

# Marina Hurricane Plan

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The following Hurricane plan is based on the one I created for Sunrise Harbor Marina in Ft. Lauderdale Florida. This hurricane plan is an example and should be revised to cover the area each particular marina is located.

The substance of the plan should not modified, and only the particular marina information and the local information should be adjusted.

Florida and the Caribbean are the most hurricane-vulnerable coastal areas of the Atlantic Ocean.

Sunrise Harbor, due to its location on the coast, is highly susceptible to the effects of high winds and storm surges created by a major storm. A strong storm surge created by a hurricane would be the main problem affecting the integrity of the marina.

A storm surge can increase high tide by as much as 10+ feet.



### **7,000 Boats were destroyed in Hurricane Ian**

Although the marina's floating docks were constructed to withstand moderate storms and the anchoring system securing the docks to the bottom has compensated for moderate storm surges. The dock pilings are high enough to compensate for moderate storm surges. However, high winds, and rough water could damage the pilings and docks to the extent that the marina could fail. If the marina was to fail and these heavy concrete docks came loose, they would more than likely cause damage to the property and yachts moored in the marina.

Another source of damage would be yachts breaking loose from their moorings. To minimize the possibility of damage to these yachts and created by them, every effort should be made to evacuate the marina of all vessels prior to a storm warning being issued by Broward County. In most cases, yacht Owners/Captains will have a plan and prior agreement with a marina inland for dockage out of the storm surge area.

However, due to the large yachts in the area during hurricane season, there needs to be more space inland to accommodate all of them. Since there is a shortage of protective dockage, once a storm watch goes into effect, by law, we will not be able to force any vessel to leave the marina. Unfortunately, we will likely have yachts in the marina during a hurricane.

This plan was developed to cope with these situations to the best of our ability.

### **The Nature of Hurricanes:**

Hurricane Season is at it's highest during the official hurricane season from June 1st to November 30.

A hurricane is a violent tropical cyclone, with winds of 74 or more miles per hour, which spiral counterclockwise around a relatively calm center known as the "eye" of the storm. At full strength hurricane winds can gust too more than 200 miles per hour as far out as 20 to 30 miles from the eye. Winds of 39 mph and greater can extend 200 miles or more in advance of the hurricane and trail hundreds of miles behind. The greatest threat from hurricane wind is flying debris. Winds may also disrupt electrical power, telephone service, gas, fresh water supplies, and transportation. TORNADOS are also possible as a spin-off of the hurricane's winds.

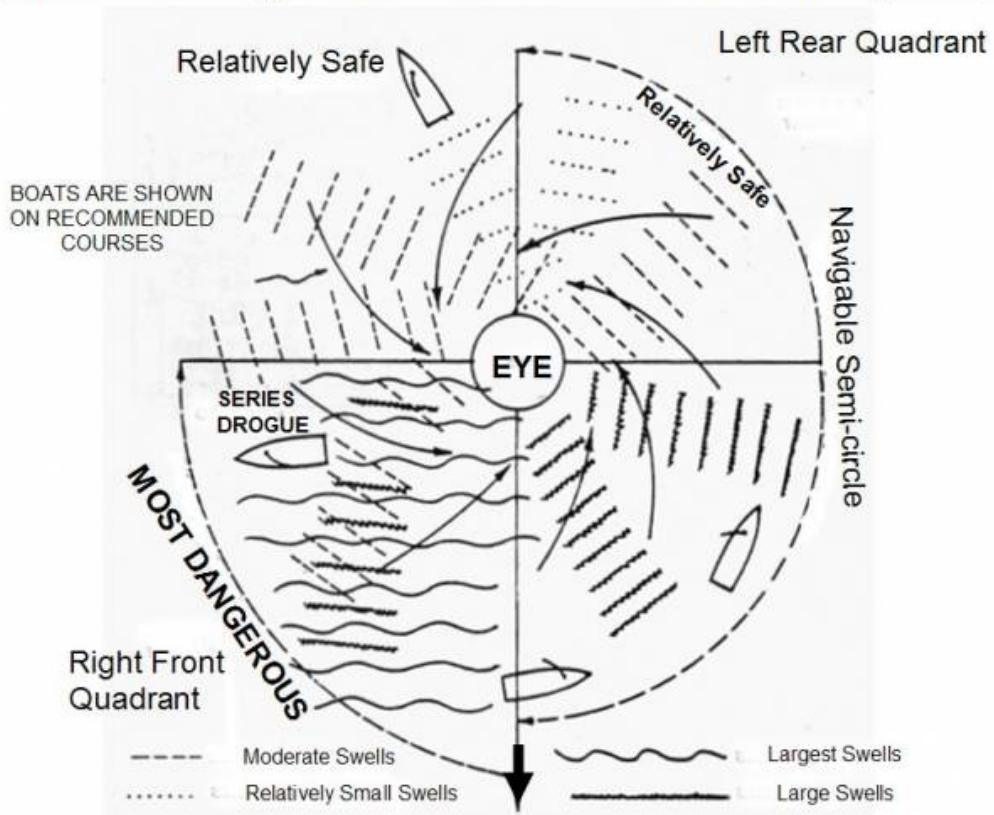
The greatest danger of the hurricane is from the storm surge. As the storm approaches and moves across a coastline, storm surge may rise 10 feet or more above normal high tide and usually is accompanied by battering waves which will overcome coastal lowlands. In addition, extensive rainfall associated with the storm, may cause widespread flooding further inland. More than 23 inches of rainfall in 24 hours has been recorded in association with a hurricane.


