpit.

F5.3: Deployment
The end of the painter of the liferaft shall be permanently made fast to a strong point of the boat.

F5.4: Servicing and Inspection
Each liferaft shall be serviced in accordance with requirements for that particular liferaft and the certificate (or copy) shall be kept on board.

F.6: LIFEBUOYS
The following shall be on board:
F6.1: A lifebuoy with a whistle, a self-igniting light and a drogue, or a Lifesling type floating harness with a self-igniting light and without a drogue.
F6.2: A lifebuoy equipped with a whistle, a drogue, a self-igniting light and a pole and a flag. The pole shall be either permanently extended, or be capable of being fully automatically extended (e.g by compressed gas or spring action in less than 20 seconds). The pole and flag shall be attached to the lifebuoy with 3m of floating line. It shall be so constructed that the flag lies at least 1.8m off the water.
F6.3: At least one of the lifebuoys shall depend entirely on permanent (e.g foam) buoyancy.
F6.4: Each inflatable lifebuoy and any automatic device (e.g pole and flag extended by compressed gas) shall be tested and serviced at intervals in accordance with its manufacturer's instructions.
F6.5: Each lifebuoy (or Lifsling) shall be fitted with marine grade retro-reflective material.
F6.6: These 2 lifebuoys shall be within reach of the helmsman and ready for instant use in double-handed and crewed races.

F.7: PYROTECHNIC SIGNALS
F.7.1: Pyrotechnic signals shall conform to SOLAS LSA Code Chapter III Visual Signals and no older than the stamped expiry date (if any) or if no expiry date stamped, no older than 4 years.
F.7.2: Shall be provided:
- 6 red parachute flares
- 4 red hand flares
- 2 orange smoke flares

F.7.3: These pyrotechnic signals shall be stowed in the watertight emergency container near the companionway.

F.8: LIFEJACKETS
F.8.1: Each crew member shall have a life jacket which conforms to CE regulations (minimum 150 N Norm EN 396), and each lifejacket shall also be:
F.8.2: equipped with a whistle and fitted with marine grade retro-reflective material
F.8.3: compatible with the wearer's safety harness
F.8.4: if automatically inflatable, the gas bottles shall be regularly checked. One spare gas bottle per lifejacket shall be on board
F.8.5: clearly marked with the boat's name or crewmember's name.

F.9: SAFETY HARNESS and SAFETY LINES
Harnesses and safety lines shall conform to CE EN1095 or ISO 12401 norms.

F9.1: Safety Harness
Each crew member shall have a safety harness

F9.2: Safety Lines (tethers)
- Each harness shall be equipped with a safety line not more than 2m long with a snaphook at each end.
- Attention must be drawn to U bolts as clipping points, because they can lead to the unclipping of plain snaphooks. For this reason, the use of snaphooks with positive locking devices is strongly recommended.
- Safety lines shall have a coloured flag embedded in the stitching, to indicate an overload. A line which has been overloaded shall be replaced.

F.10: SOFT WOOD PLUGS
Soft wood plugs, tapered and of appropriate size, shall be attached or stowed adjacent to the appropriate fitting for every through-hull opening.

F.11: FIRE EXTINGUISHERS
F.11.1: At least two fire extinguishers shall be provided, of at least 2 kg each and ABC rated, CE 0029 or SOLAS 0029/03 approved, in date, readily accessible.
F.11.2: One shall be close to the engine
F.11.3: The other close to the companionway (less than 1.5 metres from the centre of the companionway hatch).

F.12: FOGHORN
A foghorn shall be provided.

F.13: RADAR
The following equipment, in good working state, shall be provided:
F.13.1: Radar fitted with power of 2KW minimum. The radar unit shall be fixed at a height of at least 5 metres above the water line.

F.14: EPIRBs
Boat shall be equipped with two SARSAT COSPAS Epirb portable distress beacons, classified as long-life (48 hours minimum autonomy).
These beacons shall:
F.14.1: have two frequencies (406 MHz and 121.5 MHz),
F.14.2: be coded and registered with the name and MMSI number of the boat,
F.14.3: be serviced at intervals in accordance with the manufacturer's instructions,
F.14.4: be solidly attached with a line at least 3 metres long of 1000 daN minimum breaking strain.
F.14.5: They must be immediately accessible to the skipper, close to the companionway. They shall not move.

F.15: EMERGENCY TRANSMISSION
Boats shall be equipped with at least two systems, one at the front and one at the back or in the middle part of the boat, which, when the boat is inverted, allow the watertight setting of:
F.15.1: a VHF antenna
F.15.2: a SARSAT-COSPAS antenna, or any other positioning beacon antenna
F.15.3: an Iridium antenna
F.15.4: The three antennas here above can be set one at a time
F.15.5: Checks shall be done ashore or during the self-righting test.

F.16: WATERTIGHT HAND HELD VHF TRANSCEIVER
A waterproof hand-held VHF transceiver, with charged batteries and spares, shall be carried on board, in addition to the one in the emergency container.

F.17: PORTABLE RADAR TRANSPONDER
A radar transponder beacon (9.2 – 9.5 GHz frequency), portable and self-powered shall be carried on board. This beacon shall be securely attached with a line at least 3 metres long of 1000 daN minimum breaking strain.
This radar transponder beacon must be stored in the watertight emergency container

F.18: FIRST AID MANUAL and FIRST AID KIT

F.18.1: First Aid Manual
A First Aid manual shall be provided; the latest edition of one of the following is recommended by ISAF:

- International Medical Guide for Ships, World Health Organisation, Geneva,

or

- First Aid at Sea, by Douglas Justins and Colin Berry, published by Adlard Coles Nautical, London,

or

- Le Guide de la médecine à distance, by Docteur JY Chauve, published by Distance Assistance - BP33 - La Baule Cedex, France. An English translation is available.

or

- Skipper's Medical Emergency Handbook, First Aid at Sea, by Dr Briggs and Dr Mackenzie, published by Adlard Coles Nautical, London

F.18.2: First Aid Kit
A First Aid Kit shall be carried on board. The contents of the First Aid kit shall conform to the recommendations of the on-board manual.
It shall reflect the likely conditions and duration of the passage, and the number of people aboard the yacht.

F.18.3: Emergency Aid Kit for single-handed races
During single-handed races, an emergency first kit containing what the skipper thinks advisable for an emergency shall be carried at the foot of the companionway, less than 1.5 metres from the centre of the companionway and be easily and quickly accessible. It cannot be moved.

F.18.4: Medical Training
Before the start of a race, the skipper (and co-skipper for double-handed races) shall have undertaken at least once in the past five years a medical training reflecting the type of race.
This training is strongly recommended for crew members for fully crewed races.

F.19: HEAVING LINE
F.19.1: A solid heaving line of polypropylene of 15m – 25m length shall be readily accessible in the cockpit.

F.20: DIVING EQUIPMENT
The following shall be on board:
F.20.1: One Spare Air dive tank or equivalent
F.20.2: A wetsuit (full body) with gloves, flippers and mask

F.21: PERSONAL EQUIPMENT
The following equipment shall be carried on board for each crew member:
F.21.1: One pack of mini flares and one personal location light (either SOLAS or strobe), one of these shall be attached to, or carried on, each person when on deck at night.
F.21.2: a knife,
F.21.3: a waterproof flashlight.

F.22: PERSONAL SURVIVAL TRAINING
Before the start of a race, the skipper (and co-skipper for double-handed races) shall have undertaken at least once in the past five years personal survival training in accordance with the ISAF norm.
This training is strongly recommended for crew members for fully crewed races.

F.23: PERSONAL SURVIVAL EQUIPMENT
One set of Survival Equipment shall be provided for each crew member to include:
F.23.1: vacuum-packed warm clothes for each person on board
F.23.2: An immersion suit for each person on board as defined hereunder shall be provided:
F.23.2.1: in accordance with NF EN ISO 15027-1 norms, and whose thermal insulation value without thermal underwear when immersed shall be greater than 0.75 Clo (Category A).
F.23.2.2: It shall be stowed in a bag attached at the foot of the companionway, less than 1.5m from the hatch.

F.24: WATERTIGHT EMERGENCY CONTAINER

F.24.1: A watertight emergency container shall be carried on board. It shall be fitted with strong handles and with a line of 1000 daN minimum breaking strain.

F.24.2: Position

This container shall be stowed at the foot of the companionway, ie less than 1.5 metres from the companionway hatch, and cannot be stacked and it will be sealed.

F.24.3: Content

It shall contain at least:

- A watertight hand-held marine VHF transceiver with spare batteries
- An Iridium mobile phone with spare batteries
- A waterproof hand-held GPS with spare batteries
- A watertight flashlight with spare bulb and batteries
- A knife
- Cyalume type chemical light sticks
- Fluoresceine sea markers
- A strobe with spare batteries
- The pyrotechnic signals listed in B.7.2
- High energy food
- A survival blanket for each person on board
- The radar transponder beacon called in F.17

F.25: HULL MARKING

F.25.1: To assist in SAR location, the sail number shall be displayed in a highly visible manner, once on the deck. The size of the characters shall be not less than:

- Height: 900 mm
- Width: 600 mm
- Thickness: 120 mm
- Space between characters: 180 mm.

F.25.2: Exterior hull marking

To assist rescue parties to gain access to the boat, the area of the hull below the waterline which can be easily penetrated shall be clearly marked in highly visible paint (orange, yellow or red), (see Article 5.6.).

F.25.3: Interior hull marking

To assist the skipper to get out of the boat by means other than escape hatches, the area of the hull which can be easily broken shall be clearly marked with highly visible paint (yellow, orange or red), (see Article 5.6).

F.26: FLUORESCENT PAINT

To assist in SAR location:

F.26.1: Keel(s), rudder(s), and at least a minimum of 2 m² of the hull below the waterline shall be entirely covered with special fluorescent paint.

F.26.2: At least 2 m² of the surface of the deck in one place shall be covered with a bright, highly visible coloured paint.

*****

APPENDIXES TO THE CLASS RULES

APPENDIX A. RULES FOR KEEL DESIGN

Minimum safety factors to be respected:

Keel horizontal, 1g on the bulb + keel fin

- Factor of 5 for the whole keel

  The value of 5 corresponds to the multiplicative factor of load for the breaking point (or permanent deformation) of FRP (fiber reinforced plastic), or the overall loss of elastic behaviour of metals which generally equates to exceeding the elastic limit (see note 1).

- Grounding, Keel canted to the maximum, with 3 x the weight of the boat excluding the bulb weight, applied to the end of the bulb, and with all the ballast tanks filled on the same side.
  - factor of 1 for the free part (keel and fin)
  - Check that the elastic limits of the bearings and attachments of the keel are not exceeded.

Note 1: for ductile metals (ie elongation at break greater than 3%), the criteria required is an overall elastic behaviour, ie no permanent deformation (such as residual bend of the keel fin) once unloaded.
Exceeding the elastic limit locally (at a fillet for example) is permitted.

Material properties to be used:

- Metals: Use the mean values guaranteed by the manufacturer.

- FRP: Apply a factor of 0.7 to the manufacturer's mean data (target value)

Materials shall be delivered accompanied by their certificates of conformity. Taking measurements of the mechanical properties of samples of the materials is recommended.

Frequencies of keels:

Keel fitted to the boat, rotation bearing and hydraulic system attached and locked in the central position, the frequencies of the keel in torsion must be greater or equal to:

- 3.2Hz for torsion
- 1.07Hz for flexion

Centre of gravity:
The CG of the bulb shall be forward of the axis of torsion of the fin.

NB
This design rule does not impose a particular method of analysis on the structural engineer (software, method of analysis, finite element calculation, type of mesh, size of mesh…).
The structural engineer must choose the tools for his analysis and understanding. .

APPENDIX B TO THE CLASS RULE E.1

Non exhaustive list of standard commercial public brands with a “manufacturer standard” minimum power of 37HP: Yanmar 3JH4, Lombardini LDW 1404, Nani diesel 4.150, Volvo D2-40

APPENDIX C: CONSITITION OF THE CRC

René Boulaire, Chief Measurer
Daniel Andrieu, Naval Architect
Simon FORBES, ISAF

APPENDIX D. CONTENTS OF FIRST AID KIT BY DR Jean-Yves CHAUVE

Available from the General Administration: contact@imoca.org

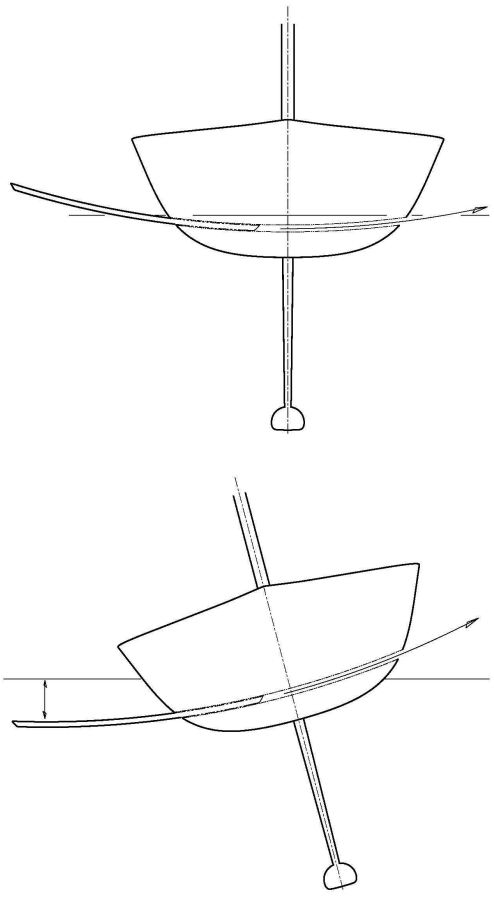
ANNEXE E. INTERPRETATIONS

The interpretations listed hereunder are the ones published to date (May 10th 2010).
These interpretations have been validated by the CRC.
New interpretations can be issued to complete the Class Rules at any time, function of the questions asked and the answers given by the CRC. These new interpretations are available on the Class Website (www.imoca.org) and addressed in parallel to the members by email.
The list of interpretations that prevails is available on the Class Website (www.imoca.org).

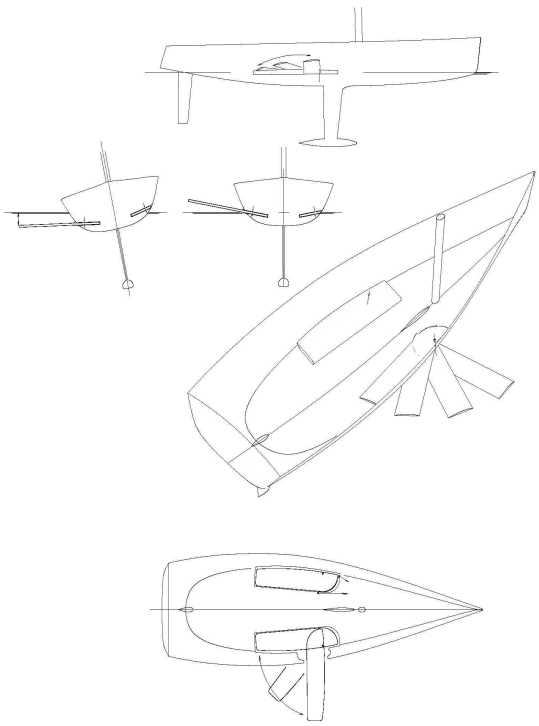
INTERPRETATION : 1-2009
Question
Do the IMOCA rules authorize the installation of asymmetric daggerboards which have multiple centers of rotation (S-shaped daggerboards)?

Response
NO. This system uses more than one axis of movement and is not in compliance with article B. 8.2 of the IMOCA Class Rules 2009.

INTERPRETATION : 2-2009
Question
The 2 DSS systems proposed below are they in compliance with the class rules IMOCA?



