



# SEAWORTHY

The BoatU.S. Marine Insurance and Damage Avoidance Report\*

## Avoiding Metal Fitting Failures



Unlike most claim files, the boat's skipper began his account by describing his feelings before the accident: "I was enjoying those blissful moments sailing at night when the wind is just right, the seas are mild, and thousands of stars were lighting up the heavens . . ." He said he had been alone on deck and was being

hypnotized by the silent wonder of it all when he heard a faint "pung," which, it turned out, was a shroud letting go. He glanced up and watched helplessly as the top of the mast started titling awkwardly to leeward. A mere second or two later it toppled over the side.

The cause of the dismasting turned out to be a chain plate that had broken below deck level. The top was still clean and shiny but the rest of it, the part that had been hidden below the deck, was a black and corroded mess (Claim #98372712).

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Corrosion is an insidious enemy of the metal fittings on your boat. It comes in several varieties, and the two most significant for boat owners are galvanic corrosion and stress corrosion. A third variety is crevice corrosion, most often seen on stainless steel screws that have been in

place for long periods of time. The fourth variety, cavitation erosion, is often seen on propeller blades and can also occur in cooling systems.

All of these except for cavitation erosion are related in that the root cause is the flow of electricity (in very small amounts) from one metal to the other. Cavitation corrosion can often result from the turbulence generated when bubbles of water vapor are created on the low-pressure side of a propeller blade, the aft-facing side. Once this corrosion begins, the affected area is a prime candidate for galvanic corrosion.

Stress corrosion is typically seen in cases where a stainless steel pin is too small for the hole. This

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\*The BoatU.S. Damage Avoidance Program is dedicated to helping you enjoy accident-free boating. *Seaworthy* looks at real claims and how they might have been avoided. Material in *Seaworthy* may be reprinted with credit to "Seaworthy, the BoatU.S. Marine Insurance and Damage Avoidance Report."



### The Aftermath of Ike

I always read each issue of *Seaworthy* carefully to learn what not to do so I can keep my boat safe and sound. Whenever I look at the photos of damaged boats, I think of how brokenhearted the owners must be over the loss of their pride and joy.

Who would have guessed that a hurricane named "Ike" would cause damage way up here in Central New York? They never had before. But on Sept 16, 2008 at 2:00 p.m., I got a call from a friend at the Oswego Yacht Club who said I'd better check out my boat.

What I found is on page 8 of the January *Seaworthy*. I now know what those other people felt like. The first thing I did was sit down and cry! We had only owned this boat for a short time and it was to be part of our retirement plan. My poor wife cried for three weeks.

I thought I had done everything right: ample chain, double painters, and what for the last nine years had been a steady hold on the bottom. All I can say is you better be sure, absolutely sure! After I was done crying, I went back and called BoatU.S. to file a claim. I can't say enough about the people at BoatU.S. They made me feel better about the situation and told me that they would take care of everything. From start to finish, all of the people involved made me feel like they were part of my family and sharing my pain.

So now I look at other people's loss in a very different light and I know exactly what those people felt.

Brace Tallents  
Oswego Harbor, New York

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I read your publication from cover to cover and was very interested in reading the "Lessons from Ike." While you made some very good points, I was disappointed at the one-sided comparison you made of Watergate and Waterford. While there was damage to boats and fixed piers at Watergate, there were many boats on both fixed and floating piers that fared very well. Our 42-foot sailboat was on a fixed

pier in Watergate and we had no damage!

By the way, the BoatU.S. CAT Team was superb! They were here first and seemed very concerned and helpful.

Gloria Rooney  
Houston, Texas

*You make a good point. Boats at Watergate that were only protected by the seawall were almost all badly damaged. The boats further back that were protected by land survived with little or no damage. That was also true at the Galveston Yacht Club—boats nearest the seawall were the ones that sustained the most damage.*

### Disembarkation Syndrome

I noted in the January '09 *Seaworthy* that someone needs help with disembarkation syndrome. I was in the Navy and as every sailor knows, it strikes as soon as your feet hit the "beach."

This is why sailors head for the nightclubs and bars, so their staggering won't be misconstrued as a physical defect. About the time you get your syndrome and buzz synchronized and get your land legs, you are back on board reinforcing the syndrome.

John Labie  
Tallahassee, Florida

### A Trailering Tale


I have been trailering a Scout 202 Durado back and forth between the beach and freshwater for eight years. I perform every maintenance item you can think of and more. I have two small children and I have two rules of thumb: I use an abundance of caution and I always want to return under my own power.

Last spring I found myself at the beach house with my wife's new 2007 Yukon. Normally I pull the boat with my Suburban. I changed the receiver from my car to my wife's and went down to the marina to hook up the trailer and pull my boat out of the water. I was shocked to find out how much higher my wife's bumper was than mine and when I went to jack up the trailer, I had to lift it higher than the jack and put on the ball. I knew this was wrong,

but I was only going to pull the boat out of the water.

The tide was low, which created a longer-than-usual ramp. When I got to the top of the ramp, the car leveled off before the trailer so that the angle between the trailer and the car was that much greater. I heard a loud noise as the trailer hitch released from the ball. You cannot imagine my surprise as I looked in the rear-view mirror and saw my boat racing back down the ramp. Fortunately my abundance-of-caution rule taught me to wrench the trailer jack wheel up tight and in the direction the trailer is moving, so that if it were to accidentally release, the trailer would, hopefully, continue in a straight line. It worked; the boat and trailer raced back down the ramp and into the water without hitting anything or turning over.

Over eight years I had changed bearings, tires, light harnesses, and wheels but had never thought about the safety cables. My boat trailer, like many others, has the rubber-coated tension cables instead of chains. You cannot see corrosion on the cables. When the trailer released, both cables



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snapped cleanly. Eight years of salt water had made them useless!

Please add inspecting your trailer's safety cables to your list of summer maintenance items.

John D. Landrum  
Augusta, Georgia

## And a Lightning Tale

We enjoy reading *Seaworthy* and have learned many helpful navigation and maintenance tips from contributing members. Articles about lightning strikes always catch my attention.

Two years ago, we were anchored in a cove across from Lanier Island. It was a sunny, clear day with no hint of wind. Since it was such a beautiful day, I had failed to check the weather forecast.

About 3 p.m., the wind picked up and quickly grew to gale force. The anchor started dragging, moving the boat further into the cove. The rain and wind became ferocious. Visibility was zero and the storm, according to the weather forecast, was expected to last for 30 minutes. The lightning was everywhere; it was like being in a disco. I started the engine and pulled the anchor up with the realization that I was committed to motor throughout the storm.

Since visibility was so restricted, I sought out an island so that my exposure to other vessels would be reduced by 50 percent. While making our way to the island, the boat was struck by lightning and I could not release my hand from the steering wheel. It reminded me of the time I pulled the plug wire from a running lawn mower ... my hands felt numb. After regaining my composure, I continued for the island. Once we arrived, I put the boat in a reverse pivot so I could monitor boat traffic. I was in this position for 20 minutes, constantly listening to the weather report. When the storm passed, there were enough hailstones at the stern to fill two 48-quart ice chests.