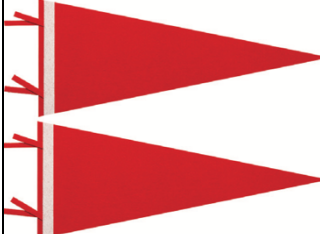
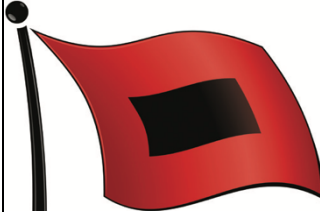



Hurricanes are classified by wind strength known as the Saffir/Simpson Scale:

Category	Wind
I	74-95 mph
II	96-110 mph
III	111-130 mph
IV	131-155 mph
V	156 + mph

### Hurricanes/Typhoons in the Northern Hemisphere



Storm Warning Flags			
Wind speed	Description	Flags	Beaufort Number
25 to 38 mph (22 to 33 knots)	Small craft advisory		6 and 7
39 to 54 mph (34 to 47 knots)	Gale warning		8 and 9
55 to 73 mph (48 to 63 knots)	Storm warning		10 and 11
Over 73 mph (over 64 knots)	Hurricane-force wind warning if not associated with a tropical cyclone		12

Force (Beaufort scale)	Equivalent speed			Description	Specifications for use at sea
	mph	knots	km/h		
0	0–1	0–1	0–1	Calm	–
1	1–3	1–3	1–5	Light air	Ripples with the appearance of scales are formed, but without foam crests.
2	4–7	4–6	6–11	Light breeze	Small wavelets, still short, but more pronounced. Crests have a glassy appearance.
3	8–12	7–10	12–19	Gentle breeze	Large wavelets. Crests begin to break. Foam of glassy appearance. Perhaps scattered.
4	13–18	11–16	20–28	Moderate breeze	Small waves, becoming larger; fairly frequent white horses.
5	19–24	17–21	29–38	Fresh breeze	Moderate waves, taking a more pronounced, longer form; many white horses are formed. Chance of some spray.
6	25–31	22–27	39–49	Strong breeze	Large waves begin to form; the white foam crests are more extensive everywhere. Probably some spray.
7	32–38	28–33	50–61	Near gale	Sea heaps up and white foam from breaking waves begins to be blown in streaks along the direction of the wind.
8	39–46	34–40	62–74	Gale	Moderately high waves of greater length; edges of crests begin to break into spindrift. The foam is blown in well-marked streaks.
9	47–54	41–47	75–88	Severe gale	High waves. Dense streaks of foam along the direction of the wind. Crests of waves begin to topple, tumble and roll over.
10	55–63	48–55	89–102	Storm	Very high waves with long overhanging crests. The resulting foam, in great patches, is blown in dense white streaks along the direction of the wind. The whole surface of the sea takes on a white appearance. The “tumbling” of the sea becomes more immense and shock-like. Visibility affected.
11	64–72	56–63	103–117	Violent storm	Exceptionally high waves (small and medium-size ships might be, for a time, lost to view behind the waves). The surface is covered with long white patches of foam lying along the direction of the wind. Everywhere, the edges of the wave crests are being blown into froth. Visibility affected.
12	73–83	64–71	118–133	Hurricane	The air is filled with foam and spray. Sea completely white with driving spray; visibility very seriously affected.