"Single Sliding Foil"



"P & S Swinging arrangements"

The request for interpretation leads the CRC to raise 5 questions concerning the systems suggested:

1. According to article B.8.1, are the proposed systems considered to be appendages?
2. According to article B.8.2, Is the system “single sliding foil” considered to be a “symmetrical central daggerboard”?
3. According to article B.8.2, what is the number of axes of movement of each appendage?
4. According to article B.8.3, what is the number of appendages of each system?
5. According to article B.1, Do the systems proposed create additional “floatation planes”?

Response:
1. Article B.8.1 (IMOCA) is a repetition of article E.1.1 (ERS) defining an appendage. The systems suggested do not contravene these rules and are thus appendages.
2. It is the point of attachment on the hull which determines if an appendage is central or not. It is the position at rest and under the normal sailing conditions which determines the possible symmetry of the system. The system “single sliding foil” cannot thus be described as “symmetrical central daggerboard”.
3. For each appendage in the two systems presented there exists one axis of movement.
4. An appendage being related to its point of attachment on the hull, it is the number of attachment points on the hull of each system, which determines the number of appendages. The system “single sliding foil” presenting two attachment points on the hull, it must be counted as two appendages, even if physically it is the same element.
5. Terms “floatation plan” are not being specifically defined in the Class Rules (IMOCA), and thus, it is up to the CRC to interpret if an appendage creates or does not create an additional floatation plan. The CRC considers that the rudders, the canting keel, as well as the appendages of the existing fleet, before the application of the Class Rules revision 2009, do not create, by their nature, additional floatation plans. Concerning future systems of appendages to come and showing different or innovative design characteristics, it is requested from the Designer to demonstrate to the Chief Measurer that none of these appendages creates a second floatation plan under the conditions envisaged with the B.1 Article. In case of doubt the Chief Measurer will submit a report with the CRC which will decide.

INTERPRETATION 03-2009
Question 1
Is it correct that neither the Chief Measurer nor any member of CRC can request an interpretation?

Response 1
The CRC is an ad hoc committee created by the IMOCA Association. In accordance with Class Rule A.8, the CRC is qualified to answer any requests for interpretation of the Class Rules which are transmitted to it as envisaged in this class rule.
Requests for interpretation can only be made by members of IMOCA. Nevertheless within the framework of its mandate, the CRC can, at its sole discretion, accept a request for interpretation made by a non-member of IMOCA, including in particular the Chief Measurer or one of the members of the CRC, if they believe it is of interest for the Class. In any event, the origin of the requests is confidential.
To the question asked, the CRC answers: NO

Question 2
Is it correct that an interpretation cannot change the explicit and literal meaning of the words used in the rule?

Response 2
The question is not a request for interpretation of the Class Rules.
To the question asked, the CRC answers: NO ANSWER

Question 3
Is there a conflict between Class Rules article A.11, and Regulations article C-V?
Article A.11 stipulates that Class Rules cannot be changed until General Meeting 2013, unless in case of “proven extreme urgency” and article C-V speaks about “modifications (...) of the text at the next Annual General Meeting”.

Response 3
The mission of the CRC is to interpret the Class Rules. The possible conflicts which could occur between the Class Rules and other documents or texts of IMOCA are outside its remit.
To the question asked, the CRC answers: NOT QUALIFIED

Question 4
Can you define “proven extreme urgency” used in Rule A.11?

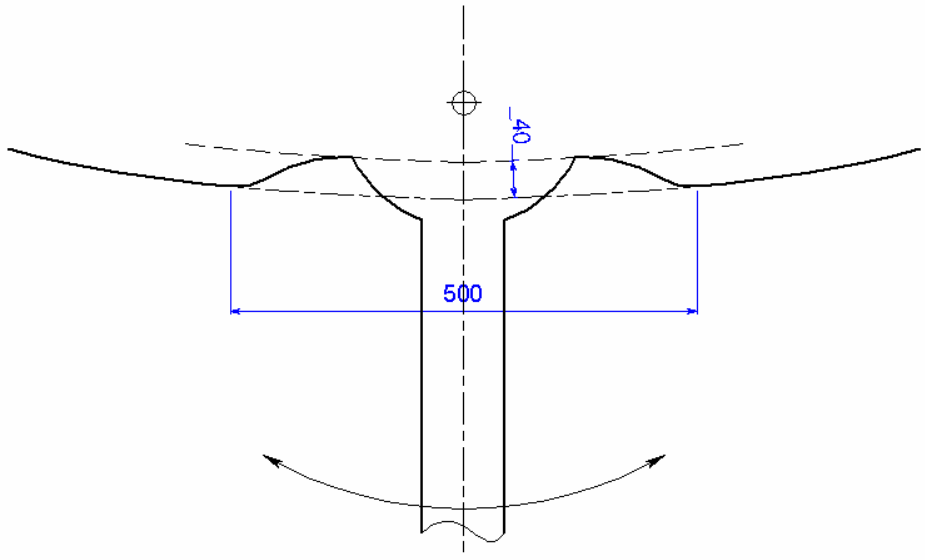
Response 4
The concept of ‘proven extreme urgency’ cannot be interpreted in abstract, but case by case, in particular on the basis of the Class Rules.
To the question asked, the CRC answers: NO

Question 5
Can you please explain what happens when the CRC changes the Rules (un-intentionally) via an interpretation which would be de facto contravening Rule A.11?

Response 5
The vocation of the CRC is to interpret the Class Rules, not to change them.
To the question asked, the CRC answers: NO ANSWER

Question 6
About Article B.1 of the Class Rules, is it correct that the 500mm restriction is applicable from a line (perimeter) which results from the intersection of the keel and the hull outer surfaces, and that the 40mm depth restriction is measured inboard from a horizontal plane passing through the lowest, adjacent points on the outer hull surface?

Response 6
The area of exclusion specified in Class Rule B.1, is limited in width to 500mm overall, edge-to-edge, and a maximum depth of 40mm measured according to the offset from the fair hull surface of the canoe-body, extended where necessary, conforming to the attached diagram.
Regarding the longitudinal limits of this area, it is noted that only technical reasons related to the functioning of the canting keel justify this exception to the Class Rule. Technical reasons, other than those directly related to the engineering of the functioning of the canting keel will not be taken into account. Within this preceding framework, the Chief Measurer is the sole person to determine the technical reasons, in view of submitted plans and the completed boat.
To the question asked, the CRC answers: NO



Question7
Is it correct that in the case of an asymmetrical daggerboard, the definition of «single axis of mobility» is «one degree of freedom»?

Response 7
The French text of the Class Rules B.8.2 Generalités, defines an axis of mobility:
«One axis of mobility means one degree of freedom, and no combined movement (helicoidally movement, etc…) is possible».
This definition is applicable throughout the whole Class Rules.
The CRC notes that a degree of freedom is defined as a translation or a rotation regarding any axis.
In the English Class Rules translation, rule B.8.2 definition is translated by "One axis of rotation means that the keel can only be moved on one plane, i.e. no combined movement (helicoïdal movement, etc…)".
This translation is not correct, and thus, regarding class rule A.6.1, the French text prevails.
To the question asked, the CRC answers: YES

INTERPRETATION 04-2009
Question
The F.15 rule was voted at the time of GM of October 22nd, 2009 with the following text:

F.15 EMERGENCY TRANSMISSION
Boats shall be equipped with at least two systems, one at the front and one at the back or in the middle part of the boat, which, when the boat is inverted, allows the deployment of: F.15.1 a VHF antenna
F.15.2 a SARSAT-COSPAS antenna, or any other positioning beacon
F.15.3 the radar transponder and Iridium
F.15.4 during the self-righting test for new boats, checks shall be done.

It appears that if the antennas VHF and Iridium can be mounted through a standard seacock, it seems difficult to make them pass the Sarsat-Cospas beacon and the radar transponder.
On this assumption, is it then possible, to answer the rules F.15.2 and F.15.3, in substituent its requirements by the possibility of installing the Sarsat-Cospas beacon and the transponder by the back hatch?

Response
The Preamble to the Class Rules specifies that:

"(…) these rules (…) must be developed in such a way to encourage (…) the research and application of new techniques in terms of safety at sea."
The CRC notes that the F.15 rule corresponds precisely to the spirit of the Preamble on the research and the application for new methods as regards safety.

The term "passe-coque" (in French) used in the F.15 rule is not defined in the Class Rules. "Passe-coque" in the sense used in F.15 rule must be understood as "System making it possible to pass through the hull and fulfilling the requirements of the Class Rules".
In the spirit of the Preamble, Technical Committee can, as its convenience, initiate or accompany all shared research, developments, related to these systems.
To the question asked, the CRC answers: NO

INTERPRETATION 05-2010
Question
Does the word « specifically » (Class Rules translation) used in Class Rule A.1, apply only to the Class Rules and nothing else?

Response
1. The adverb « expressément » (french text) means « which is stated in a formal and imperative way » (Dictionary of the Académie française).
2. The Class Rules of the IMOCA are only one of the reference documents concerning the class Open 60'. The Constitution, the Regulations (in particular B - II - Discipline) and other texts issued by the IMOCA oblige compliance by the members of Association, as well as the race documents, the RRS, and all other mandatory documents.
3. The CRC is not empowered to determine preeminence of a regulation over another, it does not have the capacity to determine if the regulations provisions, others that those of the Class Rules, could cancel or limit those of the Class Rules.
To the question asked, and as limited by the response above, the CRC answers: YES

INTERPRETATION 06-2010
Question 1
In Rule B.5.5, what is the definition of the term "hinge" in the sentence "… with its closing mechanism and hinges … »?

Response 1
To the question asked, the CRC answers: In Rule B.5.5, the term "hinge" shall be understood as " any guidance system by rotation and / or translation, which keeps the door permanently attached to the bulkhead, and meets the requirements of Class Rules. Straps or ropes are not regarded as a permanent attachment ".

Question 2
In Rule B.5.8, "The hatches, closing mechanism and hinges must be capable of resisting water pressure when the boat is inverted".
How to validate the resistance of these systems, and who is empowered to do this?

Response 2
It is the responsibility of the Members of the IMOCA, that the vessel or vessel parts are designed and built in compliance with Class Rules, leveraging their experience, recognized or approved regulations, testing, calculation notes, or other relevant and appropriate means.
To the question asked, and considering the foregoing, the CRC answers: By any relevant and appropriate means, under the responsibility of the Members.

Question 3
Is the installation of a Methanol Fuel-Cell (MFC), inconsistent with the rule E.1.2.1.9 which states «The use of petrol or any other volatile fuel requesting a specific ventilation system is forbidden »?

Response 3
A Methanol Fuel-Cell produces electricity, so it is a generator. As such, it must respect the rules concerning this type of installation, that is to say the rule E.2.b.
To the question asked, and considering the foregoing, the CRC answers: NO

Question 4
May a spare halyard be used as the anchoring-line specified in the Class Rules (Rules E.6.1 and E.6.2)?

Response 4
The anchoring-line described in the Class Rules must meet certain characteristics, length, diameter, type, number of strands, weight, and must also «… shall be ready for immediate use, easily put together ....".
The CRC believes that a spare halyard, which by its nature can be installed in the mast, cannot be considered "ready for immediate use, easily put together".
To the question asked, and considering the foregoing, the CRC answers: NO

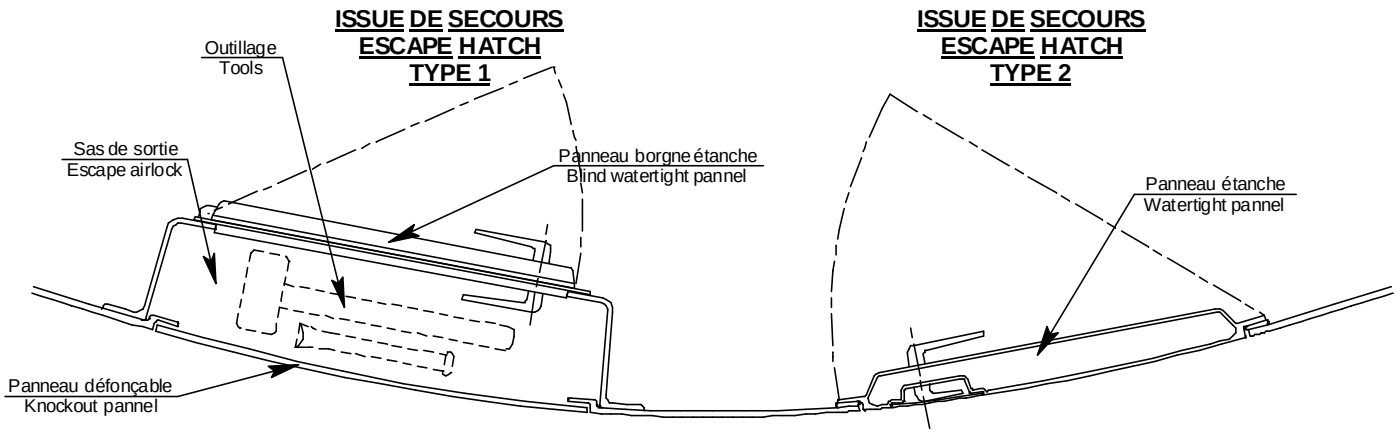
INTERPRETATION 07-2010
About the installation of an "escape airlock", Rule B.5.6.4 specifies that:
"… This device must allow the skipper to go out without damaging the float. For example, it could be made of a watertight blind door at the bottom of the hull and the necessary tools to pierce it ".

Question 1
In the Rule B.5.6.4, what is the meaning of the sentence « without damaging the float »?

Response 1
To the question asked, the CRC answers: In light of the French text, the sentence «without damaging the float» shall be understood as « preserve the hull and deck buoyancy, regardless of the position of the boat»

Question 2
How can we achieve a knockout panel to leave the boat, "without damaging the float"?

Response 2
The question is based on means and methods on how to comply with Class Rules. The question is not a request for interpretation. However, Rule B.5.6.4 offers the choice between two systems, first (Type 1) "This device …, for example, … could be made of a watertight blind door at the bottom of the hull and the necessary tools to pierce the hull in front of this panel ", the other (Type 2) " Another solution would be a completely watertight panel at the bottom or on the topsides of the hull ". CRC offers the above diagrams, as an example among others, to illustrate this rule.
To the question asked, and considering the foregoing, the CRC answers: NO ANSWER



Question 3
Does this knockout panel have to be capable of being closed after leaving the boat?

Response 3
The rule says "... This device should allow the skipper to go outside, while maintaining the integrity of the float ". This integrity must be preserved even after leaving the boat. If an escape airlock is installed (Type 1), the inner panel, which ensures the integrity of the float, must be opened and closed from inside and outside. If there is only one panel (Type 2), it cannot be knockout and must have handles on both sides.
To the question asked, and considering the foregoing, the CRC answers: NO

Question 4
May this panel be identical to the marking to be performed to pierce the hull (Rule B.5.6.3)?

Response 4
Nothing prevents the location of this panel to be identical to the markings specified in Rule B.5.6.3; insofar panel and markings meet the requirements of Class Rules.
To the question asked, and considering the foregoing, the CRC answers: YES

INTERPRETATION 08-2010
Question 1
When the pulpit is in 2 parts and open, and the opening between the pulpit and every part of the boat exceeds 360 mm, is it possible to connect the 2 parts of the pulpit with a Spectra lifeline to conform with B.6.1 Rule?

Response 1
ISO 15085 applies to Rule B.6. This standard defines, in Article 3.12, a pulpit as a "rigid frame". The lifeline described in the question is therefore not part of the pulpits, and does not comply with Article 10.6 of this standard.
It should be noted that the French version of ISO 15085 present an inconsistency in the wording of Article 10.6, and that the sentence « Cette exigence est respectée s'il est possible d'introduire … » should be understood as « Cette exigence doit être vérifiée en présentant … », as in the other official versions (English and German).
To the question asked, and considering the foregoing, the CRC answers: NO

Question 2
Knowing that the height of the upper lifeline must be equal to or greater than 600 mm, what are the requirements for the intermediate lifelines?

