Release notes for class rules for 2016 – Marblehead, Ten Rater & A Class

Long form version

A concise résumé is provided by the short form version

Notes to introduce the revised class rules and indicate the significant changes and their rationale
Notes in this colour indicate how existing and new boats may be affected

Common to all classes

Effective Date

1 July 2016. Measurement of boats and other equipment shall be to the revised rules from this day onwards.

Grandfathering

Except as prescribed in Section C, existing equipment is grandfathered as follows:

A Class	Hull, appendages, rig, sails
Ten Rater	Hull, sails
Marblehead	Hull, sails

Interpretations and Q&As

All existing interpretations are incorporated in order to make them redundant.

Since the class rules were last revised there have been many interpretations answering questions about the meaning of the class rules. According to IRSA regulations, interpretations have a lifetime of 2 years only after which they cease to apply. After the last IRSA GA few of the interpretations were actually valid – in order that the forthcoming Marblehead world championship could be held without disagreement on the same issues the interpretations were revised and brought up to date. Where possible (that is, where a simple answer to a question is satisfactory and where no rule change is possible to improve the understanding of the class rules) a Q&A has been issued. Please see the Q&A section under the Class Section of the IRSA website http://www.radiosailing.org/classes

Action required for an existing compliant boat	None
Additional action required for a new boat	None

Advertising

Advertising shall comply with the ISAF Advertising Code.

This is not a change but brings the class rule up to date with the ISAF rules concerning advertising.

Action required for an existing compliant boat	None
Additional action required for a new boat	None

Automated sheeting, steering, navigation, on board cameras

All are prohibited.

This is a rule change felt necessary to ensure that Radio Sailing remains the same as sailors currently understand it until such time as the classes feel they want to revise class rules to permit any such items. In the meantime, this avoids differences in performance achieved by using relatively advanced technology, the possibility of an 'arms race', and/or a drop in the popularity of the classes themselves, due to cost, complexity, and/or perceived unfairness of using such equipment.

Action required for an existing compliant boat	Remove any such device
Additional action required for a new boat	Remove any such device

Multiple certificates

Whereas the 1994 (A Class) and 2002 (Marblehead and 10 Rater) class rules permit only the most recent certificate to be valid, the revised class rules permit multiple certificates to be valid at the same time.

Past practice for IRSA events is that it is the competitor who enters and, even if he is requested to send details of his boat in advance of the event, use of that particular boat is not binding in any way. Not only is this normal practice for IRSA (International) events, it appears to be normal practice for most Radio Sailing events worldwide.

Whereas some owners have a single boat, others may have two or more boats which are each suited to different conditions. The latter are able to arrive at an event and choose the boat they will compete with. This allows them to match their boat to the expected conditions at the event and clearly gives those multiple boat owners an inherent advantage over those with a single boat.

There are additional complicating factors. First, some DNMs actively enforce the previous 'one valid certificate' rule by taking back an existing certificate before issuing a new one. Second, that practice is not employed by other DNMs, who issue certificates without taking back or cancelling a previous certificate. Third, some DNMs recognise multiple valid certificates within their area of administration, even though this is not in compliance with the class rules.

Thus there have been three approaches to the issue and validity of certificates and, presumably, each DNM is content with its approach to certification.

The problem is that there has been no simple means of telling if the certificate produced at an event is the most recent (and therefore only valid) certificate. While IRSA has no mechanism to canvas the views of all class owners regarding which of the various approaches identified above is preferred, it does have a natural responsibility to ensure events are fair to individual owners as far as possible. In particular, IRSA is concerned about this problem at world and continental championships for those classes for which it has specific responsibility.

Situation summary
Class rules require a single valid certificate for a boat and event rules permit choice of boats at events so multiple boat owners have an inherent advantage. Only some DNMs cancel an earlier certificate before issuing a new certificate, while some DNMs allow multiple certificates. There has been no simple way to know if the certificate presented at an event is the single current one.

One possibility that was discussed was a scheme where an event organiser requires boat certificates well in advance of the event (perhaps two weeks), while keeping the Class rules requirement for a single valid certificate for a boat.

The benefits of this scheme are that:

- The advantage of a multiple boat owner is diminished or negated by needing to declare his boat well in advance.
- Organisers have time to make enquiries of the registrar about the validity of the certificate presented.