Source: Kemp, 2011.

## Severe Weather Terms:

*Hurricane Season*– June 1 through November 30 is officially designated as hurricane season.

*Advisory* – A message released by the hurricane center, usually at 6-hour intervals, updating information on the storm or hurricane, including watches and warnings whenever they are in effect.

*Small Craft Warnings* – When a hurricane or tropical storm threatens a coastal area, small craft are advised to remain in port and not venture into open sea.

*Tropical Depression* – A circulation at the surface of the water with sustained wind speed of 38 mph or less.

*Tropical Storm* – Distinct circulation with a sustained wind speeds of 39 to 73 mph.

*Hurricane* – A tropical cyclone that rotates counterclockwise with sustained winds of 74 mph or greater.

*Storm Surge* – A rise in tide caused by a hurricane as it moves over or near the coastline. It can be much higher than the normal tidal rise, with breaking waves on top.

*Stages Of A Storm* – Progression Of Alerts And Warnings

*Tropical Storm Watch*: – The alert given when a tropical storm poses a threat to a certain coastal area within 36 hours.

*Tropical Storm Warning* – A tropical storm is expected to strike within 24 hrs. with sustained winds of 39 to 73 mph.

*Hurricane Watch* – The alert given when a hurricane poses a threat to a certain coastal area within 36 hours.

*Hurricane Warning* – A hurricane is expected to strike within 24 hours with sustained winds of 74 mph. or more accompanied by heavy rains and high waves.



## **Hurricane Plan:**

The \_\_\_\_\_Marina Plan Covers The Following Areas:

Emergency Phone Numbers/Radio Frequencies/Bridge Schedules For Broward County.

Phase I – Hurricane Watch is announced.

Phase II – Hurricane Warning.

General Hurricane Plan For Yachts/Instructions For yachts staying in marina during a hurricane.

### **During the Hurricane.**

Follow up after storm passes– assessing damages.

Diagram and instructions for removing gangways, courtesy dock, shutting off electric and water to docks.

Specific Information for Broward County Interests

**Important Phone Numbers:**

EMEGENCY	911	Ft. Lauderdale Police Dept.	761-5700
Florida Marine Patrol	1-800-DIAL-FMP	Ft. Lauderdale Marine Police	828-5440
Broward & Dade Counties	1-305-325-3346	Management	357-8250
Broward County Sheriff-Marine	938-0650	U.S. Coast Guard	927-1611

**Important Radio Frequencies**

AGENCY	CHANNEL	FREQUENCY
U.S. Coast Guard	16/22	156.80 MHz
NOAA Weather Radio, West Palm Beach	1/2	162.475 MHz
Bridge Tenders (countywide)	9/16	156.65 MHz

Hurricane Bridge Schedule

ICW Hurricane Waterway Bridge Schedule		
ICW Bridge	Hourly Operations	Between Bridges In Miles
Hillsboro Blvd.	On $\frac{3}{4}$ hr.	5.0
NE 14th St.	On $\frac{3}{4}$ hr	1.0
Atlantic Blvd.	On the hour	3.0
Commercial Blvd.	On the $\frac{1}{2}$ hr.	3.0
Oakland Park Blvd.	On the $\frac{3}{4}$ hr.	1.5
Sunrise Blvd.	On the $\frac{1}{4}$ hr.	2.1
Las Olas Blvd.	On the $\frac{1}{2}$ hr.	1.4
SE 17th St.	On the hour	1.9
Dania Beach Blvd.	On the $\frac{1}{4}$ hr.	3.5
Sheridan St	On the $\frac{1}{2}$ hr	1.1
Hollywood Blvd.	On the hour	1.7
Hallandale Beach Blvd.	On the $\frac{1}{2}$ hr.	1.8

These ICW drawbridges are scheduled to operate under the above guidelines only during hurricane situations from the time an Emergency Evacuation Order is given until 8 hours before arrival of gale force winds (39 mph/34 kts.) when all bridges are authorized to be locked down.

