2011 MACKINAC SAFETY REGULATIONS

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Mackinac Safety Regulations ("MSR")
MULTIHULL

January 24,2011

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MULTIHULL
Release 1

(January 24, 2011)

General Requirements

1. *Purpose of MSR* -- MSR - Multihull establishes uniform minimum equipment, accommodation and training standards for multihull boats racing offshore. The MSR do not replace, but rather supplement, the requirements of governmental authority, the Racing Rules of Sailing (RRS), the rules of Class Associations and all applicable rating rules.

2. *Responsibility of Person-In-Charge* -- The safety of a boat and her crew is the sole and inescapable responsibility of the Person-In-Charge. The Person-In-Charge shall do his or her best to ensure that the boat is fully found, thoroughly seaworthy and manned by an experienced crew who have undergone appropriate training and are physically fit to face bad weather. The Person-In-Charge must be satisfied as to the soundness of hull, spars, rigging, sails and gear. The Person-In-Charge must ensure that all safety equipment is properly maintained and stowed and that the crew knows where it is kept and how it is to be used. Neither the MSR, their use in connection with the Chicago Yacht Club (CYC) Race to Mackinac or the Bayview Yacht Club's Bayview Mackinac Race (the Races), nor any inspection under these MSR in any way limits or reduces the complete and unlimited responsibility of the Person-In-Charge.

3. *Crew eligibility* – Minimum Crew for a multihull is three. At least 50% of the crew must have completed two prior races or two documented non-stop passages under sail, on a multihull of a minimum of one hundred (100) nautical miles and twenty-four (24) hour minimum duration.

4. *Boat Eligibility* - Multihulls shall meet each of the following conditions:

    1) Be a minimum of 24 feet *LOA*
    2) Have a *LOA* to *BOC* ratio (*LOA/BOC*) of 2.30 or less for catamarans or 3.30 or less for trimarans.

    Boats failing to meet condition 2) above may apply for entry conditioned on:

    A) Having a proven self-righting system allowing the crew to right the boat when capsized, without outside assistance. Any such system must be demonstrated to successfully function in at least 25 knots of wind; or

    B) Having a luff to BOC ratio (Luff/BOC) of 3.2 or less for catamarans or 4.0 or less for trimarans.

    Notwithstanding these exceptions (A and B above), all entries are subject to review and acceptance or rejection by the organizing authority

Boat Eligibility Definitions:

LOA – length overall of the longest hull, excluding equipment (bow sprit, outboard engine, etc).

BOC – Beam on Centerline:

1) for a catamaran, the perpendicular distance from the centerline of one hull to the centerline of the other hull, measured at deck level.
2) for a trimaran, the perpendicular distance between the centerline of the main hull and the centerline of either ama, measured at deck level.

The centerline for 1) and 2) above shall be shall be established at the mid-point between the sides of the hull, excluding hull flares or extensions.

Luff – the luff of the mainsail measured as the distance between two points along a line parallel to the sail luff from which lines drawn at 90 degrees intersect the highest point on the head and the lowest point on the foot respectively.

5. *Functions and maintenance of equipment* -- All equipment required by the MSR shall function properly, be regularly checked, cleaned and serviced, be readily accessible, and be of a type, size and capacity suitable and adequate for the intended use and size of the boat.

6. *Heavy Items* -- Ballast, ballast tanks and associated equipment shall be permanently installed. Heavy movable items including e.g. batteries, stoves, gas bottles, toolboxes and anchors and chain shall be permanently installed or securely fastened, as appropriate.

Structural Features and Fixed Equipment

7. *Strength of Build* -- Boats shall be strongly built, watertight and, particularly with regard to hulls, decks and cabin trunks capable of withstanding solid water and knockdowns. They must be properly rigged, be fully seaworthy, be built to resist capsize, and must meet the standards set forth in these MSR.

8. *Stability and Flotation* – Adequate watertight bulkheads and compartments which may include permanently installed floatation material in each hull shall be provided to ensure that a multihull is effectively unsinkable and capable of floating in a stable position with at least half the length of one hull flooded.

9. *Shrouds* -- A boat's shrouds shall never be disconnected while racing.

10. *Hulls* -- A hull, including decks, coach roofs, windows, hatches and all other parts, shall form an integral, essentially watertight unit and any openings in it shall be capable of being immediately secured to maintain this integrity.