Response 2
The ISO 15085 standard that applies under this rule does not explicitly define the height between the different lifelines but only defines the height of the lower one.
However, the ISO 15085 standard in its starting Analysis said that the objectives are "to minimize the risk of falling overboard", and the Class Rules of IMOCA state in the Preamble that " The aim of these rules is … to ensure that, with respect to safety, standards are to an acceptable level and at least identical for all competitors."
Given these requirements and Article 10.3 on replacing an intermediate line by " any device limiting the gap between two adjacent protections below 380 mm, in any direction", which implicitly defines a maximum gap, the CRC recommends the setting of intermediate lifelines limiting to 380mm the open space between two lifelines.
To the question asked, and considering the foregoing, the CRC answers: The vertical opening between 2 lifelines must be less than 380mm.

INTERPRETATION 09-2010
Question
Within IMOCA class rule B.8.4:

"For all keels built from the 1st of July 2009, the following text applies:
Design rules:
Designers shall respect the design rules in appendix A."

In the case of a boat with a keel fin that was built before 1st of July 2009, does the construction of a new bulb require the keel fin to comply with the design rules in Appendix A?

Response
The CRC notes that Appendix A, rules for canting keel design, does not invoke the term 'keel' or 'fin' as defined in Equipment Rules of Sailing (ERS) rule E.1.2, and secondly, it is fundamental to Appendix A, that the term "keel" is used as the assembly of "keel fin" and "bulb".
The CRC considers that if one of the fundamental components of the canting keel is made from 1 July 2009, the whole of the canting keel is to be considered built from that date.
To the question asked, and considering the foregoing, the CRC answers: YES

INTERPRETATION 10-2010

Question
Within IMOCA class rule B.8.4 about watertight bulkheads:
"The transom is not a bulkhead."
How define the transom?

Response
To the question asked, the CRC answers:
The transom is the last structural element that connects the hull to the deck and / or the cockpit and closes the watertight compartment #6.
The geometric and structural characteristics of the transom shall allow the compliance with the various Class Rules that refer.

INTERPRETATION 11-2010

Within IMOCA Class Rule C.2.4:
“No fibre with a longitudinal modulus greater than 436 GPa is permitted in the construction of mast for boat obtaining her first measurement certificate after the 1st of July 2009.”

Question 1
The word "fibre" in the rule C.2.4, is it used as a generic term for a given product (M46J or HS40, for example), or should it be taken literally, as any single fibre in a batch or product?

Response 1
To the question asked, CRC answers that the word "fibre" in Rule C.2.4 must be understood as being representative of a set of fibres marketed under a generic name, such as "fibre" Toray M46J or "fibre" Mitsubishi HS40.

Question 2
In the case that the word "fibre" is understood as a set of fibres, together under one term "fibre XXX", must one consider that the maximum limit imposed applies to the average (or nominal) measurement of “fibre XXX”, or to any fibre from any batch?

Response 2
To the question asked, CRC answers that the limit imposed by Rule C.2.4 then applies to all batches of the same product, and must be considered as the mean (or nominal) value of the "fibre”, although there may exist in each batch, a number of fibre units above this limit.

Question 3
How to measure the longitudinal modulus of a “fibre”?

Response 3
The Rule C.2.4 does not specify how to measure the value of maximum longitudinal modulus, the CRC believes that any means appropriate and bonafide, approved by the Chief Measurer, is satisfactory, including the commercial documentation of “fibres” and different measurement standards existing and recognized.
To the question asked, and considering the foregoing, the CRC answers: By all means appropriate and bonafide, approved by the Chief Measurer.

Question 4
Are there tolerances to this limit?

Response 4
The text of the rule indicates a value not to be exceeded, so there is no tolerance to the maximum value of 436 GPa, and no "fibre" within the meaning of the interpretation given to that term in the Response 1 can be allowed if the average (or nominal) value of its longitudinal modulus exceeds the limit.
To the question asked, and considering the foregoing, the CRC answers: NO

Question 5
Do masts, built with fiber M46J, comply with the Class Rules?

Response 5
The question is not a request for interpretation of the Class Rules
To the question asked, and considering the foregoing, the CRC answers: NO ANSWER

Question 6
Do masts, built with fiber HS40, comply with the Class Rules?

Response 6
The question is not a request for interpretation of the Class Rules
To the question asked, and considering the foregoing, the CRC answers: NO ANSWER

Question 7
The CRC takes it into account (in particular) for which prevailed in the writing of the rule or he answers only to the text of the rule?

Response 7
The question is not a request for interpretation of the Class Rules
To the question asked, and considering the foregoing, the CRC answers: NO ANSWER

INTERPRETATION 12-2010

Question 1
In the case of a deck / hull junction with radius and / or chamfered, with simple or multiple curvature, what is the position of the sheerline?

Response 1
The position of the deck line (or sheerline) is defined by a set of rules derived from various documents:
1. IMOCA Class Rules
C.5.2.1: (...) the deck line (definition ISAF OSR)

2. IMOCA Measurement Protocol 2010
PREAMBLE:
Each measurement - except where is modified by this Protocol - shall be conducted in accordance with the requirements of the ISAF ERS and / or ISO standards. Where there is conflict between these, the Chief Measurer decides which ones apply.

3. ISAF OSR 2009-2012
No definition.

4. ISAF ERS 2009-2012
D.1.2 sheerline
The line formed by the intersection of the top of the deck and the outside of the hull shell, each extended as necessary.

5. ISO 8666
3.3 Sheerline
Intersection between deck and hull, for rounded deck edges the natural intersection, or, where no deck is fitted or the hull extends above the deck (bulwark), the upper edge of the craft's hull. The upper position of the sheerline depends on the inclination between the hull/deck intersection and the actual deck (see Figure 3).
If $\alpha >= 45$ °, the lowest position applies;
If $\alpha < 45$ °, the upper position applies.

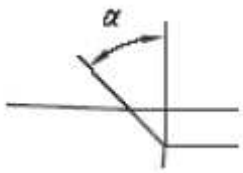
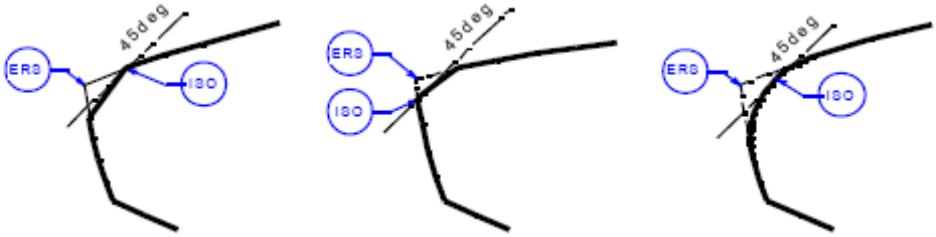


Figure 3

The CRC has the following analysis of this set of elements:
The Class Rules (1) reference to OSR to find the definition. It is probably an editorial inconsistency, because this document does not define this issue.
For Class Rules themselves, there is no definition of the sheerline, however:
The Measurement Protocol 2010 (2), attached to the Class Rules, states in its Preamble, the measurements, with some exceptions, must comply with the requirements of ERS and/or the applicable ISO Standards.
The sheerline is actually part of the elements measured (Measurement Protocol 2010, Art. A.4.5.A), and therefore this Preamble is applicable.

Moreover it is clear that in case of conflict between the ERS rules and ISO standards, the Chief Measurer will decide which are applicable.
The ERS (4) define the sheerline (or deck line) as the intersection of the hull and deck and their extensions if necessary.
ISO standards (5) specify that in case of rounding, chamfer, etc., the local 45 degrees cross tangent determines the deck line.
CRC illustrated in three diagrams below the possible conflict:



In these three patterns, there is a conflict between the ERS and ISO 8666, the Chief Measurer is the only one to decide which among those defined by ISO or ERS, is the sheerline.
He will rely in particular, if he wishes, on the following:

- The physical limitation of the manufacture of the hull and deck;
- The boundaries of the working deck and the maximum distance (0.5 m) between lifelines and sheerline;
- Any element of security, including access to chain plates.

To the question asked, and considering the foregoing, the CRC answers: sheerline is determined in accordance with the rules.

Question 2
Is there a contradiction between the rule C.5.2 (Rigging attachment) and the rule C.5.4 (Deck spreaders and outriggers) in the limitation of where the attachment of the rigging are made at extremity of the deck spreaders or the outriggers if these are used?

Response 2
Class rule C.5.2.1 says:

"The forestays, backstay, runners, lower shrouds, permanent or temporary shall be connected to the boat within the area delimited by the sheerline on the sides... "

The topological analysis of "… within the area delimited by the sheerline on the sides ..." leads the CRC to consider that there is a number of surfaces meeting this definition.
Accordingly, whatever the attachment points of “the forestays, backstay, runners, lower shrouds, permanent or temporary”, it is always possible to find a surface fitting the description of the rule C.5.2.1.
This means that the rule C.5.2 does not impose a limitation on the attachment of the described rigging elements.
Accordingly, there can be no contradiction with the rule C.5.4 setting the limits of use of deck spreaders and outriggers.
However, the CRC notes that the following rules may limit the establishment of such elements of rigging:

- ERS E.1.1, which defines an appendage as part " wholly or partly below the sheerline or its extension”, if this element can “affect: stability, leeway, steerage, directional stability, motion damping, trim, displaced volume.”
- Class Rule B.8.3 limiting the number of appendages
- Interpretation 02-2009, which limits the nature of some appendages

To the question asked, and considering the foregoing, the CRC answers: There is no contradiction between Rules C.5.4 and C.5.2, within the Class Rules

APPENDIX F – BUREAU VERITAS REPORT ON LIQUID MOTION ANALYSIS (03/05/2010)

1. GENERAL

Present Report has been drawn up within BUREAU VERITAS (herein after called BV) Marine Division General Conditions, at the request of IMOCA for the benefit of IMOCA Class Association.

Following events at sea during which a flooded compartment of an Open 60 (ft) yacht has lost its watertightness with respect to adjacent compartment, BV was requested by IMOCA to perform a liquid motion analysis in order to evaluate the maximum hydrodynamic forces exerted by this pre-existing water inside compartment on its round shaped doors. The liquid motion analysis assumptions are provided by IMOCA such as the compartment and its round shaped doors dimensions, the 3 filling levels to be studied and the deceleration magnitude order to be considered as input motion.

The aim of this report is to present from one hand the liquid motion analysis methodology used to evaluate the hydrodynamic forces acting on the compartment round shaped doors and on the other hand the numerical results for the round shaped doors strength assessment.

2. ASSUMPTIONS

The lost of watertightness of the waterproof compartment is explained due to the weakness of the round shaped doors hinges of the compartment under violent (pre-existing water) water impacts caused by strong decelerations of the Open 60 (ft) yacht.

2.1. COMPARTMENT DIMENSIONS

The compartment and its round shaped doors dimensions were provided by IMOCA ([1]).

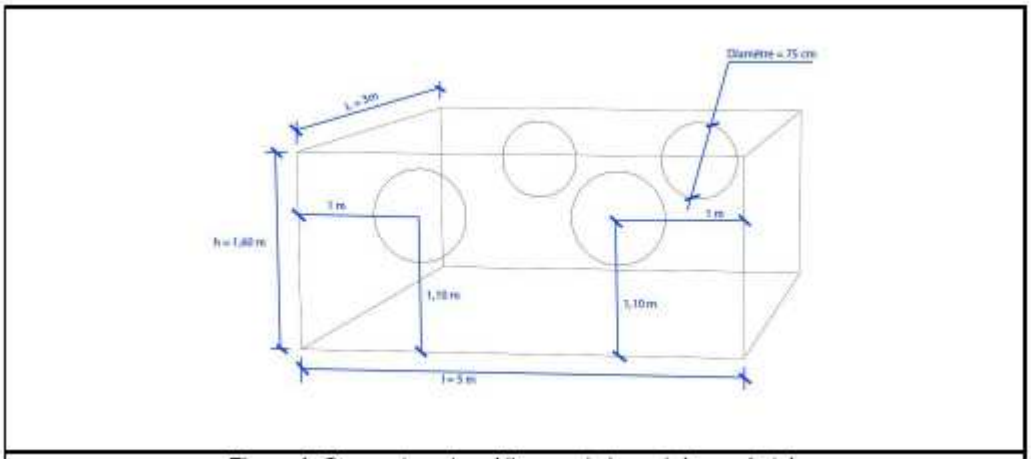


Figure 1: Compartment and its round shaped doors sketch

These dimensions are to be read as follows:
· Length of the compartment = 3.0m
· Breadth of the compartment = 5.0m
· Height of the compartment = 1.6m
· Diameter of the round shaped doors = 0.75m

2.2. FILLING LEVELS TO BE STUDIED

At the request of IMOCA ([1]), 3 fillings levels were studied:
1. h=0.5m
2. h=0.8m
3. h=1.1m

2.3. INPUT MOTIONS

In a first step, at the request of IMOCA ([1]), the input motions to be studied were the very strong longitudinal decelerations with 4g as order of magnitude with a duration time of approximately 0.2s ([1]).

In a second step, as the 4g longitudinal deceleration was considered severe with respect to reality, the input motions to be studied were the strong longitudinal decelerations with 1g & 2g as order of magnitude with a duration time of approximately 0.4s & 0.2s respectively ([2]).

3. LIQUID MOTION ANALYSIS

A liquid motion analysis is performed in order to evaluate the maximum hydrodynamic forces exerted by pre-existing water inside the above described compartment on its round shaped doors. All the assumptions necessary to perform this liquid motion analysis are given in the previous section 2.

3.1. CFD SOFTWARE USED FOR THE LIQUID MOTION ANALYSIS

The Liquid Motion Analysis has been performed using FLOW3D® ([3]) (Flow Science), CFD software presently used in BV for its large world engineering and scientific applications and tailor-made dedicated procedures. FLOW3D® is CFD software based on Navier-Stokes equations (mass and momentum conservation), Volume of Fluid (VOF) modelling technique and Finite Volume discretization. Each cell of VOF mesh is filled with either liquid or gas and a free surface presence is defined by the corresponding fraction of fluid as the filling rate of cell by the liquid phase.

3.2. MESH OF THE COMPARTMENT

Numerical VOF mesh used for the compartment is uniform. Total number of cells of this optimized mesh is 192,000 cells (respectively 60, 100 & 32 cells for the x, y & z directions) in order to respect both size ratio criteria and accuracy of the numerical solution.
Here below is figured the compartment and its round shaped doors mesh used for the liquid motion analysis.

