This column is a forum for sharing the vast range of practical experience accumulated by our membership and not just my favorite boat maintenance topics. It is intended to be the place where you, the reader, can ask technical questions and either obtain direct answers in this column or direction to appropriate reference material.

This article is another departure from my originally scripted list of topics. In case you don't remember, the topics were electrical wiring, alternators and regulators, batteries, grounding and bonding, radios and antennas, and instrumentation (depth, speed, GPS, LORAN, etc.). But due to a recent problem experienced by one of our members I think this maintenance advisory has to take precedence. Although the incident occurred on one of the Pemaquid models I think it could easily happen to any of our boats.

The occurrence was the loss of a rudder. With a good degree of skill on the part of the skipper and a little luck, he and his first mate made it back to the mooring. No secondary damage was done (as long as you don't count the elevated blood pressure and frayed nerves). But rather than an epic tale of seamanship the focus of this article is how to prevent something like this from happening to you.

If you recall, a few issues ago (Tech Tips #5) we discussed the problems that can result from improper grounding and bonding of an electrical system in a marine environment. Stray electrical currents, induced either by the presence of dissimilar metals in an electrolyte (like salt water), or those resulting from faulty electrical wiring on a boat (either yours or one near yours) can cause metals to waste away. And that's what appears to have happened in this case. The rudder was lost because the rudderpost, a very substantial piece of bronze, was eaten through just inside the top of the rudder assembly. When the helm was shifted to steer the boat the torque was just enough to twist the rudderpost apart, resulting in loss of steering and the rudder.

I have not had a chance to inspect the pieces, or have the Materials Engineering folks at work offer their opinion, but knowing a little about the construction standards applied in building the boat, and the materials that were originally used, I doubt that galvanic corrosion is the cause. It seems much more likely that there is an electrical wiring problem on the boat. Hopefully we will have time to troubleshoot that later this winter. I highly recommend that you take the time to go over all the fittings below the waterline while the boat is sitting high and dry this winter and give them a thorough inspection.

What should you be looking for? Start with a good structural inspection to see if there is any obvious weakness to the fittings. Grab the interior neck of each through hull and give it a good side to side, front to back push. Any quality bronze fitting should be more than able to handle this side load, unless it has lost considerable strength due to corrosion. It is important to remember that you may not be able to see any evidence of corrosion if it is inside the fitting or underneath the hose. Wooden boats have the additional problem in that the hull fastenings could be eaten

away in the same manner as the rudderpost but you can't inspect them unless you take things apart.

For items like the rudder you will more than likely need another person to help you. Someone to hold the rudder and look for any difference in movement between the shaft and body of the rudder, and the other person to move the tiller or wheel. Since most steering systems have a little slop in them (a little slop is a good thing) the person on the helm won't be able to feel the difference between the steering slop and any difference in movement between the rudder and its' shaft. The person holding the rudder may need to feel the difference rather than see it. Obviously if you can see the rudder shaft move and the rudder doesn't you have a significant problem. Even the smallest movement of the rudder shaft in a fiberglass rudder assembly, while the rudder is being held in a fixed position, needs to be investigated. Movement could be indicative of a severely weakened shaft, like the one that was the genesis of this article, or a web structure problem inside the rudder that has loosened and you have voids in the rudder that very likely have water in them. The winter freeze and thaw cycles will continue to take their toll until delamination causes a structural failure. If you find any cracks in the fiberglass, you may already have a delamination problem.

Other items that should be inspected is the fit of the propeller, tightness of the prop nut and jam nut, possible bends in the prop shaft, totally wasted zincs or the possibility of a worn rudder heel bearing. If you find that the zinc is severely wasted, or worse.....gone after one season, you really should inspect the submerged fittings thoroughly. Under normal conditions the bronze fittings exposed to salt water should be a nice chocolate brown color. As you are looking at all the fittings be conscious of their color. If they look as though they have a pink hue it could indicate that they are being depleted. If any of these items are corroded take action to fix them before the boat goes back in the water.

I know it might be cold and it's raining, blowing, snowing and being otherwise miserable, but a little time on and around the boat performing a good visual inspection, and mechanical integrity testing, will make the good summer weather a lot less stressful and it will just seem to last longer.