11. *Centerboard/Daggerboard Trunks* -- Centerboard 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 boat floating level in normal trim.

12. *Exits* – Each hull with accommodation shall have at least two exits. At least one exit shall be located forward of the foremost mast except where structural features prevent its installation in this location.

13. *Inverted Escape* – Multihulls shall have either:

    1. an escape hatch for access to and from each hull with accommodation in the event of an inversion or,
    2. appropriate tools for cutting an escape opening stowed securely in a location accessible from outside of the boat in the event of a capsize.

14. *Calamity Pack* – Multihulls shall have either in a pack or compartment accessible from outside of the boat when inverted the following items:

    1. pyrotechnic signals per MSR 67,
    2. a handheld VHF marine transceiver, in addition to that required by MSR 41,
    3. a handheld Global Positioning System (GPS) in a waterproof container, this is in addition to MSR 38,
    4. a waterproof flashlight,
    5. cutting tools if required per MSR 13,
    6. an EPIRB per MSR 61 if carried.

15. *Sea Cocks and Valves* -- Sea cocks or valves shall be permanently installed on all through-hull openings below the boat's loaded length of the waterline (LWL) except integral deck scuppers, speed indicators, depth finders, and the like; however a means of closing such openings shall be provided.

16. *Bow Pulpits* – A trimaran shall have a bow pulpit forward of the headstay on the main hull with lifelines supported on stanchions. The lifelines may be interrupted where there are nets or crossbeam wings outboard of the main hull. Bow pulpits may be open to allow access to a spinnaker pole or a bowsprit.

17. *Stern Pulpits* -- Boats shall have a stern pulpit, or lifelines arranged as an adequate substitute. Boats with a cabin structure aft of the aftermost cockpit are exempt from this requirement.

18. *Lifelines/Jackstays* -- All crew working areas shall be protected by lifelines or jackstays and safety harness attachment points. Jackstays may be substituted for lifelines or pulpits.

19. *Nets and Trampolines* – Nets and trampolines shall be:

    1. essentially horizontal,
    2. made from durable woven webbing, water permeable fabric or mesh with openings not larger than 2 inches in any dimension. Attachment points shall be planned to avoid chafe. The junction between a net and a yacht shall present no risk of foot trapping,
    3. solidly fixed at regular intervals on transverse and longitudinal support lines and shall be fine stitched to a bolt rope,
    4. able to carry the full weight of the crew either in normal working conditions at sea or in case of capsize, when the yacht is inverted.

    It is recommended that lines used to tie the nets should be individually tied and not continuously connected to more than four attachment points per connecting line.

Trimarans with double crossbeams shall have nets on each side covering:

1. the rectangles formed by the crossbeams, central hull and outriggers,
2. the triangles formed by the aft end of the central pulpit, the mid-point of each forward crossbeam, and the intersection of the crossbeam and the central hull,
3. the triangles formed by the aftermost part of the cockpit or steering position whichever is furthest aft, the midpoint of each after crossbeam, and the intersection of the crossbeam and the central hull, except when cockpit coamings and/or lifelines are present that adequately protect this area.

Trimarans with single crossbeams shall have nets between the central hull and each outrigger on each side between two straight lines from the intersection of the crossbeam and the outrigger, respectively to the aft end of the pulpit on the central hull, and to the aftermost point of the cockpit or steering position on the central hull whichever is furthest aft.

Catamarans: on a catamaran the total net surface area shall be limited:

1. laterally by the hulls,
2. longitudinally by transverse stations through the forestay base and the aftermost part of the boom lying fore and aft. However, a catamaran with a central nacelle (non-immersed) may satisfy the rules for a trimaran.

20. *Toilet* – Boats shall have a permanently installed toilet, or a portable toilet, properly secured.

21. *Bunks* – Boats shall have bunks, permanently installed.

22. *Cooking Facilities* -- Boats shall have a cooking stove permanently installed or securely fastened with safe accessible fuel shutoff control capable of being safely operated in a seaway.

23. *Hand Holds* – Boats shall have adequate hand holds shall be fitted below deck so that crew members may move about safely at sea.

