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# SV Ventura Storm Preparation and Procedure Plan

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# Introduction

The order of priority when preparing SV Ventura (“vessel”) for a storm *(ie: tropical depression, cyclone, hurricane, etc.)* is (1) Protect human life, (2) Seek to prevent or minimize personal injury, (3) Reduce the exposure of property to damage, (4) Minimize damage to property that cannot be relocated and (5) Seek to restore normal boating operations as quickly as possible.

Circumstances may prevent evacuation from the storm path. This Storm Preparedness Plan (hereinafter referred to as the “Plan”), in addition to describing evacuation procedures, outlines recommended best practices for securing the vessel in a sheltered anchorage, a marina or harbor, or hauling out to a reliable boatyard. This Plan also describes procedures for communicating and carrying out storm responses before, during, and after it occurs. Successful preparation for a storm depends on how early and how orderly preparations are made, even though the chances may be great that the vessel will not suffer a direct hit.

At all times, Skipper and all crew will remain aware of weather conditions, but not rely solely on electronic models or local forecasts. Monitoring the clouds, sea state, wind, temperate, and barometer offer real-time indications of weather changes and should be routinely documented in the vessel’s log.

Preparation procedures should be well underway during any storm watch phase. The vessel should be secured or evacuated by the time a warning is issued. A last-minute call for area evacuation by an Emergency Management Agency could prevent the necessary time to secure or evacuate the vessel.

Skipper and crew will follow any instructions issued by local officials, which may include relocating immediately if ordered to do so. Under any circumstances, plans must be made to leave areas that might be adversely affected by storm tide, surge, or flooding.

## Inventory of Onboard Safety Equipment

* SeaSafe Self-Righting Ocean Life Raft, capacity 6 person
* Fully equipped (formerly buoyant and waterproof) Rapid Ditch Bag packed with necessities including manual watermaker, secondary water desalination kit, basic first aid kit, emergency rations, battery operated handheld VHF, rechargeable handheld VHF, signal flares, flare gun, visual and auditory signals, shark repellent, fishing equipment, flashlights, food, water, seasickness medication, and a 15m polypropylene line.
  + In case of use, additional dry bags are stored in the same place to collect crew and vessel documents, essential electronics, food, and water reserves.
* (2) EPIRB units: Global Fix ACR 406 (with GPS) and Satellite ACR 406
* Iridium GO! 2-way satellite communication system with emergency location feature (SOS) registered to onshore family contacts, used for PredictWind Offshore weather downloads, and real time tracking
* Garmin/DeLorme InReach SE 2-way satellite communicator with emergency location feature (SOS) registered to search and rescue operations (SAR), real time tracking, and optional satellite weather forecasts
* Adventure Marine Medical Kit 3000 with essential medications, wound/burn care kits, CPR, and general first aid supplies and guide books.
* Life vests: (8) offshore PFDs with additional reflective tape, (2) near shore, (1) inflatable offshore PFD with spare CO2 canister, (1) kayaking near shore vest.
* Safety harnesses and tethers: (3) adjustable harnesses, (4) single tethers, (2) double tethers.
* Ship’s Station VHF ICM-502, with DSC and SOS
* Handheld submersible VHF radio ICOM IC-M25 (rechargeable)
* Handheld submersible VHF radio Standard Horizon HX260S (battery operated)
* SSB Radio ICOM IC-718
* Safety life lines for entire vessel perimeter (upgraded to rigging material encased in vinyl)
* Safety jack lines from stern to bow on both hulls (webbing material, secured around nacelle)
* Radar reflector mounted high on spreaders
* Overboard flag on pole with radar reflector, with attached automatic strobe light
* (2) MOB throwables: (1) Overboard ring on 30m floating polypropylene line and attached automatic strobe light, (1) Horseshoe on 15m polypropylene with attached automatic strobe light
* Stainless steel emergency tiller
* Electric bilge pumps: (6) with built-in float switches, (2) automatic bilge pumps in engine compartments
* Manual bilge pumps: (2) built-in high volume, (1) per hull
* Crash pump: (1) oversized 1500 gallon per hour powered by 12V at nav station or directly to battery

### Ground Tackle and Sea Anchors

* Primary Anchor: 33kg (73lb) Rocna on 30m (300ft) of 10mm chain with 1kg rotating swivel connection and adjustable trip buoy
* Secondary Anchor: FX 23 Aluminum Fortress
* (2) 20ft at 24mm Snubber line with metal eye hooks joined by shackles and using a Mantus boat hook
* (2) 45ft at 22mm Storm Snubber lines with metal eye hooks and spliced loops with built in chafe guard, joined by galvanized shackles and a Mantus boat hook
* (2) 15ft at 22mm Mooring lines with metal eye hooks, non-attached chafe guard, galvanized shackles, and a Mantus mooring locking snap shackle
* In-line mounted Lewmar chain stop, portable Mantus anchor bungee
* 24ft Para-Tech Sea Anchor with 100m (300ft) braided line
* 12ft Para-Tech Sea Anchor
* 4ft Para-Tech Ocean Drogue

### Mooring Line Inventory

All lines are labeled at both ends with their lengths written on blue tape. Line storage location is indicated on vessel’s station diagram.

