

2021 BAYVIEW MACKINAC RACE

Saturday, July 24, 2021

The World's Longest Continuously Run Long Distance Freshwater Yacht Race

Safety Equipment Requirements (SER)

MONOHULL

1. General Requirements

- 1.1 **Purpose** - The SER establish uniform minimum equipment, accommodation and training standards for boats racing in the 2021 Bayview Mackinac Race (the "Race"). The SER do not replace, but rather supplement, the requirements of governmental authorities, the Racing Rules of Sailing (RRS), the rules of Class Associations and all applicable rating rules. Canadian boats operating temporarily in waters subject to U.S. jurisdiction, shall at all times be in compliance with Canadian laws and regulations governing recreational boats operating in waters subject to Canadian jurisdiction.
- 1.2 **Responsibility of Person-In-Charge** - The safety of a boat and her crew is the sole and inescapable responsibility of the "Person-In-Charge", as per RRS 46, who shall ensure that the boat is seaworthy and manned by an experienced crew with sufficient ability and experience to face bad weather. The Person-In-Charge shall be satisfied as to the soundness of hull, spars, rigging, sails, and all gear. The Person-In-Charge shall ensure that all safety equipment is at all times properly maintained and safely stowed, and that the crew knows where it is kept and how it is to be used.
 - 1.2.1 Should there be an incident during a race the Organizing Authority or US Sailing may conduct an investigation to determine the facts of the incident and provide recommendations. By participating in a race conducted under the SER, the person in charge, each competitor and boat owner agrees to reasonably cooperate with the organizing authority and US Sailing in the development of an independent incident report.
- 1.3 **Inspections** - A boat may be inspected at any time by an inspector or measurer of the Organizing Authority. If she does not comply with these regulations her entry may be rejected or she will be subject to a protest filed by the Race Committee (RC). A violation of the Safety Equipment Requirements may result in a penalty other than disqualification.
- 1.4 **Equipment and Knowledge** - All equipment required by the SER shall function properly, be regularly checked, cleaned and serviced, and be of a type, size and capacity suitable and for the intended use and size of the boat and the size of the crew, who will have practiced with the use of equipment. This equipment shall be readily accessible while underway and, when not in use, stored in such a way that deterioration is minimized.
- 1.5 **Secure Storage** - A boat's heavy items such as batteries, stoves, toolboxes, anchors, chain and internal ballast shall be secured.
- 1.6 **Strength of Build** - A boat shall be strongly built, watertight and, particularly with regard to

hulls, decks and cabin trunks, capable of withstanding solid water and knockdowns. A boat shall be properly rigged and ballasted, be fully seaworthy, built to resist capsize and shall meet the standards set forth herein. A boat's shrouds and at least one forestay shall remain attached at all times.

- 1.7 Watertight Integrity** - A boat's hull, including deck, coach roof, windows, hatches and all other parts, shall form an integral watertight unit and any openings in it shall be capable of being immediately secured to maintain this integrity.