24. *Bilge Pumps* – Boats shall have a portable or permanently installed bilge pump or pumps capable of pumping out all compartments in all hulls. Bilge pumps shall not be connected to cockpit drains unless the combined system has sufficient capacity to handle the maximum combined volume. Bilge pumps may not discharge into a cockpit unless that cockpit opens aft to the sea.

25. *Permanently Installed Compass* -- Boats shall have a permanently installed marine magnetic compass.

26. *Halyards* -- No mast shall have less than two halyards, each capable of hoisting a sail.

27. *Boom Support* -- Boats shall have some means to prevent the boom from dropping independent of the mainsail or the main halyard. Topping lifts or supporting vangs are acceptable for this purpose.

28. *Navigation Lights* -- Boats shall carry navigation lights that are permanently installed, such that they will not be masked by sails or the heeling of the boat.

29. *Reserve Navigation Lights* -- Boats must carry reserve navigation lights with a power and/or wiring system separate from that used for the Navigation Lights required by MSR 28. Boats may, in order to satisfy this requirement, carry portable battery powered navigation lights with sufficient luminosity for the conditions of the race.

30. *Spare Bulbs for Navigation Lights* -- Boats shall carry spare bulbs for navigation lights. However, spares are not required for LED navigation lights.

31. *Display of Navigation Lights* -- Boats shall display navigation lights between sunset and sunrise, and at any other time deemed appropriate by the Person in Charge.

32. *Propulsion Engine and Fuel Tanks* -- A propulsion engine shall be provided, capable of powering the boat at a speed in knots equal to the square root of its LWL in feet. Such engines shall be either:

    1. a securely covered inboard engine together with permanently installed exhaust and fuel supply systems and fuel tanks; or
    2. an outboard engine with associated tanks and fuel supply systems, all securely fastened. The outboard must be ready for immediate use as a source of propulsion.

33. *Boat Batteries* -- When an electric starter is the only method for starting the engine, boats shall carry a separate battery, the primary purpose of which is starting the engine.

34. *Engine Fuel* -- Boats shall, at a minimum, carry fuel sufficient to motor at a speed of five (5) knots for ten (10) hours. Fuel tanks must be provided with shutoff valves or in the case of a portable fuel tank, a quick disconnect of the fuel line.

35. *Permanently Installed Marine Radio Transceiver* -- Boats shall carry a permanently installed VHF marine radio transceiver, which shall have a rated output power of twenty-five (25) watts And shall be connected to the masthead antenna referenced in MSR 36

36. *Masthead Antenna* -- Boats shall have a functional masthead antenna, with co-axial feeder cable with not more than 40% power loss.

37. *Emergency Antenna* -- Boats shall carry an emergency antenna that does not depend on the mast.

38. *Global Positioning System* (GPS) -- Boats shall carry a permanently installed or portable GPS.

Portable Equipment and Supplies for the Boat

39. *Reflective Sailboard* -- Boats shall carry a reflective sailboard displaying its sail number. The sailboard shall be constructed to be displayed easily as prescribed by the Sailing Instructions. Each character shall be at least ten (10) inches high and made of contrasting marine-grade reflective material mounted on a black background.

40. *Buckets* -- Boats shall have two (2) buckets of stout construction, each with at least two (2) gallons (US) capacity. Each bucket shall have a lanyard.

41. *Portable Marine Radio Transceiver* -- In addition to the permanently installed radio transceiver required under MSR 35, boats shall carry a hand-held watertight VHF marine transceiver, or a hand-held VHF marine transceiver with a waterproof cover. This is in addition to the handheld VHF transceiver required by MSR 14.

42. *Cellular Phone* -- Boats shall carry a working cellular telephone, and shall provide the cellular number to the Race Committee on the entry form.

43. *Soft Wood Plugs* – Boats shall carry soft wood plugs, tapered and of the appropriate size, to be stowed or attached adjacent to the appropriate fitting for every through-hull opening.

44. *Jackstays* -- Boats shall be fitted with jackstays attached to through-bolted or welded deck plates or other suitable and strong anchorage fitted on deck, port and starboard of the boat's center line to provide secure attachments for safety harnesses/tethers. Stainless steel 1x19 wire, webbing or composite line with a minimum breaking strength of 4,500 lbf (foot pounds) is recommended.