During the trip back to the dock, the sky cleared and everything was again calm. It was beautiful. I thought about past summers when storms had come and everyone raced back to the marina to wait for them to pass. I understand now that if you

are at the dock with hundreds of other boats and your boat is hit by lightning, you are just unlucky. But when you get by lightning out in the open, you're a dummy.

I appreciate having the opportunity to read your publication. During the winter months, *Seaworthy* keeps my passion for boating alive and the lessons are invaluable.

David Hill  
Marietta, Georgia

## Questioning Flares

Let me offer some comments and suggestions about the USCG requirement that boats carry pyrotechnic visual distress signals. Maybe you have been working on these issues and are far ahead of my thinking.

There are several problems with this requirement. 1. Flares are expensive and need constant replacement. 2. Flares are, I am told, inherently dangerous to use. Very hot, dangerous molten slag drops down from them, which can easily seriously injure the person deploying the flare and can cause serious damage to the boat. Instructions say to hold the flare to leeward. Who will remember that if land or a potential rescue boat is to windward? 3. There is no simple, reliable method for disposal of out-of-date flares. My local fire department was not interested. The special hazardous waste disposal in Philadelphia (which disposes of guns and ammunition retrieved on the streets of Philadelphia) did take them. I think that West Marine will take flares they sold; I'm not sure if they take others. 4. There is no regular way to train and practice using these devices. It is illegal, I think, to deploy a flare when you are not in distress. In my 50 years of boating (in command of vessels), I have never once set off a flare. I am ill prepared to do so in an emergency.

At the same time, changes in technology are providing many additional ways of signaling for distress, including: VHF, especially DSC VHF; cell phones (especially those equipped with GPS); satellite phones; EPIRB; and laser flares.

I appreciate that these devices do not do exactly the same thing as classic flares, but the trade-off is that they can be used safely

and effectively. These devices may be on a boat already, and there is no constant cost for replacing them when they expire.

It would seem to me that there could be some flexibility in the mandate that boats have distress signaling capability, involving some combination of the various devices.

As long as pyrotechnic devices remain required by the Coast Guard, I suggest: 1. All Coast Guard stations be required to accept expired flares for disposal. 2. All Coast Guard stations have (or arrange for) regular (like the first Saturday of every month), supervised training and practice sessions so boaters can become familiar and comfortable with the use of pyrotechnic devices.

Ben Stavis  
Bala Cynwyd, Pennsylvania

*Your letter is timely since this issue includes an article about flares, and recently, Seaworthy editors were involved in testing flares with the BoatU.S. Foundation. We feel they still can play an important role, at least offshore.*


*We'll relate a story sent in to us by Al Sampson, a reader in Rhode Island. After a sailboat's sails were shredded by a storm and their engine quit, the crew set off an old-style EPIRB. The Coast Guard launched a search, but was unable to home in on the signal. In the meantime, the crew tried to make cell phone calls to 911, but kept losing the signal. Finally, after the Coast Guard spotted their flares, the crew was rescued.*

*Incidentally, the Foundation tested laser flares, and while they have their place, they found that they are more difficult to use in summoning help.*

## A Strange Case of Justice

Can you tell me if there have been any further developments in the case of Bismark Dinius?

Allen Smith  
Howard City, Michigan

*In response to a request from the Lake County District Attorney, the trial has been postponed until May.* 

## Man vs. Machine: Are Your Autopilot and GPS More Reliable Than Your Lookout?

As *Seaworthy* has frequently noted, whenever the autopilot is switched on, you can't ignore Rule Five—the need to watch out for other boats or, in this case, buoys. The member had entered a waypoint for the buoy, no doubt thinking that his GPS had a built-in error that would keep the boat safely away. As you can see from the photo, it didn't (Claim #0900597).

The bigger question is, where was the lookout? The answer is that the entire crew was sitting in the cockpit when the designated lookout up at the bow fell asleep. Apparently no one noticed the guy had nodded off or that the buoy was getting closer and closer, until finally it hit.



Two suggestions: When you program your GPS, don't assume it will be anything but dead-on accurate. And even during the day, it's a good idea to have two people standing watch to keep each other engaged and alert.

## Life Jackets and Kill Switches

A man in Arizona was taking his 18-foot bass boat out onto a lake by himself one night, as he had done many times before, when he struck a jetty that had recently been built. In an instant, he was catapulted off the bow and landed, unconscious, in the water (Claim # 0706806).

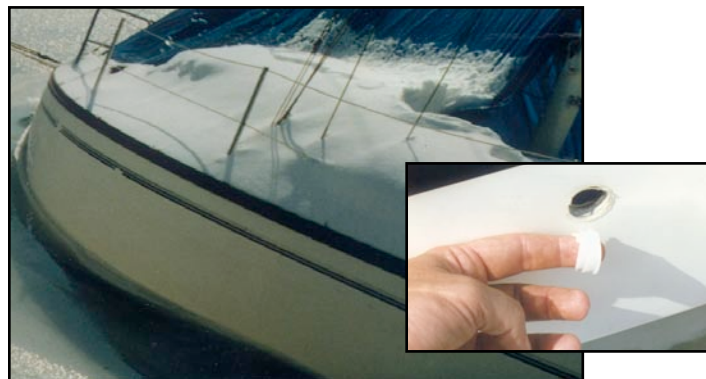
You might think this Alert would be about the need to slow down at night or whenever visibility is limited. It's not. While reducing speed at night is certainly a good idea, this claim is noteworthy for what the boat's owner did correctly: Prior to getting underway, he attached the engine's kill switch to the life jacket he was wearing. If he hadn't bothered with the life jacket or kill switch,

he would likely have been run over by his own boat, cut up by the prop and drowned. Instead, the engine was stopped before he hit the water and he floated quietly beside the boat until he regained consciousness. Despite a few broken ribs, he was able to climb back aboard, start the engine, and return home.

It could be argued that there is no need for a good swimmer on a boat to always wear his or her life jacket in all conditions. But when you're by yourself, especially at night or in foul weather, a life jacket certainly makes a lot of sense. As for the kill switch, it should *always* be attached to whoever is at the controls when the boat is underway. Always.

## Cracked Plastic Fittings

As a general rule, boats with low freeboard have a greater chance of sinking accidentally. A ski boat, for example, is more likely to be overcome by rainwater, a slow leak, or even a following sea than a mega-boat with a towering hull and thousands of cubic feet of volume.



But a boat is often much "closer" to the water than its lofty freeboard would indicate. A cracked plastic through-hull at the boot stripe means that, as a practical matter, the boat only has to sink an inch or two before it floods and heads to the bottom.

With the boat shown here, a through-hull at the boot stripe, meant to drain the deck, was cracked and began leaking after an especially heavy snowstorm lowered the waterline slightly. Water then began lapping into the boat, which quickly sank (Claim #035343A).