* 300ft 22mm double braided nylon line, coiled in plastic crate and marked every 50ft
* 165ft 22mm three strand twisted nylon line (50m)
* 165ft 22mm three strand twisted nylon line (50m)
* 125ft 20mm three strand twisted nylon line with stainless steel thimble (eye hook) on one end
* 125ft 20mm three strand twisted nylon line with stainless steel thimble (eye hook) on one end
* 110ft 22mm three strand twisted nylon line
* 100ft 22mm three strand twisted nylon line
* 100ft 22mm three strand twisted nylon line
* 55ft 22mm three strand twisted nylon line
* 40ft 22mm three strand twisted nylon line
* 35ft 20mm three strand twisted nylon line
* 35ft 20mm three strand twisted nylon line
* 30ft 20mm three strand twisted nylon line
* 25ft 20mm three strand twisted nylon line

### Fire Suppression

All onboard fire extinguishers are to be maintained at full or replaced.

* (3) 2kg ABC extinguishers (engine compartment, galley, starboard hull hall)
* (5) 1kg ABC extinguishers (engine compartments, galley, nav station)
* (2) 1kg automatic AB extinguishers mounted in each engine compartment

(2) 1kg automatic Halon extinguishers *(need to be recharged)*

# Crew Safety

All crew shall be familiar with the location and functionality of all safety equipment.

The Skipper shall inform the crew of any hazardous location on or near the vessel, especially while underway, including: boom and sheet slide blocks, sheave pulling angles, jib sheets, etc.

Crew shall never underestimate the risk of falling overboard, even in moderate seas. The policy while on deck of maintaining one hand available for the boat at all time is required. If on deck in heavy weather a life jacket and/or harness and tether must be worn and used correctly at all times.

When on deck at night, no matter how much light ambient light is present, all crew should carry a flashlight or headlamp.

All crew should have a set of personal protective equipment including sailing gloves, boat shoes, waterproof jacket and pants, sun and/or safety glasses, sun shading hat with chinstrap, etc. A sailing knife must be carried while underway and sailing.

All crew should have general working knowledge of the vessel’s station diagram and systems, including navigation and communication devices, electrical systems, rigging, firefighting, and water removal. Familiarity with these systems is vital to the safety of all crew. Knowing where things are and how they work is the responsibility of every person on board SV Ventura.

The onboard medicine and first aid kit should be given the same attention as the safety equipment. It is a good safety practice for all crew to have some first aid knowledge and experience. Several books with guidelines and manuals are available describing what to do when faced with common injuries.

If a crew member notices a problem onboard they must inform the Skipper. The Skipper is accountable for repairing all known issues at the earliest opportunity. A minor issue can quickly degenerate into a major problem if not remedied, but may remain a slight incident if all equipment operates properly and the necessary spare parts are onboard at the right time.

**Skipper will always be open to suggestions for improving the safety of people and systems onboard SV Ventura.**

# Heavy Weather Tactics

In all heavy weather scenarios, non-essential items should be removed from the deck or cockpit and stowed within lazarettes or within the vessel. *(This includes unnecessary lines, fenders, inflatable paddleboards, cushions, deck loungers, snorkel gear, etc.)* Kayaks must be secured so they do not obstruct crew from walking to the bow of the vessel in any way, or hinder the use of tethers. Fishing equipment should be securely tied to the upper area of the davits. Hatches should be securely closed. Throwables *(life ring, horseshoe buoy, man overboard flag on pole)* should be accessible and tied to the vessel with a clove hitch that is secure yet easy to quickly remove in case of emergency. Additional lashings should be added to secure the dinghy in the davits to prevent it from swinging and chafe guards should be placed as needed. Any unnecessary windage should be removed.

The Plan may include one or more of the following heavy weather tactics.

### While Underway

SV Ventura being a multihull vessel is characterized by the absence of list due to a very high lateral stability. This stability also implies that very high loads are applied to fittings and riggings when the wind rises, and it is necessary to shorten or reef the sails to prevent damage. The Skipper will manage the response to heavy weather depending to some extent on how long it is expected to last. *(ie: passing squall, building gale, large thunderstorm, tropical depression, cyclone, etc.)*

Crew should have all safety related gear easily accessible. Keeping equipment at the ready either in the cockpit or settee is valuable and should include life jackets, harnesses, tethers, sailing gloves, waterproof jackets and pants, hat with chin strap, boat shoes, boat knives, portable VHF, binoculars, flashlights, headlamps, safety glasses or goggles, first aid kit, water bottles and quick snacks. If severe conditions develop while underway, the waterproof and buoyant ditch bag should be readily accessible and a second waterproof bag should be packed that include all person’s essential medications, identification, vessel documentation, local chart(s), additional food and water.

When navigating in swell, Skipper will not enter water shallower than 2.5 to 3 times the total of the swell height plus wind wave height. Water shallower than this is unstable and could cause the vessel to capsize or suffer damage.

Heavy weather tactics while underway can include reefing, motor-sailing with a full or reefed mainsail, heaving-to, or sailing downwind. At all times the Skipper and crew will monitor the vessel’s position with regard to the swell, waves, wind, and any lee shore or hard objects in the water.