The disadvantages of the scheme are that:

- It does not deal with variant DNM practices of certification.
- It requires event organisers and certification authorities to undertake additional duties and put in place additional processes for certification, event entry, and certificate checking.
- The competitor would be required to withdraw from the event if the boat is not certificated by the time the need to lodge the certificate arrives (delays are typical in getting a new build prepared in time for its first event), or if the boat is irreparably damaged or lost before the event.
- History tells us that race committees, even at the most major events, do not refuse entry to boats that do not comply with the rules. After all, they are facilitators and not policemen, and competitors have typically travelled some distance and at some expense to attend. A race committee would thus come under great pressure to give special dispensation to a competitor to use another boat, and so competitors would effectively be able to choose their boat on the day by providing one of the above “excuses”.
- The advantage enjoyed by multiple boat owners remains at any event where the scheme is not used and the previous normal practice prevails.

If the class rules permit multiple certificates, on the other hand, an event organiser can implement this scheme if they wish to ensure competitors use the boat which matches the entered certificate. However, as it is likely most events will continue to be run as they are now (no pre-submission of the certificate required) the owner of a single boat will not be at such a disadvantage with respect to a multiple boat owner that he was previously.

The previous class rules do not prevent any boat from being configured to suit a particular wind condition or venue – the boat can be re-rated for a specific event and then it can be returned to its original configuration immediately afterwards. The drawback of the previous system is that the boat has to be re-measured and re-certificated in order to achieve the return to its original state. There is a clear cost to this exercise which can be viewed as no more than bureaucratic nonsense. Thus there is effectively a tax on experimentation or on the attempt to reduce the advantage enjoyed by a multiple boat owner.

The control of what equipment is used by the competitor at an event is clearly in the hands of the event organiser and the event rules they choose to invoke and enforce. The equipment used by the competitor is ultimately more an event rules issue than a class rules issue. The conclusion is that the class rules can be amended to reduce the advantage enjoyed by a multiple boat owner over the owner of a single boat without affecting what happens at an event. This is in line with the general trend to reduce unnecessary cost in the sport. An advantage still remains with the multiple boat owner as each boat can be fully optimised to particular conditions. A single boat/design that is configured to suit different conditions will almost always be at some disadvantage compared to a fully optimised boat in each condition.

Other future options
Future active class organisations may have the resources to create an accessible electronic database of certificates that can be easily accessed by event organisers and race committees (as well as registrars, certification authorities, and owners themselves) thus avoiding most of the snags identified with the scheme outlined above. However, having a requirement to use a particular boat at an event will remain an event rule and not a class rule.

Conclusion
Permitting multiple certificates for a single boat to help level the playing field with a multiple boat owner is a class rule change that can be as effective under such a central register of certificates as under the previous system. Permitting multiple certificates additionally addresses the issues around the variability of DNM practice, ensuring fairness for all competitors, particularly at open events.

Action required for an existing compliant boat	None
Additional action required for a new boat	None

Hull geometry

It is prohibited to change the geometry of the hull shell during an event.

Whereas placement of the appendages is generally heavily restricted, there has been no rule limiting or prohibiting change of hull form during an event or race. In the Ten Rater and A Class it may be difficult to alter hull form without making the boat non-compliant with its certificate. However, this does not mean it is impossible to make such a change. In the Marblehead class a change to the hull form would not normally render the hull non-compliant.

As with the prohibition of on board automated sheeting, steering, navigation, and camera equipment, this is a rule change felt necessary to ensure that Radio Sailing remains the same as we currently understand it until such time as the classes feel they want to revise class rules to permit this feature. In the meantime, this avoids differences in performance achieved by using relatively advanced technology, the possibility of an 'arms race', and/or a drop in the popularity of the classes themselves, due to cost, complexity, and/or perceived unfairness.

Action required for an existing compliant boat	Remove or de-activate any such device
Additional action required for a new boat	Remove or de-activate any such device

Minimum mainsail luff length

A universal minimum mainsail luff length is introduced.

There are three reasons for this:

- To ensure the mainsail is large enough to carry the normal sail numbers and national letters
- To ensure that, when a race is abandoned because boats cannot sail, it is likely that all boats will be similarly affected and criticism of the race officer/race team will be minimised
- To introduce a cost reduction/limiting factor that assists owners to sensibly plan their investment/expenditure.