Plastic fittings deteriorate in sunlight and get brittle with age. How common are cracked fittings? One surveyor estimated that of the boats he surveys with plastic fittings, *almost half* have at least one fitting that is cracked. *Suggestion:* This spring, replace plastic fittings near the waterline with bronze or Marelon; it's a quick and simple job and the difference in cost is negligible.

## Projects Gone Awry: Sometimes It's the Part

Every marina has at least one wag who insists the reason manufacturers put the word "Marine" in front of a product is so they can charge twice as much. Typically, this guy ignores ABYC standards and maintains his boat by rummaging around in his garage for parts. So, as yet another installment of why houses and boats are different, we offer the following photo of a threaded fitting. The fitting had been attached to a hose with a clamp, but the hose slipped off and caused extensive water damage (\$41,000) to the boat's engines and interior. Unlike a house, boats vibrate and get bounced around by waves. All it would have taken to prevent the expensive repairs was a two-dollar hose barb screwed onto the threaded fitting. A second clamp would also have been a good idea.



## And Sometimes It's the Guy with the Wrench

Sometimes it's not the part, but the labor that goes awry. To cite a few recent examples: A boat owner changed his engine oil but didn't tighten the filter adequately. When he started the engine, the oil dribbled out and sometime later the engine made a horrible metallic sound and died. Another boat owner removed a plastic depth sounder transducer, then reinstalled it with a pair of pliers (most transducers should be hand-tightened). He put a slight crack in the transducer, which nearly sank the boat. One final example: A boat owner installed a new prop, turned on the engine, shoved the throttle forward, and went about 300 yards before it fell off.



Before attacking a project for the first time, do some homework. Ask a more experienced person if you're not sure, or see if it's one of the many subjects covered by a *DIY Boat Owner* CD-ROM.

## Extinguishing Fires 101

Fire extinguishers are rated for the types of fires they are designed to put out: "A" is for combustibles such as wood and fiberglass; "B" is for flammable liquids, such as gasoline and oil; and "C" for electrical equipment, like wires and circuit breakers. The extinguishers found on many boats, which also happen to be the least expensive, are rated BC.

While BC extinguishers, strictly speaking, meet the Coast Guard's minimum standards for fire extinguishers, they are all but useless if an electrical or fuel fire were to ignite the boat itself. The point was driven home this winter during the BoatU.S. Foundation fire extinguisher tests earlier. Wood that had been soaked in kerosene kept burning even after an entire BC extinguisher had been discharged. By way of contrast, the same fire was easily extinguished by a comparable ABC extinguisher. The latter is only slightly more expensive.

Portable BC extinguishers do have their place, however, because they typically release a gas (CO<sub>2</sub>), and are best suited for enclosed spaces like engine rooms and best discharged through a fire port. They also don't leave any residue. They should be mounted where they will be readily accessible.



One other point gleaned from testing with inexperienced users: Read the instructions and know how to operate the extinguisher *before* you have to use it. Don't wait until you're faced with a wall of flames to become familiar with how the thing works.

To learn about how many and what types of extinguishers are required on your boat: [http://www.uscgboating.org/SAFETY/fedreqs/equ\\_fire.htm](http://www.uscgboating.org/SAFETY/fedreqs/equ_fire.htm).

# Visual Distress Signals— Offshore, They Can be Lifesavers

*Claim #010847: On a dark night, two miles offshore near Cocoa Beach, Florida, an electrical problem killed both engines as well as the 12-volt system on a 24-foot center console. The owner did not have a cell phone and was becoming increasingly more concerned as the wind slowly carried him further and further offshore. After all attempts to revive the electrical system had failed, he loaded the boat's flare gun, aimed it up, pulled the trigger and watched as a bright red meteor flare lit up the dark sky. Over the next ten minutes he fired three more flares. He saved the last two to help rescuers—if someone had seen the first three—locate his boat. Then he sat alone in the darkness and waited.*



battery power and when all else fails, they may be your last hope.

Not only is it a good idea to carry visual distress signals, it's the law. The USCG requires that all vessels must carry VDS's, unless the boat is being used on small bodies of water, such as most lakes, rivers, and small bays. The Coast Guard requires day and night signals be carried, though the ubiquitous meteor flares satisfy both requirements and most people have them onboard. Some vessels, such as boats under 16 feet, open sailboats under 26 feet that have no engine, and human-powered boats don't need daytime VDS's, but still need to have nighttime VDS's aboard when operating between sunset and sunrise (for more information on requirements, go to: [http://www.uscgboating.org/safety/fedreqs/equ\\_vds.htm](http://www.uscgboating.org/safety/fedreqs/equ_vds.htm)). Even for these boats, a simple

*Someone on the beach had seen the flares and called 911. The Coast Guard sent a boat out to search the area and when the man saw the lights of a boat, he fired off the remaining two flares. The Coast Guard quickly located the boat and arranged to have it towed home by TowBoatU.S. Back at the dock, the owner found the cause of the electrical problem—an overheated wiring harness.*

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Given the impressive array of electronic devices that are now available, visual distress signals (VDS) have a reputation among boat owners for being low-tech; some are no more than an orange flag that can be waved to attract attention. But, as the boat owner off Cocoa Beach learned, anything electronic on a boat can be rendered useless with a dead battery. And even if you do have a cell phone, the range is very limited. Flares don't need

## The Problem of Disposal

If you buy several flares every three-and-a-half years, eventually you (and millions of other boaters) are going to accumulate a pile of old flares. Some can be kept for backups, but any flare that is more than seven or eight years old is not likely to be much help in an emergency. So what do you do with them? There are some things you *can't* do with expired flares; you can't throw them out in the trash, you can't set them off in a non-emergency, and you shouldn't let them pile up on your boat or at home (note: soaking old flares in water does *not* make them safe). So what should you do with the really old

ones? So far, that's a question without a complete answer. Flares are hazardous waste and can't go to landfills or be shipped by individuals. Some states such as Florida have special collection facilities at some marinas. The best bet is to call your state fire marshal's office to see if there is a state program. Next, contact your local county public works or sanitation department. Finally, try the local U.S. Power Squadron or USCG Auxiliary groups who may be able to use them for demonstrations, but be aware that they won't be equipped to take flares from everyone.

inexpensive flare gun kit is the best way to satisfy the requirements.

There are several types of VDS's, such as orange distress flags for day use and electric distress lights for night use only, but the most common way to satisfy the USCG requirements for VDS's is to buy a kit that includes a flare gun and the required three USCG-approved day/night flares. But stop and think for a minute; those kinds of flares can only be seen for about six *seconds*. Assuming all of the flares work as advertised, you only have 18 seconds for someone to notice you. Remember, the USCG requirements are minimums—six flares will double your odds of being seen and rescued. Odds can also be improved by increasing hang time—the longer the better. While the typical meteor flares fired from a flare gun only go up a few hundred feet, parachute flares launch up to 1,000 feet, have a burn time of 40 seconds or more, and are much brighter, vastly improving the odds of being noticed and at a greater distance.