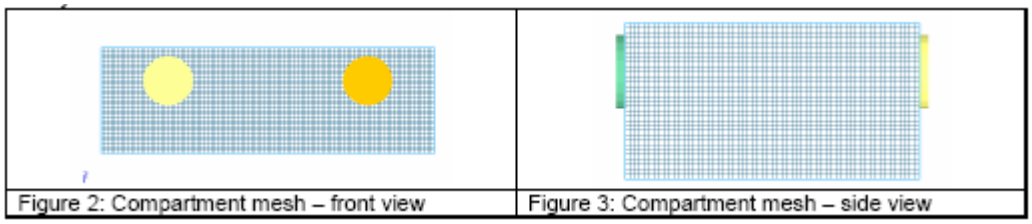


Figure 2: Compartment mesh – front view

Figure 3: Compartment mesh – side view

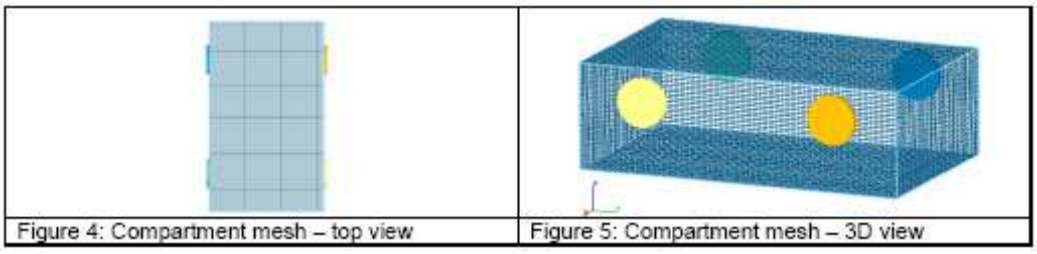


Figure 4: Compartment mesh – top view

Figure 5: Compartment mesh – 3D view

3.3. INPUT MOTIONS

In a first step, even if longitudinal deceleration with 4g as order of magnitude with only the duration time of approximately 0.2s ([1]) was requested by IMOCA, BV decided to run more cases in order to perform a sensitivity analysis on the time duration of this deceleration. Thus for the 3 filling levels h=0.5m, h=0.8m & h=1.1m (requested by IMOCA) BV performed 5 calculations corresponding to the following deceleration duration:

· Dt=0.1s, deceleration with 4g as order of magnitude
· Dt=0.2s, deceleration with 4g as order of magnitude (requested by IMOCA)
· Dt=0.3s, deceleration with 4g as order of magnitude
· Dt=0.4s, deceleration with 4g as order of magnitude
· Dt=9.9s, deceleration with 4g as order of magnitude (asymptotic case → unrealistic case)

In a second step, as the 4g longitudinal deceleration was considered severe with respect to reality, the input motions to be studied were the strong longitudinal decelerations with 1g & 2g as order of magnitude with a duration time of approximately 0.4s & 0.2s respectively ([2]).

The fluid is at rest at t=0, then at t=0.1s is applied a deceleration with 1g, 2g & 4g as order of magnitude (depending on the case) with the above time durations as figured hereafter.

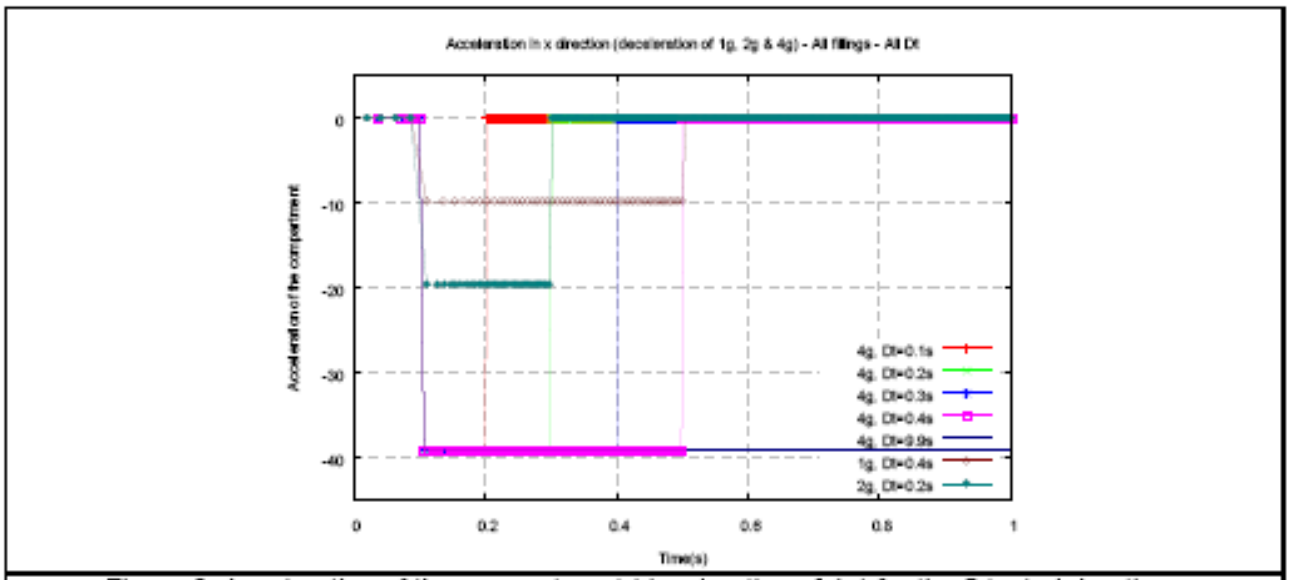


Figure 6: Acceleration of the compartment (deceleration of 4g) for the 5 tested durations

3.4. FILLING HEIGHT H=0.5M

In this section, the filling level h=0.5m is considered.

3.4.1. 4G DECELERATION

As already mentioned (see section 2.3) BV decided to perform a sensitivity analysis on the time duration of the deceleration. Thus for the filling level h=0.5m, BV performed 5 calculations corresponding to the following deceleration duration:

· Dt=0.1s, deceleration with 4g as order of magnitude
· Dt=0.2s, deceleration with 4g as order of magnitude (requested by IMOCA)
· Dt=0.3s, deceleration with 4g as order of magnitude
· Dt=0.4s, deceleration with 4g as order of magnitude
· Dt=9.9s, deceleration with 4g as order of magnitude (asymptotic case → unrealistic case)

Hereafter are presented some snapshots of the liquid for the deceleration duration 0.2s (as requested by IMOCA) for the first 0.55s of simulation.

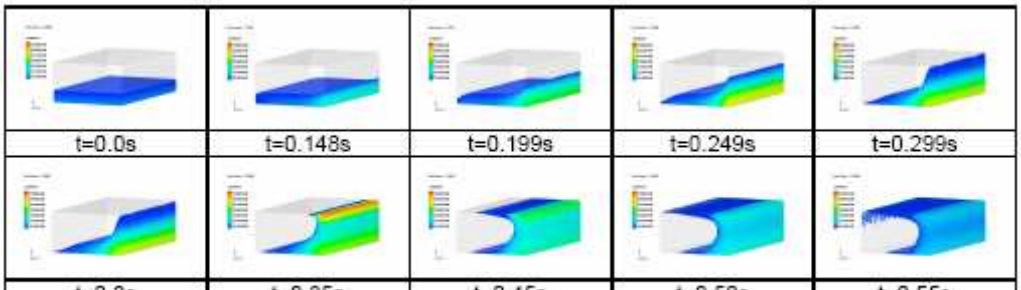


Figure 7: Snapshot of the flow for h=0.5m, Dt=0.2s for t in [0.0s:0.55s]

As we can observe on the snapshots, the flow is quasi 2D. Hence, the forces exerted by the water on the round shaped doors located on the same wall are identical.

The force (as function of the time, see section 2.3) exerted by the water inside the compartment on the most exposed round shaped door during the deceleration is figured below for the 5 different duration times:

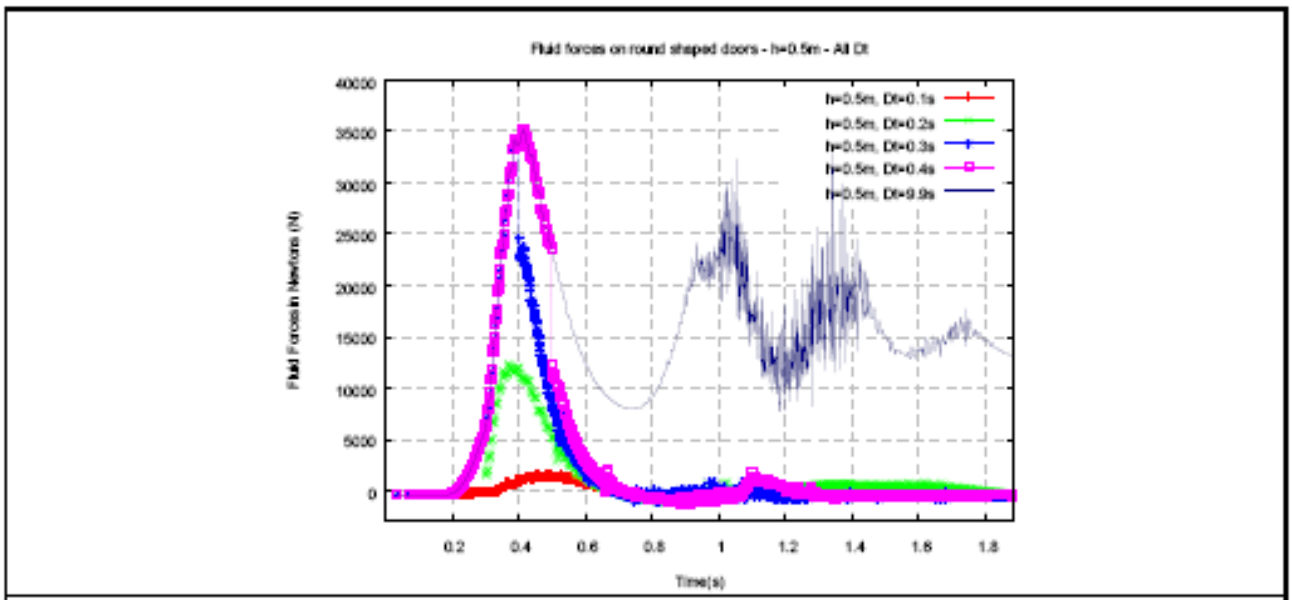


Figure 8: Zoom of the fluid forces exerted on the most exposed round shaped door for h=0.5m

As already mentioned, the fluid force exerted by the water on the round shaped door located on the same wall is identical as this one depicted above (Figure 8).

As we can see, the fluid force increases with the duration of the deceleration till Dt ≈ 0.3s. For deceleration duration times greater than 0.3s (see Dt=0.4s and Dt=9.9s referred here as asymptotic case), **the maximum fluid force exerted by the fluid on the most exposed round shaped door remains identical and equals to 35160 Newtons for h=0.5m.**

For the asymptotic case (long duration for deceleration, Dt=9.9s), the fluid force converges towards a limit which corresponds to the hydrostatic pressure which can be easily calculated by taking into account a modified gravity as follows: $\vec{g}_{eq} = -g\vec{k} + 4g\vec{i}$ where $(\vec{i}, \vec{j}, \vec{k})$ are the unit vectors of the Galilean reference frame.

As the round shaped door surface is equal to 0.442 m² ($=\pi.R^2$), the maximum equivalent pressure acting on the door is equal to:

$$P_{eq} = \frac{F}{S} = \frac{35160}{0.442} \approx 80000\ Pa = 0.8\ bar$$

3.4.2. 1G & 2G DECELERATION

In a second step, as the 4g longitudinal deceleration was considered severe with respect to reality, the input motions to be studied were the strong longitudinal decelerations with 1g & 2g as order of magnitude with a duration time of approximately 0.4s & 0.2s respectively ([2]) as follows:

· Dt=0.4s, deceleration with 1g as order of magnitude (requested by IMOCA)
· Dt=0.2s, deceleration with 2g as order of magnitude (requested by IMOCA)

Hereafter are presented some snapshots of the liquid for the deceleration duration 0.2s for the first 0.55s of simulation.

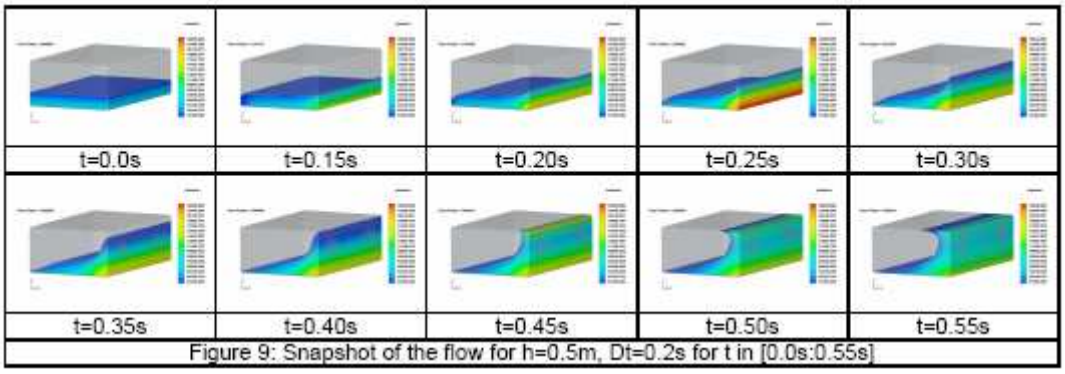


Figure 9: Snapshot of the flow for h=0.5m, Dt=0.2s for t in [0.0s:0.55s]

As we can observe on the snapshots, the flow is quasi 2D. Hence, the forces exerted by the water on the round shaped doors located on the same wall are identical.

The force (as function of the time, see section 2.3) exerted by the water inside the compartment on the most exposed round shaped door during the deceleration is figured below for the 2 cases:

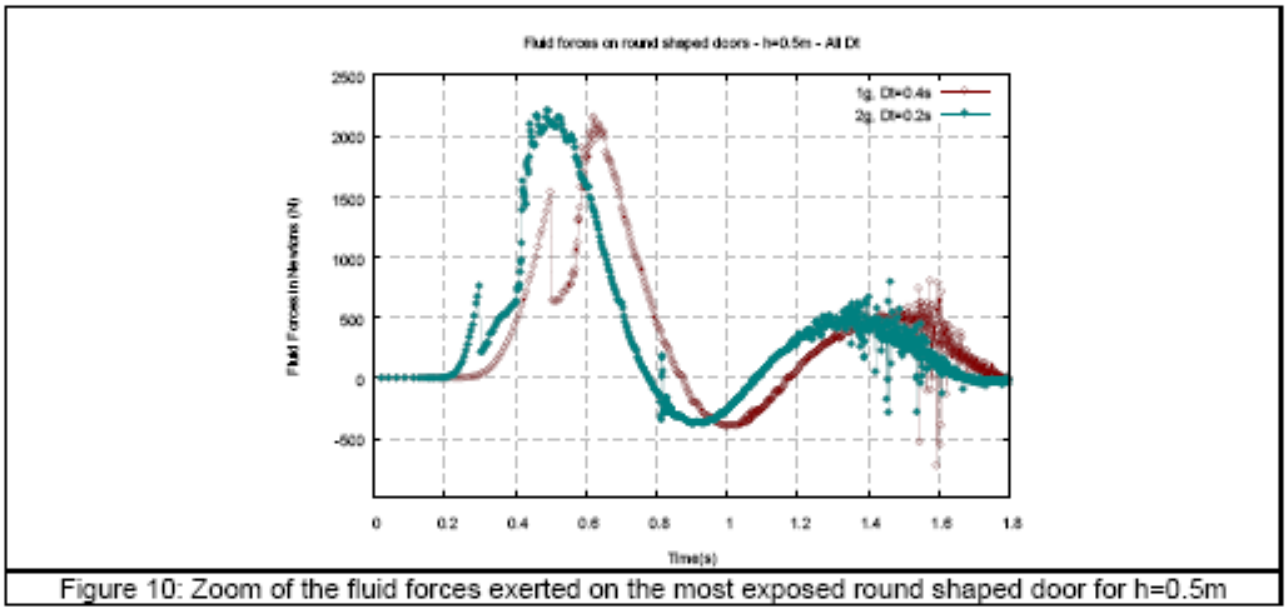


Figure 10: Zoom of the fluid forces exerted on the most exposed round shaped door for h=0.5m

As already mentioned, the fluid force exerted by the water on the round shaped door located on the same wall is identical as this one depicted above (Figure 10).

The maximum fluid force exerted by the fluid on the most exposed round shaped door equals to 2210 Newtons for h=0.5m.

As the round shaped door surface is equal to 0.442 m² (= $\pi.R^2$), the maximum equivalent pressure acting on the door is equal to:

$$P_{eq} = \frac{F}{S} = \frac{2210}{0.442} \approx 5000\ Pa = 0.05\ bar$$

3.5. FILLING HEIGHT H=0.8M

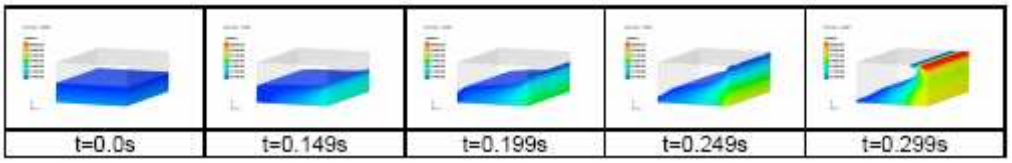
In this section, the filling level h=0.8m is considered.