2. Hull and Structure Requirements

2.1 Hull Openings, Cockpit and Through-hull Fittings

- 2.1.1 Companionways**-A boat's companionway(s) shall be capable of being blocked off to main deck level (sheerline). The method of blocking should be solid, watertight and rigidly secured, if not permanent.
- 2.1.2 Hatch Boards** - A boat's hatch boards, whether or not in position in the hatchway, shall be secured in a way that prevents their being lost overboard.
- 2.1.3 Cockpit Construction** - A boat's entire cockpit shall be solid, watertight, strongly fastened and/or sealed. Weather-tight seat hatches are acceptable only if capable of being secured when closed.
- 2.1.4 Cockpit Drains** - A boat's cockpit drains shall be capable of draining six inches of water in 5 minutes. One square inch (645mm²) of effective drain per eight square feet (0.743m²) of cockpit sole will meet this requirement.
- 2.1.5 Cockpit Dimensions** - A boat's maximum cockpit volume for cockpits not open to the sea, including any compartments capable of flooding, to lowest points of coaming over which water can adequately escape, shall not exceed 0.08 x LOA x Max. Beam x Freeboard aft. The cockpit sole shall be at least 0.02 x L above LWL.
- 2.1.6 Through-hull Fittings** - A boat's through-hull openings below the waterline shall be equipped with sea cocks or valves, except for integral deck scuppers, speed transducers, depth finder transducers and the like; however, a means of closing such openings shall be provided.
- 2.1.7 Centerboard/Dagger-board Trunks** - Centerboard and dagger-board 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 when floating level in normal trim.
- 2.1.8 Canting Keel** - A canting keel pivot shall be completely contained within a watertight enclosure, which shall comply with section 2.1.7 above herein. Access points in the watertight enclosure for control and actuation systems or any other purpose shall comply with section 1.7 above herein.
- 2.1.9 Movable Ballast** - Movable ballast systems shall be fitted with a manual control and secondary actuation system, which shall be capable of controlling the full sailing load of the keel in the event of a failure of the primary system. Such failures may include electrical and hydraulic failure and mechanical failure of the components and the structure to which it mounts. The system must be quickly operated, and shall be operated at any angle of heel. It would be desirable if this system was capable of securing the keel on the centerline.

2.2 Stability

- 2.2.1 When evaluating your vessels ability to safely participate in the race, we highly recommend that you consider US Sailing's recommendation of a stability index of 103 or higher for coastal races.
- 2.2.2 A boat with a movable or variable ballast (water or canting keel) shall comply with the requirements of Appendix K of the U.S. Sailing Safety Equipment Requirements and have a knockdown recovery factor greater than or equal to 0.8.

2.3 Accommodations

- 2.3.1 **Marine Sanitation Device (MSDs)** - A boat shall be equipped with a MSD permanently installed or, properly secured. Michigan law and Canadian law prohibits discharge of sewage, treated or untreated, into the fresh waters of the Great Lakes. All installed MSDs shall be U.S. Coast Guard certified or Canadian Coast Guard certified (for boats registered in Canada) and working properly. The "Y" valve must be secured so that waste cannot be discharged into the water.
- 2.3.2 **Bunks** - A boat shall have bunks sufficient to accommodate the off-watch crew.
- 2.3.3 **Cooking Facilities** - A boat shall have a stove with a fuel shutoff.
- 2.3.4 **Hand Holds** - A boat shall have adequate hand holds below decks.

2.4 Lifelines

- 2.4.1 **Lifeline Enclosure** - A boat's deck including the headstay shall be surrounded by a suitably strong enclosure, typically consisting of lifelines and pulpits, meeting the requirements in 2.4.2 to 2.4.5 and 2.5.
 - 2.4.2 **Stanchions and Pulpits** - A boat's stanchion and pulpit bases shall be within the working deck. Stanchions used with HMPE (High-Molecular-Weight Polyethylene) shall have rounded openings to reduce chafe. **NOTE: HMPE may not be allowed after 1/1/2022.**
 - 2.4.3 **Bow Pulpits** - Bow pulpits may be open, but the opening between the vertical portion of stanchion pulpit and any part of the boat shall not exceed 14.2" (360mm).
 - 2.4.4 **Lifeline Material** - Lifelines may be either stainless steel wire or HMPE line with spliced terminations or terminals specifically intended for the purpose. A multipart-lashing segment not to exceed 4" per end termination for the purpose of attaching lifelines to pulpits is allowed. Lifelines shall be taut. When HMPE is used, the load-bearing portion (core) shall meet or exceed minimum diameter requirements. **NOTE: HMPE may not be allowed after 1/1/2022.**
 - 2.4.4.1 - **Lifeline Deflection** - Lifeline deflection shall not exceed the following: a) when a deflecting force of 9 lbs. (40N) is applied to a lifeline midway between supports of an upper or single lifeline, the lifeline shall not deflect more than 2" (51mm). This measurement shall be taken at the widest span between supports that are aft of the mast. B) When a deflecting force of 9 lbs. (40N) is applied midway between supports of an intermediate lifeline of all spans that are aft of the mast, deflection shall not exceed 5" (120mm) from a straight line between the stanchions.
 - 2.4.5 **Stanchion Spacing** - The maximum spacing between the bases of lifeline supports (e.g. stanchions and pulpits) shall be 87"(2.2m).
- 2.5 **Toe Rails**-Toe rails shall be fitted around the foredeck from the base of the mast with a minimum height of 3/4" (18mm) for boats under 30' (9.14M) and 1" (25mm) for boats over 30'. An additional installed lifeline that is 1-2" (25-51mm) above the deck will satisfy this requirement for boats without toe rails.
- 2.6 **Specific Requirements For Boats Less Than 30'** - It is required that boats less than 30 feet (9.14m) shall meet the requirements of 2.4.1 through 2.5 above and:

- (a) Shall have at least one lifeline with 18" (457mm) minimum height above deck, and a maximum vertical gap of 18" (457mm). Taller heights will require a second lifeline. The minimum diameter shall be 1/8" (3mm); or
 - (b) If not meeting the requirements of 2.4.1 through 2.5 above herein, each crew member shall wear a safety harness and tether complying with section 3.1.3 below herein at all times while not in cabin, which tether shall be attached to strong point on boat.
- 2.7 Specific Requirements for boats 30' and over** – Boats 30' (9.14m) and over shall meet the requirements of 2.4.1 through 2.4.5 and 2.5 above herein and:
- (a) Have at least two lifelines with 24" (762mm) minimum height above deck, and a maximum vertical gap of 15" (381mm). The minimum diameter will be 5/32" (4mm) for boats to 43' (13.1m) and 3/16" (5mm) for boats over 43' (13.1m).
- 2.8 Dewatering Pumps** -A boat shall have a permanently installed manual bilge pump of at least 10 GPM (37.8 liter per minute) capacity which is operable from on deck with the cabin closed with the discharge not dependent on an open hatch. Unless permanently attached to the pump, the bilge pump handle shall be securely attached to the boat in its vicinity via a lanyard or catch. A bilge pump discharge shall not be connected to a cockpit drain. The bilge pump shall not discharge into a cockpit unless that cockpit opens aft to the sea.
- 2.9 Mast and Rigging** - A boat shall have the heel of a keel-stepped mast securely fastened to the mast step or adjoining structure.
- 2.10 Mechanical** - A boat shall have a mechanical propulsion system that is permanently installed or mounted in an immediately deployable position and capable of driving the boat upwind with positive progress in a Force 5 (Beaufort Wind Scale) wind condition (16 to 20 knots) without sails for 10 hours. The boat's engine and generator installation (if so equipped) must conform to ISO and/or U.S. Coast Guard or Canadian Coast Guard standards.

3. Required Safety Equipment

A boat shall at all times be in compliance with all United States Federal Requirements for Recreational Boats and the laws of the State of Michigan. Canadian boats operating temporarily in waters subject to U.S. jurisdiction shall at all times be in compliance with Canadian laws and regulations governing recreational boats operating in water subject to Canadian jurisdiction.

It is important to understand that the U.S. Federal Requirements for Recreational Boats and the boating laws of the State of Michigan, enforced by officers of the Law Enforcement Division of the Michigan Department of Natural Resources, County Sherriff's Department, U.S. Coast Guard and any other authorized law enforcement agency provide the laws and minimum requirements for recreational boats, these are considered the **MINIMUM requirements and **DO NOT** guarantee the safety of your vessel or its passengers.**

The United States Coast Guard sets minimum standards for recreational vessels and associated safety equipment. To meet these standards, required equipment must be U.S. Coast Guard "approved" or "certified". This means that it meets U.S. Coast Guard specifications, standards, and regulations for performance, construction, or materials.