Aerial flares are good for attracting attention but because they drift with the wind, they're lousy for tracking. Your arsenal should also include some handheld flares, which burn much longer and are particularly useful for directing help to your location once a search is underway. But relying only on pyrotechnics for daytime use is not a good idea. This past fall, the BoatU.S. Foundation did some real-world testing of flares and found that during the daytime, even the best flares were hard to spot—meteor flares were nearly invisible. Better by far are smoke canisters, which are tossed overboard, or handheld smoke flares.

Don't wait until an emergency to open the package and look at the directions. And make sure you can locate your VDS's; the USCG requirements say that they must be readily accessible—stuffed in a locker under the spare anchor doesn't cut it. You may be able to attend a flare demonstration at a Power Squadron or USCG Auxiliary flotilla. At the very least, practice retrieving your VDS's and preparing to use them. Be careful when practicing loading flare guns—treat them as you would a firearm.

While it is possible to practice firing flares in a non-emergency, *you must notify the local Coast Guard station as well as any local authorities*; otherwise the Coast Guard will launch a search. The Coast Guard prefers that anyone who wants to

## Kids and Flare Guns



Over the years, the issue of handguns has triggered a lot of controversy but one thing everyone agrees on: Leaving loaded guns in a house when there are kids around is a thoroughly bad idea.


Leaving a loaded flare gun in a boat's cabin is equally as dangerous. Young "Terminators" can use the gun to blow away space aliens or in this case the family boat. Fortunately, the 12-year-old boy wasn't hurt (Claim #981201A).

That's not always the case. Two brothers aged 11 and 13 were helping a mem-

ber unload some items from his 40-foot sailboat when the older brother picked up a loaded flare gun resting on a shelf. Whether the boy toyed with the gun in front of his brother or dropped it is unclear; the result was that the gun went off and the younger brother was struck in the eye with a 12-gauge meteor flare at close range. The boy spent six days in a hospital and lost some of the vision in his right eye because of the accident. The owner of the boat had kept the flare gun loaded in case it was needed quickly, though this case illustrates why this is an extremely bad idea. (Claim #9508501)

practice form a group with others who want to do the same so they can be done at the same time. Some marinas have special days just for such an event. It is also possible to buy white practice flares—you won't need to notify the Coast Guard if you fire them.

All pyrotechnics expire 42 months *after manufacture*; the chemicals used in them deteriorate over time and make them less effective and reliable. When buying flares, make sure the expiration date is years, not months away. The Foundation found that handheld flares were difficult or impossible to start as they aged beyond expiration and other old flares often fizzled. That said, it's still a good idea to keep recently retired flares around, just in case, but remember that they don't count towards your minimum requirement of three.

It's hard to improve on something as simple as a pyrotechnical flare, but one company has introduced a laser flare that they say can be seen for many miles in the dark. The disadvantages, which are significant, are that they must be aimed to be effective and they are not USCG approved. But a laser flare is capable of emitting a wide beam of light for 40 hours, is not a fire hazard, and there are no disposal issues. The Foundation tested laser flares and found that some, especially the green ones, were exceptionally bright, but required aiming at a potential rescuer, which can be more difficult than just sending a flare aloft. That said, as a supplement to other Coast Guard-approved devices, it might be something to consider. You can read more about it at the manufacturer's web site: [www.greatlandlaser.com](http://www.greatlandlaser.com). 

# Educating the Crew for an Emergency

## *What's the Point of Having Safety Gear Aboard if No One Knows Where it is or How to Use it?*

Early one July morning on Massachusetts' Cape Code Bay, Bill Fihlman and his crew were fishing from his 20-foot center console when Fihlman heard a single beep that seemed to have come from the boat's 200-hp outboard. Thinking it was nothing important, he ignored it until a few minutes later when he heard a second beep. He put down his fishing rod and was checking the engine temperature gauges when he heard a third beep that was immediately followed by a high-pitched alarm. He smelled burning wires and looked aft to see a wisp of smoke coming from the engine.

Fihlman shut off the ignition and asked one of his crew to hand him a fire extinguisher. He pulled off the engine cover (a mistake), and saw more smoke—much more smoke—and flames. A few seconds later, the crew who was searching for the extinguisher finally asked where it was. Fihlman told him it was mounted to the port side of the center console. More time passed. The crew was having trouble finding the extinguisher because it was covered by the console's canvas enclosure.

The fire extinguisher, when it was finally located, failed to put out the fire—it knocked down the flames but they shot up again a few seconds later. Fihlman asked someone to turn off the battery switch. More time passed before someone asked where it was. The switch was finally located and turned off. The fire went out.

Start to finish, the ordeal had taken maybe two minutes, although Fihlman said it "seemed like a lifetime." He had always been careful to check electronics and safety gear before leaving the dock, but

had assumed his crew, one of which was his grown son, knew where to locate obvious safety equipment like fire extinguish-

**" Start to finish, the ordeal had taken maybe two minutes, although Fihlman said it 'seemed like a lifetime.' "**

ers and the battery switch. After all, it was a completely open 20-foot boat.

Fihlman's advice to readers: *"Don't assume anything! Give a briefing to all passengers before embarking, regardless of their experience."*

### **Briefing the Crew**

Before leaving the dock, spend a few minutes with your guests to make sure they at least know the basics of onboard safety equipment. Don't assume anything. When Bill Fihlman's boat caught fire, the crew was only a few feet away and he was available to give instructions and answer questions. That's not always the case; if the captain (you) were to fall overboard or become incapacitated, the crew would have to locate emergency equipment and

make decisions based solely on whatever instructions you had given them prior to departure.

The list below includes basic safety equipment your crew should be familiar with. Note that for anyone coming aboard who is new to boating, you might also emphasize that the equipment below—flares, fire extinguishers, life jackets, etc.—are not likely to be necessary. Boating is supposed to be fun; no use scaring anybody.

#### **Life Jackets**

Show guests where they're stored, and make sure everyone knows how to put them on. Many people, for example, will try to put their feet through the armholes.

#### **Fire Extinguishers**

These should be out in the open and near areas—engine, galley—where fires are most likely to occur. Take a minute to explain how it is operated and which type of fire an extinguisher is meant to be used on. Point out fire port locations, if any.

#### **Flares**

Show where they're located and give maybe a word or two about how the things work and when to use them. Explain that flares should be pointed UP, for example.

#### **Engine and Fuel Shutoffs**

Especially on sailboats, it's not always obvious how to shut off the engine; it may

involve opening a hatch and pulling out a kill knob.

Not all boats have a fuel shutoff, but if one is available, it should also be pointed out to the crew.

## VHF

Take a few minutes—as much time as necessary—to acquaint people with the operation of a VHF, including emergency and DSC modes if available. A brief explanation of when to use mayday (“grave or imminent danger”) and pan-pan (“very urgent message”) is also advisable.

## Battery Switch

Aside from its location and how it works, you might want to warn people not to flip the switch in a non-emergency; with some switches it could wreck the alternator if the engine were running.

## Charts

If someone is new to boating, there won't

be time to explain all the nuances of using a chart. At the very least, indicate which charts you'll be using, where you're planning to go and the route you'll be taking.

