Notice to Mariners

16th October 2020

Port Denarau Marina Cyclone Procedures

The season for cyclones is once again upon us and it is important that all companies, their employees and boat owners are ready and prepared in the event that Denarau Island is struck by a cyclone.

Port Denarau Marina will be operating a flag and siren system again this season which can be seen below.

PORTDENARAUMARINA

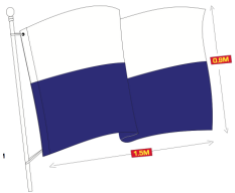
DISMAC Flag Warning System

November 2010

Under Port Denarau Marina's new DISMAC policy we are pleased to announce a new Flag based information system for the benefit of all of our customers. The flag warning system will be flown from the main waterside flagstaff which is also the meeting point for the dissemination of any important information relating to the situation at hand. A civil defence sound signal will be used to alert all to flag changes.

Type of Alert

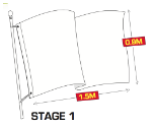
Cyclone



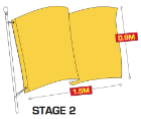
Tsunami

(Red and Green Flags Only)

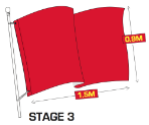
Levels of Alert



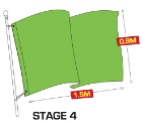
Stage 1 - Alert - Monitoring a Tropical Depression in Fiji Waters. Watch closely for further instructions.



Stage 2 - Warning - Monitoring a Cyclone in Fiji Waters - prepare to evacuate.



Stage 3 - Warning - Cyclone/ Tsunami imminent - EVACUATE MARINA.



Stage 4 - Stand Down - Threat has passed - All Clear.

NB: Flags may be lowered during the cyclone event. Marina is not open until green flag is flying.

Should a red alert be issued, all vessels must be removed from the Marina Precinct immediately.

Port Denarau Marina staff will be available to help where possible but the onus is on the owner of the vessel. **Should a vessel be left on the marina the owner will be responsible for any damage incurred as a result.**

Now is the time for each individual company/owner to devise their own plan for relocating their vessel/s if such an event should occur.

As a reminder of the seriousness of a cyclone and their potential destructive power, further information is provided below. Port Denarau Marina Ltd management and staff thank you in advance for your individual preparation and cooperation in ensuring that we all get through the cyclone season without loss of capital or more importantly, life.

Boat Owners duties during strong wind:

- Ensure that vessels within the Marina are moored with additional lines and fenders.
- Ensure that gear, equipment, awnings etc are secured.
- Ensure mooring lines are slightly slack, so that in surges no snatching will occur.
- Ensure mooring lines pass first between the uprights of cleats, if practical, before being warped around and tied off.
- Ensure mooring lines are fastened to substantial parts of the vessel.
- Ensure mooring lines **are not** secured to the jetty gangways.

IN THE EVENT OF A CYCLONE OR STORM WARNING ALL VESSELS ARE TO VACATE THE MARINA AND PRECINCT.

Land Based Operators duties:

- Ensure that nothing loose is left lying around. Debris flying around during strong winds poses an extreme hazard to both property and life.

CYCLONES - STORM SURGE – HIGH WINDS

Cyclones are dangerous because they produce destructive winds, heavy rainfall with flooding and damaging storm surges that can cause inundation of low-lying coastal areas. They can kill and are never to be underestimated.

Cyclones have wind gusts in excess of 90 km/h around their centres and, in the most severe cyclones; gusts can exceed 280 km/h. These very destructive winds can cause extensive property damage and turn airborne debris into potentially lethal missiles. It is important to remember that, during the passage of the cyclone centre or "eye", there will be a temporary lull in the wind, but that this will soon be replaced by destructive winds from another direction.

Heavy rainfall associated with the passage of a tropical cyclone can produce extensive flooding. This can cause further damage and death by drowning. The heavy rain can persist as the cyclone moves inland and decays, hence flooding due to a decayed cyclone can occur a long way from the tropical coast as the remains of a cyclone moves inland.