For a copy of “A Boater’s Guide to the Federal Requirements for Recreational Boats and Safety Tips” visit <https://www.uscgboating.org/images/420.PDF>

For a copy of “The Handbook of Michigan Boating Laws and responsibilities – The Official Boating Handbook of the Michigan Department of Natural Resources”, visit <https://assets.kalkomey.com/boater/pdfs/handbook/michigan-handbook-entire.pdf>

US Sailing prescribes that every boat shall carry lifesaving equipment conforming to government regulations that apply in the racing area. Go to:

<https://www.ussailing.org/competition/offshore/safety-information/>

3.1 Personal Safety Equipment

3.1.1 Lifejackets – A boat shall have at least one (1) wearable U.S. Coast Guard approved Personal Flotation Device (PFD) in good and serviceable condition of appropriate size and type for each person on board. If inflatable, the PFD shall be regularly checked for air retention.

3.1.2 PFD Equipment – Each PFD shall be equipped with a whistle and a water proof light.

3.1.3 Safety Harness – Each crew member shall have a safety harness and compatible safety tether not more than 6.7 feet (2m) long with a minimum tensile strength of 4500 lbs. (20kN). The tether shall have a snap hook at its far end and a means to quickly disconnect the tether at the chest end. This snap hook requirement may also be accomplished with a safety harness that has an integral snap hook to quickly disconnect the tether at the chest end of the tether.

3.1.4 Personal Safety Knife – Each crew member shall have a personal safety knife, preferably straight blade or, if folding, able to be opened with one hand, to be attached to or carried on each crew member at all times. The personal safety knife should be readily accessible at all times including while wearing foul weather gear and PFD/safety harness. This recommendation is in addition to the requirement of section 3.24 below herein.

3.2 Deck Safety Equipment

3.2.1 Jack-lines- A boat shall carry jack-lines with a breaking strength of at least 4500 lb. (20kN) which allow the crew to reach all points on deck, connected to similarly strong attachment points, in place while racing.

3.3 Navigation Lights

3.3.1 A boat *racing between sunset and sunrise* shall carry navigation lights that meet U.S. Coast Guard requirements or applicable government requirements mounted so that they will not be obscured by sails nor be located below deck level. **Boats shall display navigation lights between sunset and sunrise, and at any other time deemed appropriate by the Person-In-Charge.**

3.3.2 A boat shall have a second set of navigation lights that comply with U.S. Coast Guard or applicable government requirements and which can be connected to a different power source than the primary lights.

3.4 Fire Extinguishers - A boat shall carry fully charged Marine Type B fire extinguishers that meet U.S. Coast Guard or other applicable government requirements, when applicable.

3.5 Sound- Making Devices - A boat shall carry a sound- making device that meets U.S. Coast Guard or other applicable requirements, when applicable.

3.6 Visual Distress Signals (VDSs)

- 3.6.1 A boat shall carry one (1) SOLAS orange smoke flare not older than the expiration date.
- 3.6.2 A boat shall carry three (3) SOLAS red hand flares not older than the expiration date.
- 3.6.3 Boat flares stored inside of life rafts may not be used to satisfy the Visual Distress signal requirement.

3.7 Man Overboard Equipment

- 3.7.1 **Throw-able Device** - A boat shall carry a U.S. Coast Guard or applicable government approved 'throw-able device'. If the device carried under 3.7.2 satisfies this requirement, then no additional device is needed.
- 3.7.2 **Pole, Flag, Lifebuoy, Light, Whistle and Drogue** - A boat shall have a man overboard pole and flag, with a lifebuoy, a self-igniting light, a whistle, and a drogue attached. A self-inflating *Man Overboard Module*, Dan Buoy or similar device will satisfy this requirement. Self-inflating apparatus shall be tested and serviced in accordance with the manufacturer's specifications. These items shall be stored on deck, ready for immediate use, and affixed in a manner that allows for a "quick release".
- 3.7.3 **Heaving Line** - A boat shall have a throwing sock-type heaving line of 50' (15m) or greater of floating polypropylene line readily accessible to the cockpit.
- 3.7.4 **MOB Recording** - A boat shall carry an electronic means to record the position of a man overboard within ten seconds. This may be the same instrument listed in section 3.9 below herein.