## GPS and Loran

If electronics are available, crew should know the basics of operation and how to get a lat/lon position. True story: In response to a request for his position from the Coast Guard, a panicky passenger on a boat on Long Island Sound responded that they were “OUT TO SEA, YOU \*&(@%#\* FOOL!” Not much help.

## Man Overboard Gear, including EPIRBs

Again, it's not just where the MOB gear is located that's important, but also a brief explanation of how and when to use it.

## First Aid Kit

These can range from basic first aid—Band-Aids, sun screen, gauze, and burn ointment—to kits that are practically a

portable clinic. Most kits are bare-bones basic, however, and you would do well to tell guests what types of emergencies can and can't be addressed by the kit.

## Thru-hull Location/Operation

This is useful for everyone aboard to know when you're at the helm and water mysteriously starts rising over the floorboards.

## Bilge Pump

Make note of the bilge pump switch, if there is one, the pumps location (in case it gets clogged) and also the location of any other pumps, including buckets, that are onboard.

## Flashlight

It may come in handy if you need to find any of the other stuff at night. 🦋

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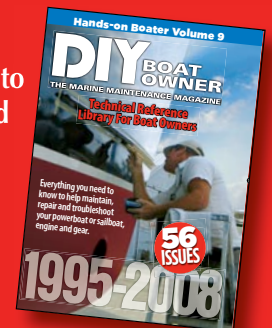


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## TESTING YOUR BOAT, from page 1

concentrates the stress in a small area, producing microscopic cracks that allow water in, with galvanic corrosion often close behind.

Put two different metals near one another, bathe them in salt water and you'll end up with a low-voltage battery and, eventually, one or two badly corroded pieces of metal. The metals don't need to be two separate lumps; alloys can corrode almost as easily as separate and distinct pieces of metal, which is the insidious side of metal corrosion. The offending piece of metal can look more or less fine until one day it falls apart. Since nearly every piece of metal on a boat has a purpose, your troubles are generally just beginning when the piece fails.

Galvanic corrosion requires three things. One, the metal parts must be dissimilar

## Stray Current Corrosion

The corrosion on the shaft in the photo was initially thought to be caused by dissimilar metals—galvanic corrosion. But upon closer examination, the surveyor found the prop shaft and its zinc anode were both deeply pitted and there were “halos” in the bottom paint around several bronze through-hulls, all of which indicated corrosion caused by stray 12-volt current. On a hunch, the surveyor turned off the battery switch and connected a digital voltmeter between the prop shaft and rudderpost. With the battery switch turned off, the voltmeter indicated No Current. He then turned on the battery switch but only activated the circuit for the bilge pump. As he suspected, the voltmeter indicated 12.6 volts—a substantial leak—was being passed between the rudderpost and prop shaft. The surveyor also found the voltage remained constant even when the float switch was dropped, which should have turned off the electrical current from the float switch to the pump.

Switches should always be wired into the *positive* side of the appliance circuit, but in this case the float switch had been wired to the pump's negative side. Initially, this works just as well as wiring the switch to the positive side,

and separated from each other in the galvanic chart. The farther apart they are in the chart, the worse and more rapid will be the corrosion. Second, the parts must be electrically connected by a liquid that will conduct electricity, a so-called “electrolytic solution.” We call it salt water. Pure, distilled water will not conduct electricity, but the fresh water in lakes and rivers, although less electrolytic than salt water, is still an electrolyte, more or less so depending on pollutants. Third, the two metals must also have an electrically conductive connection to each other. This can be the boat itself, in the case of an aluminum or steel boat, or it can be the threads of the stainless steel screws in your aluminum mast. Take out any of the three and you have eliminated galvanic corrosion.

The galvanic chart, also known as a “Nobility Index,” and sometimes as an “Anodic Index,” rates the metals by their voltage potential. The range goes from



Photo: Doug Cowie

but over time it can cause serious corrosion problems. The reason is carbon. Whenever they're activated, bilge pumps throw off tiny particles of carbon inside the housing that eventually builds up and conducts current to the pump shaft, which typically sits in bilge water. When a pump is wired to the negative side, current constantly runs through the pump on its way to the switch and the pump shaft will continuously leak stray current into the bilge water, regardless of whether the pump is running or not.

Problems with stray current corrosion are more common than you might think. Make sure your float switch is wired through the positive side. That way, as carbon builds up, any stray current will only be conducted infrequently—when the switch is in the UP position. Keep battery cables and wires away from the bilge. Note that like galvanic corrosion, corrosion caused by stray current is considered a maintenance issue and is not covered by insurance.

magnesium at -1,750 millivolts to beryllium at +1,850 millivolts. In harsh environments, such as salt water, especially warm salt water, the difference (the voltage potential) between the two metals should not exceed 150 millivolts.

There's more to actually measuring the voltage potential than simply connecting two bits of metal sitting in a tub of seawater to a digital multimeter. The numbers noted above are examples from the Nobility Index, and the actual numbers can vary, even on the same boat, depending on the water the boat is in, its temperature, how long the boat has been in the water ... even the condition of the bottom paint can affect the reading.

Reducing or eliminating galvanic corrosion requires managing any of the three requirements noted above. Since, in many cases, there will be little choice in the matter of the two metals (stainless fittings on an aluminum mast, for example), and you can't avoid putting the boat in the water, you need to either eliminate the connection between the two or provide a third metal to take all the punishment. This is the reason for the anodes on your propeller shaft, engine cooling system, trim tabs and so on. The “sacrificial anode” corrodes so that the other metals won't.

## Recognizing Corrosion

So much for the ideal world. In reality, you need to keep a constant watch for corrosion. There are some indicators that are relatively easy to spot—visual and physical clues to be aware of that will keep you ahead of the game.

Aluminum corrodes and leaves a telltale white dust on the surface. Corrosion on painted aluminum is indicated by bubbles. If the corrosion is occurring in a closed space, such as a stainless steel screw in an aluminum fitting, the aluminum chloride can be nearly solid, locking the screw in place while simultaneously making the join weaker.

Aluminum forms a very tough coating of aluminum oxide on the surface almost immediately upon exposure to air. This is highly resistant to corrosion, but pits, cracks, stress fractures and abrasion expose fresh aluminum to the air (or water) and galvanic corrosion can occur.

Stainless steel fittings that are corroding will weep rust, turn black or brown and will often show signs of pits, cracks or fractures. Stainless steel fittings that are

enclosed, sealed off from the air, are particularly susceptible to corrosion. Stainless steel is only rust-resistant in the presence of oxygen. Cut off the oxygen and the thin film of chrome oxide that is on the surface will break down and the stainless corrodes. This anoxic corrosion turns the stainless steel black. This is sometimes called “closed cell” corrosion, because there is only the single metal involved. The moisture that is present becomes acidic and the stainless steel literally dissolves.

Bronze fittings are susceptible to dezincification. The zinc part of the alloy leaches out at the surface, leaving a porous, brittle fitting of weak copper. As the condition progresses, the dezincification works its way in, and eventually the part will fail, with the seacock handle breaking off in your hand or failing outright, leaving you with a hole in the boat.

