

Electric shock drowning, often called ESD is a relatively unknown danger to swimmers and boat owners. As more and more docks are incorporating shore power for lights and other electrical conveniences, cases of ESD are on the rise. And since so few people are aware of this risk, there will continue to be many more innocent victims each year.

Electric Shock Drowning is caused by small amounts of 120 volt alternating current leaking into fresh water in places where swimmers or divers may be electrocuted or incapacitated by the current causing immediate death or death by drowning. ESD is a fresh water phenomenon because fresh water is highly resistant to electrical flow. This means that a swimmer in the path of this current becomes the path of least resistance for the electrical current. It takes very few amps to incapacitate a person and lead to drowning.

While most ESD fatalities happen around docks and marinas, there have also been cases reported at water fountains, irrigation ditches, golf course ponds and other bodies of water. But the most common cause of ESD comes from a boat plugged in to shore power. In order for AC current to escape into the water around the boat, two things must occur. The first is some electrical fault on the boat. This would be a short circuit, a wiring error or a malfunctioning appliance which is sending AC electricity away from its intended path. Bear in mind that AC electricity travels in a loop, from its source to the load and back again, forming what is called a circuit. If this circuit is broken, the electricity will try to find a way back to its source. A proper AC setup will include a green grounding wire that is a backup return path for electricity to complete its circuit in the case of a fault in the circuit. So the second thing that must go wrong is that this backup grounding system has a break in it so that it does not function as a return path to the source.

So what can you do to protect your loved ones from ESD? The number one option would be to never swim around docks or marinas where shore sourced electricity is present unless that electricity is turned off. Also, if you must swim or dive around your boat in order to work on fittings or equipment, make sure that all electricity is turned off before you enter the water. If you feel tingling or shocks while swimming, do not swim toward the dock. Swim away from the dock or marina and head to shore 100 yards or more away. When rescuing an ESD victim, do not go in the water as that could make you a victim as well. Instead, turn off the shore power connection at the meter or unplug the shore power cords, then throw a line to the person or row out to them. And most importantly, spread the word about the risks ESD to all of your friends and family who have docks or spend time at marinas.

If you own a dock that will use shore power, post no swimming signs at your dock. Only hire trained marine electricians to handle the wiring at your dock as those not trained as marine electricians may create hazards with their lack of understanding about the special needs and requirements of this specialized area of electrical installations. You can purchase testers that can test your dock and the waters around it for electricity leaks. In addition you should consider the following protective devices for your dock.

Galvanic Isolators – These are designed to help prevent your boat from suffering from or contributing to galvanic corrosion while plugged in to shore power. Choose a failsafe model that requires that if it fails, it will fail in the off position.

Reverse Polarity Indicator – Can tell you if a neutral wire becomes hot thus removing your protections from circuit breakers that are installed on hot wires.

Isolation Transformer – This device transfers electricity from the shore to the boat without the shore wires physically touching the boat's wires. If you have a fault, then the current no longer seeks a path through the water back to shore.

Our culture has a long history of sharing good times playing and swimming around our docks but the news of ESD has not been shared enough to let everyone know that these past places of water fun are now much more dangerous with the addition of shore power. Please share this information with anyone you know who may be at risk.