The following is a recommended web site to keep track of hurricanes and severe storms– <http://www.nhc.noaa.gov/> It is advisable to bookmark this site on your web browser.

## **Phase I**

### **Hurricane Watch:**

When a hurricane watch is announced all marina personnel will be on a 24hr alert. All personnel will be required to be available and stand-by to be contacted for immediate recall to the marina.

All vessels in the marina will be contacted and asked to evacuate the facility.

As stated in the introduction, every effort will be made to have all yachts evacuate the marina as soon as a hurricane is on a track that will place it to land in the general area of Southeast Florida.

Owners/Captains will be instructed to contact the Broward County Sheriff's Office (BSO) who will be in command of a Flotilla Plan for yachts intending to move their vessels up the New River. BSO will be operating out of a Command Post located at the Fort Lauderdale Marine Police Unit's headquarters on SE 15th Street Canal, telephone number (954) 828-5440. Additionally, waterway reports will be communicated between police agencies on 7268.0 KHz (Lower Side Band).

### **Yachts That Cannot Evacuate Sunrise Harbor Marina**

Any vessel that is not able to evacuate the marina will be given instructions on how to secure their vessel. If possible, all vessels will be spaced out to leave room for maneuvering and setting up additional lines.

All vessels remaining in the marina will be contacted to make sure their batteries are fully charged (all electrical on the docks will be shut down if the Hurricane Watch is upgraded to a Warning). They will also be advised to start preparations to secure the vessel.

## **Marina**

It will be necessary for the marina to stock emergency equipment and supplies the facility warrants such as extra mooring lines, lumber for fender boards, chafing gear, flashlights and batteries. A high volume GPH pump should be available for use in an emergency situation to keep a vessel from sinking while other arrangements are made to save it.

An area on an upper floor of the garage will be established to store all of the marina equipment, including dock carts, bikes, electric dock cart and all loose equipment located on the docks and marina area.

A walkthrough will be done of all the areas and procedures for shutting down the electric, water, and other service to the docks. Preparations will be started for removing the courtesy dock.

## **Preparation Of Marina Grounds And Docks**

- Notify personnel that the facility is on a hurricane alert. Personnel should commence preparations for putting the hurricane plan into action.
- Personnel should be put on standby to start securing operations within the next twenty-four (24) hours.
- Begin facility protection preparations by policing marina and dock areas. Stow away or secure loose equipment.
- Take down large signs antennas or other removable items subject to wind damage.
- Facility protection precautions should commence at this time. Storm shutters or other protective equipment should be made ready and/or installed for use.
- Process and mail all paperwork that can be completed immediately. Set all new paperwork aside to be completed after the hurricane.
- Remove expensive equipment and important records to inland facility for storage.

- Dockmaster should begin contacting vessel owners/captains in order to begin removing vessels from the facility, if possible.

## **Phase II**

Hurricane Warning 24 hours prior to the hurricane

In these hours prior to the projected arrival of the hurricane, the “Hurricane Warning” has been issued and it is highly likely that the hurricane will landfall near the marina. The following activities should be in progress or nearing completion so that most personnel can be released in the next twelve hours. All vessel removal operations should be well underway and completed during this twenty-four hour period. Plans for securing remaining vessels should commence.

All vessel protection and securing operations should be completed with a final check of doubled mooring lines, tied off with sufficient slack and fender boards and/or other protective equipment in place.

Employees who are not staffing the facilities during the storm should be released no later than twelve hours prior to the storm. Instructions for reporting back to work after the storm should be given.

Whether staffing or evacuating the facility, insure that all perimeter access points in the form of fences, gates, and building doors are locked and secured.