Stern drives and outboards are prime candidates for galvanic corrosion. The stainless steel prop shaft and the aluminum of the unit itself are ready to become a galvanic cell. Stray currents in a marina or improper bonding can overcome the usually small zincs that are installed on the drive units and serious corrosion can occur relatively quickly. One of the things to look for is a rough, scaly covering of the propeller, the prop shaft or the aluminum housing. This is zinc, deposited from the zinc anode to the other, cathodic, metals by the flow of positively charged ions from the sacrificial anode.

## Preventing Corrosion

The good news from all this is that corrosion is relatively easy to detect. On aluminum, look for the white dust or nearly-solid buildup of corrosion products. Stainless steel screws in aluminum fittings can become virtually welded to the aluminum. Prevention includes coating the screws with material such as Tef-Gel or LanoCote.

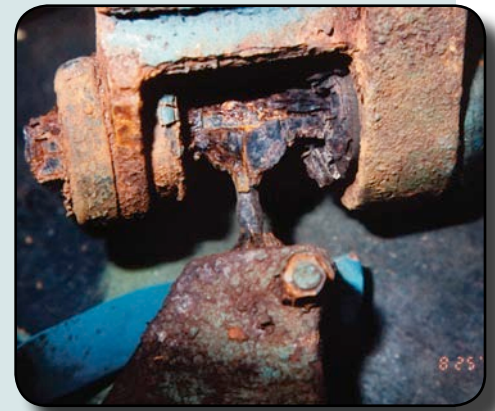
Tef-Gel does not electrically insulate the two metals from each other. What it does is lubricate the mating surfaces, thus preventing the abrasive removal of the chrome oxide coating on the stainless steel screws. LanoCote works in a similar manner, and both products will, if properly used, prevent water ingress. Note that LanoCote melts at roughly 104 degrees Fahrenheit, whereas Tef-Gel's melting point is above 500 degrees Fahrenheit.

LanoCote's lower melting point can be useful, as when it is poured into swaged fittings to keep water out indefinitely.

## Stainless Steel Isn't Always Stainless

It's no secret that water has an adversarial relationship with metal, especially when the water contains salt and the metal is steel (note the engine mount on the right). Even some grades of stainless steel can be affected. We could go into a long explanation about which grades of stainless steel are best at resisting the various types of corrosion, but the bottom line is that nobody can look at a stainless steel fitting and say for certain that it is made of 316 stainless (good) or 304 stainless (not so good). This is true even with the people who import the stuff and there have been many cases when hardware manufacturers found that the “stainless steel” they were importing was more steel than stainless.

The bow eye on the right looked like a stout stainless steel fitting but after a few seasons of splashing through waves it became clear that it wasn't. The same is true of some hose clamps. You can get an early indication that something is amiss with a magnet (stainless steel isn't usually magnetic) but any cracks, pitting or heavy rust (some light surface rust is acceptable) indicates the fitting is likely to fail and needs to be replaced.



Exposed stainless steel should be polished in order to reduce the minute scratches and pits that are on the surface. As we saw above, these nearly microscopic lesions can provide a venue for the formation of crevice corrosion. After polishing, a good coat of wax will provide some measure of surface protection. A good rinse with fresh water after going out will do much to prolong the life of all deck fittings, no matter what they're made of.

With bronze fittings, the process of dezincification will first evidence itself by green stains, perhaps a green ring around the fitting. The fitting itself will gradually change color, turning a shiny, coppery hue. Prevention consists of buying good, marine-grade bronze, and avoiding using stainless steel screws or bolts on bronze fittings.

Aluminum by itself is highly resistant to corrosion, and the naturally occurring layer of aluminum oxide on the surface provides protection. Anodized aluminum is also very resistant, but both of these protective

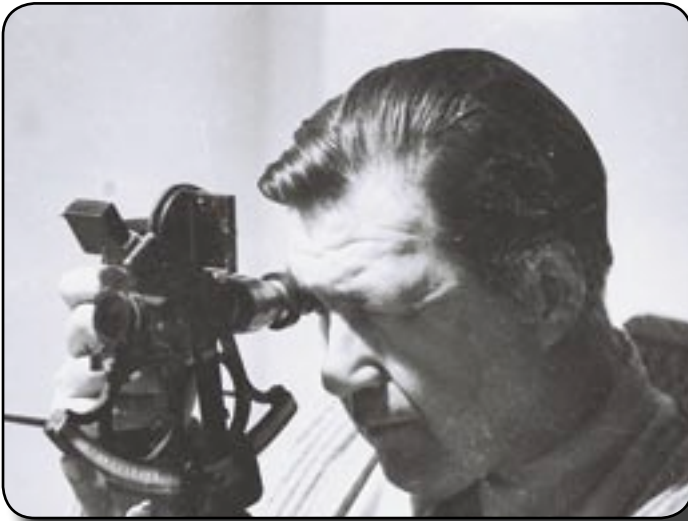
coatings can be removed or damaged by abrasion. Halyards slapping against a mast will wear off the aluminum oxide, coating the line with a gray dust that was once part of your mast. Tie off your halyards.

The bottom line? Corrosion never sleeps. Even on a boat with all metal parts bonded to one another, good anodes and no problem with stray current, there are screws and fasteners that are in airless environments, such as under the nylon plug in Nyloc nuts or at the mating surfaces of hose clamps. Pay attention to problem areas, clean off the corrosion with dilute oxalic or phosphoric acid and a stiff nylon, stainless steel or brass brush, depending on the metal being cleaned. Never use steel wool. Tiny bits of steel will remain behind and it will soon look worse than it did to begin with.

Give the boat a good rinse with fresh water after you return, and a periodic wax job on the fittings will do wonders for both the cosmetics and the service life of the fittings. ⚓

# The History of Navigation

## *Electronic Navigation Has Solved Some Problems But Has it Also Been Creating Others?*



Sextant (And James E. Goodlander)



GPS 2-23

*For a little over 100 years, navigators have been gradually replacing traditional navigation techniques with a series of new-fangled electronic gadgets: RDF, Loran, and now GPS. Life for the navigator is, in theory, now much less stressful. The operative word here is “less,” because electronic navigation, despite finding its way aboard more and more boats, is not completely foolproof.*

\*\*\*\*\*

The introduction of RDF (Radio Direction Finding) in the early 1900s ushered in the dawn of electronic navigation, not with a bang but with a series of cryptic dots and dashes. Using two or more radio transmitting towers, a navigator could home in on radio signals and, using triangulation, plot an approximate position on a chart. Even with practice, however, accuracy with an RDF was less than with visual fixes, but it could still be a lifesaver in pea-soup fog. The biggest drawback was that the system

could only be used in areas along the coast that had towers. The RDF system began to be phased out in the 1970s and most towers have now ceased to transmit.