Large enough to carry normal sail numbers

There has been no minimum size for a mainsail and/or headsail in the M, 10R or A Classes. In principle it would be possible for a competitor to have a sail so small that the sail marks on it would serve no purpose for identification, either for other boats when trying to protest or for the race committee when observing the start line for recalls or the finishing order. The first object of IRSA expressed in its constitution is "the promotion and encouragement of designing, building, and racing radio sailing boats". If the class rules encourage or permit boats that are not capable of being raced then IRSA is failing in this primary object.

The rules concerning sail marks themselves have, up to the present, permitted ever more reduced size to fit onto very small sails. This is a fundamental error as it actively permits the reduction of sail numbers to the point that they serve no purpose when racing. The sail marks rules for the next issue App E address this and set a sensible lower limit to the size of sail numbers below which they may be omitted on headsails. This is so that sail numbers need not be applied on a very small headsail if they would have to be below that minimum limiting size – for example on the headsail of a minimum size swing rig. However, it follows that at least one sail has to be large enough to carry the maximum size numbers and a minimum luff length (mainsail for M and A Class, any sail for 10R class) is required to achieve this.

It is known that an IOM No 3 mainsail is large enough to carry the maximum size sail numbers so the minimum luff length for the other classes is bound to be more than 880 mm. For reasons covered below it does not follow that 880 mm should be the minimum size for the other classes.

Race abandonment/postponement

Where there is no consistency in the smallest size of sails used by competitors at an event it is possible that the race officer will be in a position where he is criticised by half of the competitors regardless of whether he continues to race (by those without small enough sails), or abandons racing (by those with smaller sails). The promotion of racing radio sailing boats, of the IRSA classes and their events would not be served well by a major disagreement over whether to abandon or not and the IRSA executive has an

interest in enabling the race officer for its events to make good decisions and provide equitable racing for all.

At a ranking race for IOM in the United Kingdom in 2015 the wind and sea conditions were such that the boats were incapable of adequate control to permit sensible racing. There was a significant danger of boats banking because they were unable to tack. Rescue of a large number of any such boats would have been problematic. Start lines and the few heats seen in these conditions were a shambles. The race officer first postponed racing and, when conditions failed to improve, abandoned the event early. What was remarkable about this was that there was no dissent from the competitors. It is believed this can be attributed to the fact that they were all equally affected. There is a clear lesson to learn here for the other classes. Introduction of a lower limit to mainsail luff length ensures no-one is aggrieved if racing is abandoned because it is 'too windy'. It sets a definite limit on the need for smaller sails and is simpler/cheaper.

Cost reduction
Should there be a world or European championship planned for a venue where it is reputed to be extremely windy it is reasonable that competitors planning to travel large distances to attend (at considerable cost to themselves) should be able to do so safe in the knowledge that they will be at no disadvantage compared to locals when it comes to their level of preparation. With no lower limit to rig height, how should they determine what is the smallest rig they will need? They could ask some local owners, they might look at local wind roses, they could ask the designer, or their sailmaker. They could ask all of these and take an average, or the smallest. None of these will help them as much as a hard limit in the class rules. Having that hard limit will allow owners to plan their rig purchases from the outset, and so will contribute to reducing costs.

Precedents for a lower rig height limit
Abandonment/postponement in high winds is far less frequent than postponement because there is too little wind. There are always differences of opinion about whether races should continue or not but this is something that most competitors are well adapted to. A factor that assists race committees to reach this decision to postpone/abandon is that in the IOM, M and A Classes there is an upper rig height limit. In the IOM and A Class this height limit was established at the outset. In the M class it was not established until some time in the 1970s/80s. The height limit was established because of a proliferation of rigs of ever-increasing height, remarkable for the time because of the universal use of alloy masts. Adopting the height limit in the Marblehead class set a hard limit to which owners could go, safe in the knowledge that no-one could be better prepared for light airs than they due to having a yet taller rig. The upper height limit successfully serves to limit cost and complexity.

The choice of the height limit
A good example of a poorly chosen limit in the class rules is the current draught limit in the Marblehead class. Around 1998 the IRSA EC decided that there should be a draught limit in each class so that race organisations could run IRSA events safe in the knowledge that no competitor could present with a boat that would not float on the chosen site. Although the principle is perfectly sound the figure for the draught limit was more difficult. The IRSA DNMs were consulted and indicated their preferred draught limit. A normal draught at the time for the majority of boats was around 580 mm. The majority preferred 600 mm and the second choice was 650 mm. The chairman of IRSA owned a boat with a 654 mm draught whose designer claimed the boat could not possibly be altered. The draught limit was set at 700 mm in order to accommodate that design and its sister-ships. A consequence of choosing a limit considerably higher than the current normal value was that the new limit then became a target for designers and builders. Even when their boats did not always give improved performance, the impression given was of an arms race, and a side effect was that several important sailing waters were lost because newer boats could not float there. The popularity of the class was dropping anyway because of competition from the widely recognised benefits of the IOM class but it is unlikely that the overly large draught limit helped the situation. The lesson taken from this is that setting a limit that is far removed from the current norm is not wise if undesirable or unnecessary development is to be avoided.