#### Reefing

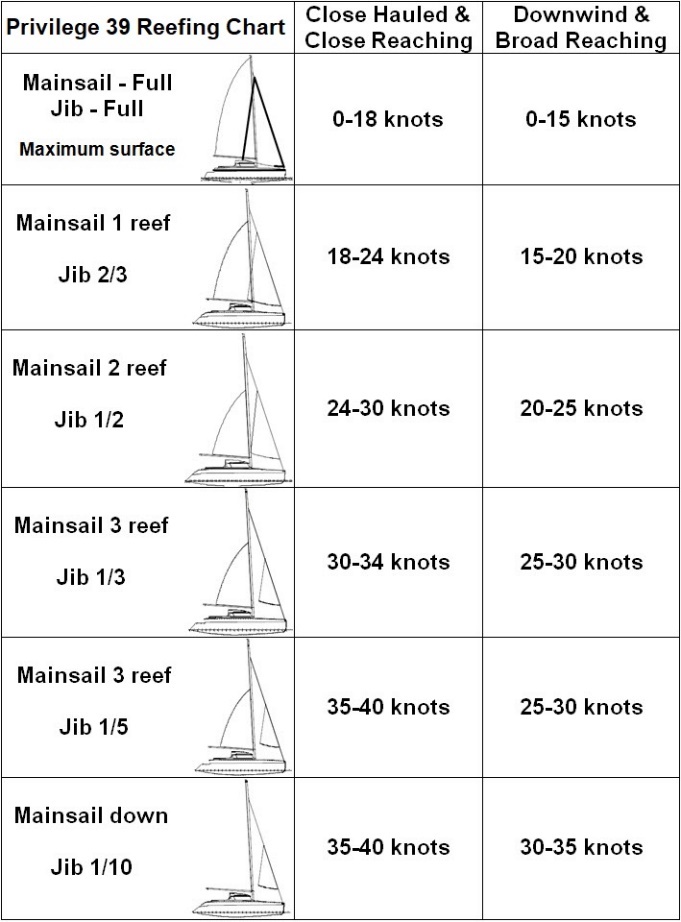
Indications that it is time to reef, to reduce the sail forces and the rig loading, are: (1) slack leeward shrouds, (2) the leeward hull is much more deeply immersed than the windward hull, and (3) the leeward wake is larger than the windward wake. Skipper and crew will monitor the leeward bow and wakes as heavier weather builds and react appropriately. All crew will watch the weather to windward and be ready to reef if a squall is approaching, not wait until it arrives.

As the wind increases, many forces act upon the vessel. The effect can seem dramatic because the force on the sail is proportional to the square of the wind’s velocity. An increase in wind speed from 10 knots to 20 knots is a four-fold increase in force on the sails. *(ie: 10x10=100 vs. 20x20=400)* The effect on the vessel is noticeable, rigging and crew are stressed, and there will be an increase in weather helm. Reefing stabilizes the vessel, increases speed and ease of handling, and provides a smoother ride.

Skipper will pay close attention to building wind and seas when sailing off the wind. Best practice is reefing early, and using caution as the vessel turns up to a close reach to reef. As the vessel turns up the apparent wind and the effect of the waves will increase significantly. The critical moment for this maneuver is when the vessel is beam-on to the waves, and the mainsail should be eased and the jib will drive the vessel through the turn.

In heavy weather the jib sail should be used for power and made flatter by moving the jib cars aft. Sail trim is first adjusted to travel to leeward, then to ease the sails and if still overpowered the crew must reef.

When using the chart below, the speed numbers are to be the higher of either apparent wind or true wind, whichever is the case on the current course.



##### Reefing while Powered

Skipper will explain the process sequentially and assign crew specific tasks. Crew will restate their assigned tasks to prove mutual understanding of expectations. Skipper will call out actions and Crew will respond in same. *(ie: Skipper says “Turn into irons.” and helmsman will reply “Turning into irons.”)*

Setting Mainsail First Reef

1. Helmsman will consult the weather vane and wind indicator instrument and turn the vessel into irons.
2. One or more crew member(s) wearing appropriate safety gear will go forward to the mast.
3. With the main luffing, crew in the cockpit will ease the mainsheet and traveler.
4. Crew at the mast will secure the topping lift and then ease the main halyard until the first row of cringles set into the main reaches the boom, or the reefing tack is at the gooseneck.
5. Crew at the mast will tighten the first reef line until the 1st reef tack and clew are secure and tight against the boom.
6. Crew at the mast will tension the main halyard by hand using the mast mounted winch, securing winch handle when complete. Then they will ease the topping lift.
7. Helmsman will fall off the wind, resume sailing on course while crew trim sails as needed, and may turn off engine(s) when it makes sense to do so.

Setting Mainsail Second and Third Reefs

The procedure is essentially the same as tying in the first reef. The prior reef(s) remain secured. The mast should be inspected when taking a second reef because pulling rearward, the head piece of a reefed sail tends to invert the curvature of the mast. If this occurs, relieve the front triangle by furling the jib more, or by bearing off and slackening the mainsail as the course allows.

