OFFICIAL NOTICE BOARD HydoContest BY ENSM

April 27, 2026

1. APPENDICES

a. Can the boat be modified to suit the competition, i.e. add an appendage or another element? Question asked by Hydrometra on 7/01-Answered by the Technical Committee on 15/01.

The boat may be modified between races, as long as it complies with the Notice of Race. However, it will be necessary to check that the appendages do not exceed the imposed dimensions of 2.5x2x2.5 m. In the event of a change and before the next race, a measurement will be carried out by the technical committee to check compliance.

b. When taking measurements, must the appendages (e.g. the rudder) be completely aligned with the axis of the boat? Question asked by Hydrometra on 7/01-Reply by the Technical Committee on 15/01.

The racing rules state that: 'During inspection, movable appendages and rigging must be oriented parallel to the ship's axis.'

Definition:

'Axis of the vessel: axis materialising the direction in which the boat moves forward in calm waters and acting as a longitudinal axis of symmetry for the hull.

c. Can we modify parts of the boat between two competitions and adapt these parts to each competition? This applies, for example, to the propellers. Can we replace a component if it is damaged? This applies, for example, to the propellers.

The ship's structure (hull, keel, internal structure, bulkheads and reinforcements) and on-board electronics may not be modified after the start of the first race, except in the event of a proven damage, in which case they may be replaced with identical parts.

2. INSURANCE

a. Do we need to take out third-party liability insurance for the sums mentioned in the Regulations? Another question was asked about CIVIL LIABILITY and LEGAL PROTECTION (RECOURSE AND PENAL DEFENCE), our insurer said that this was specific and that he was not sure it would be possible to obtain it, as the event is very unusual, perhaps you could help in some way? In previous years, which insurer have you taken out such insurance with and what was the cost?

To take part in HC, each team must provide proof of liability and legal expenses insurance (art 19). Teams are not required to refer to Appendix 1 of the Regulations, which is given as an example.

3. BATTERIES

a. Is there a penalty for discharging the battery before the end of the race? Question asked by Hydrometra on 7/01-Reply by the Technical Committee on 15/01.

A distinction must be made in the case of mass or agility races: any vessel that is unable to complete the course, particularly due to a flat battery, will be classified as DNF.

This does not apply to endurance races.

b. What are the dimensions and weight of the battery that you will give us for the competition? Question asked by Hydrometra on 9/01-Response made by the technical committee on 15/01.

These batteries are generally used for vehicles such as lawnmowers, golf carts, jet skis, etc.
Their dimensions are approximately

- *194 x 126 x 183 mm*
- *and weigh between 6 and 8 kg*

Response given by the Technical Committee on 02/02.

The battery finally chosen by the technical committee is a maintenance-free, sealed liquid electrolyte model from the Japanese company YUASA, whose full specifications are given in Appendix 1.

c. Battery types : Why lead-acid batteries were chosen - Question asked at the meeting to present the project to the French teams on 10/12/24 - Answer given by the technical committee on 15/12/24.

The technical committee has chosen lead-acid batteries because of their lower cost than Lipo or Li-ion batteries, for example, and to minimise safety problems (avoiding a possible fire if they are misused). They will be either gel or liquid acid (sealed).

Response given by the Technical Committee on 02/02/25.

Please refer to the answer in section 3-b above.

d. With regard to motorisation, one question was whether it was possible to use batteries other than those used for propulsion in order to power the foil steering brains, for example. Question asked at the meeting to present the project to the French teams on 10/12/24 - Answer given by the technical committee on 15/12/24.