The generally greater numbers of Marbleheads in use and the consistency of level of preparation between the more competitive owners provided a sound basis for making an assessment of what should be the minimum height limit. The IRSA technical committee comprises many Marblehead owners who were able to use their judgement about an appropriate limit. The relatively small range of ‘normal’ displacement and

draught serves to focus the size of smallest rigs already in use. A figure of 990 mm would cover the vast majority of existing rigs.

The same decision for the 10R class was considerably eased by virtue of the fact that most 10R owners own Marbleheads and would choose to use their smallest Marblehead rig on their 10R. Again the relatively small range of 'normal' displacement and draught serves to focus the size of smallest rigs already in use. Hence the figure of 990 mm was chosen for this class too.

The A Class poses a more difficult problem by virtue of boats ranging more widely in displacement and sail area. An informal poll of competitors at a free sailing and Radio Sailing events at Fleetwood, known as a windy venue and amongst well prepared competitors, indicated smallest luffs of 1610, 1580 and 1400 mm. Other input suggested a light boat in the class could use its No 1 rig (2000+ mm) in 25 knots but the competitor thought a lowest rig of 1390 would be acceptable. Other input from the Australian fleet, generally used to windy conditions, indicated lowest rigs commonly around 1600 mm.

Wishing to avoid the problem of setting a limit so far below the current 'normal' that a new target would be set, a limit of 1390 mm was chosen.

As there is no limit to the number of sails used on a 10R or A Class it is always possible to create narrower sails within the height limit to reduce the windward heeling moment to a degree and the bow burying moment considerably.

Calculations have been made to put these limits into context by determining the limiting wind speed in which each such rig can be used. Comparing the stability of the different classes and the expected heel moments produced by their rigs gave the following approximate figures for limiting wind speeds:

Class	**IOM**	**M**	**10R**	**A**
Main luff	880	990	990	1390
Vt (knots)	37	45	48	37
Vt (km/h)	44	53	57	43

Vt (knots) is the true wind speed measured at 10 metres – the normal standard for quoted wind speeds. Vt (km/h) is the true wind speed in km/hour measured 1 metre off the water surface. The calculations have been calibrated to an event for the A Class where good data from a local weather station was available showing a consistent 30 knots for the day. As can be seen the minimum height rig for M and 10R can be used in winds up to 45 and 48 knots, where 44 knots is Strong Gale Force 9 and 52 knots is Storm Force 10.

Action required for an existing compliant boat	Do not use a mainsail with a luff less than the limit
Additional action required for a new boat	Do not use a mainsail with a luff less than the limit

Carrying and reefing a mainsail

The mainsail (largest sail for the 10R class) is to be carried set and may not be reefed.

The purpose of having a minimum size, of which the mainsail may be the only sail on which sail marks are displayed, would be subverted if it were permitted not to use the mainsail or to reef it.

Action required for an existing compliant boat	Always carry mainsail; do not reef it
Additional action required for a new boat	Always carry mainsail; do not reef it

A Class

General

SCR format
For the first time the class rules are formatted according to the ISAF Standard Class Rules.

Having class rules written to the SCR format is a prerequisite for having and maintaining any IRSA class status. This step is seen as an investment for the future of this class.

Boat/Hull

Measurement trim
The concept of measurement trim has been introduced. The boat is measured when floating in this prescribed state. Instead of requiring the boat to have sails on board for this step a nominal sail weight of 100 grams is used instead. The heaviest headsail luff spar (if used) and headsail boom shall be on board. The mast shall be vertical, rigging shall be slack.

The 1994 class rules require the boat's heaviest sails to be on board when it undergoes initial certification measurement. Under the revised rules, the owner can have his boat measured and then have his sails made to the maximum permitted sizes while remaining fully compliant with the class rules.

Action required for an existing compliant boat	None
Additional action required for a new boat	Boat can be measured before purchase of sails.