1. Helmsman will again consult the weather instruments and turn the vessel into irons, luffing the main.
2. Crew in the cockpit will ease the mainsheet and traveler.
3. Crew at the mast will secure the topping lift and ease the main halyard until the next row of cringles set into the main reach the boom.
4. Crew at the mast will snug the second reef tack and clew against the boom and then re-raise the main.
5. Helmsman will again fall off the wind and resume sailing while crew trim sails for course.

Reefing the jib happens by simply using the roller furler to decrease the jib sail plane the desired amount.

##### Reefing Under Sail

SV Ventura can be easily reefed while under sail or heaved to. The bat cars on the mainsail track allow the sail to move freely when off the wind on a beam reach to a close reach.

1. Helmsmen will position the vessel on a close reach or heave-to.
2. Crew will trim the jib so it continues to drive the vessel forward.
3. Crew in the cockpit will ease the main sheet and traveler.
4. Crew at the mast will secure the topping lift and will lower the halyard to the desired reef point.
5. Crew at the mast will pull in the reefing line, making sure both tack and clew are tight against the boom.
6. Crew at the mast will raise the main halyard.
7. Helmsmen will resume course while crew trim sails.

##### Shaking Out a Reef

The process for removing the reef works in reverse as described above.

1. Helmsman will turn engine(s) on and point vessel into wind to luff the main.
2. Crew in the cockpit will ease the main sheet.
3. Crew at the mast will ease the reef line(s) and raise main sail.
4. Helmsman will resume course while crew trim sails.

#### Motorsailing

If the storm can be reasonably outrun without undue stress on the vessel or the crew, the Skipper may motor with the aid of a reefed mainsail to travel windward more effectively in a strong wind than sailing under a reefed mainsail and a deeply furled jib. Both engines should be engaged so the rudders don’t have to compensate for a shifted pivot point. Course will be adjusted to achieve the best Velocity Made Good while keeping the mainsail full.

#### Heaving-To

Heaving-to is a way of slowing a sailboat's forward progress, as well as fixing the helm and sail positions so that the boat does not have to be steered. This is useful in heavy weather, but can also be used to stall travelling while waiting for more favorable conditions, such as waiting for the tide to change before entering an inlet against a strong current, or watching a storm cross the vessel’s intended course in the distance before encountering it.

It is important when choosing the tack, heaving to, and remaining hove to, in a confined space that adequate room is allowed for these maneuvers.

SV Ventura will heave to comfortably with a double reefed main sail and a partially furled jib.

For this maneuver, the helmsman will tack the vessel to a beam reach without changing any lines. With the backwinded jib sail, the helmsmen will turn the steering wheel all the way to windward and then lock the wheel. The vessel will settle in to a paused state and speed should drop significantly.

When heaving-to Skipper and crew will monitor the strength and direction of any current, and if the vessel tends to lie beam-on to the seas then furling the jib somewhat might allow the mainsail to hold the vessel more to the wind.

To recover from this maneuver, crew will release the windward jib sheet, the helmsman will unlock the wheel and bear downwind. Once the course is established crew will trim the sails accordingly to resume sailing.

#### Sailing Downwind

Sailing downwind fast can be a good tactic if it allows the vessel to avoid an approaching storm, taking care that the vessel is not overtaking the waves, which would put it at risk of burying the bows and broaching or pitchpoling. Depending on sea conditions it may be safer to steer downwind under bare poles than reefed. Deploying a drogue to slow the boat speed should only be considered if absolutely necessary as it presents unique challenges which may be unnecessary.

### While Not Underway

In all scenarios, Skipper will work with crew to reduce windage to the extent sensible for the predicted strength and duration of the storm, and the type of shelter used. This may include removing the sails, bimini, dodger, cockpit and hatch screens or covers, dinghy, solar panels, kayaks, paddleboards, paddles, boat hooks, etc. from the boat.

The entire effect of the weather event, the buildup, storm, and aftermath all need to be considered. If a category one storm is expected, the likely surge (according to the Saffir-Simpson scale) is only 4' - 5'; a category two surge is 6' - 8'; a category three surge is 9' - 12; a category four surge is 13' - 18'; and a category five surge is above 18'. Low lying areas and seawalls are also vulnerable to storm surge. If securing the vessel in the water, this depth must be factored in to any calculations.

#### Securing Vessel on Land

If the storm forces are predicted to be significant, or the vessel will be unattended during a time when a storm could develop, Skipper will explore options for hauling the vessel out of the water. If determined that this is the most practical solution, it is important to not delay making arrangements because as a storm gets closer, marinas and boatyards may become congested as more boat owners make the same decision.

Skipper will also consider any anticipated tidal surge and, if this will overcome the location near the marina or boatyard, consider moving the vessel further inland or find an area of higher ground until the storm passes.