45. *Fire Extinguishers* -- Boats shall carry at least two (2) operable fire extinguishers, readily accessible in different parts of the boat.

46. *Anchors* -- Boats shall carry at least two (2) anchors attached to a suitable combination of chain and rope, assembled and ready for immediate use.

47. *High-Powered Flashlight or Searchlight* -- Boats shall carry a watertight, high-powered flashlight or searchlight.

48. *Flashlights* -- In addition to the flashlight or searchlight required by MSR 47, boats shall carry at least two (2) watertight flashlights.

49. *First Aid Kit* -- Boats shall carry a first aid kit suitable for the likely conditions of the passage and the number of crew aboard.

50. *First Aid Manual* -- Boats shall carry a suitable first aid manual.

51. *Foghorn* -- Boats shall carry a foghorn.

52. *Radar reflector* -- Boats shall carry a radar reflector, functioning independent of any power source.

53. *Charts* -- Navigational charts, not solely electronic, must be provided as follows:

    a. *Chicago Yacht Club Race to Mackinac* -- Boats must carry the non-electronic editions of U.S. Chart #14901 - Lake Michigan and either Chart #14880 (Straits of Mackinac) or #14881 Mackinac Island and surrounding area) or their paper equivalents.

    b. *Bayview Mackinac Race* -- Boats must carry the non-electronic editions of U.S. Chart 14860, U.S. Chart 14864 and either U.S. Chart 14880 or U.S. Chart 14881or their paper equivalents.

54. *Safety Equipment Location Diagram* -- A durable waterproof diagram locating the principal items of safety equipment shall be provided and displayed in the main accommodation area where it can best be seen.

55. *Depth Sounder* -- Boats shall carry a depth sounder capable of sounding depths up to one hundred (100) feet.

56. *Spare Tiller* -- Boats shall carry an emergency tiller, capable of being fitted to the rudder stock. Boats using an unbreakable metal tiller are exempt from this requirement. Boats with two interchangeable tillers attached to a common rudder system are exempt from this requirement.

57. *Emergency Steering Methods* -- Crews must be aware of alternative methods of steering the boat in any sea condition in the event of rudder loss. At lease one method must have been proven to work on board the boat. An inspector may require that this method be demonstrated.

58. *Tools and spare parts* -- Boats shall carry appropriate tools and spare parts, including effective means to quickly disconnect or sever the standing rigging from the hull.

59. *Boat's Name* -- Each boat's name shall be on buoyant safety equipment.

60. *Retro-Reflective Material* -- Marine-grade retro-reflective material shall be fitted to buoyant safety equipment.

61. *EPIRBs* – Any EPIRB that is required to be carried per these regulations shall be a 406 MHz EPIRB that is **either:**

    1. connected to a continuously functioning *external* GPS **or,**
    2. fitted with an *internal* GPS.

    The EPIRB shall be properly registered with the appropriate authority and should be tested in accordance with the manufacturer's instructions when first commissioned and then at least annually. **Notwithstanding any other requirements in these regulations, EPIRBS are strongly recommended for all boats**

62. *Liferaft(s)* -- Any liferaft required to be carried per these regulations shall be in full compliance with **APPENDIX A – LIFE RAFT MINIMUM SPECIFICATIONS attached hereto**

63. *Anti-Exposure Suits* - shall meet all the following minimum requirements:

    1. minimum inherent buoyancy of 22 lbs.,
    2. minimum immersed CLO value of .40,
    3. suits must be a full body suit of one piece construction,
    4. one suit must be carried for each crew member on board,
    5. each suit must be equipped with a personal strobe light,
    6. each suit must be equipped with a whistle,
    7. diver's wet suits and/or dry suits are not allowed.

The following suits are known to meet the requirements specified in items 1, 2, and 3 and 7 above:

Mustang Models: MS2176, MS2700
MS2175, MS2075
MS2076, MS2195

Guy Cotton TPS

64. a) ***For the Bayview Mackinac Race*** – Boats sailing the Cove Island Course only shall have a liferaft(s) meeting the requirements of MSR 62 shall be provided capable of carrying the entire crew, or Anti-exposure Suits meeting the requirements of MSR 63 shall be provided for the entire crew.

    b) ***For the Chicago Yacht Club Race to Mackinac*** -- Liferaft(s) meeting the requirements of MSR 62 shall be provided capable of carrying the entire crew, or Anti-exposure Suits meeting the requirements of MSR 63 shall be provided for the entire crew. Boats carrying an EPIRB meeting the requirements of MSR 61 are not required to carry Liferafts or Anti-exposure suits.