3.8 Communications Equipment

- 3.8.1 **VHF Radio** - A boat shall have a permanently installed 25-watt VHF radio connected to a masthead antenna by a co-axial feeder cable with no more than 40% power loss. Such radio shall have DSC (Digital Selective Calling) capability, have an antenna of at least 15" (381mm) in length, be connected to or have an internal GPS, and have the assigned MMSI number (unique to the boat) programmed into the VHF.
- 3.8.2 **Handheld VHF Radio** - A boat shall have a watertight handheld VHF radio or a handheld VHF radio with a waterproof cover. **Note: After 1/1/2022, this radio may be required to have DSC/GPS capability.**
- 3.8.3 **Cellular Phone** - A boat shall carry a working cellular telephone in a waterproof container, and shall provide the cellular number to the Race Committee on the entry form.

3.9 **Global Positioning System** - A boat shall carry a GPS receiver.

3.10 **Depth Sounder** - A boat shall have a permanently installed depth sounder that can measure to depths of at least 200 ft. (61m).

3.11 **Compass** - A boat shall have a permanently mounted magnetic compass independent of the boat's electrical system suitable for steering at sea.

3.12 **Charts** - A boat shall have non-electronic charts that are appropriate for the race area. 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 14881 or their paper equivalents.

3.13 **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 Race's 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.

3.14 **Soft Plugs** - A boat shall carry soft plugs of an appropriate material, tapered and of the appropriate size, attached or stowed adjacent to every through-hull opening.

- 3.15 Anchor** - A boat shall carry one anchor, meeting the anchor manufacturer's recommendations based on the yacht's size, with a suitable combination of chain and line.
- 3.16 Lights**
- 3.16.1 Searchlight** - A boat shall carry a watertight, high-powered searchlight, suitable for searching for a person overboard at night or for collision avoidance.
- 3.16.2 Flashlights** - A boat shall carry at least two watertight flashlights with spare batteries in addition to the requirement of section 3.16.1 above herein.
- 3.17 Medical Kit** - A boat shall carry a first aid kit and first aid manual suitable for the likely conditions of the passage and the number of crew aboard.
- 3.18 Radar Reflector** - A boat shall carry an 11.5" (292mm) diameter or greater octahedral radar reflector or one of equivalent performance.
- 3.19 Dewatering** - A boat shall carry two (2) sturdy buckets of at least two gallons (8 liters) capacity with lanyards attached.
- 3.20 Safety Diagram** - A boat shall post a durable, waterproof diagram or chart locating the principal items of safety equipment and through-hull fittings in the main accommodation area where it can be easily seen.
- 3.21 Emergency Steering** - Wheel steered boats shall have an emergency tiller, capable of being fitted to the rudder stock.
- 3.22 Tools and Spares** - A boat shall carry tools and spare parts, including an effective means to quickly disconnect or sever the standing rigging from the hull.
- 3.23 Identification** - All lifesaving equipment shall bear retro-reflective material and be marked with the yacht's or wearer's name. The exception would be for new equipment or rented equipment (e.g. life rafts) that would require the unpacking of sealed equipment in order to meet this requirement. The boat name shall be added during the first servicing of any new equipment.
- 3.24 Cockpit Knife** - A boat shall carry a strong, sharp knife, sheathed and securely restrained which is readily accessible from the deck and/or cockpit.
- 3.25 Mainsail Reefing or Trysail** - A boat shall have a mainsail reefing capable of reducing the luff length by at least 10%. In lieu of this requirement, a boat shall carry a trysail, with the boat's sail number displayed on both sides, which can be set independently of the main boom, has an area less than 17.5% of E x P, and which is capable of being attached to the mast. Storm sails manufactured after 01/01/2014 shall be constructed from a highly visible material.
- 3.26 Halyards** - A boat shall not be rigged with any halyard that requires a person to go aloft in order to lower a sail.
- 3.27 Boom Support** - A boat shall have a means to prevent the boom from dropping if support from the mainsail or halyard fails.