3.5.1. 4G DECELERATION

In this section, the filling level h=0.8m is considered. As already mentioned (see section 2.3) BV decided to perform a sensitivity analysis on the time duration of the deceleration. Thus for the filling level h=0.8m, BV performed 5 calculations corresponding to the following deceleration duration:

· Dt=0.1s, deceleration with 4g as order of magnitude
· Dt=0.2s, deceleration with 4g as order of magnitude (requested by IMOCA)
· Dt=0.3s, deceleration with 4g as order of magnitude
· Dt=0.4s, deceleration with 4g as order of magnitude
· Dt=9.9s, deceleration with 4g as order of magnitude (asymptotic case → unrealistic case)

Hereafter are presented some snapshots of the liquid for the deceleration duration 0.2s (as requested by IMOCA) for the first 0.55s of simulation.



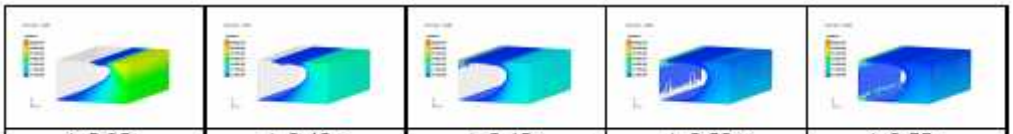


Figure 11: Snapshot of the flow for h=0.8m, Dt=0.2s for t in [0.0s:0.55s]

As we can observe on the snapshots, the flow is quasi 2D. Hence, the forces exerted by the water on the round shaped doors located on the same wall are identical.

The force (as function of the time, see section 2.3) exerted by the water inside the compartment on the most exposed round shaped door during the deceleration is figured below for the 5 different duration times:

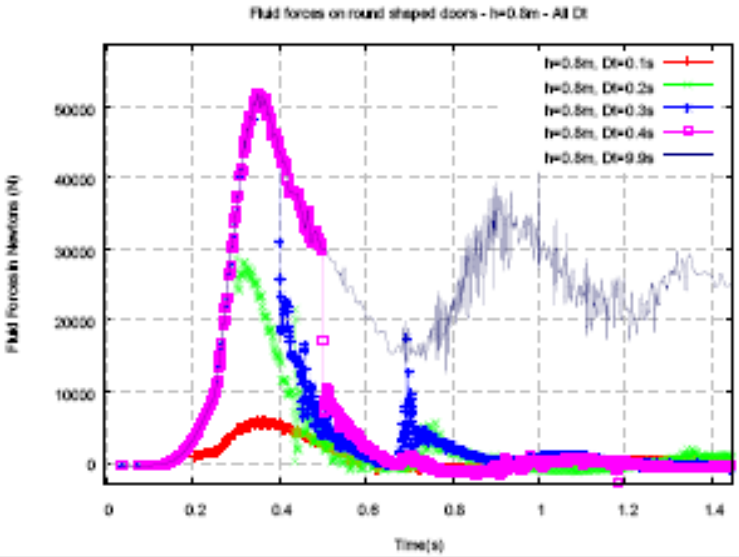


Figure 12: Zoom of the fluid forces exerted on the most exposed round shaped door for h=0.8m

As already mentioned, the fluid force exerted by the water on the round shaped door located on the same wall is identical as this one depicted above (Figure 12).

As we can see, the fluid force increases with the duration of the deceleration till Dt between 0.2s and 0.3s. For deceleration duration times greater than 0.3s (see Dt=0.4s and Dt=9.9s referred here as asymptotic case), **the**

maximum fluid force exerted by the fluid on the most exposed round shaped door remains identical and equals to 51800 Newtons for h=0.8m.

As already mentioned, for the asymptotic case (long duration for deceleration, Dt=9.9s), the fluid force converges towards a limit which corresponds to the hydrostatic pressure which can be easily calculated by taking into account a modified gravity as follows $\vec{g}_{eq} = -g\vec{k} + 4g\vec{i}$ where $(\vec{i}, \vec{j}, \vec{k})$ are the unit vectors of the Galilean reference frame.

As the round shaped door surface is equal to 0.442 m² ($=\pi.R^2$), the maximum equivalent pressure acting on the door is equal to:

$$P_{eq} = \frac{F}{S} = \frac{51800}{0.442} \approx 118000\ Pa = 1.18\ bar$$

3.5.2. 1G & 2G DECELERATION

In a second step, as the 4g longitudinal deceleration was considered severe with respect to reality, the input motions to be studied were the strong longitudinal decelerations with 1g & 2g as order of magnitude with a duration time of approximately 0.4s & 0.2s respectively ([2]) as follows:

· Dt=0.4s, deceleration with 1g as order of magnitude (requested by IMOCA)
· Dt=0.2s, deceleration with 2g as order of magnitude (requested by IMOCA)

Hereafter are presented some snapshots of the liquid for the deceleration duration 0.4s for the first 0.55s of simulation.

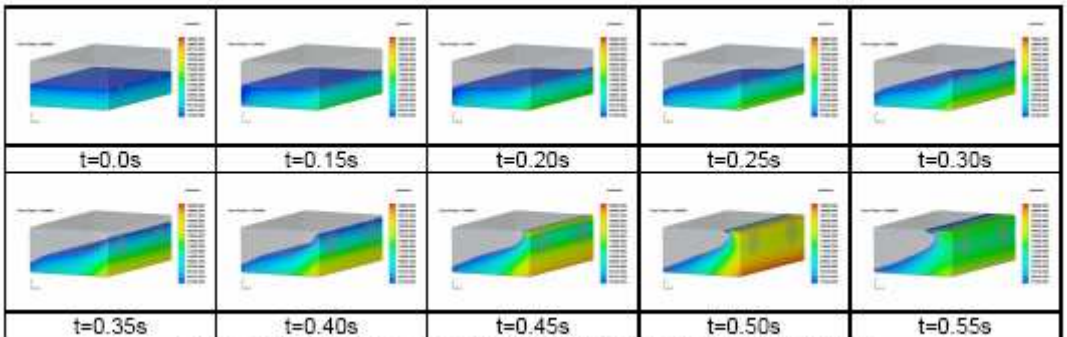


Figure 13: Snapshot of the flow for h=0.8m, Dt=0.1s for t in [0.0s:0.55s]

As we can observe on the snapshots, the flow is quasi 2D. Hence, the forces exerted by the water on the round shaped doors located on the same wall are identical.

The force (as function of the time, see section 2.3) exerted by the water inside the compartment on the most exposed round shaped door during the deceleration is figured below for the 2 cases:

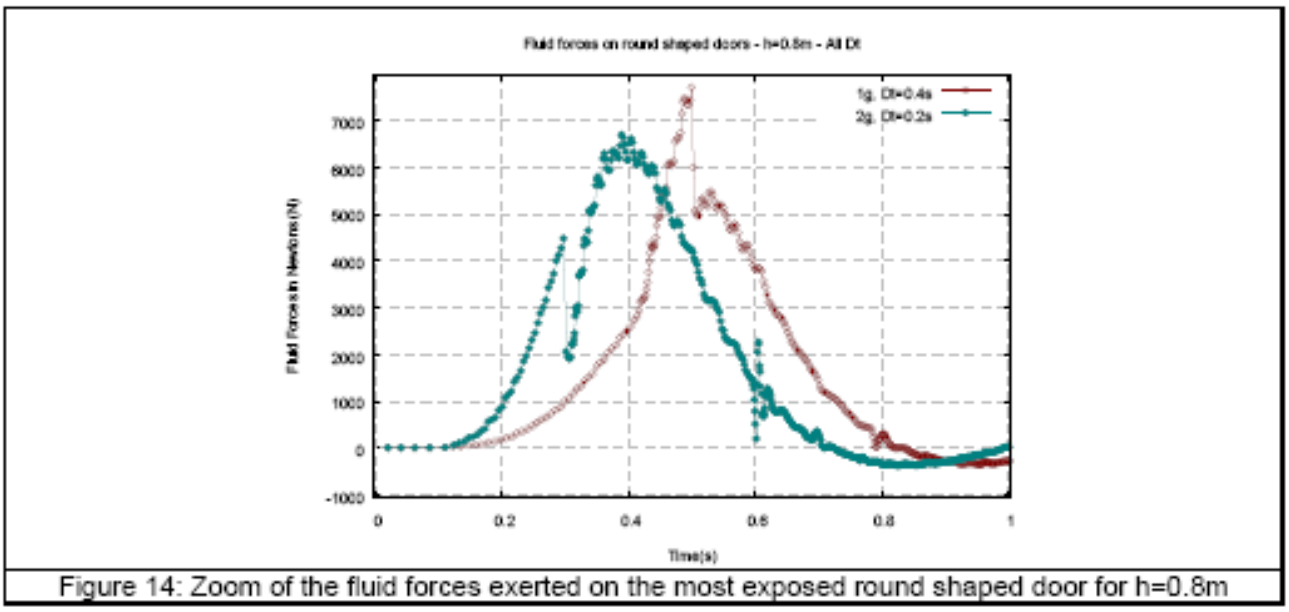


Figure 14: Zoom of the fluid forces exerted on the most exposed round shaped door for h=0.8m

The maximum fluid force exerted by the fluid on the most exposed round shaped door equals to 7700Newtons for h=0.8m.

As the round shaped door surface is equal to 0.442 m² ($=\pi.R^2$), the maximum equivalent pressure acting on the door is equal to:

$$P_{eq} = \frac{F}{S} = \frac{7700}{0.442} \approx 17420\ Pa = 0.17\ bar$$

3.6. FILLING HEIGHT H=1.1M

In this section, the filling level h=1.1m is considered.

3.6.1. 4G DECELERATION

In this section, the filling level h=1.1m is considered. As already mentioned (see section 2.3) BV decided to perform a sensitivity analysis on the time duration of the deceleration. Thus for the filling level h=1.1m, BV performed 5 calculations corresponding to the following deceleration duration:

· Dt=0.1s, deceleration with 4g as order of magnitude
· Dt=0.2s, deceleration with 4g as order of magnitude (requested by IMOCA)
· Dt=0.3s, deceleration with 4g as order of magnitude
· Dt=0.4s, deceleration with 4g as order of magnitude
· Dt=9.9s, deceleration with 4g as order of magnitude (asymptotic case → unrealistic case)

Hereafter are presented some snapshots of the liquid for the deceleration duration 0.2s (as requested by IMOCA) for the first 0.55s of simulation.

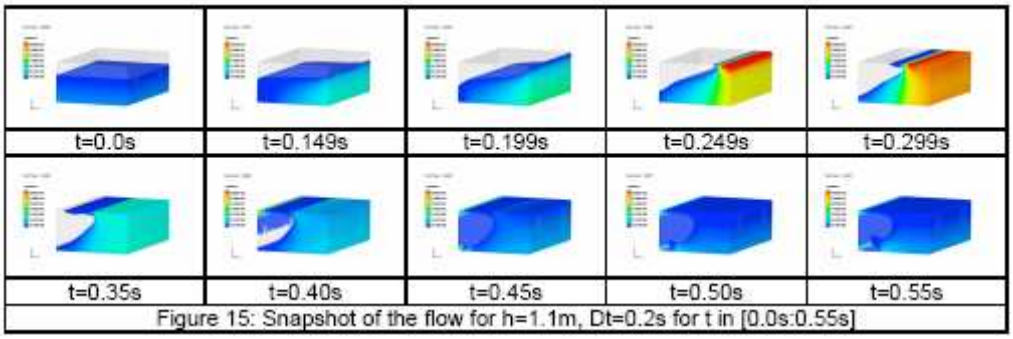


Figure 15: Snapshot of the flow for h=1.1m, Dt=0.2s for t in [0.0s:0.55s]

As we can observe on the snapshots, the flow is quasi 2D. Hence, the forces exerted by the water on the round shaped doors located on the same wall are identical.

The force (as function of the time, see section 2.3) exerted by the water inside the compartment on the most exposed round shaped door during the deceleration is figured below for the 5 different duration times:

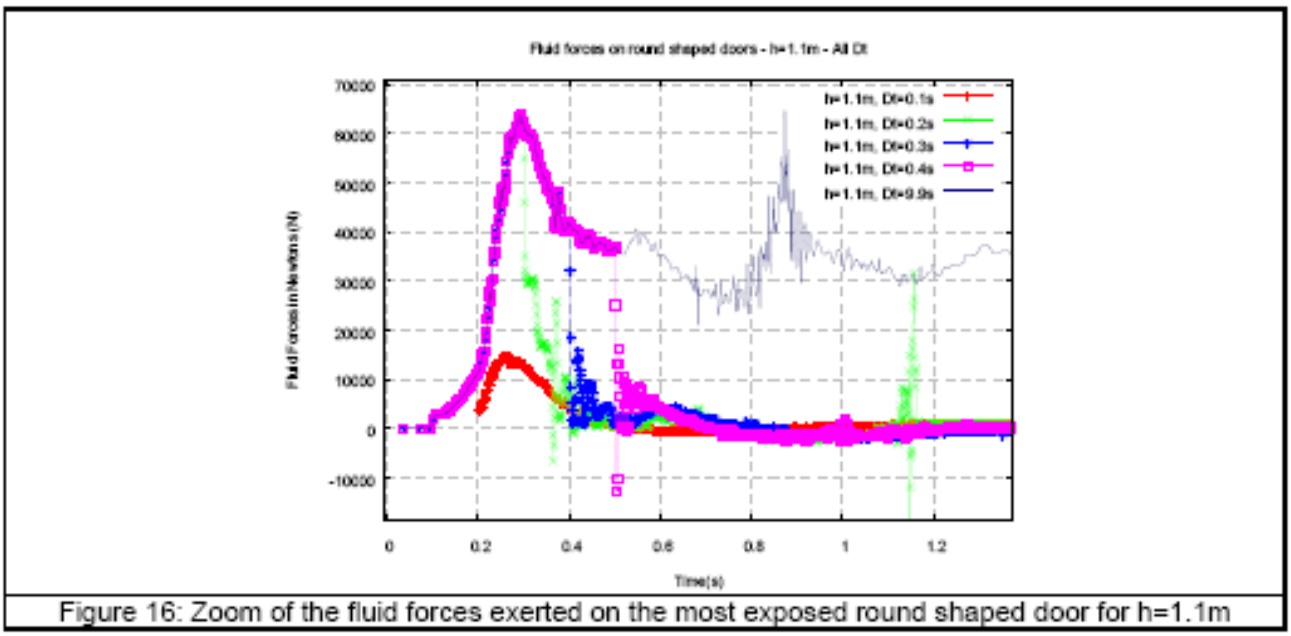


Figure 16: Zoom of the fluid forces exerted on the most exposed round shaped door for h=1.1m

As already mentioned, the fluid force exerted by the water on the round shaped door located on the same wall is identical as this one depicted above (Figure 12).

As we can see, the fluid force increases with the duration of the deceleration till Dt $\approx$0.2s. For deceleration duration times greater than 0.2s (see Dt=0.3s, 0.4s and Dt=9.9s referred here as asymptotic case), **the maximum fluid force exerted by the fluid on the most exposed round shaped door remains identical and equals to 63680 Newtons for h=1.1m.**

As already mentioned, for the asymptotic case (long duration for deceleration, Dt=9.9s), the fluid force converges towards a limit which corresponds to the hydrostatic pressure which can be easily calculated by taking into account a modified gravity as follows $\vec{g}_{eq} = -g\vec{k} + 4g\vec{i}$ where $(\vec{i}, \vec{j}, \vec{k})$ are the unit vectors of the Galilean reference frame.