The destructive high winds accompanying tropical cyclones also produce phenomenal seas, which are dangerous both for vessels out at sea and those moored in harbours.

METEOROLOGICAL WARNING SYSTEMS

The Nadi Tropical Cyclone Warning Centre (TCWC) will issue Special Weather Bulleting appropriate to the given threat, ranging from cyclone alert for the initial information stage to cyclone warning for the highest level of threat.

CYCLONE ALERT

Issued every six hours.

Issued whenever there is a significant probability of a tropical cyclone developing and moving into the Fiji area. Gale force winds are not expected within 24 hours but may occur within 48 hours.

CYCLONE WARNING

Issued every three hours.

Issued when there is an imminent threat of a tropical cyclone affecting the Fiji area or parts thereof. Such warnings will contain information pertaining to the predicted wind strengths that could be expected in specific areas. Such wind strengths are detailed in the following categories.

TABLE SHOWING CYCLONE SEVERITY CATEGORIES

Bureau of Meteorology Category Wind Info

PLEASE NOTE: Descriptions of damage are indicative only, damage may vary between localities due to factors such as building standards, surface flooding etc.

CATEGORY	AVERAGE WIND (km/h)	STRONGEST GUST (km/h)	CENTRAL PRESSURE (hPa)
Category 1	63 - 90	Less than 125	Greater than 985

CAT 1 Typical Effects [indicative only] Negligible house damage. Damage to some crops, trees and caravans. Boats may drag moorings.			
Category 2	91 - 125	125 - 170	985 - 970
CAT 2 Typical Effects [indicative only] Minor house damage/Risk of power failure. Significant damage to signs, trees and caravans. Small boats may break moorings.			
Category 3	126 - 165	170 - 225	970 - 945
CAT 3 Typical Effects [indicative only] Some roof and structural damage. Some caravans destroyed. Power failures likely.			
Category 4	166 - 225	225 - 280	945 - 920
CAT 4 Typical Effects [indicative only] Significant roofing loss and structural damage. Many caravans destroyed and blown away. Dangerous airborne debris. Widespread power failures.			
Category 5	Greater than 225	More than 280	Below 920
CAT 5 Typical Effects [indicative only] Extremely dangerous with widespread destruction.			

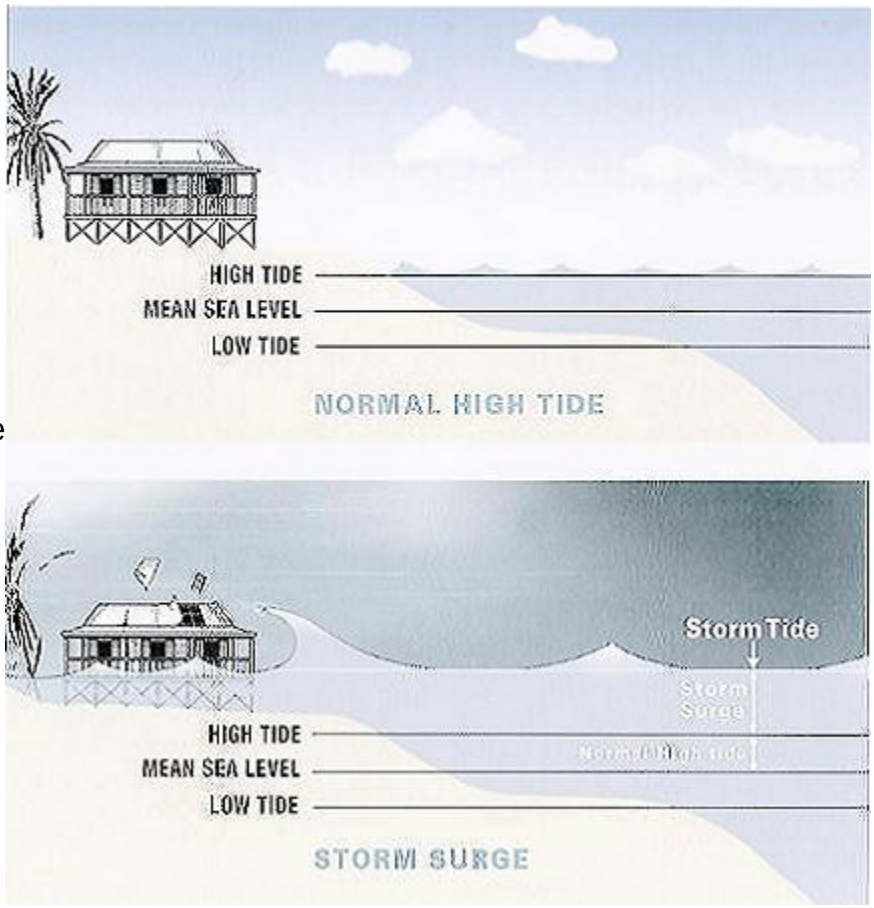
STORM SURGE:

A *storm surge* is generated by weather systems forcing water onshore over a generally limited stretch of coastline. It will normally build up over a time frame of a few hours, as the cyclone or similar weather system approaches. Normally wind-waves on top of the surge will contribute to its effect: it will cause serious local flooding. Wherever your nearest high ground is, know how to get there or stay with friends living on higher ground.

What is Storm Surge?

A storm surge is a rise above the normal water level along a shore that is the result of strong onshore winds and /or reduced atmospheric pressure. Storm surges accompany a tropical cyclone as it comes ashore. They may also be formed by intense low-pressure systems in non-tropical areas.

Around the world, drowning by storm surge accounts for a high proportion of the deaths in tropical cyclones**.**



Storm Surge + Normal Tide = Storm Tide

To join Port Denarau Marina's Cyclone Warning Email Service please go to the following link:

http://eepurl.com/8Au55

When to Take Action

The best advice is to prepare or move your boat when a cyclone is a substantial possibility, even before a cyclone watch is issued. If you wait longer, and your plan includes relocating the boat, your engine may have problems, the hurricane hole you chose may be inaccessible. Or, if you planned to have your boat weather the storm ashore, you may find the marina is too busy to haul your boat.

- Always keep your vessel in good condition. Be sure that all systems are functioning.
- Review your insurance policies and keep them up-to-date.
- Keep batteries fully charged and make certain bilge pumps are fully operational.
- Create a cyclone plan for your vessel. Be sure to file a copy of the plan with the marina.

- Take photographs of your boat, write a description along with an inventory and put them with your important papers.
- Purchase and stow mooring line to use in the event of a cyclone. As a general rule, line should be twice the diameter of your normal line.
- Talk with the marina about our cyclone plans and how to protect your boat.
- Unless your vessel can run fast, and you have a good head start, do not try to outrun an approaching storm. Twelve-foot seas can exist up to 150 miles from the center of the storm system.

Priority One: Reduce Windage
One of the first steps when preparing your boat for a storm is to take off all loose gear that will create windage: canvas covers, bimini tops, spray dodgers, outriggers, antennas, anchors, running rigging, booms, life rings, dinghies, portable davits, etc. Sails also create a lot of windage, especially when they come unfurled, and should never be left on deck in a storm. If there's time, windage can be greatly reduced on a sailboat by unstepping the boom and mast.

Preventing Water Damage
Remove cowl ventilators and seal the openings. Use duct tape to cover instrument gauges. Duct tape should also be used around hatches, ports, lockers, etc. to prevent water damage below. Close all but the cockpit drain seacocks and bang a plug into the engine's exhaust ports. If the boat does take on water, it will sit lower, and water could back-up into the cylinders. (Remember to remove the plug before starting the engine when the storm has passed.)