As you may have noticed, HydroContest 2025 by ENSM is focused on minimising the total energy consumed by the various courses across all the events. There is no speed event. To do this, we are going to measure the total power

consumed by each boat by continuously measuring the voltage of the source (battery) and the current delivered during each event.
So, in the spirit of equality between the teams, we have decided to authorise only one source of energy, i.e. 2 12V batteries connected in series (i.e. 24V) with a total capacity of 30 Ah (chosen by the organisers and supplied by them on arrival at the competition site). Whatever solutions are envisaged (sail adjustment, foils, etc.) they will have to make do with this single source of energy.
However, for your tests on your premises, you can use the power sources you have without any problem.
If you need a different voltage to control the foils or other systems, you will need to install one or more voltage regulators adapted to your use.

e. ***How often are batteries allowed to be recharged during the competition? Are there any specific rules concerning the frequency of battery recharging, or should we design our system with a recommended level of autonomy in mind?***
Additionally, is it mandatory to use these batteries for all components, or would it be possible to use additional batteries specifically for the telemetry system?
Question asked by Hydrometra on 19/03-Response made by the technical committee on 20/03
As you know, the batteries (2 x 12 V batteries in series, i.e. 24 V and a capacity of 30 Ah) will be supplied by the Hydrocontest organizers,
Upon arrival at the competition site, the batteries will be fully charged.
After each race, they will be recharged by the organization. So, before each new use in competition, you will have batteries charged to their nominal capacity.
As for your question about the possibility of using an extra battery for telemetry and everything to do with remote control, this is not planned. In fact, the race project is based on reducing consumption, whatever the source. To achieve this, a single energy source must be able to supply everything needed to run the boat. Of course, the aim is to put all teams on an equal footing, which we will check before each event.

f. **We would like to ask whether there is any possibility of using an alternative power source different from the main batteries for the innovation-related components, or if all systems must strictly be powered exclusively by the onboard batteries.**
Question asked by Hydrometra (Colombia) on Saturday, January 31, 2026. Answer provided by the technical committee on February 1, 2026.
For batteries and any additional energy sources are not permitted under the race rules. The total energy consumption of the vessel on each course is taken into account for the ranking of the teams

4. LOADING

a. **Will the 10-litre cans be completely full, with 'no free surface' ? Question asked by Hydrometra on 7/01-Response made by the Technical Committee on 15/01/25.**
All cans are filled to exactly 10 kg. There is therefore a liquid head.

b. **Is each can guaranteed to weigh a total of 10 kg when full? Can the weight of the cans be counted? Question asked by Hydrometra on 7/01-Response by the Technical Committee on 15/01/25.**
The total weight of each can will be provided by the organisers to ensure fairness between the teams. The total weight to be taken on board will be either 40kg or 100kg.

c. **Do the dimensions indicated for the cans (19 x 18.5 x 34 cm) include the dimensions of the cap and the support? Question asked by Hydrometra on 7/01-Response by the Technical Committee on 15/01/25.**
The cans supplied by the organisers are stackable, which means that the handle and cap fit into a slot in the next can.

d. **Do the loads have to be covered and entirely inside the vessel, or can they simply be placed on top? For example, if it is a catamaran platform or if it extends beyond the deck. Question asked by Hydrometra on 7/01-Reply by the Technical Committee on 15/01/25.**
Each team has the choice of placing the loads inside or outside (deck) or anywhere on board the ship. However, it will be necessary to check that the ship loaded in this way will meet the requirement of a maximum righting moment for an angle of heel equal to or greater than 20°.
The team must also ensure that the loads are properly secured to avoid any loss during the races.

e. **La charge peut-elle dépasser du pont ou doit-elle être complètement à l'intérieur du bateau ? Question posée par Hydrometra le 9/01-Réponse faite par le comité technique le 15/01/25.**
The loads (40 or 100 kg) can be placed on deck or inside the ship, provided the ship's stability meets the stability criterion, i.e. the maximum righting moment is reached for an inclination of 20° or more.

5. STABILITY

a. **We are currently reviewing Section 10.3 "Freeboard and stability" of the HC Design 2026 Rules, and we would like to request a clarification regarding its applicability to our vessel.**
Our boat is a trimaran configuration, and the rule states that:
"The vessel must be designed so that, in all configurations, the maximum heeling moment is reached at a heel angle greater than or equal to 25°."
In multihull vessels such as trimarans, the transverse stability behaves fundamentally different from that of monohulls and the righting moment is typically very large from very small heel angles. Therefore, in practice, the maximum heeling moment may occur at angles significantly lower than 25°.