    EPIRBS and Liferafts or Anti-exposure suits are strongly recommended for all boats.

65. *Lifesling* -- Boats shall carry a Lifesling® ready for instant use. Lifeslings inflated with compressed gas should be tested and serviced at intervals in accordance with its manufacturer's instructions.

66. *Man Overboard Pole* -- Boats shall carry within reach of the helmsman and ready for instant use a man overboard pole and flag with a lifebuoy, a self igniting light, a whistle and a drogue attached. A boat may carry a self inflating MOB module to satisfy this requirement. Self – inflating MOB modules should be tested and serviced in accordance with its manufacturer's specifications.

67. *Pyrotechnic Signals* -- Pyrotechnic signals shall be provided conforming to Safety of Life At Sea (SOLAS) LSA Code Chapter III - Visual Signals and not older than the stamped expiry date. At a minimum, each boat shall carry:

    1. 4 red parachute flares, and
    2. 4 red hand flares

    Flares shall be stored in a readily accessible location, such that they can be located and fired within sixty (60) seconds. Flares stored inside of liferafts may not be used to satisfy this requirement.

68. *Heaving Line* -- Boats shall carry a heaving line, at least 1/4 inch in diameter and at least fifty (50) feet in length, readily accessible to the cockpit.

69. *Cockpit Knife* -- A strong, sharp knife, sheathed and securely restrained shall be provided readily accessible from the deck or cockpit.

70. *Storm Jib* -- Boats shall carry a storm jib of area not greater than 5% height of the foretriangle squared, with luff maximum length 65% height of the foretriangle. This sail shall have means to attach the luff to the stay independent of any luff-groove device. Boats shall have sheeting positions on the deck for this sail.

71. *Mainsail Reefing Equipment* -- Boats shall have mainsail reefing equipment that will allow the luff of the mainsail to be reduced by 25%.

Personal Equipment

72. *Personal Flotation Devices (PFDs)* -- Each crew member 16 years of age or older shall have **either**:

    1. a Type 1 U.S. Coast Guard approved PFD **or**,

    2. an inflatable PFD having at least thirty-two (32) pounds buoyancy and designed to securely suspend an unconscious person face upwards at approximately 45 degrees to the water surface. All inflatable PFDs shall have a compressed gas inflation system. Inflatable PFDs need not have a water-activated auto-inflate system in order to satisfy this requirement. Belt pack PFDs with rip cord inflation providing at least thirty-two (32) pounds of buoyancy may be used to satisfy this requirement.

    Each crew member under 16 years of age shall have a U.S. Coast Guard approved PFD appropriate for the crew member's age and weight and suitable for offshore sailing conditions, as determined by the Person-In-Charge.

73. *PFD Equipment* -- Each PFD must be equipped with a whistle, a waterproof light, be fitted with marine-grade retro-reflective material, be clearly marked with the boat's or wearer's name, and be compatible with the wearer's safety harness. If the PFD is inflatable, it must be regularly checked for air retention.

74. *Wearing of PFDs* -- Each crew member shall wear PFDs complying with MSR 72 and MSR 73:

    1. while on deck between sunset and sunrise; and
    2. at all other times, unless the Person-In-Charge directs they be put aside.

    The U.S. Sailing prescription requiring that all crew members wear their PFDs while starting and finishing is waived.

    The wearing of an Anti-Exposure Suit as defined in MSR 64 satisfies the requirements of MSR 74 1, and 2, above but does not replace the requirement for each crew member to also have a PFD available as defined in MSR 72 and 73.

75. *Safety Harnesses and Tethers* -- Each crew member shall have a harness, and a safety line (tether) not more than 7 feet long with a snap hook at each end.

Training

76. *Annual Man Overboard Practice* -- Man-overboard procedures appropriate for the boat's size and speed shall be practiced aboard the boat at least annually. At least two-thirds of all crew members racing on the boat during the Race must participate in this practice. A Crew Overboard Drill Certificate of such practice shall be signed by participating crew members and kept aboard the boat:

    http://www.cycracetomackinac.com/pdf/2011_crew_overboard_form.pdf

    http://www.bycmack.com/mack/pdf/2011_crew_overboard_form.pdf

    Practice of the "Quick Stop" man-overboard procedure is strongly recommended.