Prior to hauling the vessel out of the water Skipper will discuss the process with the boatyard Master in regards to the weight of the vessel, weight distribution, strong points for lifting the vessel, location of sensitive equipment or sensors, keel, props, and rudders. The depth and speed transducers under the sole in the port aft cabin should be removed with through hull plugs in their places. The amount of fuel and water onboard will affect the load balancing and should be reviewed prior to securing the vessel on the boatyard equipment. Any unnecessary excessive freshwater should be drained unless it negatively affects the vessel’s balance. The jack stands used to hold the vessel should be substantial and positioned in a way that minimizes rocking in any direction. The location within the boatyard should be sheltered with adequate distance between other vessels. Optionally, eyes embedded pavement or in large movable concrete blocks, helical anchors, or ground mounts should be located near the vessel in case additional lines need to be tied to strap the vessel to the ground, further protecting it from extreme wind and adding security to the balance on the jack stands. Skipper will ideally remain with the vessel, or make arrangements for the vessel to be monitored routinely and plan for regular maintenance depending on the duration of the haul out.

SV Ventura’s haul out checklist should be completed to the extent of the anticipated haul out duration with plans for completing the process if the period is extended.

#### Securing Vessel in Marina

If securing the vessel at a floating dock within a marina, the Skipper should request the largest slip in the range available for a vessel of its size so that the vessel may be centered with room to move only slightly with the force from the waves without risk of impacting the dock as the lines stretch. It's also critical that the Skipper measure the height of the pilings to determine if they will remain above the predicted storm surge. A fixed dock should be avoided because they typically cannot safely manage the balance of taut lines to keep the vessel in a safe horizontal position but yet long enough to handle the vertical change from storm surge.

All fenders should be deployed at the points most likely to impact the pontoons. All fenders should be fully inflated and covered with a protective wrap, and additional chafe guard can be provided by securing a piece of canvas between the hull and the fenders. Additionally, a fender board can be deployed across the outside of the fenders to more evenly distribute any potential impacts against a greater area. While securing the lines, crew should keep a roving fender ready to protect the hull as needed.

If mooring alongside *(1 side)*, the six basic mooring lines shall be tied: bow line forward of the vessel, bow breast line, rising spring line from the bow, down spring line from the stern, stern breast line, and stern line aft of the vessel. *(The minimum for normal mooring includes the two spring lines and two breast lines.)*

If mooring alongside a catwalk so either the aft or stern and one side of the vessel may be secured *(2 sides)*, then two aft or stern lines will be set so that they cross athwartship, two spring lines will be used on either starboard or port, and breast lines secured as available.

If mooring where pontoons will be protecting the vessel from all sides but the approach *(3 sides)*, then lines will extend from both bows or both stern hulls and cross before being secured on the dock cleat, two spring lines and two breast lines will be secured from both hulls.

Using a Mediterranean moor, the Skipper can first drop an anchor to windward of the berth and far enough from the dock to allow sufficient scope for the depth and conditions. Then reverse slowly toward the slip while releasing rode from the windlass. The stern lines should be secured so they cross, and the anchor chain will not use a bridle. Alternatively, the vessel can be backed in to the slip and the dinghy can be used to set the anchor.

In some harbors rather than use an anchor the vessel will be attached to a mooring ball using two lines from each forward hull and will be secured with the assistance of marina staff.

As the weather progresses, crew will monitor the position of the boat in the slip and adjust the lines and fenders as needed.

Skipper should walk the dock to determine if neighboring vessels are manned and share contact information for a mutual watch team. If using VHF to communicate a lesser used channel will be designated and crew will dual-monitor with channel 16.

#### Securing Vessel on Mooring

If public or private moorings rated to hold a vessel the size and weight of SV Ventura in the predicted storm conditions are available, Skipper will secure permission to use the mooring and coordinate transit in advance of arriving at least 24 hours prior to the storm’s expected landfall. The weather forecast will be closely monitored to ensure that the location remains safe. The surrounding vessels and moorings condition should also be inspected for potential risks if they are not secured. If other sailors are nearby and Skipper and crew will inquire or start a radio net for communication during the storm, while also monitoring channel 16 and the local harbor channel, *(ie: channel 67)*.

A backup plan must be communicated to all crew in the unlikely instance that the mooring line or snubber parts in the storm.

###### Mooring Procedure When Using Both Bows

1. Helmsmen will ideally position the vessel to approach the mooring from downwind.
2. Crew at the bow will use a cleat hitch to secure one side of the mooring snubber to a bow cleat with a short piece of chafe protection in place where needed.
3. Crew at the bow will point the boathook in the direction of the mooring and may use hand signals to indicate if turning, forward or reverse power are required to position the vessel appropriately.
4. If the crew at the bow give a hand signal the helmsman must acknowledge each signal verbally.
5. Crew at the bow will use the boathook to grab the loop, slide the bridle through the loop, and tie the other end of the snubber to the other bow cleat in a way that drops forward of the vessel and is clear of the anchor and jib furler, with a chafe guard in place where needed.
6. Under heavy weather, snubber line will also be tied to the cleats at midship.
7. Once secured the Skipper will inspect the length of snubber line used and the security of the cleat hitches before the engine(s) will be stopped.
8. Crew will dive to inspect the quality and condition of the mooring line and its holding.