As the round shaped door surface is equal to 0.442 m² ($=\pi.R^2$), the maximum equivalent pressure acting on the door is equal to:

$$P_{eq} = \frac{F}{S} = \frac{63680}{0.442} \approx 144100\ Pa = 1.44\ bar$$

3.6.2. 1G & 2G DECELERATION

In a second step, as the 4g longitudinal deceleration was considered severe with respect to reality, the input motions to be studied were the strong longitudinal decelerations with 1g & 2g as order of magnitude with a duration time of approximately 0.4s & 0.2s respectively ([2]) as follows:

· Dt=0.4s, deceleration with 1g as order of magnitude (requested by IMOCA)
· Dt=0.2s, deceleration with 2g as order of magnitude (requested by IMOCA)

Hereafter are presented some snapshots of the liquid for the deceleration duration 0.2s for the first 0.55s of simulation.

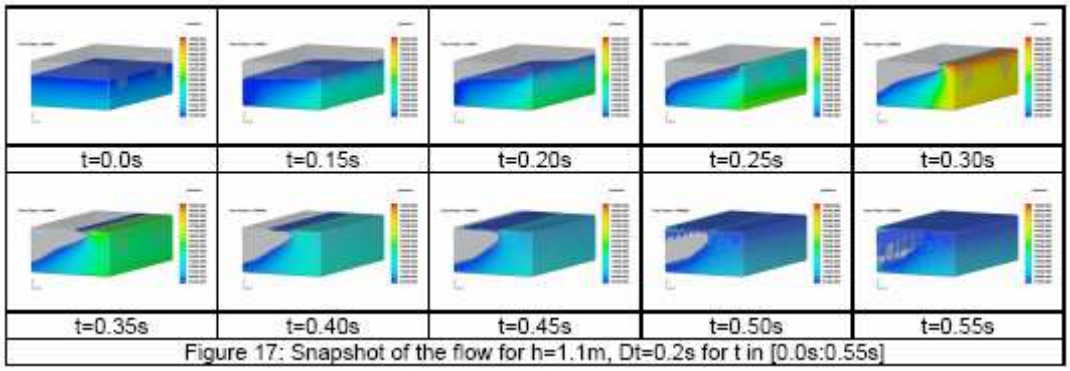


Figure 17: Snapshot of the flow for h=1.1m, Dt=0.2s for t in [0.0s:0.55s]

As we can observe on the snapshots, the flow is quasi 2D. Hence, the forces exerted by the water on the round shaped doors located on the same wall are identical.

The force (as function of the time, see section 2.3) exerted by the water inside the compartment on the most exposed round shaped door during the deceleration is figured below for the 2 cases:

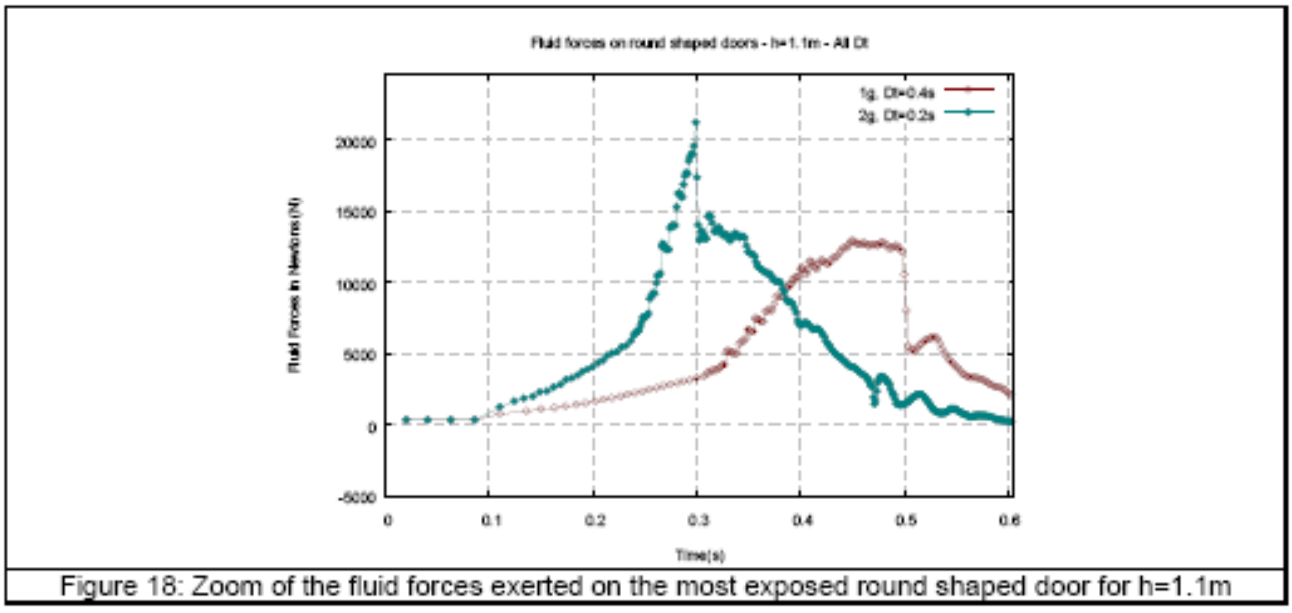


Figure 18: Zoom of the fluid forces exerted on the most exposed round shaped door for h=1.1m

The maximum fluid force exerted by the fluid on the most exposed round shaped door remains identical and equals to 21200 Newtons for h=1.1m.

As the round shaped door surface is equal to 0.442 m2 ($=\pi.R^2$), the maximum equivalent pressure acting on the door is equal to:

$$P_{eq} = \frac{F}{S} = \frac{21200}{0.442} \approx 50000\ Pa = 0.5\ bar$$

3.7. MAXIMUM FORCE ON THE TRANSVERSE WALL

As shown on the figure 15, the maximum force exerted by the fluid on the compartment's transverse wall is equal to:

$F_{max} = p_{eq} * S = 1.3 * 101300 * 5 * 1.6 = 1053520\ (Newtons)$

This maximum fluid force (exerted by the fluid on the compartment's transverse wall) is obtained for the fluid height h=1.1m, a 4g longitudinal deceleration and for Dt=0.2s. It corresponds to a uniform pressure acting on the compartment's transverse wall equal to 1.3 bars.

3.8. RESULTS SYNTHESIS

Putting together all the results obtained for h=0.5m, 0.8m and 1.1m (see sections 3.4, 3.5 & 3.6), the maximum fluid forces obtained on the most exposed round shaped door are summed up in the following table:

Force in Newtons (N)	h=0.5m	h=0.8m	h=1.1m
4g, Dt=0.1s	1 515	5862	14 800
4g, Dt=0.2s	12 346	34 654	63 680
4g, Dt=0.3s	34 270	51 800	63 680
4g, Dt=0.4s	35159	51 800	63 680
4g, Dt=9.9s	35159	51 800	63 680
1g, Dt=0.4s	2 155	7 696	12 906
2g, Dt=0.2s	2 211	6 686	21 200

So the maximum force fluid force obtained on the most exposed round shaped door is equal to 63800 Newtons obtained for h=1.1m, a 4g longitudinal deceleration and for a deceleration time Dt=0.2s.

For 1g & 2g longitudinal decelerations, the maximum force fluid force obtained on the most exposed round shaped door is equal to 21200 Newtons obtained for h=1.1m and for a deceleration time Dt=0.2s.

4. CONCLUSION

The maximum force fluid force obtained on the most exposed round shaped door is equal to 63800 Newtons obtained for h=1.1m, a 4g longitudinal deceleration and for a deceleration time Dt=0.2s. It corresponds to a uniform pressure acting on this round shaped door equal to 1.44 bars.

For 1g & 2g longitudinal decelerations, the maximum force fluid force obtained on the most exposed round shaped door is equal to 21200 Newtons obtained for h=1.1m, a 2g longitudinal deceleration and for a deceleration time Dt=0.2s.

The maximum force exerted by the fluid on the compartment's transverse wall is equal to 1050000 Newtons for a fluid height equal to h=1.1m and for Dt=0.2s. It corresponds to a uniform pressure acting on the compartment's transverse wall equal to 1.3 bars.

REFERENCES

DOCUMENTS:

[1] "Cahier des charges de calculs de pression d'eau dans un compartiment de bateau IMOCA ", IMOCA email sent to BV on the 22 February 2010.

[2] "IMOCA Sloshing", IMOCA e-mail sent to BV on the 18 March 2010.

SOFTWARE:

[3] FLOW3D®, v.9.4 (Flow Science)

IMOCA
OCEAN RACING
WORLD CHAMPIONSHIP

INTERNATIONAL MONOHULL OPEN CLASS ASSOCIATION
I.M.O.C.A.

OPEN 60’ ISAF INTERNATIONAL CLASS

Measurement Protocol 2011

ISAF
WORLD SAILING

PREAMBLE:

This measurement protocol defines the various procedures and methodology for measurement and calculations used for measurement of IMOCA Class boats.

Each measurement – except where modified by this protocol – shall be done in compliance with ISAF ERS prescriptions and/or the ISO norms in force. Where there is a conflict between these, the Chief Measurer shall decide which ones apply.

INDEX

GENERAL PRINCIPLES

A.1 PROCEDURE

Skippers wishing to have their boat measured must contact the Technical Secretariat of the Class (chief.measurer@imoca.org) which will ensure the exchange of information between the Chief Measurer, the measurers, the designers and the calculation office assigned to do the measurement calculations.
The official Class measurers are listed in the appendix of the Internal Regulations. They shall respect the prescriptions of chapter H-1 of the Equipment Rules of Sailing (ISAF).
The data, measurements and information collated for the issue of a measurement certificate are confidential.
The Chief Measurer shall provide a detailed report of all tests carried out for issuing measurement certificates. A copy of this document must be given to the skipper of the boat concerned, as well as the Technical Secretariat of the Class.

A.2 MEASUREMENT AND CALCULATION EQUIPMENT

A.2.1 Official calculation software

The software used for stability calculations is MAAT Hydro +.

A.2.2 Measurement equipment

The following equipment is permitted:
1. Spirit level, lead line, tape measures and ruler
2. Laser telemeter
3. Electronic level (0.1° and 0.01°)
4. Optical level with automatic setting
5. Dynamometer
6. Photogrammetry system – recording and image processing
7. Laser tracker and laser-type measurement system
8. Ultrasound scanner (0.6% accuracy) or equivalent

The Chief Measurer will request certification of each piece of equipment used. Dynamometers must have an accuracy of 0.1% (maximum value) of their capacity. They shall be adapted to the weight to be lifted (Scales 10T-12T5).
For CG measurements, the use of a dynamometer optimised for the values to be measured, and having an accuracy of +/- 0.1% (maximum value) of their capacity (1000 and 5000 or 10000 daN), is recommended.

A.3 UNITS OF MEASURE

Results of measurements taken during a measurement session:

Linear measurements:	Metres with 3 decimal points.
Measurements of weight:	Kilogrammes.
Measurements of force:	daN.
Measurements of angle:	Degrees with one decimal place

A.4 PRINCIPLES OF MEASUREMENTS ASHORE

Preamble: Measurement markers

- Two measurement markers shall be marked by the Measurer, which could be screws. These markers must be on the hull at all times.
- **Forward measurement mark (point RPF):** It shall be on the centreline of the hull, at the bow approximately 250 mm above the estimated waterline.
- **Aft measurement marker AR (point RPA):** It shall be on the centreline at the back of the hull.

The aim of these measurements of IMOCA boats is:

1. To measure the Length Overall of the hull[1]

2. To fix in place **the forward measurement marker**, and in relation to this point, identify:
a. The bow of the hull (forward extremity of hull on the centreline)
b. The aft extremity of the hull on the centreline
c. The forwardmost point of the bowsprit or spinnaker pole when it is on the centreline.

3. To establish the draft and CG of the keel

- **Configuration 1: boat having a fixed keel:**

Record the profile of the underside of the bulb on the centreline

- **Configuration 2: boat having a canting keel, in place:**

Same as for a fixed keel.
The keel must be at its maximum draft position (perpendicular to the flotation plane of the hull).

- **Configuration 3: boat having a canting keel lying flat on the ground (in the case of a new keel, or measurement of a new boat) :**

3.1- Record the forward and aft positions of the axis of rotation on the centreline of the canting keel
3.2- Record the profile of the underside of the bulb, on the centreline of the canting keel, compared to the axis of rotation of the bulb. These operations are done with the keel laid flat on the ground.
3.3- measurements for the keel/ bulb combined:

- The shape of the bulb in order to calculate its volume and check its density.
- Measure and weigh, with the keel suspended horizontally (trailing edge and axis), using two load cells at the axis of rotation or keel head, and at the bulb. The horizontal distance between the two load cells shall be noted. From these measurements, the weight of the combined keel and bulb can be calculated, as well as the centre of gravity (value required for calculating Avs wc).

4. Establish the position of the axis of rotation of the keel on the hull

Using an optical level or laser system, note the height and longitudinal positions of the axes of rotation of the canting keel in relation to point RPF, namely points RPKA and RPKF (find the intersection of the axis of rotation of the keel and the bearings). These measurements can also be taken using the technique described below in § 5/B, instead of using the optical level or other permitted system.

5. Check the 3D image of the hull. One of the following 2 methods must be employed.

Preamble: The aim of the measurements taken below is to verify the theoretical model provided by the designer. This model will then be used to calculate the position of the centre of gravity, AVS and AVS wc, and draft. If necessary, where there are differences between the theoretical model and the measurements, the designer's theoretical model will be corrected under the authority of the Chief Measurer.

[1] NB: Where there is a new configuration on a boat, the bow (intersection of the extension of the stem and the deck on the centreline of the hull) must be defined by drawing on design software.

A – Control by points of the sections of the hull, deck and coachroof and intersections

- Define at least 4 sections perpendicular to the centreline of the hull: FFS, MPS, AFS, TFS (see below)

- Measure or solve by calculation from the measurements taken ashore, the position of each of the following :
    a. Sheerline (1)
    b. Width of the section (2)
    c. Depth from mid-freeboard (3)
    d. Theoretical waterline (4)
    e. Depth of hull on centreline (5)
    f. Depth at approximately 50% between point d and e (6)
    g. Deck on the centreline (7)

These points shall be identified by the initials of the section followed by numbers 1 to 7. Example FFS1, FFS2, FFS3 …FFS7.

- Record the shape of the coachroof – watertight volume – (not including any cuddies) and its longitudinal position, namely :
    a. At least 4 points of intersection of the coachroof and deck
    b. The curve of the coachroof on the centreline of the boat (minimum 4 points)
    c. Two sections of the coachroof perpendicular to the centreline of the hull

- Measure the shape of the cockpit in order to establish its geometry, openings and volume.

B – Overall control (hull, deck, coachroof, and cockpit) with numerous points

Using a system which can produce a 3D numeric file (photogrammetry, laser, etc …)
This numeric file will be compared with the numeric file produced by the designer

6. Measure the air draft
The air draft is the distance deducted from the value at the highest point (mast or sail) (excluding equipment and supports for electronic equipment, wands/ navigation lights etc…), from the mast base, freeboards, compared to the waterline. Measurements and calculations shall be done in measurement trim (Article A.9).

A.5 PRINCIPLE OF MEASUREMENTS AND TESTS AFLOAT

These measurements shall be done in accordance with the measurement protocol.
There are 7 types of on-the-water measurements and tests:

1. Weighing of the boat using a load cell. The Measurer shall ensure that the boat is in measurement trim.
It is the skipper's responsibility to ensure that all compartments, ballast tanks etc… are empty.