Recesses, hollows, projections etc in the deck.
It is made plain that recesses and opening in the deck are permitted for a handle, the mast, access to radio control equipment, and for a deck edge rail.

This change eliminates the need for an interpretation concerning compliance of screw top pots and the like with the rule regulating the round of deck.

Action required for an existing compliant boat	None
Additional action required for a new boat	None

Deck datum point
Under the 1994 class rules the distance of the mast from the forward end of the hull is recorded on the measurement forms and certificate. In the revised rules this distance is taken to a deck datum point on the deck aft of the mast.

The advantage of this is that degradation of the forward end of the boat in collisions is not, and should not be, critical to the compliance of the boat with its certificate. Having the deck datum point aft of the mast ensures this distance is always positive.

Action required for an existing compliant boat	None
Additional action required for a new boat	Provide transverse line across centreplane aft of the mast

Waterline limit marks
In the 1994 class rules there is no requirement for these to be visible when afloat, only that they are 30 mm long. As a confidence-building measure the revised rules state that they shall be long enough to be visible when the boat is afloat.

Action required for an existing compliant boat	None
Additional action required for a new boat	Provide waterline limit marks long enough to be visible when afloat

Quarter beam lengths
There has been no requirement that the measured quarter beam lengths are similar or guidance regarding measurement of a boat that has un-equal half beams. It is known that offsetting a boat with a QBL penalty from the centreline of the measurement jig will result in a reduction of the average QBL and hence an increase in sail area. The opportunity to gain sail area in this way should be limited and so a maximum difference in the measured QBL dimensions is introduced. How to measure a boat with unequal half beams and where the QBLs are not within the permitted maximum difference are issues that can be handled by the issue of Q&As.

Action required for an existing compliant boat	None
Additional action required for a new boat	If difference exceeds permitted figure the measurer adjusts boat's position on measurement jig

Rig

Main boom depth
A datum line is established for the main boom spar. This is used to determine the vertical and transverse cross sections.

Under the 1994 class rules the measurement of the boom cross section was ambiguous. It is possible that, regardless of how the 1994 class rule is interpreted, there will be boats that are non-compliant in this respect.

The method in the revised rules ensures consistency in application of the rules and permits normal boom arrangements to be used on future boats without modification.

Action required for an existing compliant boat	None
Additional action required for a new boat	Check boom design is compliant

B measurement – mainsail luff perpendicular
The mainsail foot, B, is measured as the mainsail luff perpendicular.

In the 1994 class rules where, for example, B is taken when the boom is at any non-90 degree angle to the mast, any change of the mainsail leech length or kicking strap tension may take the actual B measurement beyond the recorded value. An owner cannot be sure he is complying with the class rules when he purchases a new sail which may have a different leech length.

Most classes that restrict the size of the mainsail foot by using a limit mark on the main boom require the B dimension to be measured with the boom at right angles to the mast. It is common to use other angles in radio control boats and so a right angle approach is thought to be unworkable. Instead the revised rules restrict the mainsail luff perpendicular to the B dimension for the boat.

The revised rule eliminates the need for limit marks on the main boom, and in particular the need for two limit marks when a boat uses pocket luff and other luff sails.

Action required for an existing compliant boat	None
Additional action required for a new boat	No limit mark (boom band) required on main boom

No spinnaker or genoa
Spinnakers and genoas are prohibited.

The 1994 class rules permit these features but it is thought no current boats use them. Rather than find that an owner has devised a workable system that gives a performance advantage at some stage in the future thereby precipitating a rule change to prohibit at that point or, alternatively, an arms race for the other owners, it is thought best to prohibit these items now.

Action required for an existing compliant boat	Remove any such device
Additional action required for a new boat	Remove any such device

Sails

Headboard limit zone
A headboard limit zone is established. It is then not important if a headboard is used, or how large the headboard is within that zone, as the dimensions are taken to the perimeter of the zone.

The 1994 class rules requirement to limit the fore and aft position of the sail head with respect to the mast is invariably not complied with and removing this enables compliance with the class rules when setting the sail.

Action required for an existing compliant boat	None
Additional action required for a new boat	None

Mainsail foot roach
Under the 1994 class rules the foot roach is restricted by reference to a line from the lower mast limit mark to the boom limit mark. The sail maker cannot guarantee to make a sail to the maximum size that will comply with the class rules when used. The owner cannot easily comply with this rule when he sets the sail as it is a difficult judgement to make.