4. Required Skills

- 4.1 Emergency Steering** - A boat's crew shall be aware of multiple methods of steering the boat with the rudder disabled, and shall have chosen and practiced one method of steering the boat with the rudder disabled and be prepared to demonstrate said method of steering both upwind and downwind.
- 4.2 Man Overboard Training** - Annually, two-thirds of the boat's racing crew shall practice man-overboard procedures appropriate for the boat's size and speed. The practice shall consist of marking and returning to a position on the water, and demonstrating a method of hoisting a crewmember back on deck, or other consistent means of reboarding the crew member. Crew Overboard Drill Documentation of such practice shall be signed by participating crew members and kept aboard the boat. A document can be downloaded from the "Safety and other Docs" section of the "Official Board" tab on the Race website; www.bycmack.com. Practice of the "Quick Stop" man-overboard procedure is strongly recommended.
- 4.3 Safety at Sea** - These safety options set forth below are required for all boats, but especially for

those crewmembers who are participating in this race for the first time and for those boats which are participating in the race for the first time. **At least 30% of those aboard, but not fewer than two members of the crew including the person in charge shall have:**

- 4.3.1** Completed and hold a valid, current US Sailing Safety at Sea Certification (Coastal or Offshore) or an equivalent level certificate; **or**
 - 4.3.2** Attended or viewed online four (4) DRYA (Detroit Regional Yacht Racing Association; www.DRYA.org) or BYC Winter Seminar Series; **or**
 - 4.3.3** Read a minimum of eight (8) safety articles posted under the 'Safety' tab on the Race website.
- 4.4** As required in 1.2 above, the person in charge shall ensure that all crew members know where all emergency equipment is located and how to operate the equipment. In addition, the person in charge shall discuss with at least 2/3 of the crew how to handle various emergency situations including Crew Overboard, Grounding, Loss of Steering, Flooding, Fire, Dismasting and Abandon Ship.

THE FOLLOWING SECTIONS PROVIDE RECOMMENDATIONS FOR ADDITIONAL EQUIPMENT, GEAR AND THEIR USE WHICH YOU MAY WISH TO HAVE ON BOARD DURING THE RACE. THOUGH NOT REQUIRED, THE ORGANIZING AUTHORITY **STRONGLY RECOMMENDS THE FOLLOWING:**

5. Hull and Structure Recommendations

- 5.1 Dewatering Pumps** - It is STRONGLY RECOMMENDED that a boat shall have a second permanently installed manual or electrically operated bilge pump operable from below deck, otherwise meeting the same criteria as in section 2.8 above herein.
- 5.2 Boat Batteries** - It is STRONGLY RECOMMENDED that a boat shall carry a separate battery, the primary purpose of which is starting the engine, when an electric starter is the only method for starting the engine.

6. Recommended Safety Equipment

6.1 Personal Safety Equipment

- 6.1.1 Wearing of PFDs** - It is STRONGLY RECOMMENDED that each crewmember shall wear a PFD at all times while underway, unless the Person-In-Charge directs that they may be put aside.
A lifejacket can save your life, but only if you wear it.
- 6.1.2 Recommended PFD** - It is STRONGLY RECOMMENDED that each crewmember shall wear either a, U.S. Coast Guard approved PFD or, an inflatable PFD having at least 33.7 lbs. buoyancy, intended to be worn over the shoulders, meeting either U.S. Coast Guard or ISO specifications. All inflatable PFDs shall have a compressed gas inflation system.
- 6.1.3 PFD Equipment** - In addition to the requirements of sections 3.1.2 and 3.23 above herein, it is STRONGLY RECOMMENDED that each PFD shall be equipped with crotch or leg straps, a whistle, a waterproof light, be fitted with marine-grade retroreflective material, and 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 shall be regularly checked for air retention.

6.2 Man Overboard Equipment

6.2.1 Lifesling® - It is STRONGLY RECOMMENDED that a boat shall carry a Lifesling® or equivalent man overboard rescue device equipped with a self-igniting light stored on deck and ready for immediate use.

6.3 Communications Equipment

6.3.1 Emergency Antenna - It is STRONGLY RECOMMENDED that a boat shall have an emergency VHF antenna with sufficient coax to reach the deck, and have a minimum antenna length of 15" (381mm).

6.3.2 EPIRB - It is STRONGLY RECOMMENDED that a boat shall carry either a 406MHz EPIRB which is properly registered to the boat, or a floating 406MHz Personal Locator Beacon, registered to the owner with a notation in the registration that it is aboard the boat. This device shall be equipped with an internal GPS.