2. Measurement of the freeboard at points RPF and RPA, boat at 0° of heel.

3. Measurement of the density of sea water (SG).

4. Measurement of the freeboard at point RPF, the load at FDYNA, the angle and the moment at LDYNA when heeled at "90°".

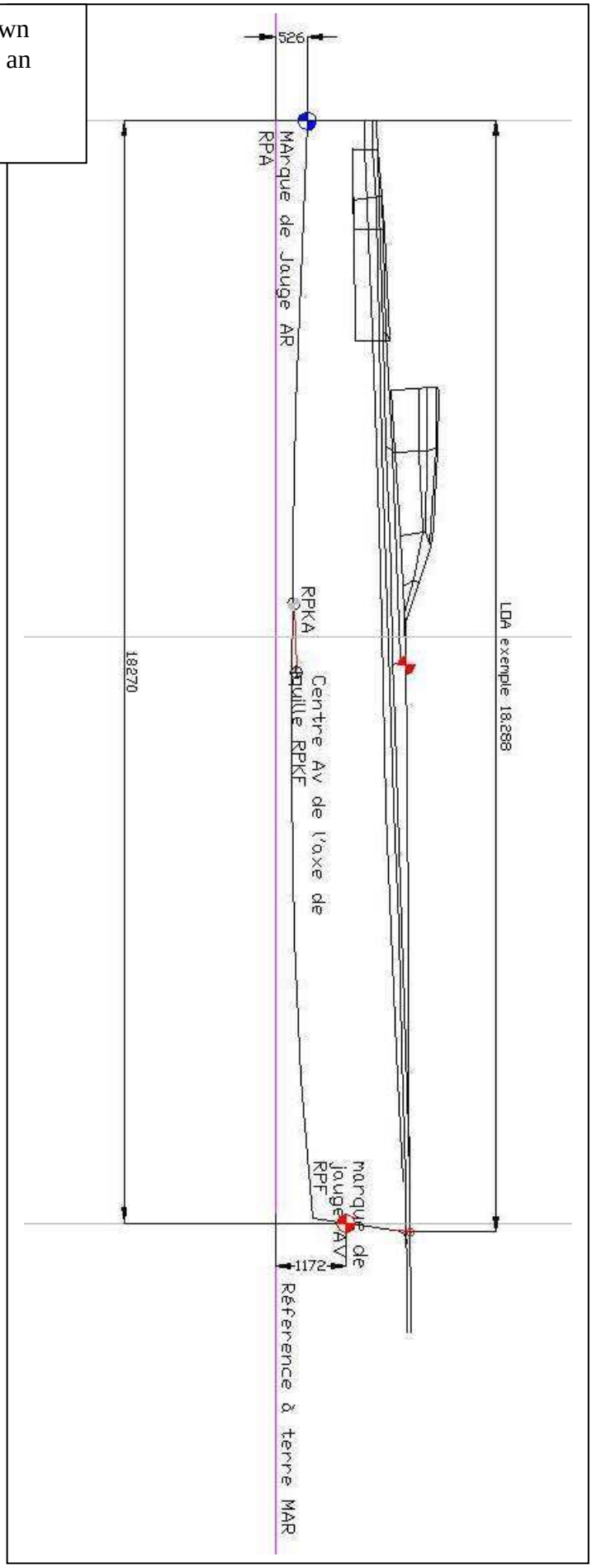
5. Measurement of the heel of the boat by canting the keel (10°) and/or ballast tanks on each side and the corresponding keel angle in the 10° test trim.

6. Measurement of the engine traction using the dynamometer and the speed of the boat under engine.

7. 180° self-righting test

Further measurements may be taken at the request of the Chief Measurer (depending on the case, these measurements could be done on land or on the water).

The dimensions shown here are provided as an example



A.6 LIST OF MEASUREMENTS AND SPECIFIC POINTS

ABREVIATION	DEFINITION
RPF	Forward measurement marker
RPA	End of the hull aft on the centreline
RPKF	Forward point of the axis of rotation of the keel OR forward intersection of the keel and hull
RPKA	Aft point of the axis of rotation of the keel OR aft intersection of the keel and hull
HULLAV	Bow: end of hull forward on the centreline
BSPRIT	Forwardmost point of the bowsprit
	Sections in relation to MAR (Measurement trim, see §B.3.1)
FFS	Forward section between the mast and bow
MPS	Section at mast
AFS	Section between mast and transom
TFS	Section at the end of LOA
	Points recorded in each section above (x,y)
XXX 1	Sheerline (1)
XXX 2	Width of section (2)
XXX 3	Depth measured from approximately mid theoretical freeboard (3)
XXX 4	Depth at theoretical flotation (4)
XXX 5	Depth on the centreline (5)
XXX 6	Depth at approximately 50% between points b and c. (6)
XXX 7	Deck on the centreline (7)
	Longitudinal positions in MAR (z)
LBSPRIT	Longitudinal position of forwardmost point of bowsprit
LHULLAV	Longitudinal position of the bow
LRPF	longitudinal ZERO reference
LFFS	Longitudinal position of section FFS
LMPS	Longitudinal position of section MPS
LRPKF	Longitudinal position of point RPKF
LRPKA	Longitudinal position of point RPKA
LAFS	Longitudinal position of section AFS
LTFS = LRPA	Longitudinal position of section TFS and point RPA
	Freeboard on the water
FRPF	Freeboard at the measurement marker
FRPA	Freeboard at the transom (end of LOA)
	Freeboard and measurements at "90°"
FFRPF90	Freeboard at measurement marker RPF
ANGLE	Angle measured when heeled at "90°"
FDYNA	Load measured at the load cell attachment when boat at 90°
LDYNA	Shortest distance between the load cell attachment and the deck
	Various
J	Base of the fore triangle
SFJ	Distance between the bow and front of the mast
SG	Water density
LOA	Length overall
MAR	Measurement trim ashore.

WL	Waterline
QT	Mast rake (angle) afloat
DRAFT	Draft afloat
PDYNA	Measured mass of the boat (in Kg)
	Coachroof
Pont/Roof Line	Points marked PRF1, PRF2… PRF4
Roof Centerline	Points marked RC1, RC2, … RC4
Roof Sections	Sections marked RS1 and RS2
	Cockpit
	The shape of cockpits makes it impossible to generalise this part of the boat. The Measurer will take all the points needed for theoretical reconstruction and calculation of volume.

A.7 RESPONSIBILITY

The skipper or his/her official representative must be present during measurement sessions, and al manoeuvres are his/her responsibility.
During measurement sessions, a checklist (provided by IMOCA and reiterating each paragraph of the Class Rules) must be signed by both the measurer and the skipper or his/ her representative. This checklist must be revalidated for the delivery of a new certificate.

A.8 PROVISION OF DRAWINGS AND DOCUMENTS

The skipper, or his/her representative, must provide the following documents to the technical secretariat (chief.measurer@imoca.org):

All numeric data must use the same reference in XYZ.

- The 3D surface model showing only the watertight shell of the boat (hull excluding appendices, coachroof, cockpit), in IGES format with finished NURBS surfaces (IGES 144).
- The 3D surface model showing only the inside walls of the ballast tanks, in IGES format with finished NURBS surfaces (IGES 144).
- Numeric data of fixed or moveable appendages showing their volume and centre of volume, either as a 2D drawing or 3D model.
- Drawings relating to the flooding of different watertight compartments in accordance with paragraph B.7 of the IMOCA Class Rules at 0° and 180°, showing the location of the escape hatch.
- Drawing showing the volume and location of buoyancy accompanied by a table summarising these as well as the characteristics of the closed-cell foam used in the calculation of buoyancy.
- Drawing showing the location of the ballast system plumbing, with description of each ballast tank (dimension, volume, centre of gravity).
- Technical drawing of the canting keel system, for the boat sitting at theoretical 0° and 10° (2D file).
- Document attesting to the density of the bulb
- For masts built after 1st July 2009, document attesting to the correct materials in the mast (Paragraph C.2.4)
- For keels built after 1st July 2009, the calculations (DJC).
- For keels built after 1st July 2009, report of the control (CND) and frequencies.
- For all keels (including those built before 1st July 2009) each year when the measurement certificate is renewed, the certificate of control of frequencies.
- For all masts (regardless of when built), each year when the measurement certificate is renewed, the certificate of ultrasound check.
- The IMOCA document « HULL CONSTRUCTION DECLARATION » signed by the relevant parties.

- The Chief Measurer, if he deems necessary, can request any additional documents.

A.9 CONDITIONS FOR MEASUREMENT

Measurements on the water must take place on flat water, with less than 15 mm of waves, less than 10 knots of wind and no current. The salinity (SG) of the water shall be measured, and extrapolated to 1,025 for the calculations of draft, air draft and stability.

A.10 CONFIGURATION FOR MEASUREMENT

A.10.1 Light equipment measurement trim

The boat shall be equipped as follows:

Must remain in place:

Mast(s), standing rigging and runners, boom(s), vang, all headsail furlers and all running rigging in the mast (runner in normal position, halyards tied off at the mast base, topping lifts, etc.).
Forestays on locks must be in place.

The measurer will note the list of equipment.

- Hardware and permanently fixed equipment on the deck and mast(s), excluding the Sat B dome antenna or other type of antenna for sending high resolution images and high speed connection, which can be removed. The AVS calculation does not include the dome antenna (Sat B or equivalent), so if it is in place for the test, a correction weight will be subtracted for this calculation.
- Fixtures.
- Batteries, electrical wiring, plumbing.
- Fixed/ permanently installed electronic equipment
- Keel(s) and mast(s) positioned on the centreline.
- Daggerboards and moveable equipment in their highest position or least favorable position relative to the measurements to be taken or calculations to be done.

A detailed list of the above equipment shall be drawn up and added to the check list (failure to respect this list could lead to the certificate being invalidated).

Must be disembarked:

- All sails.
- Any hardware not permanently fixed and running rigging.
- Anchors, warps and chain.
- All safety equipment.
- Foredeck running rigging, spinnaker poles if applicable.
- All moveable equipment.
- All equipment, fresh water containers, fuel jerrycans, navigation equipment, clothing, food, personal belongings, etc.

Must be emptied:

- All fixed fresh water tanks.
- All fixed fuel tanks.
- All ballast tanks as well as all related pipes.

This configuration is the reference for establishing the longitudinal flotation plane of the boat for stability and draft calculations.

A.10.2 Configuration for the 180° self-righting test

Identical to measurement trim, but without:

- Mast(s), rigging, boom(s), vang, headsail furler(s) and halyards, electronic equipment on the deck, such as radome/ radar on mount, antennas, …
- Hardware permanently fixed to the mast(s).
- Vents for diesel and other liquids must be blocked

The Chief Measurer may ask for a modification of this configuration.

A.11 BUOYANCY

The boat must have a total buoyancy volume expressed in m3 equal or greater than 130% of the boat's displacement as measured at weighing.
Are taken into account for the calculation of this volume:

- The combined volumes of fixed parts which are waterproof.
- 50% of the ballast tank volume, excluding central ballast if they exist (ballast tanks whose centre of gravity is aligned on the centreline of the boat).
- The volume of structural compartments when filled with closed-cell foam.
- Additional closed-cell volume, not removable, laminated or glued directly onto the structure of the hull.

MEASUREMENT SESSION

B.1 MEASUREMENT

To facilitate the measurement session, the skipper must contact the Chief Measurer in order to prepare for measurement. The aim of this advance planning is to limit the costs of measurement and obtain the best measurement results.

- The operations described in § A.4 and A.5 must be done in the configuration defined in A.9 and A.10.
- Paragraphs B.2, B.3, B.4, B.5, B.6, B.7, and B.8 define all these measurement operations.

B.2 SELF-RIGHTING TEST (180°)

The hull is prepared for the 180° test and must be in the correct configuration (A.10.2).
The Measurer must check that the equipment complies with the rules.

The hull floating upside down with the deck down, ie inverted 180 must right itself and return to the deck upwards without any assistance outside the boat.
This test must be done with the skipper inside the boat. The skipper may use any system which can start the righting of the boat, while remaining inside the boat. In that case, ie active self-righting due to use of a system inside the boat, the presence of a second person is recommended. This person must not intervene in any way with the righting of the boat. The use of such a system implies that the system can be reset at least three times and within two hours at the most, without outside assistance. This will be left to the judgement of the Measurer.

Deliberate flooding of compartments is forbidden.
An exception to this is that a fixed keel boat may fill the forward ballast tanks for use in this event, when the following two conditions are fulfilled:

- It must be possible to fill these forward ballast tanks with the boat inverted, and empty them with the boat upright.
- Once the boat has been righted with the ballast tanks full, the freeboard at the bow must not be less than 75% of the freeboard at the bow prior to filling the ballast tanks.

During this test, the following operations must be done while the boat is inverted at 180:

- The skipper must exit the boat (in the water) via the aft escape hatch, and get back inside the boat via the same escape hatch.
- Deploy the antennas for communication as per paragraph F.15

B.3 MEASURMENTS ASHORE

Conditions for measurement:

If in configuration 1 or 2 of paragraph A.4.3, the keel must be attached to the boat.
If in configuration 3 of paragraph A.4.3, the canting keel must not be attached to the boat for measurements ashore, but the bearings (or equivalent system enabling geometric reading of the axis of rotation of the canting keel) must be in place on the hull.

B.3.1 Measurement plane (MAR: Measurement ashore reference)

The boat must sit in a measurement plane on land similar to that given by the designer (DWL).
The measurer can ask for a modification of the MAR drawing if he feels it is too far off the supposed floatation plane.

B.3.2 LOA

The relevant ISO norms are to be used for the details relating to this measurement.

LOA = distance between two perpendicular planes on the centreline and floatation plane of the boat, passing through:

- The aftmost point of the hull.
- The point defined ass being the forwardmost point of the hull (HULLAV).

B.3.3 Section
4 sections are defined in perpendicular vertical planes along the centreline.

- FFS: Forward Freeboard Section.
Between the bow and section MFS[2].

- MFS: Mast Freeboard Section.
Passes through the centre of the mast bearing or forward face of the mast.

- AFS: Aft Freeboard Section.
Between MFS and the stern of the boat[3] .

- TFS: Transom Freeboard Section.
Passes through the aft most point of the hull, or forward of this point if it is not possible to form a section via this point.

Each section shall be marked by a longitudinal measurement in relation to measurement marker RPF: LFFS, LMFS, LAFS, LTFS.

B.3.4 Measurements in each section
In each section, the coordinates of the 7 points defined in A4 (5) shall be measured.
Where an accurate measurement cannot be taken, the measurer will select a suitable replacement measurement.

B.3.5 Measurements of the position of the axis of rotation of the keel

Fixed keel boat:
RPKF: Intersection of the centre of the leading edge of the fin and the hull.
RPKA: Intersection of the trailing edge with the hull.

Canting keel boat:
The above points, RPKF and RPKA are respectively the middle of the keel rotation bearings fixed to the hull.
The longitudinal positions/RPF of points RPKF and RPKA shall be recorded as LRPKF and LRPKA.

B.3.6 Profile of the underside of the bulb (on the centreline of the boat)

Boat with fixed keel or canting keel in place:
5 points (BDP1…5) shall be recorded on this plane (height in relation to the horizontal MAR reference plane and position LBDP1…5 longitudinal / RPF).
The Measurer will select the most appropriate points.

Canting keel not attached to boat:
Measurements which enable 3D identification of the 5 points of the profile as required above and the 2 centres of the axis of rotation of the keel.

[2] The measurer will select the most appropriate position of the section.
[3] The measurer will select the most appropriate position of the section.

B.3.7 Draft
The draft is calculated from measurements ashore, and the freeboard at points RPF and RPA measured afloat.

B.3.8 Keel weight and CG of the keel
Canting keel boat: See § A.4.3

B.3.9 Mast weight and CG of the mast (optional)
2 possible methods:
- Find the horizontal equilibrium, weighing and measurement along the mast from the centre of gravity.
- Weigh the mast at each end, mast horizontal. Calculate the position of the CG.