Securing a Boat on Land

Boats stored ashore are far more likely to be saved than boats stored in the water. There are some types of boats that must be pulled if they are to have any chance of surviving. Smaller, open boats and high performance powerboats with low freeboard will almost always be overcome by waves, spray, and rain. Fortunately, most of these boats can be placed on trailers and transported inland. Boats ashore should be stored well above the anticipated storm surge, but even when boats are tipped off jackstands and cradles by rising water, the damage they sustain in a storm tends to be less severe than the damage to boats left in the water. Windage is also a consideration. If nothing else, reduce windage as much as possible and make sure your boat has extra jackstands, at least three or four on each side for boats under 30’ and five or six for larger boats. The jackstands must be supported by plywood and chained together. Smaller sailboats should be stored in cyclone holes/ graves. High-rise storage racks are vulnerable in a storm’s high winds. If possible, boats on storage racks should be placed on trailers and taken home.

Trailer Boats
A trailer is a ticket to take your boat inland, to a more sheltered location away from the tidal surge. But your boat won't get far on a neglected trailer that has two flat tires and rusted wheel bearings. Inspect your trailer regularly to make sure it will be operable when it's needed.

If you take your boat home, you may want to leave it, and not your car, in the garage. A boat is lighter and more vulnerable to high winds than a car. If this isn't practical, put the boat and trailer where they will get the best protection from wind, falling branches, etc.

Let some air out of the trailer tires and block the wheels. You can increase the weight of lighter outboard boats by leaving the drain plug in and using a garden hose to add water. (Rain will add a lot more water later.) This has the added advantage of giving you emergency water (non-drinking) if the main water supply gets knocked out by the cyclone. Place wood blocks between the trailer's frame and springs to support the added weight. On a boat with a stern drive, remove the drain plug so that the engine won't be damaged by flooding.

Secure the trailer to trees or with anchors or augers. Strip all loose gear, bimini tops, canvas covers, electronics, etc. and then lash the boat to the trailer.

Securing a Boat in the Water

Any boat in the water should be secured in a snug harbor. The trick is deciding which harbors will be still be snug if a cyclone comes ashore and which will be vulnerable. Storm surge—high water—is a major consideration. A storm surge of 10’ or more is common in a cyclone, so a seawall or sandy spit that normally protects a harbor may not offer any protection in a cyclone. Crowded, rock strewn harbors are picturesque, but they may not be the best place to keep your boat in a storm. Rocks are hard on boats, should yours break loose, and in a crowded harbor the chance of another boat breaking loose and banging into your boat is that much greater. Finally, what is the bottom of the harbor like? If you plan to anchor, check your charts to see how much water your boat will be anchored in. The best anchoring is usually in sand, followed by clay, hard mud, shells, broken shells, and soft mud. Also, water can sometimes be blown out of the harbor, leaving boats stranded briefly. If this happens, your boat would rather settle onto anything but rocks.

At a Dock

If you are allowed to stay at dock, ensure that you have good docklines: lines that are longer, larger, arranged better, and/or protected against chafing. If you decide to leave your boat at a dock, you'll need to devise a docking plan that is liable to be far different than your normal docking arrangement. By the time preparations are completed, your boat should resemble a spider suspended in the center of a large web. This web will allow the boat to rise on the surge, be bounced around by the storm, and still remain in position.

Take a look at your boat slip and its relation to the rest of the harbor. For most boats you'll want to arrange the bow toward open water or, lacking that, toward the least protected direction. This reduces windage. Next, look for trees, pilings, and dock cleats-anything sturdy-that could be used for securing docklines. With most docking arrangements, lines will have to be fairly taut if the boat is going to be kept away from pilings. The key to your docking arrangement is to use long lines, the longer the better, to accommodate the surge. (A good rule of thumb: storm docklines should be at least as long as

the boat itself.) You will probably want to use other boat owners' pilings (and vice versa), which calls for a great deal of planning and cooperation with slip neighbors and marina management.

Lines should also be a larger diameter to resist chafe and excessive stretching. On most boats you should use 3/8 inch line for boats up to 20 feet, 1/2 inch line for boats 20-34 feet, and 5/8-3/4 inch lines for larger boats. Chafe protectors must be on any portion of the line that could be chafed by chocks, pulpits, pilings, etc. To secure lines to hard-to-reach outer pilings, put the eye on the piling so that lines can be adjusted from the boat. For other lines, put the eye on the boat to allow for final adjustment from the dock.