6.4 Life Raft(s) - It is STRONGLY RECOMMENDED that a boat shall carry adequate inflatable life raft(s) designed for saving life at sea with designed capacity for containing entire crew. Boats built after 01/06/ 2001 shall have the life raft stowed in a deck mounted rigid container or stowed in watertight or self-draining purpose built rigid compartment(s) opening adjacent to the cockpit of the working deck. The raft shall be stored in such a way that it is capable of being launched within 15 seconds. Boats built prior to 01/06/2001 may alternatively stow the life raft in a valise not weighing over 88 lbs. (39.9kg) securely below deck and adjacent to the companionway. The life raft shall hold a current certificate of inspection. **Note: After 1/1/2022, a life raft may become required equipment.**

6.5 Flashlights - it is STRONGLY RECOMMENDED that a boat shall carry a watertight flashlight for each crewmember with spare batteries and bulbs in addition to the requirement of section 3.16.2 above herein. Total number of flashlights need not exceed the total number of crew.

6.6 Storm Jib - It is STRONGLY RECOMMENDED that a boat shall carry a storm jib of area not greater than 5% height of the fore-triangle squared, with luff maximum length 65% height of the fore-triangle. 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.

6.7 A boat that does not exactly meet an item in these SER's, but has a component or design with a proven safety record for the SER in question, may make a request to the Race Committee for a review of that item. The Race Committee may review that item and has the sole discretion to accept that deviation from the SER.

Double Handed Requirements (applicable to Double Handed Class entrants only)

7. Autopilot

Boats must carry an autopilot or tiller-pilot, installed and ready for immediate use, which may be used while racing. This modifies RRS 52.

8. Wearing of Safety Harnesses and Tethers

Each crew member shall wear a safety harness and tether complying with section 3.1.3 above herein at all times while not in cabin, which tether shall be attached to a strong point on boat.

US Sailing

Safety Equipment Requirements (SER)

Appendix K

Movable and Variable Ballast

Memo: References in BYC Mackinac Monohull SER 2.2.2

Notwithstanding the maximum length limit of 24m in the standard, this Appendix invokes International Standard ISO 12217-2, Small Craft – Stability and buoyancy assessment and categorization – Part 2: Sailing boats of hull length greater than or equal to 6m. The functions KFR (Knockdown Recovery Factor) and FIR (Inversion Recovery Factor) are defined in ISO 12217-2, except as modified by this Appendix.

This Appendix applies to Monohull Yachts only. Unless specifically stated, a requirement applies to SER categories Ocean, Coasta and Nearshore.

1. Stability

1.1 Boat Condition

In the calculation of stability data:

- (a) Deck and other enclosed volume above the sheerline and cockpit volume shall be taken into account.
- (b) Mass shall be taken as the most restrictive case of either Minimum Operating Mass and Loaded Arrival Condition as defined by ISO 12217-2, paragraph 3.5.

1.2 General Standards

In the assessment of ISO category for yachts fitted with moveable and/or variable ballast, ISO 12217-2, paragraph 6.1.4 b) shall not apply. Boats shall comply with paragraphs 6.2.3, 6.3.1 and 6.4. Calculations shall be for the ballast condition that results in the most adverse result when considering each individual stability requirement. ISO 12217-2 Annex C, paragraph C.3.3, first sentence, the word 'may' is replaced with 'shall'. ISO 12217-2 Annex C, paragraph C.3.4 shall not be used in the calculation of righting lever.

1.3 Knockdown Recovery

Boats with moveable/variable ballast shall comply with the following minimum values of Knockdown Recovery Factor (KRF) calculated in accordance with ISO 12217-2 paragraph 6.4.4 with the modification that the reference to ISO 8666 paragraph 5.5.2 changed to incorporate actual mainsail area and centre of effort. The lesser of FKR90 and FKR-90 shall be used:

SR Category

FKR

Boats with age date prior to 11/04 may seek dispensation from this section 1.3 by application to World Sailing.