Could you please confirm whether this 25° criterion applies strictly to multihull vessels, or whether an alternative stability justification may be accepted for trimaran configurations?
Additionally, the rule also specifies that:
"The vessel must remain watertight up to a heel angle of 25°, for the most unfavorable configuration."
Our understanding is that this requirement refers to preventing water ingress into the internal volume of the vessel, rather than preventing the deck or external surfaces from becoming submerged.
Could you please confirm whether a hull with watertight hatches / sealed upper surfaces that prevent internal flooding would still meet this watertightness criterion, even if part of the outer hull becomes temporarily submerged before 25°?
Finally, we would also like to ask whether these two requirements (heel angle and watertightness up to 25°) will be verified through experimental tests during the technical inspection or prior to the competition. If so, could you please indicate:

- **whether the tests would be performed with payload, without payload, or under which loading condition(s), and**
- **the general methodology that would be used to assess heel angle and watertightness (i.e., how the tests would be conducted in practice)?**

Question asked by Hydrometra on 6/01-Reply by the Technical Committee on 7/01/26- Answered by the Technical Committee on 15/01/2025.

Compliance of a Multihull with HC DESIGN RULES 2026*: A Monohull is a vessel on which the line of intersection of the water surface and the boat at any operating draft (light or heavy condition) forms a single closed curve.*
If it makes two or more footprints under the same conditions it is a multihull.

A Multihull must comply with all requirements of HC DESIGN RULES except section 10.3 whereas alternative criteria is as follows:
The vessel must:

- *Be designed in such a way that, in all configurations, the maximum heeling lever is reached at an angle of heel greater than or equal to 10°.*
- *have a minimum freeboard of 10 cm, for the most unfavorable configuration, on any non-watertight hull.*

Openings in watertight enclosure are permitted providing they remain tight at all time during any race by means of closure of similar strength.
According section 11 of HC DESIGN RULES, above requirements shall be checked by submitting to the technical committee a freeboard and an intact stability calculation for displacement and draught corresponding to the following 3 configurations:

- *Vessel under loading (vessel with a mass of 100 kg),*
- *Vessel under lest (vessel with a mass of 40 kg),*
- *Ship with no loading and no lest on board.*

6. TEAM RANKINGS

a. Are the competitions marked in the same way? Question asked by Hydrometra on 7/01/2025-Answered by the Technical Committee on 15/01/2025.

The Hydrocontest by ENSM challenge comprises 4 independent competitions. As explained in the specifications, there are three types of event:

- *An event in which the vessel is loaded with 40 kilos (4 x 10-litre drums filled with water, which will be supplied and calibrated to 10 kilos by the organisers),*
- *An event where the boat is loaded with 100 kilos (10 10-litre cans filled with water, supplied and calibrated to 10 kilos by the organisers),*
  For these events, the cumulative energy consumption over the two races will be used to decide between the teams.
- *An agility event. This is a race in which the boats are loaded with 40 kilos and two teams compete against each other. The team that covers the shortest distance will be declared the winner and will compete against the next team.*
- *An endurance race. This is a group race (involving 6 to 12 competing boats) in which the boat, carrying a 40-kilo load, that has covered the greatest distance either until the battery runs out or after one hour has elapsed (the battery having been fully charged at the start) will be declared the winner.*

7. RACE VENUE - WEATHER CONDITIONS

a. Where will the races take place?

Question asked at the meeting to present the project to the French teams on 10/12/24 - Answer given by the technical committee on 15/12/24

The races will take place inside the pool.

b. **Do you have data on average winds in the port? Question asked at the meeting to present the project to the French teams on 10/12/24 - Answer given by the technical committee on 15/12/24.**

As far as this information is concerned, the organisation is making enquiries and will get back to the teams.

Questions asked by Hydrometra Sede Medellin on 21 January 2025 by videoconference.

Answer given by the technical committee on 27/01/25 during the videoconference.

8. ELECTRONICS - REMOTE CONTROL

a. **How do I go about buying electronic equipment? Can you send us step-by-step instructions? Question asked by Latvia on 24/01/25 - reply from the Technical Committee on 24/01/25.**

The electronics kit includes:

- *A remote control with a high-definition screen (this remote control allows you to control the speed and direction of the boat and display all the data on the screen).*
- *A central unit (the orange Cube) in radio contact with the remote control, to which are connected:*
  - *The GPS*
  - *The video camera*
  - *Battery voltage and current flow measurement*
  - *The servomotor (not supplied) that operates the rudder*
  - *The variable speed drive (not supplied), which controls the power supplied to the motor.*

The kit is supplied by the French company Airbot Systems (https://www.airbot-systems.com/). The company director's e-mail address is julien.q@airbot-systems.com.