Remember to also remove all loose items on deck including bimini tops, plastic side enclosures, sails and dinghies. Store them on land. Store small, loose items below deck, including antennas. Secure all hatches and doors, and tape all windows from the inside. Disconnect electric, water and other connections from dock. Shut off fuel lines at the tank and close through hull fittings. Remove all electronics and valuables to prevent destruction or theft. When you are through: Help your neighbors. All it takes is one boat incorrectly tied up to damage many in a marina.

Hurricane Holes: Mangrove Shelter
Whenever canals, rivers, or waterways are available, they serve as shelters-cyclone holes.

In a narrow residential canal, a boat should be secured in the center with several sturdy lines ashore (the "spider web ") to both sides of the canal. The boat should be facing the canal's entrance and be as far back from open water as possible. Besides sheltering the boat, being away from the entrance should help with another consideration, which is the need to maintain a navigable waterway.

Securing boats in the mangrove shelter is possible only if arrangements with the landowners whose mangroves you will be using to secure your boat is allowed. If your boat is already in the canal, getting other vessel owners involved in planning for a cyclone increases the chances that your boat (and theirs) will survive. This is important. All it takes to wreak havoc in a narrow canal is one or two neglected boats coming loose.

In wider waterways, boats should be secured using a combination of anchors and lines tied to mangroves ashore. The more lines and anchors the better. Moor your boat away from the main channel. Other considerations: a cyclone hole has tidal restrictions. Plan on moving your boat early.

After the Storm

If your boat was damaged, you'll want to contact your insurance company immediately. As soon as it is safe, here are some things you should do to protect your boat and reduce potential problems.

1. Protect the boat from weather exposure, leaks, mildew, dry mud, etc. Regardless of the boat's condition, it should be cleaned and dried out.

2. If the engine and other machinery have been submerged or gotten wet, it should be “pickled” by flushing with fresh water and then filling with diesel fuel or kerosene.
3. If your boat is sunk or must be moved by a salvage company, let your insurance company assist with the arrangements. Do not sign any salvage or wreck removal contracts without first getting approval from your insurance claims staff.

Chafe Gear

Chafe protectors are essential on all lines: at a dock, at a mooring, or at anchor. Nylon stretches and absorbs shock, which is good, but this stretching under tremendous loads also works the line against chocks and other contact points. On moorings or at anchor, the line stretched over the edge of the rail can create sufficient heat to melt the line internally. Polyester (Dacron) has much less stretch, but is more chafe resistant than nylon. By using a polyester line from the cleat through the chock and then joining it with a nylon line (use two eyes) to the piling or mooring, you can get the best of both types of line-the chafe resistance of polyester and the stretch of nylon.

Any line must be protected in a storm. For a super system, if your chocks are large enough, fit a second, larger diameter hose around another hose that fits snugly to the line. Drill holes in both hoses, and use cord to tie them securely to the line. In a pinch you can use a single hose.

If you need chafe protection quickly, use duct tape (a lot) to secure several layers of heavy canvas to the lines. This won't be as rugged as hose, but it is certainly better than leaving the line unprotected.

Cleats and Chocks

Many boats have cleats and chocks that are woefully inadequate. This problem becomes critical when more and larger diameter storm lines are used during a storm. If necessary, add more and larger cleats and chocks now; they'll make securing the boat easier all year. Assess the ability of cleats to carry heavy loads. This means making sure all are backed properly with stainless steel or aluminum plates. Marine plywood is OK if it's healthy-free of rot and delamination. On sailboats, winches (if backed properly) and even keel stepped masts can also be used to secure lines at a dock. (NOTE: Anchor lines should NOT be secured to the mast, as it creates that much more stretch on the line at the chock, which further increases the chances of chafe failure.)

Don't put too many eggs in one basket by leading numerous lines to a single cleat, even if it is backed properly. Two lines per cleat is probably the maximum. Also, a cleat is not reliable when lines are led perpendicular to the base and the cleat can be wrenched out by the tremendous loads. Two-hole cleats are more vulnerable than four-hole cleats.