Time marches on. LORAN (Long Range Aid to Navigation), which was first used during World War II, required the operator to plot Time Differences on a LORAN chart. The original units were bulky, power hungry and expensive but as earlier problems were overcome, LORAN started finding its way onto thousands of recreational boats in the 1970s. Like RDF, the major drawback to LORAN was that it could only be used in coastal and inland waters. Still in use today, a newer, more accurate version, called E-LORAN is being developed as a backup to GPS. Loran's current accuracy of about a quarter-of-a-mile will be substantially improved.

The best-known and most accurate electronic positioning aid currently in use is GPS (Global Positioning System), which,

because of its accuracy, low cost, and worldwide availability, has become the gold standard for electronic navigation. GPS accuracy is based on 24 solar-powered satellites that are 12,000 miles above the earth and moving at 7,000 mph. These satellites send out time-stamped signals to receivers that instantly use triangulation to calculate a boat's position. In the early days of GPS, the Department of Defense introduced an error into the signals to degrade accuracy, but in 2000, it was turned off.

Since GPS is entirely digital, it is easy to route position information to other onboard devices, the most useful of which is the chartplotter. By displaying a digitized nautical chart on a screen, GPS information can pinpoint where your boat is on the chart, its speed, and compass course. With the click of a few buttons, you can zoom in as close as your marina slip. GPS data can be streamed into a radar display so that you can see not only where land

and other boats are in the fog, but also where you are. GPS can be interfaced with autopilots and EPIRBs (406-MHz). The latter can give you a pinpoint location, saving valuable time.

You'd think that with all of this progress, the navigator's and skipper's jobs (on small boats these are usually the same person) would now be remarkably easy. No more fiddling with sextants, weak RDF or LORAN signals, etc. What could go wrong?

*John Walker, who sails his 33-foot sailboat on Long Island Sound, used to program his GPS waypoints to the coordinates of buoys or other navigation aids. This is back when the U.S. Department of Defense purposefully introduced a GPS error that gave recreational units an accuracy of a few hundred feet. Last summer, John bought a brand new GPS that, among other things, could easily be interfaced with his autopilot.*

*On his way to New London, John said that his new GPS beeped a few times to let him know he was nearing his waypoint, then, bam! The boat stopped dead in the water, the bow at the exact center of the buoy. "I knew GPS had become more accurate," he says, "but I never knew it was that accurate."*

The story above illustrates that there is absolutely no electronic substitute for an alert skipper. Fortunately for John, there was not another boat between him and his GPS coordinate.

John isn't the only skipper who is guilty of relying too much on his electronics. When electronics—GPS and an autopilot—have been allowed to "assume control," boats have run aground (Claim #0008492) hit rocks (Claim #0803984) and even a reef (Claim #0800316), all of which were charted and could



**It's important to keep any chart, including a chartplotter, up to date. The damage above occurred when a sailboat struck a small concrete breakwater. The owner's GPS showed that he was right where he thought he was, but the breakwater had just been constructed (Claim #0609871).**

have been avoided if the operator had remained alert.

Still more accidents have occurred because GPS was relied on as the sole

means of navigation. Last year, an inexperienced sailor in a 25-foot sailboat off Rhode Island got into trouble when his boat started taking on water. The bilge pump hid the problem until the battery died, at which point he noticed his GPS screen go blank followed a minute or two later by the uncomfortable realization that his boat was sinking. Using a handheld VHF radio, he managed to contact the Coast Guard but was unable to give them a position; he reported only that he could "barely see land." While the Coast Guard was using his VHF signal to get a position, the sailboat began to slip underwater. Fortunately, another boater overheard the conversation, and after a quick search, spotted the boat just before it disappeared. The

man—credit blind luck—was pulled from the water a few minutes later.

The point: Never rely solely on GPS; always refer to your paper charts and note position and course changes. ⚓

## What About Charts?

A couple of years ago, a *Seaworthy* editor was delivering a boat down the ICW in South Carolina when he noticed his chartplotter showed the 42-foot boat was crossing a marsh, not the middle of the ICW where the boat clearly was. According to C. J. Foster, technical support manager at Garmin, a modern GPS receiver is accurate to within about nine feet 95 percent of the time (older units may only be accurate to within 100 feet). And while that is impressive, GPS is not always perfect. Foster says that significant errors can be induced by satellites, atmospheric conditions, and the receivers.

Another problem could be the charts themselves; how do you know the chart on your GPS is accurate and up to date? Vector-drawn charts, which are made by digitizing data on existing charts, are the most accurate and also the

easiest to keep updated. The latter can be done at home on your computer. Raster charts—the other type of chart used in some chartplotters, especially older chartplotters—are more likely to contain errors. Raster charts are made by scanning the information on paper charts and the location of some objects may shift as the data is manipulated. Also, it isn't possible to update a raster chart without buying a chip from the manufacturer. (For more information on vector vs. raster charts, see the April 2007 and the January 2008 issues of *Seaworthy*.)

Something else to consider: Each chart uses a datum, or reference position, and the GPS receiver has to be set at the chart's datum or the accuracy may be far off. Most U.S. charts use the WGS 84 datum, but it pays to make sure that the chart and GPS datum agree.



## Why is Jerry smiling?

Seaworthy receives a lot of boat stuff from marine manufacturers who hope we'll write about it. Sometimes we do; usually we don't. In the meantime, our offices are continually cluttered with things like mooring balls, seasickness inhalers, whistles, fix-up-your-boat books, rope, anchors, flare guns, etc.

Jerry Cardarelli stopped by last fall with a slightly used roll of duct tape. Jerry is Vice President of BoatU.S. Towing Services, which has nothing to do with 3M, the company that made this particular roll of duct tape. He said he'd used the tape—3M #8979—to patch up his boat's dodger (temporarily). Even though it had been exposed to rain, heat, and cold for two months, there was *no residue* on the dodger when he pulled off the tape. Jerry was happy (see photo) about his clean dodger.

The tape, according to 3M, has its limits. After six months, there may be some residue when it's removed. The time varies depending on the surface, the temperature, humidity, and other conditions, such as people walking on it.

In the interest of science, *Seaworthy* editors devised an experiment to see if 3M's tape would perform as well on other surfaces as it had last fall on Jerry's dodger. We cut off two pieces and put one inside on the office door (wood) and one outside on the BoatU.S. picnic table (steel). Then we waited.

In the meantime, the tape was subjected to a wide range of humidity and temperatures, from subtropical to nearly freezing (and that was just in the office). Finally, after five months, we yanked off the pieces of tape and ... there was no residue! Jerry

was right. So 3M's duct tape, #8979, is now one of the few products to be officially recommended by *Seaworthy*.

Here's something for trailer boat owners to think about this summer when they're zooming down the road with thousands of pounds of boat bouncing along behind the car: If you're traveling at 50 mph, the trailer's 12-inch tires will be going 60 mph; 10-inch tires will be going 70 mph; and 8-inch tires will be going 90 mph! It's no wonder that, according to the BoatU.S. Trailing Club Roadside Assistance, blown tires are the number one reason for dispatch calls.

This spring, you can avoid a lot of headaches by taking a few minutes to make sure your tires are healthy. Most trailer tires are left outdoors and fail because they "rot" over time (look for spiderweb cracks on the sidewall). That's true even if the tires are rarely used.