###### Mooring Procedure When Using Center Cleat

1. Helmsmen will ideally position the vessel to approach the mooring from downwind.
2. The anchor will be lowered just above the water line so that it does not interfere with the mooring process.
3. Crew at the bow will point the boathook in the direction of the mooring and may use hand signals to indicate if turning, forward or reverse power are required to position the vessel appropriately.
4. If the crew at the bow give a hand signal the helmsman must acknowledge each signal verbally.
5. Crew at the bow will use the boathook to grab the loop, slide the loop through the unused side of the anchor roller, and secure it around the center cleat so it is clear of the hanging anchor and rode.
6. A small line should be tied using a square knot around the forward portion of the loop at the point of the cleat. (In case the vessel shifts forward and side to side this will secure it to the mooring line regardless of position.)
7. The anchor can be raised to a point where it does not interfere with the mooring and is above the water. A small line around the center cleat should be secured to the rode with a rolling hitch and a small amount of rode should be released to relieve the windlass of any tension.
8. Once secured to the mooring, the Skipper will inspect the length of snubber line used and the security of the cleat hitches before the engine(s) will be stopped.
9. Crew will dive to inspect the quality and condition of the mooring line and its holding.

#### Standard Anchoring Procedure

When selecting an anchorage there are three fundamental considerations:

1. **Shelter.** The anchorage must be sheltered from the wind and swell in a sufficiently large area.
2. **Anchor holding.** The best hold is provided by a muddy or sandy ground, if the sand is not too compact. The anchor may slip on a grassy bottom without gripping, or become lodged or break out of a rocky bottom. Coral should always be avoided.
3. **Traffic.** If the anchorage is busy the Skipper will have to give attention to the swinging radius of various other boats.

Skipper will secure Primary anchor in a place where the bottom should provide good holding and there are no other objects within the swinging circle of the vessel, resulting in a ratio of 7:1 chain to effective depth. *(The effective depth is calculated by adding the water depth at high tide plus the height of vessel’s bow from the surface of the water plus the surface offset of the transducer.)*

1. Helmsman will steer windward slowly to a stop using gentle reverse power, then shift to neutral.
2. Crew at the bow will release the anchor using the Down button on the deck near the windlass. When this button is not in use the cover should be closed.
3. If the wind is not pushing the vessel, the helmsman will reverse with both engines slowly to drift downwind.
4. Crew at the bow will signal any necessary directional changes and the helmsman will repeat verbally to confirm the action was communicated.
5. Crew will signal at each 25ft interval, as marked in color on the rode.
6. Once the chain paid out reaches 5:1, the helmsman will test that the anchor is set by focusing on an unmoving landmark on shore and reversing engine(s) at 1000RMP for 30 seconds, followed by 1500RPM for 30 seconds, and returning to neutral. (This simulates the potential force of wind and demonstrates the anchor’s holding power.)
7. Crew will observe the chain’s behavior for evidence that the anchor is holding, skipping, or dragging.
8. If apparently holding, crew at the bow will then release additional rode for a scope of 7:1.
9. The helmsman will once again test again that the anchor is holding by reversing at 2000RPM for 30-45 seconds, and return to neutral.
10. Crew will attach snubber line to forward cleats on the starboard and port bows with chafe guards in place and secure the line using the bridle shackle to a link of chain, checking that the locking pin is closed.
11. Crew will release another length of chain just long enough to create a catenary, allowing the more elastic nylon snubber line to absorb the environmental forces between the vessel and the anchor.
12. Crew will then use the center cleat to tie a small length of line to the chain using a rolling hitch and release enough chain to relieve the windlass of any strain.
13. Skipper will review the condition of the snubber and anchor before disengaging the engine(s).

If the anchorage is in a location where there is concern that the anchor could become lodged and unable to be lifted without undue stress on the windlass, a trip buoy will be deployed to allow a secondary method to pry the anchor from its holding.

#### Storm Anchoring Procedure

Consideration must be given to the additional environmental load on the ground tackle predicted with the storm. The freeboard of the catamaran will increase the impact of the wind, and the depth of the anchorage should be considered in relation to the predicted swell and wave heights. As the wind speed doubles, the holding power requirements for the ground tackle quadruple.

When choosing an anchorage to weather extreme swells (in excess of 20 feet), Skipper will seek protection from the swell direction and avoid anchoring in shallow water. Very large swells may refract around points of land, which will change speed, wavelength and direction. Best practice is anchoring in water depths at least three times the combined swell and wave height knowing that the swell can change direction, even in excess of 180 degrees. Local sailors and harbormasters may have the experience to know how swell from different directions and of different heights will affect the anchorage, and they should be consulted.

Skipper and crew will follow the same procedure as listed in Standard Anchoring Procedure, and will release additional chain for a 10:1 scope before applying the bridle. The snubber used for the catenary will be lengthened by double in a storm scenario and in extreme weather will be tied to the midship cleats in addition to the bow cleats as an extra precaution.

To limit the amount the vessel will swing if the wind or current changes direction, a second anchor may be used. If using a Bahamian moor, deploy the second anchor at 180 degrees to the first anchor and attach the second rode to the bridle. As the vessel turns with the current the Skipper should check that the two chains do not twist together. Alternatively, the second anchor may be set from the stern and secured to one of the stern cleats. Attaching a bridle is optional and may present more risk in that the dinghy would be prevented from releasing from the davits if needed.