APPENDIX A
LIFE RAFT MINIMUM SPECIFICATIONS

1.0 General design

Liferaft(s) capable of carrying the whole crew shall meet the following minimum requirements:

a) Liferaft(s) shall be stowed either in a valise on the working deck or below deck adjacent to the companionway and each raft shall be capable of being got to the lifelines or launched within 15 seconds..

b) Must be designed and used solely for saving life at sea

c) The liferaft shall be so constructed that, when fully inflated and floating with the cover uppermost, it shall be stable in a seaway

d) A canopy is not required.

e) The liferaft shall be fitted with a painter line and shall have a lifeline becketed round the outside. A lifeline shall also be fitted round the inside of the liferaft

f) The liferaft shall be capable of being readily righted by one person if it inflates in an inverted position

g) The liferaft shall be fitted at each opening with efficient means to enable persons in the water to climb on board

h) The liferaft shall be contained in a valise or other container so constructed as to be capable of withstanding hard wear under conditions met with at sea. The liferaft in its valise or other container shall be inherently buoyant

i) The buoyancy of the liferaft shall be so arranged as to achieve a division into an even number of separate compartments, half of which shall be capable of supporting out of the water the number of persons which the liferaft is fit to accommodate, without reducing the total supporting area.

The Race Committee will permit the use of liferafts that met the requirements applicable before the 1999 Bayview Mackinac Race. Therefore, Subsection (i) above is modified by deleting the phrase "without reducing the total supporting area" to permit the use of this style liferaft. Competitors should note that ALL liferafts, including this style of liferaft, must satisfy the other requirements of this Appendix -– A.

j) The number of persons which an inflatable liferaft shall be permitted to accommodate shall be equal to:

i the greatest whole number obtained by dividing by .096 the volume, measured in cubic metres of the main buoyancy tubes (which for this purpose shall include neither the arches nor the thwarts if fitted) when inflated, or

ii the greatest whole number obtained by dividing by 3720 the area measured in square centimetres of the floor (which for this purpose may include the thwart or thwarts if fitted) of the liferaft when inflated whichever number shall the less

k) The floor of the liferaft shall be waterproof and is strongly recommended to be capable of being sufficiently insulated against the cold either:-

i by means of one or more compartments which the occupants can inflate if they so desire, or which inflate automatically and can be deflated and re-inflated by the occupants; or

ii by other equally efficient means not dependent on inflation

l) Servicing and/or inspection certificates or copies shall be kept on board the yacht.

m) Each liferaft shall have a valid inspection certificate of new or serviced status from the liferaft manufacturer or the manufacturer's approved service station dated on or after August 1, 2009, or August 1, 2008 for liferafts that have been used exclusively in freshwater.

Notwithstanding the specified servicing periods it is strongly recommended that a liferaft should be carefully inspected externally at least annually and taken for servicing if there is any sign of damage or deterioration.

2.0 Equipment

It is recommended, but not required, that the following equipment be securely attached to each liferaft: Sea anchor or drogue, bellows pump or other means of maintaining inflation of air chambers, strobe signaling light, waterproof handheld VHF transceiver, heaving line, bailer, raft repair kit, two paddles and first aid kit.

In addition, the liferaft shall be inflated by a gas that is not injurious to the occupants, and the inflation shall take place simultaneously either on the pulling of a line or by some other equally simple and efficient method.

3.0 Marking of liferafts

3.1 Each liferaft shall be clearly marked with the yacht's name or sail number of identification code on:-

a) the valise or container

b) the certificate

3.2 Numbers and letters on the liferaft should be as large as possible and in a strongly contrasting color. Marine grade retro-reflective material shall be appropriately fitted to every raft.

***NOTE:* Competitors should note that the above liferafts requirements are the minimum specifications for the Chicago Yacht Club Race to Mackinac and the Bayview Mackinac Race. Competitors are encouraged to use, purchase or rent liferafts as specified by the current ISAF Offshore Special Regulations for Category 2 races.**