The revised rules measure the foot roach relative to a line through the tack point and clew point thus enabling the sail maker to ensure compliance when constructing the sail. Once the sail is compliant the owner cannot easily then set the sail in a non-compliant way.

Action required for an existing compliant boat	None
Additional action required for a new boat	None (assuming sail made to rules)

Luff perpendicular of mainsail to be measured
Whereas the foot length of mainsails is controlled by the 1994 class rules only by the requirement to set the sail inside the boom limit mark, the revised rules measure the luff perpendicular of the mainsail instead. This follows from the removal of the need for the boom limit mark (for the reasons explained above). In order to retain some clear control over the size of sails used on the boat, sails are marked with the smallest B dimension with which they will comply.

In order that existing sails shall comply with the revised class rules they will be permitted to have a luff perpendicular dimension of up to B + 10 mm. This additional length is thought to permit all existing sails to comply with the revised rule.

Action required for an existing compliant boat	None
Additional action required for a new boat	None (assuming sail made to rules)

Headsail half height cross width
Under the 1994 class rules the only measurement taken on a headsail is the mid-leech to mid-luff cross width. To conform to normal practice, this is rationalised to the half-height cross width in the revised rules. From that dimension, the smallest J measurement with which the sail complies is determined.

Action required for an existing compliant boat	None
Additional action required for a new boat	None (assuming sail made to rules)

B and J measurement to be marked on sails
Sails will be marked with the smallest B and J measurements with which they comply. It follows that any sail with a B measurement smaller than or equal to the B measurement permitted by the certificate may be used providing it is set within the limit marks on the mast and complies with the sail marks rules. Similarly for the headsail.

Action required for an existing compliant boat	None
Additional action required for a new boat	None. Measurer task

Events

Event measurement
Under the 1994 class rules a boat only has to weigh within 0.1 kg of the certificated weight and have sails that comply with the class rules to be compliant at an event. In the absence of any better solution proposed by the international owners' association in 1993 this was the chosen method of ensuring that a boat could be guaranteed to comply with its measurement certificate if checked at an event. The problem with this solution is that it appears to open the way for abuse. For example a boat with a draught some 50 mm deeper than permitted appears to comply with the class rules.

The revised class rules contain tolerances for the principle hull dimensions that can be checked at event measurement given some rudimentary equipment used with reasonable care. For example the following can be checked: the distance between the waterline limit marks, the draught to the datum waterplane, and the freeboard to the datum waterplane. The tolerances chosen are such that if a boat has been measured accurately by a competent measurer and it is subsequently checked by an event measurer exercising reasonable care then the boat will be found to be compliant with its certificate.

Where there is access to the same equipment used for certification measurement another set of tolerances is given in the expectation that the measurements can be taken with greater accuracy.

Action required for an existing compliant boat	None
Additional action required for a new boat	None

Non compliance with the certificated dimensions
Where a boat is found not to comply with the tolerances and cannot be brought into those tolerances, it is suggested that the jury should consider allowing the boat to be brought into rating in another configuration.

Currently the RRS allow a boat to correct deviations in excess of tolerances and continue racing. However, if it is impossible to correct the boat, there appears to be no option but to cease racing. Rather than leave a competitor exposed to this possibility the option to allow him to return the boat to another compliant rating is suggested.

Action required for an existing compliant boat	None
Additional action required for a new boat	None

Marblehead Class

Rig

Measured area marked on sails
The measured area of the largest mainsail shall be marked on all mainsails in a sail group. Likewise for headsails. This is a confidence-building measure for other owners that will minimise the risk of a larger than permitted sail are being used.

Action required for an existing compliant boat	None
Additional action required for a new boat	None. Measurer task

Foot roach restriction
As an alternative to a straight or a fair curve foot roach profile, the option is offered to use a foot roach profile that fits within a triangle with 25 mm depth.

Sails already exist that have foot roach shapes that do not comply with the 2002 class rules but which do comply with the revised class rule. It is not good practice to amend class rules to bring non compliant equipment into compliance, but in this case the decision to do this has been aided because construction of booms will be less complex/costly as a result of being able to use commonly available straight tubes.

Action required for an existing compliant boat	None
Additional action required for a new boat	None (assuming sail made to rules)

Certificate values of cross widths
Where the measured cross widths of sails are less than the maximum permitted by the class rules the certificate will show the maximum permitted values rather than the measured values.

