

Hurricane Preparedness for Boats

A boat doesn't have to be in the direct path of a hurricane to incur major damage. As a precaution, CIRMA encourages its members that own police or fire boats or other town-owned boats to be prepared to take prompt action before major storms to prevent damage and remain ready for emergency response.

The location of the boat is the most important factor in preventing damage during a major storm. While there are never any certainties in a major storm or hurricane, choose the most storm-worthy location possible to locate the boat. Stripping down the boat and adding extra lines, while critical, won't necessarily protect a boat in a crowded marina exposed to the storm surge and high winds of a hurricane. If the boat can't be hauled out, consider securing it in a narrow, protected body of water.

If your boat is stored in a slip, it's a good idea to add extra lines, chafe protection, and extra fenders. If the boat is on a lift, removing it from the lift and securing it ashore is the best way to prevent damage. Boats stored on jacks can topple over in high winds. The practice, pioneered during Hurricane Wilma, of strapping down boats stored on jacks successfully reduced the number of boats damaged in storms by an estimated two-thirds.

Guide for Discussion

For boats on the water or in a slip or dock:

1. Open boats on the water and those with clogged scuppers can be sunk by significant rainfall. Make sure scuppers are clear and free of debris, so that water can drain away.
2. Pump out the bilge in advance of the storm.
3. Secure all hatches and stow loose items and canvases.
4. Experts recommend doubling up dock lines. Try to keep the number of lines secured on any one cleat or piling to two. That way if one line fails, the boat will still be secured. The boat's chances of surviving a storm can be improved significantly by using more and larger lines. All things being equal, a $\frac{3}{4}$ " line will outlast a $\frac{1}{2}$ " line and two $\frac{3}{4}$ " lines will outlast a single $\frac{3}{4}$ " line. The size of the line will likely be dictated by the size of the cleats. Now is the time to replace old, frayed, or chafed lines (see *Additional Discussion below*.)

For boats stored on jacks outdoors:

1. Consider strapping down the boat to the ground. Marinas recommend using 5/8-inch, three-strand nylon line, secured to a four-foot helical anchors with round eyes or eye set into the ground, or if possible into concrete.

Additional Discussion Notes

Line failure during hurricanes is a major cause of damage to boats. There are five critical factors that predict how rope will fare in a storm.

1. Breaking strength. All things being equal, a braid-on-braid line will have the most breaking strength followed by plait, and then a three strand.
2. Stretch. A rope must absorb the tremendous amounts of energy produced by high winds and waves. There are two ways that a rope absorbs energy: The material itself stretches and the weave of the material can expand and contract mechanically. Before the fiber itself stretches, the lay of the rope untwists and absorbs energy. **Nylon stretches more than polyester** and, all things being equal, a **three-strand twist line will stretch more (and absorb more energy) than a braid-on-braid line**. A plaited line (similar to three strand but softer and with a square profile) will stretch more than either three-strand or braid-on-braid.

Continued

Questions? Ask your Supervisor or CIRMA Risk Management Consultant.

Hurricane Preparedness for Boats, *cont.*

3. Chafe and Cleat Location. All of this stretching back and forth has the potential to chafe the line, especially if it is secured to a cleat that is a foot or two away from the chock. All of this rubbing under pressure will quickly cause abrasion. When the line is bent sharply down to the water, only about half the ropes fibers are taking the load. Because of compression, the remainder of the fibers will be ineffective. Stretching and rubbing at a sharp angle also creates heat, a lot of heat. Nylon line starts to deteriorate at 300° F, and at 350° it will have lost half of its strength. There have been many instances when lines have melted and failed internally.
4. Age. Dirt, grit and salt over time, abrades the rope's thin fibers and weakens the line. Repeated expansion and contraction weakens the fibers. Fibers are also weakened by sunlight and exposure to some chemicals. Thus, an older line, even one that is strong looking and supple, may be significantly weaker than a new one. Two indications that the line is deteriorated are stiffness and, when it's under load, squeaking. In commercial marine uses, rope is often retired at pre-determined intervals, typically after two to three years of everyday use, to prevent catastrophic failures.
5. Line quality. Better quality line is pre-shrunk with lubricant added to the fibers. Three-strand twist should always be built with a medium lay construction. The latter has more twist and will absorb energy more readily than rope made with soft-lay construction. While less expensive, soft-lay rope is much more prone to failure. If it's easy to separate the strands, the line is probably soft lay.

Attendees _____