You can contact him to order the kit, specifying 'HydroContest 2025 by ENSM'.

The kit will already be programmed to meet the requirements of the competition organisation, namely:

- *GPS data recovery (position, speed, heading, etc.)*
- *Video recovery,*
- *Battery data recovery (voltage and current),*
- *Transmission of GPS data to TimeZero (MaxSea) software, which will be provided free of charge to teams by the company sponsoring the competition.*

b. **Remote control equipment: does it have free programming management software? Question asked by Latvia on 24/01/25 - reply from the Technical Committee on 24/01/25.**

The central unit (the orange Cube) is programmable using Ardupilot open source software, which can handle all your needs. This international community of users offers a very wide range of programs for controlling all the functions of air, sea and land (rover) drones.

c. **Can you provide us with detailed information on the method used to calculate the consumption of the vessels taking part in the Hydrocontest? More specifically, we would like to know what equations will be used to determine this consumption and how the power consumed will be calculated. Question asked by Colombia on 26/03/25 - reply from the Technical Committee on 27/03/25**

The remote-control system allows you to receive all the data from your boat in real time, i.e. the time, battery voltage, instantaneous current, latitude and longitude at a frequency of 1Hz (one measurement every second). All this data is recorded in an Excel-type file in .csv format, which must be processed to reorganize it (data tab --> convert). The race committee will retrieve these files to calculate the energy consumption for each race via a USB connection on your boat's autopilot (the orange cube that manages all the transmissions). As the battery capacity before each race is difficult to measure, we'll assume that after recharging the battery (between each race) you'll be at the optimum capacity, i.e. 30 Ah. All this while checking that the voltage at full charge is consistent with that of a fully charged battery (12.6 to 12.8 V).

You can use the Excel.csv data to calculate the consumption after each race and check the accuracy of our calculations.

A model calculation in Excel can be sent to you.

d. **Can we use a personal remote control for sending commands and the provided (mandatory) remote control only for reception on the vessel? Question asked by IUT of Brest on 25/11/2025. Technical committee's response on 28/11/2025.**

It is not permitted to use multiple remote controls.

The mandatory remote control provides a wide range of functions:

- *Control of engine power (forward and reverse),*
- *Control of the rudder (or pod) used to steer the vessel,*
- *Retrieval of vessel data (video and, via the Cube Orange, battery voltage, battery current, GPS data — heading, latitude, longitude, speed, etc.), which can then be processed and transferred to a professional marine navigation software (TimeZero).*

e. **Regarding the camera placement: according to the regulations, the camera must be fixed to the bow of the vessel to allow the pilot and the public to observe the water in front of the boat. In our case, the vessel is a trimaran, which includes two lateral hulls in addition to the main hull. These side hulls are shorter, and maintaining visibility of them is important to prevent potential collisions or contact with obstacles during navigation.**

For this reason, we would like to ask whether it would be acceptable to place the camera on the stern or at an intermediate position along the main hull, allowing a wider field of view that still provides situational awareness while also offering partial visibility of the lateral hulls. This configuration would

enhance safety and operational control without compromising the intended purpose of real-time monitoring.

Question asked by Hydrometra (Colombia) on Saturday, January 31, 2026.

Answer provided by the technical committee on February 1, 2026.

Notwithstanding the provisions of Rule 10.11 Electronics of the regulations, namely:

"The camera must be fixed to the bow of the vessel to allow the pilot and the public (via the big screen broadcast of the competitions) to watch the water in front of the bow of the boat."

The technical committee accepts that your team positions the camera in such a way as to allow the side hulls to be seen. This configuration is indeed relevant to ensure that the buoys are passed without contact.

However, it is essential to have a view that is not too wide, in order to ensure sufficient resolution on the screen intended for spectators.