All facility precautionary preparations should be completed twelve hours prior to the hurricane’s arrival.

Prior to shutting down the power, all vessels in the marina will be instructed to clear the docks of any and all equipment related to the vessel. All vessels will be contacted to make sure all lines are doubled up, batteries are fully charged and all electrical, phone and cable connections are disconnected and removed from the dock.

After all the vessels are properly secured, all personnel attached to the vessel will be instructed to leave the marina immediately when their vessel is secured. No one will be allowed to stay in the marina on board any vessel.



At this point the marina will be secured and all power, water and other services to the docks will be shut down. When all the docks are evacuated of all personnel, all gangways will be disconnected and moved onto the docks. The courtesy dock will be disconnected from the seawall and tied up securely to C Dock. Included at the back of this plan are instructions for removing the gangways and courtesy dock and drawings with the locations of all water mains, electrical circuits and procedures for shutting them down.

Once all the docks are secured and shut down marina personnel will proceed with securing and storing all of the marina equipment, computers, files and all other important documents and equipment.

### **Instructions to Yacht Captains/Owners**

General Precautions And Instructions For Yacht Owners/Captains – instructions will be printed and placed on the counter in the marina office during hurricane season and will be re-distributed to vessels in the marina as soon as a Hurricane Watch for Broward County is issued.

They are included in this plan as point of information for marina personnel. The General Hurricane Precautions And Instructions for Yacht Owners/Captains will also be kept on file in our computers under My Documents in MS Word as Yacht Hurricane Precautions and Instructions.doc. A hard copy is included in the back section of this plan and will be kept in the managers file draw under “ Hurricane Procedures”.

### **Precautions:**

Prior to hurricane season, develop a detailed plan of action to remove your vessel to a secure berth up the New River out of the storm surge zone. The Department of Emergency Preparedness, the Broward County Sheriff's Office and the City of Ft. Lauderdale Police Department may coordinate flotilla efforts to move boats through the drawbridges in groups in order to avoid unnecessary bridge openings. Please contact them to determine whether a flotilla will take place. A copy of scheduled emergency bridge openings; phone numbers and radio frequencies are included with these procedures. The following is general information regarding the flotilla

## **Flotilla:**

The Broward County Sheriff's Office (BSO) will be in command of a Flotilla Plan for yachts intending to move their vessels up the New River. BSO will be operating out of a Command Post located at the Fort Lauderdale Marine Police Unit's headquarters on SE 15th Street Canal, telephone number (954) 761-5440. Additionally, waterway reports will be communicated between police agencies on 7268.0 KHz (Lower Side Band).

**Phase I** – of the Flotilla Plan is preparation and observation of potential waterway hazards by marine police.

**Phase II** – of the Flotilla Plan restricts the movement of vessel traffic up the New River to those only escorted in law enforcement flotillas. If vessels try to move up the river on their own during Phase II they will be stopped prior to New River entry by law enforcement. When Phase II is in effect the bridges are on a restricted opening schedule and they only open for flotillas.

**Phase III** – evacuation, if this is ordered the flotilla operations will cease approximately 3.5 hours after commencement or when winds reach 39 mph, whichever ever comes first at this point all bridges will be locked down.

In Fort Lauderdale there are two staging areas for vessels to join flotillas; the first is off of the Bahia Mar Marina and the second is off Pier 66 Marina. Once Phase II is in effect Marine Law Enforcement units will begin escorting flotilla groups up the New River. There is no specific time when flotillas will get underway; it is at the discretion of the officer in charge.

If you do not have a hurricane refuge up the New River and must secure your vessel at Sunrise Harbor Marina, you should develop a plan of action and specifically identify and assemble needed equipment and supplies. Keep them together and practice your plan to ensure it works before hurricane season.

Arrange for someone locally to carry out your plan, if you are out of town during the hurricane season.

Check your dockage agreement – know your responsibilities and liabilities if you cannot leave the marina before a hurricane hits. Sunrise Harbor Marina will not be responsible for damage to, or created by your vessel during a storm.