In the unfortunate event that the anchor drags, the windlass fails, or the vessel is in danger of impact to a lee shore, it is better to release the chain, marking it with a buoy for retrieval in the future, than to attempt to manually raise the anchor in a heavy weather emergency situation. The end of the anchor chain should be attached by a rope rather than a shackle so that it can be cut in this scenario.

#### Securing Vessel to a River Lined with Mangrove Trees

River beds are constantly changing, often accumulating sediment from upstream, depositing this sediment in the slower moving curves or wider points. If approaching a secure location with uncharted or unreliable charted depths, Skipper and another crew member will first anchor the vessel near the mouth of the river or canal with adequate depth for safety at low tide. Skipper and crew will then use a portable chartplotter with GPS data and a portable depth sounder to explore the best route to navigate the vessel upriver. When a successful track has been determined it will be saved in the chartplotter to be used as a guide when later maneuvering the vessel. This also gives the Skipper and crew an opportunity to familiarize themselves with the environment and look for any possible hazards.

Due to the less predictable nature of securing the vessel to the mangroves, ideally this operation is conducted with a buddy boat and both vessel’s crew cooperate for the safest holding.

In preparing the vessel for the mangroves, the lines used to secure the vessel to the trees will be coiled so that they are easily accessible at each of the cleats where they are expected to be used. Crew will wear sunscreen and insect repellent proactively.

At high tide, Skipper and crew will carefully power the vessel to the designated location following the chartplotter’s track and pulling the dinghy astern. When close to the desired place, crew will quickly deploy the anchor at a 3:1 ratio. Once the anchor has set, the boat will gently spin around before coming to a rest in the opposite direction, up the river. A helmsman will remain ready in case of urgent maneuvering while other crew quickly board the dinghy and tie long lines from the thickest mangrove tree at the highest reachable point with a bowline knot and bring the other end to secure it to a cleat. The two forward port and starboard cleats go first, then the two rear cleats, then the two midship cleats. Due to the nature of the river’s tidal current, the anchor cannot be relied upon. Once the six initial lines are set, all crew should work together to tighten the lines using winches until the vessel position is parallel to the incoming and outgoing current. No more than two lines should be led to a single cleat on the vessel and all should be led to separate mangrove trunks near shore.

If a buddy boat has travelled with the vessel or there are others nearby, they can assist in this process either by setting lines or by pushing the hull with their dinghy to keep the vessel centered until the lines are secured.

# Conditional Storm Response Plans

## Condition 5: Storm Season Begins

Normal boating operation. Skipper and crew will monitor weather, continue potential storm awareness.

Skipper will:

* Review and revise storm Plan, maintenance lists, and equipment inventories.
* Examine all safety equipment and ensure it is stowed properly and is in good condition.
* Examine all lines, working and mooring, for signs of wear and replace as necessary.
* Stow all safety equipment in the location designated on the vessel’s station diagram at the nav station.
  + Update station diagram with any changes or additions using the color coding of red for fire, blue for flood, and yellow for safety.
* Replenish any expired safety equipment or supplies.
* Recertify any necessary safety gear *(ie: liferaft, fire extinguishers, etc.)*
* Meet with crew for Plan awareness and feedback.
* Check with local sailors, MSC or Coast Guard, and marinas for updated conditions in known storm shelter locations.
* Check weather forecasts daily and visually monitor the environment and the vessel’s surroundings.

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## Condition 4: Storm in the Vicinity

A storm has developed and could pose a threat to the area. Based on the predicted strength and path of the storm, Skipper will determine the safest and most practical location for the vessel. The overriding consideration in hurricane preparation and decision making in this Plan is preserving the safety of lives. Preventing damage to property is secondary to human safety.

Skipper will make arrangements to relocate the vessel with a minimum of 24 hours in that location prior to the storm’s predicted landfall to safely secure the vessel and make any necessary adjustments at the new location. Skipper will be prepared to execute the Plan, yet may not put the Plan in motion until the risk of storm conditions develop.

Based on the predicted wind, wave, and swell directions, some locations will be safer than others. This may be a sheltered anchorage near shore, in the lee of a geographic feature, up a river lined with mangrove trees, secured to a substantial mooring, within a marina slip, or out of the water in a boatyard.

Skipper and crew will evaluate the storm threat potential by plotting its advance and assessing weather reports to determine a timetable for action for this particular storm.

Crew will perform storm readiness inspections on vessel and equipment. Fuel and water tanks should be filled, provisions should be well stocked, and routine maintenance for the engines and batteries should be performed proactively. Rigging, fittings, lines, and sails should be visually inspected. Gear should be sorted and stored so that safety related equipment is easily accessible. Crew should check the inventory list against the station diagram to ensure all equipment listed is available and in good condition.

## Condition 3: 72-48 Hours to Landfall

A storm is threatening. Skipper will begin implementation of Plan and this information will be documented in the vessel’s log.