9. ENGINE

a. **Do you authorise engine flanging? Question asked at the meeting to present the project to the French teams on 10/12/24 - Answer given by the technical committee on 15/12/24.**

Yes, you will need to indicate in your documentation that your engine is flanged and give its power rating before and after flanging.

b. **Why did you specify that the engine should be cooled by seawater? Question asked at the meeting to present the project to the French teams on 10/12/24 - Answer given by the technical committee on 15/12/24.**

A conventional DC motor has an efficiency of 45-50%, except for brushless motors, which have a much higher efficiency. So, with a conventional 1 kW motor, you can expect 300-400 W of dissipated heat. This can affect the operation of the electronics that will be installed in the hull of the boat.

The same applies to the drives that will power the motors, which will also have to be water-cooled.

Any submerged motor (waterproof motor or pod) will not have this problem.

The main reason for choosing seawater cooling is to minimise power consumption, as the vessel will simply need to be fitted with a water intake below the waterline, which will ensure sufficient water circulation to cool the components concerned when the vessel is in motion. However, it is not impossible for a team to opt for cooling by means of a cooling pump, to the detriment, of course, of the energy consumed.

c. **Can you suggest engine models? Question asked by Latvia on 24/01/25 - Answer from the Technical Committee on 24/01/2025.**

It is up to the team to define the propulsion system for its vessel, depending on the type of hull envisaged.

Vessels can be propelled in different ways:

- *A continuous engine placed inside the vessel and fitted with a shaft connected to a propeller. It must then be cooled.*
- *A watertight pod placed under the hull (fixed or steerable),*
- *A watertight engine placed directly under the hull and connected directly to the propeller.*

In all cases, the motor power must not exceed 1000 W ± 10%

10. . REGULATIONS

a. ***What rules or what types of changes are mentioned in article 8: RIGHTS OF THE ORGANISER: To modify these rules until the prize-giving ceremony. Question asked by Hydrometra on 7/01-Reply by the Technical Committee on 15/01/25.***
The modifications mentioned in article 8 essentially concern the reorganisation of the races according to the weather conditions (mainly the appearance of too strong a wind which could endanger the integrity of the boats - capsizing for example).
Under article 8, the organiser has the right to modify the rules with the exception of articles 10 and 12.
However, articles 10 and 12 may be modified before the last race, in the event of safety, force majeure or any event likely to compromise the normal running of the challenge.

b. ***Do we now have to give the names of the team members?***
Yes. 4 people must be mentioned in the team description (art 5).

c. ***Can we return the registration form after the deadline?***
Yes, up to and including February 16.

d. ***Does the registration form have to be signed by the most senior member of staff at the University or by a manager?***
The form must be signed by a person responsible for signing on behalf of the university, not necessarily the dean.

e. **We plan to use funds from the Erasmus+ programme for the mobility of our participants. Can your institution sign the documents relating to the training of our staff and students in VET (vocational education and training)? Question asked by Latvia on 24/01/25 - reply from the Technical Committee on 24/01/25.**
Yes, our institution can sign these documents. A priori it is possible for staff and students but we need to know the ERASMUS + Charter.

APPENDIX 1 - Battery selected by the Technical Committee

YUASA

Yuasa Technical Data Sheet

Yuasa U1 - Garden Machinery Batteries

Performance

Voltage	12V
Capacity (20-hour)	30Ah
Cold Cranking Amps (EN1)	330A

Dimensions

Length	194mm
Width	126mm
Height	183mm

Weights & Measures

Mean Weight with Acid	7.8kg

Container Features

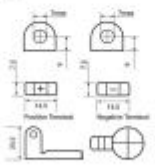
Case Type	U1 BCI
Cell Layout	1
Hold Down	N
Lid Type	SMF Double Lid

Technology

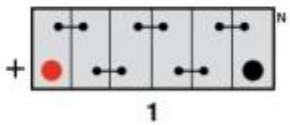
Flame Arrestor	✔
Technology	Ca/Ca
Separator	PE
Recommended Charge Rate	2A

Terminal Type

T4



Cell Assembly Layout



Battery Hold-down

Data Sheet generated on 30/01/2025 - E&OE