Consolidate all records including, insurance policies, a recent photo of your vessel, vessel documentation, equipment inventory, lease agreement with the marina and telephone numbers of appropriate authorities, i.e., marina manager, dockmaster, Coast Guard, insurance agent, National Weather Service, etc., and keep them in your possession. They may be needed when you return to check on your yacht after the hurricane.

Maintain an inventory of both the items removed and those left on board. Items of value should be marked so they can readily be identified.

Before a hurricane threatens, analyze how you will remove valuable equipment from the vessel and how long it will take, so you will have an accurate estimate of the time and work involved. When a hurricane is impending, and after you have made mooring provisions, remove all moveable equipment such as canvas, dinghies, radios, and other expensive equipment that is removable. Lash down everything you cannot remove. Make sure your bilge pumps are working and your batteries are fully charged. Electrical power to the docks will be shut down.

Do not remain on your yacht during a severe storm. When wind and seas warrant, marine agencies remove their boats from service and will not be able to rescue anyone in port during the storm.

### **Securing your yacht at Sunrise Harbor during the storm.**

Do not secure your vessel to dock pilings. Securing the vessel to the pilings will limit its movement in response to the tides. when the tide level increases. The height of the marina's pilings was configured to hold the docks in place during a calculated storm surge. However, there is no guarantee that the surge will not increase the level of high tide to the point where the docks will go over the top of the pilings, and we will lose the integrity of the marina.

Double all lines. Rig crossing spring lines fore and aft. All of the cleats on the docks at Sunrise Harbor are thru-bolted. If room permits, the

marina will spread out all vessels with sufficient space between them. This may require moving your vessel to a different dock.

Cover all lines at rough points to prevent chafing. Wrap with tape, rags, and split rubber hoses, etc. Install plenty of fenders to protect the vessel from rubbing against the dock and other yachts.

Batteries should be fully charged and checked to ensure their capability to run automatic bilge pumps for the duration of the storm. Consider backup batteries. Cut off all devices consuming electricity except bilge pumps.

Enhance the watertight integrity of your vessel both above and below the waterline. Seal windows, doors and hatches if necessary, with duct tape. Shut seacocks and cap off or plug unvalved through-hull fittings such as sink drains.

Do not stay aboard. Winds, during a hurricane, can exceed 100 mph and tornadoes are often associated with these storms. All vehicles on the property, including the garage, must be removed. Stay tuned to news broadcasts and weather advisories concerning the hurricane so that you will know when the danger has passed. The following is a recommended web site to keep track of hurricanes and severe storms–  
<http://www.nhc.noaa.gov/> It is advisable to bookmark this site on your web browser.

After the hurricane has passed, there may be extensive damage to the area. While checking the condition of your vessel is an important concern, there may be limitations such as flooded roads and downed power lines. A check of your vessel should be made as soon as practicable to determine its condition and security.

The staff at Sunrise Harbor Marina will return to the property as soon as feasibly possible however, please bear in mind they will be busy correcting and surveying the damage to the marina and might not have the time or ability to access your vessel to give you a report over the phone.

### **During The Hurricane**

Sunrise Harbor is located in the evacuation zone. The entire marina and facility must be evacuated of all personnel when and if local authorities

deem it necessary. Any vehicles left on the property should be moved to the highest levels available in the parking garage.

Any marina personnel directed and allowed to stay on property should adhere to the following procedures.

- Stay in a protected and safe place inside the main building.
- If the facility is to remain staffed, extreme caution should be exercised if outdoor activities become necessary.
- No one should attempt to move or re-secure a loose vessel or equipment during the storm period.
- Stay tuned to news and weather broadcasts concerning the hurricane's movement so you will know when the danger has passed. A battery-operated radio is available in the marina office.
- Do not venture out during the "eye" or lull in the hurricane.

#### **After The Hurricane Has Passed:**

The hurricane may cause extensive damage; flooded roads, downed power lines, and washed out beach or Intra-Coastal areas. While checking the condition of the facility is of a main concern, there may be limitations that may impede us from accessing it.

As personnel return to the facility and begin the preliminary damage assessment process, they should be aware of the following problems:

Be aware of possible downed electrical wires that should be considered "Hot" and avoided until the Power Company or maintenance personnel are notified. Although the main power may be out generators may be operating thus electrical lines will be charged.