Skipper will complete a formal Storm Preparation worksheet and Official Crew List with their emergency contacts. If leaving an area of data connectivity this information will be sent to the list of trusted contacts and the vessel’s insurance company. If data will be accessible distributing this information may be delayed until the storm is more imminent.

Vessel will be relocated to the predetermined safe location and Skipper will confirm that the backup plan remains practical and the secondary location is available.

Crew will regularly monitor weather forecasts, reviewing all models, plus routinely take wind and barometer readings from the vessel at no more than 4 hour intervals. This information will be documented in the vessel’s log.

Crew will make regular calls to the radio net for the area and dual-monitor with channel 16.

The solar power generated will likely diminish due to cloud cover, so crew should start the engine(s) as needed to supplement the battery heath. Diesel engines perform best under strain, so crew will take the throttle(s) out of gear and increase the RPMs to 2200 to charge the batteries and generate hot water, at least 30 minutes per start.

## Condition 2: 48-36 Hours to Landfall

A storm may strike within the next two days. Skipper and crew will complete securing of the vessel.

If not already sent, Skipper will share the Storm Preparation Worksheet with trusted contacts and the vessel’s insurance company. This information will also be added to the vessel’s log.

Skipper and crew will continue to evaluate the storm threat potential. Weather reports will be consulted as new information is published, the crew will monitor wind and barometer readings from the vessel at intervals no greater than four hours, and document this information with a general weather description in the vessel’s log.

The vessel’s security in holding will be regularly monitored as the weather intensity increases to assure safety of the crew and the vessel. If the conditions deteriorate in this location Skipper must decide to relocate to the backup location with enough time to do so safely.

Regular calls to the radio net for the area will be made and crew will dual-monitor channel 16.

Skipper will make continual checks of storm readiness preparations of all areas of the vessel and be prepared to step up preparation timetables if forward speed and intensity increase. Any loose items that can be affected by the wind will be secured and any unnecessary windage will be removed and safely stowed.

Crew will monitor the engines, batteries, and freshwater reserves. Crew will ration water unless it is safe enough to run the watermaker or add municipal water if at a marina.

Provisions should be prepared in advance of the storm for easy access during the heavy weather. Portable meals with minimal effort should be prioritized.

## Condition 1: 24 Hours to Landfall

The vessel should not be moved at this time unless absolutely necessary and the crew or vessel is in imminent danger. Skipper should evolve the backup plan in the event that this happens and communicate this clearly with the crew to outline all responsibilities and expectations. Any changes to the Plan must also be communicated to the trusted contacts list and vessel insurance company. The updated Plan will be documented in the vessel’s log.

Skipper and crew will constantly monitor the vessel’s holding and the surrounding situation. At least one crew member must be on watch at all times. If at anchor an anchor watch alarm should be set on multiple devices and monitored by multiple people regularly.

Weather reports will be consulted as new information is published, and crew will monitor wind and barometer readings from the vessel hourly, and document this information with a general weather description in the vessel’s log.

Regular calls to the radio net for the area will be made and crew will dual-monitor with channel 16.

Crew will continue to monitor battery health and minimize non-essential use of electronics. Any portable electronic devices not in use can be stored in a drybag the galley oven for protection. *(Put the lighter in the oven in effort to lockout/tagout.)*

## Condition 0: Storm

The vessel should not be moved at this time unless absolutely necessary and the crew or vessel is in imminent danger. Skipper will continue to think ahead and evolve the backup plan based on the weather conditions.

At least one person must be on watch at all times. All crew must wear life jackets and tethers when outside, and minimize time spent on deck or in the cockpit when possible.

As safety allows, Skipper and crew will monitor condition of the vessel’s holding by physically inspecting the lines or anchor, staying as aware of the surrounding situation as possible. If on anchor or mooring, an anchor watch alarm should be set on multiple devices and monitored by multiple people regularly.

Weather reports will be consulted as new information is published, and crew will monitor wind and barometer readings from the vessel hourly, and document this information with a general weather description in the vessel’s log.

Crew will maintain regular calls to the radio net for the area and dual-monitor with channel 16.

Crew will continue to monitor the vessel’s battery health and minimize non-essential use of electronics.

## Storm Recovery

Once the storm has passed, the vessel should remain in the protected location until an announcement is made that the risk of any dangerous wind, waves, or storm surge is no longer a concern.

The vessel and any safety equipment or ground tackle will be inspected in great detail. All crew will review the condition of the vessel and any maintenance items will be listed in the vessel’s log. Skipper will make arrangements for any repairs or replacements as needed and in a timely fashion to maintain safe boating operations. Any damages will be documented with photographs.

Any storm equipment used will be dried thoroughly before it is packed away in the location(s) designated by the station diagram. Any changes to the availability of any equipment listed in this diagram will be documented in the vessel’s log and the Skipper with either ensure that it is replaced, or the diagram will be updated.

# Safety Drills

On a regular schedule, Skipper will lead safety drills with specific objectives including: Man Overboard, Anchoring, Docking, Mooring, Reefing, Fire Fighting, and Seamanship. Skipper will regularly assess crews’ skills and offer additional practice as needed. Crew will study any material where more familiarity is needed. Details for safety drills will be documented in the vessel’s log.