The 2002 measurement forms and certificate require the actual cross width of an undersize sail to be recorded on the certificate. Sails made subsequently shall comply with this reduced size. The revised class rule eliminates this effect.

Action required for an existing compliant boat	None
Additional action required for a new boat	None

Ten Rater Class

Hull/boat

Slack rigging when measured
When the waterline endings are checked against the waterline limit marks the rigging shall be slack.

The 2002 class rules do not require this and it is known that waterline length can be shortened considerably by applying large tension to the fore and aft rigging for certification measurement.

Action required for an existing compliant boat	None
Additional action required for a new boat	None

Waterline limit marks on plumb ended boats with a full length waterline
The 2002 class rules make it impossible for waterline limit marks on plumb-ended boats to comply easily with the class rules.

A suitable wording is given that permits plumb ended boats to comply with the class rules regarding placement of the waterline limit marks.

Action required for an existing compliant boat	None
Additional action required for a new boat	None

No restriction on lower displacement
The 2002 class rules place a limit on how far short of the waterline limit marks the waterline endings may fall. This effectively restricts the amount by which the boat may be lighter than when certified. However, although compliance with this rule is no more difficult to check than compliance with the requirement not to exceed the waterline limit marks, it is thought to be a pointless rule.

There will now be no lower limit to displacement or waterline length compared to the certificated dimensions.

Action required for an existing compliant boat	None
Additional action required for a new boat	None

Weight of boat
The weight of the boat will be recorded at certification measurement. At an event the weight shall be no more than this figure plus a tolerance.

This allows some simple event measurement that will give a good indication of whether a boat is likely to comply with the waterline limit mark rules. It also makes it easier for the owner to maintain his boat and be confident that it remains in compliance.

Action required for an existing compliant boat	None
Additional action required for a new boat	None. Measurer task

Sails

Measured area marked on sails
The measured area of the largest mainsail shall be marked on all mainsails. Likewise for headsails. This will minimise the risk of a larger than permitted sail are being used and is a confidence-building measure that will reassure other competitors that the rules are being complied with.

Action required for an existing compliant boat	None
Additional action required for a new boat	None. Measurer task

Measured sail area - method
There are some refinements to the way in which sails are measured. The principle change is that a line through the head and tack of a sail shall be perpendicular to the grid lines with the clew point placed on a grid line. Cross widths (horizontal) are taken at 200 mm spacing above the clew point and depths (vertical) are taken at 50 mm spacing below the clew point.

Several benefits arise from this change:

- The approximate luff, leech and foot dimensions can be determined from the measured data and will be quoted on the certificate as an aid to sail makers and equipment inspectors at events.
- The luff, leech and foot dimensions can be quickly checked at event measurement as a rough guide to a sail's compliance.
- The requirement for smaller, alternative, sails to fit within the profile of the largest will become redundant although the effect is retained.
- It becomes possible for replacement and alternative smaller sails to be measured and found to be complaint without reference to the sails that were checked at the boat's initial certification measurement.

Action required for an existing compliant boat	None
Additional action required for a new boat	None

Sail luff length
The 2002 class rules do not restrict the height of the tallest rig in any way.

It is thought useful to limit the luff length of the tallest sail to 2200 mm for the following reasons:

- Equalises performance of boats in low wind speeds and helps ensure competitors are not aggrieved when racing is postponed/abandoned because the wind is too light.
- Makes it easier for owners to plan their expenditure on rigs.
- Ensures those travelling by plane to any event are not unduly penalised compared to those travelling by road because of maximum length restrictions on outsize baggage.
- It is a similar restriction to that used in the M Class.
- Should an event be planned for a renowned light airs venue, competitors will be able to make a sensible choice regarding design of rig and/or boat that can be expected to be competitive.

It is thought useful to set a minimum luff length of the tallest sail to 1990 mm. This serves to focus the height of the largest measured rig on boats to the range 1990 – 2200 mm. As this is the range used by existing boats, almost exclusively as far as we can tell, it is not thought to be contentious. Given the permission for multiple certificates, some owners may consider having a special low No 1 rig and a special high No 1. Having a special high No 1 rig probably involves reducing the width of the lower, reduced area rigs already owned, and would thus be highly unlikely. However, having a special low No 1 rig presents no such problems, and so to limit any gain offered by this possibility the minimum luff length is set.

Action required for an existing compliant boat	None
Additional action required for a new boat	None (assuming sail made to rules)

end