Electrical equipment of the facility that has been submerged in water should not be started until it has been checked and repaired as necessary.

Broken sewer or water mains should be reported immediately to either the utility company responsible for repair or to the maintenance personnel if owned and maintained by the facility.

Office and dock electrical wiring should be checked completely prior to turning on the main power switch.



Wet electrical equipment, such, radios, computers, calculators, etc. should be inspected and repaired or replaced as necessary, prior to operation.

Prepare a written assessment of damages as soon as possible. Estimate damages to docks and other marina facilities: Marina office, electrical transformers, electrical service, and telephones.

If there has been any theft or vandalism loss or damage to the facility, other than storm related, a report should be made to local police or other law enforcement authorities so that appropriate actions can be taken. The incident report number and, if possible a copy of the incident report, should be obtained to substantiate any insurance claim or IRS property loss reporting.

While it is understandable that immediate repairs may need to be undertaken, all actions taken during the course of repairs to any insurance adjustment should be properly documented and filed. In the case of property damages, appraisers assigned by our insurance company will be involved in assisting with the adjustment. Insurance companies will establish storm claim offices to handle the numerous claims after a hurricane strikes.

It is obvious that third party vessel owners, captains, caretakers and others with vessel interests will inquire as to the status of their vessel. These inquiries should be fielded as best as possible, especially if there is no damage to their property. Notification of any vessel damage should be made as soon as possible.

While vessel owners may want to return to the marina as soon as possible, they should be advised as to the situation at the facility and as to the availability of berthing facilities for their vessel. If damages preclude the facility from providing a berthing space for the vessels, owners should be so notified and advised as to when the facility may be available to provide a berth.

If the facility is relatively undamaged, then efforts should be made to become operational and provide facility services to those who are not so fortunate.

Controlled access and/or security at the marina may be required. No one should be allowed on the property except owners/captains of yachts in the marina, salvage contractors, repairers, estimators, surveyors, adjusters, and appraisers. All press should be referred to the corporate office. **Instructions For Shutting Down Electric/Water Service To The Docks**

**Electric:**

On the south side of the marina office building are two doors, one for the head and one for the electrical room. The door on the east side of the wall (closest to the water) is the electrical room. The key to this door is located in the marina office storage closet on a key rack attached to the wall on the right side.

The large gray electrical panel on the back wall is the main breaker for the marina. **To shut down the electricity – switch off each dock’s breaker first and then the main breaker. When turning on the electricity – turn on the main breaker first and then each dock in succession.** Do not turn the individual dock breakers on before turning on the main breaker – this may cause a surge when the main breaker is turned on, tripping all the individual power post breakers.

**Water:**

Both the fire and freshwater standpipe shut-off wheels are secured by a chain and padlock; the key for the fire standpipes and the key for the freshwater standpipes are also located on the key rack in the marina office storage closet. There are four fresh water and three fire shut-off valves (Blue) located at intervals along the building side of the main walkway of the seawall. On the west end of the walkway a freshwater standpipe is on the west side of the walkway, and the fire standpipe is located in the shrubs at the entrance to the marina from the main driveway.

**Gangways:**

Each dock gangway is connected to a plate on the seawall with a pin, which is a one-inch diameter pipe that passes through the connecting hinge. These pipes have a bolt on the end that must be removed to take out the pin. Once removed, the gangway should be lowered and pushed forward onto the dock.

**Courtesy Dock:**

The courtesy dock will be the hardest to remove. This dock should be removed during phase I of the hurricane plan due to the time and effort required. Each stainless u-piling will have to be disconnected from the seawall and pulled out of the hinges connecting them to the dock. Each pile anchor has four bolts connecting them to the sea wall. Once they are removed, and the dock is free of its connection to the seawall, it should be pulled alongside the west side of B Dock and secured.

The following page is a diagram with the various points marked for a visual description. (draw a visual depiction of your marina indicating the main shutdown areas).

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Author: Richard (Dick) Grves  
Keywords:  
Comments:  
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