B.3.10 Calculating air draft

See $ A.4.6 and B.8

B.4 MEASURMENTS AFLOAT

Conditions for measurement:
The boat must be complete, as per the conditions laid out in articles A.9 and A.10 of this document

B.4.1 Water density (SG)
The water density must be measured. A sample must be collected approximately 300mm beneath the surface.
The reference used in measurement is 1.025 g/cm 3. Any difference in relation to this reference must be corrected by 0.35mm for a variation of 0.001 of SG and applied to the RPF and RPA measurements afloat.

B.4.2 Weighing
The boat must be lifted from a single hoist point, or other systems as long as they are all brought together at a single point. The bottom attachment of the load cell must be attached to this point. The other load cell attachment must be attached to the crane.
Only load cells certified by the Measurer are permitted.
Skippers or their representatives shall make every effort to ensure that pipes, ballast tanks and valves are empty of any liquid whatsoever. The only exceptions are hydraulic system reservoirs. However, a description of these systems and the capacity of the reservoirs shall be provided to the Measurer.
The weight recorded by the load cell shall be expressed in Kg.

B.4.3 Measurements of freeboard at 0°
The freeboard at points RPF and RPA are measured and recorded: FRPF and FRPA.

B.4.4 Measurement of canting keel
In order to calculate AVSwc, the maximum angle of the canting keel must be recorded. This can be done during the 10° test.

B.5 STABILITY TESTS (90°)

Boat in the configuration laid out in A.10.1.
The mast(s) and keel are on the centreline of the boat. The boat is inclined to a measured heel angle. This angle shall be as close to 90° as possible, and held in this position by a strop around the mast.
Measurements of FFRPF90, FDYNA, LDYNA contribute to determining the vertical position of the boat's centre of gravity via calculation.

The spreaders, be they mast(s) or deck, shall not be made watertight for the test.
The Chief Measurer may request that the test be carried out on both sides.

Measurement of forward freeboard at "90°"
The Forward freeboard at point RPF shall be measured, boat inclined to "90°".
FFRPF90: Freeboard at RPF boat at "90°"

B.6 INITIAL HEEL ANGLE TEST (10° on each side)

There are 2 methods:

Method A by simulation, based on the values recorded by approved measurers during the various measurement operations. This simulation shall be run on Maat Hydro + software.

Method B by measuring the heel angle in measurement trim, boat afloat.

The choice of method is up to the Chief Measurer.

Where the boat is being measured for the first time, or where there has been major modification to the boat, the heel angle test of the boat afloat is a requirement.

Boat in the configuration detailed in A.10.1.
(Mast on the centreline, forestays – including removable ones – in place with furlers)

The aim of the following measurements is to check if :

- The angle of heel with the ballast tanks and/or the canting keel is not greater than 10° on each side.
- The bisector of the sum of the heel angles measured on each side (see above) matches the centreline of the "hull".

Measurement procedure, with the boat in measurement trim (§ A10.1)
The Measurer marks and/or locates two points on the transom which he considers to be symmetrical in relation to the centreline of the boat. These points can be hull chines, or measurement markers put in place during measurements ashore. In all cases, the Measurer must be certain that these points are completely symmetrical to the centreline of the boat. The Measurer will record the angle of the mast off vertical and the freeboard at the above two points corresponding to the boat upright.

Canting keel boats

The Measurer will fix his inclinometer in place on a surface close to horizontal.

- The keel is fully canted to one side (structural end stop, and if not, a sealed mechanical end stop). The angle is recorded in this position. The Measurer sets the inclinometer to ZERO and measures the freeboard on the side heeled at the specific point he has selected. (see above).
- The keel is fully canted on the other side (structural end stop, and if not, a sealed mechanical end stop). In this position, the Measurer records and notes the value on the inclinometer and measures the freeboard on the side heeled over at the opposite point specifically selected (see above).
- In all cases, the total from one side to the other must not exceed 2 times 10°. The maximum 10° angle shall be calculated from the data recorded, regardless of the symmetry of the boat.
- If the boat has lateral and/or central ballast tanks, these shall be filled or emptied to determine the maximum possible increase in heel on each side. The Measurer shall check that the measured variations in heel do not modify the symmetry recorded, defined in §c) above.

Note:
Sea water shall be used to fill the ballast tanks.
If the 10° rule is not respected, keel angle end stops shall be installed, and sealed by the Measurer, and new measurements shall be taken to check them.

Boats with ballast tanks and fixed keel

The Measurer will fix his inclinometer in place on a surface close to horizontal.

- The ballast tanks on one side are fully filled. In this position, the Measurer sets his inclinometer to ZERO and measures the freeboard on the side heeled over at the specific point he has selected (see above).

- The ballast tanks which were initially filled are totally emptied, and the ballast tanks on the other side are filled. In this position, the Measurer records and notes the value on the inclinometer and measures the freeboard on the side heeled over at the opposite point specifically selected (see above).
- In all cases, the total from one side to the other must not exceed 2 times 10°. The maximum 10° angle shall be calculated from the data recorded, regardless of the symmetry of the boat.

Note:
Sea water shall be used to fill the ballast tanks.
If the boat does not meet the 10° rule, the volume of the ballast tanks shall be reduced, and new measurements shall be taken to validate the modification.

B.7 CHECKING OF BALLAST TANKS (Volume and CG)

A – Volume

The measurer will check that the ballast tanks are empty. Each ballast tank shall be accessible via a hatch which opens at the lowest point of the tank. The ballast tanks shall be filled one by one using a precision flow meter certified by the Chief Measurer.

B – Geometry

The measurer will measure the ballast tanks and note their position with the aim of verifying the 3D model provided by the designer. The Chief Measurer will tell the measurer which measurements to record depending on the ballast configuration.

B.8 Air draft

Measurements shall be done in conformity with paragraph A.4 PRINCIPLE OF MEASUREMENTS ASHORE in this document.

A – Establishing air draft at mast level

B – Check the geometry of the highest sails.

- Angle at high point of the mainsail.
- Position of the mainsail head board at the highest possible point of the mast.
- Check that no other sail (other than mainsail) can be higher than the air draft.

APPENDIX

C.1 GENERAL METHODOLOGY FOR CALCULATIONS (for information)

The general operations for calculations are summarised as follows:

Upright trim, in measurement trim

1. Verification of the designer's drawings by the calculations office (and corrected if necessary), using the hull measurements.
2. The "upright" trim established by the calculations office is obtained from weight PDYNA and aft freeboard FFRPA and rotation around point RPA (where the boat floats).
3. Draft is established by (Measurer's calculation) the measurement recorded of the underside of the bulb (measurements ashore) and the two freeboards measured afloat (FFRPF and FFRPA).

90° test
From the following measurements
1. Measurement of force at the masthead FDYNA
2. Measurement of the angle of heel of the boat (about 90°) ANGLE
3. Measurement of freeboard at the measurement marker at the bow FFRPF90, with the boat at "90°"
4. Measurement of the distance between the load cell and the deck LDYNA

The calculations office will:
a. Rotate the boat to "90°" (exact angle measured)
b. Upright trim on the forward freeboard
c. Rotation (trim) of the boat to match the measured forward freeboard **FFRPF** and weight **PDYNA**
d. Calculation of AVS and the stability curve (keel on centreline, ballast tanks empty)
e. Establish the most unfavourable AVSwc configuration by calculation
f. Calculation of the AVSwc in this condition
g. Calculation of the RM as per paragraph D.6 of the IMOCA Class Rules.
h.Determination of the angle of heel (10°) in the least favorable keel (angle) and ballast tank (filled) conditions.

C.2 MEASUREMENT PROCEDURE

Boats wishing to obtain a measurement certificate must contact the Technical Secretariat (chief.measurer@imoca.org) or download the relevant documents on IMOCA Class website (http://www.imoca.org).

C.3 OFFICIAL MEASURERS

Chief Measurer for the Class: René BOULAIRE: chief.measurer@imoca.org
Official Measurers of the Class:

- Europe : East, Atlantic and Mediterranean :
  Jean SANS : jean.sans@wanadoo.fr
- United Kingdom :
  Stephanie MERRY: stephaniemerry@focus-offshore.com
- New Zealand: Jim MAC ELREA: jmcelrea@xtra.co.nz

Other measurers can be added during the year, under the authority of the Chief Measurer and with the agreement of the President of the Technical Committee.

C.4 A list of providers of services (not exhaustive) retained by IMOCA for mast and keel inspections is available from the IMOCA Class secretariat.

EXAMPLE OF OPEN 60' MEASUREMENT CERTIFICATE

Available from the Technical secretariat: chief.measurer@imoca.org

HONORARY MEMBERS

(Constitution - Article 6.1)

Catherine CHABAUD	(FRA)
Isabelle AUTISSIER	(FRA)
Alain GAUTIER	(FRA)
Jean-Luc VAN DEN HEEDE	(FRA)
Christophe AUGUIN	(FRA)
Philippe JEANTOT	(FRA)
Mark SCHRADER	(USA)
Titouan LAMAZOU	(FRA)
Giovanni SOLDINI	(ITA)
Michel DESJOYEAUX	(FRA)
Jacques GUILBAUD	(FRA)

*****

OFFICIAL AGENDA 2011 – amended by Rider n°1 (page 90)

Races taken into account for the IMOCA World Championship

- EUROPA RACE
Offshore race round Europe, crewed, with stopovers
Coefficient: 4
Start from Istanbul (Turkey) on 1st July 2011

- TRANSAT JACQUES VABRE
Double-handed transatlantic race
Coefficient: 3
Start from Le Havre (France) on 30th October 2011
Arrival in Puerto Limon (Costa Rica)

- B TO B TRANSAT
Single-handed transatlantic race
Coefficient: to be defined

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PROVISIONAL AGENDA
and NEXT MAJOR EVENTS – amended by Rider n°1 (page 90)

2012
Provisional Race Agenda

- THE TRANSAT
Single-handed transatlantic race
Coefficient: 4
Start from Plymouth – dates to be confirmed

- VENDEE GLOBE
Single-handed round the world race without stops
Coefficient: 10
Start from Les Sables d'Olonne (France) on 11th November 2012

RIDER N° 1 TO IMOCA YEARBOOK 2011

This rider modifies articles of the 2011 IMOCA Yearbook related to the programme of the IMOCA World Championship. The programme defined in this rider was decided by the Executive Committee in agreement with the Event Committee and with consultation of the skippers with secured sponsorships on 1st June 2011. This decision results from the postponement request from the organiser of the Europa Race due to lack of sufficient number of entries.

APPENDIX TO THE WORLD CHAMPIONSHIP REGULATION FOR THE 2011 WORLD CHAMPIONSHIP

Page 19 read now:

A - 1: Schedule and coefficients
2011: (total of coefficients: to be defined)
- Transat Jacques Vabre, Coef 3
- B to B Transat, Coef to be defined by the Executive Committee

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OFFICIAL AGENDA 2011 - PROVISIONAL AGENDA and NEXT MAJOR EVENTS

Page 89 read now:

OFFICIAL AGENDA 2011
Races taken into account for the IMOCA World Championship

- TRANSAT JACQUES VABRE
Double-handed transatlantic race
Coefficient : 3
Start from Le Havre (France) on 30th Octobre 2011

- B TO B TRANSAT
Single-handed transatlantic race
Coefficient : to be defined

PROVISIONAL AGENDA and NEXT MAJOR EVENTS
2012 Provisional Race Agenda

- EUROPA RACE
Offshore race round Europe, crewed, with stopovers
Coefficient: 4
Start from Istanbul (Turkey) – dates and course to be defined

- VENDEE GLOBE
Single-handed round the world race without stops
Coefficient: 10
Start from Les Sables d'Olonne (France) on 11th November 2012

APPENDIX TO THE REGULATIONS OF THE CLASS

COMPOSITION OF THE EXECUTIVE COMMITTEE
MANAGERS AND MEMBERS OF THE COMMITTEES
SUBSCRIPTION FEES
COST OF THE MEASUREMENT CERTIFICATES

FINANCIAL YEAR 2011

Executive Committee:

President: Luc TALBOURDET
Vice-President: Jean LE CAM
General Secretary: Bernard STAMM
Pascal CHADAIL
Antoine MERMOD
Alex THOMSON
Dominique WAVRE
Jose Maria BENAVIDES

Technical Committee:

President: Pascal CHADAIL
Members: Luc TALBOURDET, Dominique WAVRE, Bernard STAMM, Jean LE CAM, Hervé GIORSETTI, Nicolas ABIVEN, Antoine MERMOD and René BOULAIRE (as part of his contract).

Event Committee:

President: Alex THOMSON
Members: Luc TALBOURDET, Jean LE CAM , Dominique WAVRE, José Maria BENAVIDES, Gwénaël GBICK, Yannick PERRIGOT, Gaëtan GOUEROU (as part of his contract)

Class Rules Committee (CRC):
René BOULAIRE
Daniel ANDRIEU
Simon FORBES

2011 Subscription fees:
Full Member: 12 000€ + VAT where applicable
Full Member by right: 300€ + VAT where applicable
Associated Member: 300€ + VAT where applicable

Measurement certificate:

Complete measurement:	5800 € H.T. (estimation)
Modification of the certificate:	function of the modifications
Renewal including "the 2009 measurements":	3500 € H.T (for boats obtaining a first measurement certificate before 2009)
Simple renewal:	free of charge

(These fees do not include the travelling expenses of the measurer; they are to be borne by the campaigns)
Measurers are appointed by the Chief Measurer.
The fees here above are maximum fees established by the Class and the Chief Measurer in relations with the official measurers. They are to be borne directly by the campaigns.

INTERNATIONAL MONOHULL OPEN CLASS ASSOCIATION 60'

International Class registered by International Sailing Federation (ISAF)

Subscription Form 2011

I undersigned,

Name: …….

First name: ……..

Address:…….....

……

Phone number: ……..……

Fax:…….....

Mobile: …….....……....

Email: …….....……

Confirm I join I.M.O.C.A

As

☐ **Full Member** (See Articles of Association)
2011 Amount: 12 000€ + VAT where applicable

Boat's racing name: ……..……..

Age date : …….....

Architect: …….....

Nationality and sail number: …….....

Project Manager: …….....

Phone number : …….....

☐ **Full Member by Right** (See Articles of Association)
2011 Amount: 300€ + VAT where applicable

☐ **Associated Member** (See Articles of Association)
2011 Amount: 300€ + VAT where applicable

By signing this subscription form, I hereby expressly commit myself:
- to comply with all terms of the legal documents which rules the Association, namely the Constitution of the Class, the Regulations of the Class, the Class Rules of IMOCA, the Notice of World Championship Regulations an its annual appendix, which I have read and have been given a copy;
- not to bring any claim or action in any way connected with the application and the interpretation of the above mentioned legal documents against ISAF and/or IMOCA and/or their respective representatives, and/or Chief Class Measurer of the IMOCA Class and/or against the CRC and/or its members.

The skipper Full Member signing this subscription form is an official entrant of the IMOCA World Championship and skipper Full Member further grants IMOCA the non exclusive right and license to utilize his endorsement (i.e. the right to use the name, voice, likeness, photograph, signature, quotations, initials, facsimile and biographical information) for promotional and/or advertising purposes and skipper further grants to IMOCA the right to license such endorsement to its sponsors and/or IMOCA race organisers solely in accordance with the aims of the association IMOCA.

In On

Signature (preceded by the handwritten mention "agree and approved")

IMOCA
OCEAN RACING
WORLD CHAMPIONSHIP

CONTACTS

Contact the International Sailing Federation
ISAF

Jerome PELS – General Secretary
Email : secretariat@isaf.co.uk

Simon FORBES –Technical Secretary
Email : simon@isaf.co.uk

Contact IMOCA

IMOCA – C/o FFVoile - 17, rue Henri Boquillon – 75015 PARIS - France

Luc TALBOURDET – President: president@imoca.org
René BOULAIRE – Class Chief Measurer: chief.measurer@imoca.org
General Administration – Mer et Projets : contact@imoca.org

IMOCA Website: http://www.imoca.org

ISAF
WORLD SAILING