If the sidewalls have deteriorated, or if there is less than 2/32-inch tread, the tire needs to be replaced! (To check the treads, place a penny into several tread grooves across the tire. The tire is OK if part of Lincoln's head is covered by the tread.)

Three other suggestions:

1. If you want your tires to last longer, take them off and store them inside whenever the trailer will be sitting for long periods. Not only does this help them last longer, it greatly reduces the chances of your boat being stolen.
2. Always, always, always carry a spare. Trying to find a replacement tire on a Sunday afternoon in the middle of nowhere can be a HUGE hassle.
3. The very best way to avoid roadside calamity is with BoatU.S. Trailer Assist "Unlimited," which provides service for your boat trailer and tow vehicle while you're trailering your boat. Call 800-888-4869.

*Seaworthy* heard from many readers about the cover story we did in the October, 2008 issue on the collision of two boats on California's Clear Lake. One reader sent a copy of an article from the Danbury *Times-News* about another boating collision, this one on Connecticut's Candlewood Lake. Robert Miller, who wrote the article, said the accident occurred in the early morning

when three men in a 24' speedboat "roared off" into the darkness and collided in a narrow channel with two fishermen in a 17-foot boat. There was no mention of alcohol but Miller reported the men in the 24-foot boat had just left a restaurant. The men in the smaller boat were participating in a bass tournament.

Two of the men in the speedboat were killed, including the boat's owner. The third man was badly injured and had to spend several months in a hospital. The two fishermen in the bass boat were treated for minor injuries and released the next day.

Attorneys representing two of the injured men (one from each boat) are suing a total of 48 parties, including the owners of the lake (an electric utility company), the organizers of the bass tournament, the boat owner's estate, the owner of the restaurant, and possibly the police, who the attorneys claim failed to adequately patrol the lake. The suits will drag on for years and will likely cost everyone a lot of money.

Aside from articles on how to avoid collisions, *Seaworthy* has also written about the need for boaters, even cautious boaters, to carry adequate liability coverage. In the event of a serious accident, a lot of suits may be filed and civil courts will often apportion liability, which means your liability could be anywhere from 0 to 100 percent, depending on the degree of perceived negligence.

Given the amounts of money that can be awarded in a suit, many people opt to have an "umbrella" (excess) policy to cover verdict or settlement amounts above their boat policy's liability limit. Two things you should be aware of if you have one of these policies: First, if your boat's insurance does not carry the umbrella policy's required liability limit (usually \$300,000), *you* are personally responsible for the difference. And second, don't buy a boat (or automobile, second home, RV, etc.) and assume it will be covered by your existing umbrella policy. It may not be, unless the carrier has been notified *in writing*. In one recent BoatU.S. claim, the insurance company that provided the excess coverage would not cover the liability in a drowning because the boat's owner had not declared his boat on the umbrella policy.



Sam the seagull. Or maybe Samantha.

And now another bird on a boat story. Most boat owners write *Seaworthy* because they've found a way to keep birds off of their boats. Their techniques have ranged from installing electric wires (not recommended) to using gizmos that squirt water at anything that moves.

Cliff Steele, a member in Kentucky, wrote *Seaworthy* with a clever way to attract birds to his boat: He gives them food. Several years ago, Cliff was anchored in the Whaleback Channel on Lake Huron when Sam (or maybe Samantha), "boldly" came aboard. Coincidentally, Cliff and his wife, Sandy, were eating dinner. The next morning when Cliff came on deck, there was Sam again, pacing back and forth waiting for breakfast. Sam followed the boat all week from anchorage to anchorage, coming aboard whenever the boat was stopped. He was like a member of the family. Curiously, Cliff said that Sam seemed to be housebroken.

The following year, Cliff and Sandy returned but there was no Sam. They were disappointed. Cliff sent a picture; please let us know if you've seen Sam.

Some claim files have happy endings; some claim files have sad endings; and some, like Claim #0601178, have both. The sad ending first: Two guys broke into a 28-foot boat in Baltimore, Maryland late one night, started the engines, and calmly motored out of the marina. Several people saw the boat leaving but did nothing because they assumed it was the owner going for a late-night cruise.

The following morning, the police found the boat a few miles away on a beach. The boat's interior had been ransacked and the props, rudders and much of the boat's bottom had been destroyed. Sometime later, it was determined that the repair bill for the damage would be \$35,000.

Now for the happy ending: Police found one of the crooks asleep on the boat and the other one wandering around on the beach. Whatever the crime, it's always hugely satisfying when the crooks get caught.

It should be noted that the happy ending was short lived. Despite a restitution order from the court, the two men didn't pay a dime for any of the damage. That's because they didn't have a dime. As the judge said, they were "so asset-less that they are probably incapable of being anything but criminals."

Finally, the lesson: Whenever you leave your boat untended, *take the keys with you!* According to the claim file, the boat's owner left the boat's keys in a drink holder next to the nav station. Leaving the keys somewhere handy isn't unusual—a lot of

skippers do it—which, as the claim file indicates, isn't lost on the sorts of people who like to steal boats and go joy riding.

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## Mystery Solved: Her Name is Bubbles

Photo:Brad Rowe



Photo:Cliff McKay



Photo:Debbie Means



*Seaworthy* received a pile of mail from readers about the story on the back cover of the January issue. It seems the elephant in the photo, "Bubbles," belongs to T.I.G.E.R.S. Preservation Station, a wildlife education organization in Myrtle Beach, South Carolina. (T.I.G.E.R.S. stands for The Institute of Greatly Endangered and Rare Species.) She has appeared in two movies, *Ace Ventura Pet Detective* and *Malaika* (HBO), and was a guest on David Leno and Animal Planet. Bubbles was also in a video with, ahem, Janet Jackson.

Some Bubbles trivia: She is 26 years old (elephants can live to be 100), is nine feet tall and weighs four tons. She eats a lot.

Bubbles became an orphan at the age of two after her mother was killed for her tusks. (Selling ivory was legal until 1986, which encouraged poaching.) Bubbles was brought to the U.S. from Africa in 1984 and in the years since, she has become, in the words of one *Seaworthy* reader, "one of Grand Strand's most recognizable personalities." Bubbles loves her weekly dip in the Intracoastal Waterway and especially seems to enjoy playing with kids. And as you can see, kids really enjoy playing with her.

To learn more about T.I.G.E.R.S., go to [tigerfriends.com](http://tigerfriends.com).



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# Introducing Digital Seaworthy! (Look Familiar?)

**S**tarting with the next issue, *Seaworthy* will only be sent to insured members electronically. This is being done for a variety of reasons, but the real question is how will it affect you, the *Seaworthy* reader?

The short answer is that it won't, or it shouldn't. Absolutely nothing will be taken from the editorial content; in fact we're planning to *add* content. When you're working with only 16 pages, it is often necessary to edit copy and photographs that would otherwise have enhanced the article.

With the electronic version, editors have the option of adding links to elaborate on whatever topic is being addressed, use a larger typeface (easier on the eyes) and, whenever possible, include videos.

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