



Mike Holt Enterprises

Electrical Safety

Committed to the safety of the electrical community

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Electric Shock Drowning Incident Update

Every year Electric Shock Drowning claims several new victims. As the summer approaches and people will be taking to their boats and boat docks, it's important to remind you of the hidden dangers. It's our responsibility, especially as electricians, to do our part in educating the public to help keep families safe around lakes and marinas.



Electric Shock Drowning (ESD) is known as a "silent killer". It's a danger that you can't see, and you can't smell. Usually by the time you feel it, the current can paralyze the body's skeletal muscles, inhibiting the ability to swim or move one's limbs (i.e. electrically induced cramp). The outcome in many cases is the drowning death of an otherwise healthy individual.



ESD is not the same as death by electrocution, which usually results from direct contact with energized metal objects or surfaces. ESD is a unique form of drowning caused by the presence of AC electrical currents in freshwater lakes, rivers, pools, ponds. ESD occurs when the human body acts as a conductor for AC electrical current in the water. It is particularly dangerous around water where electricity is being used, such as docks and marinas, swimming pools, spas, fountains, and irrigation pumps, among others.

ESD incidents are difficult to track because so many of the deaths are reported as drownings. The [Electric Shock Drowning Prevention Association \(ESDPA\)](#) was created to educate the public regarding ESD and it's prevention. In the opinion of the ESDPA, the risk of swimming around docks and boats using AC electricity is unacceptable. They recommend staying at least 150 feet away from any structure or equipment powered by AC in the water, or located on the waterfront.

- Rule #1:** NO SWIMMING near any dock or boat using AC power.
- Rule #2:** Follow codes and standards including ground fault protection where specified (these could be GFCIs or 30ma ground fault protection breakers). See Article 555.3 in the NEC.

The ESDPA reminds us to never use codes and standards (nor any other sensing device) as a "Green Light" for swimming. Codes and standards will protect most people who accidentally end up in the water but they cannot be expected to protect swimmers near AC sources. And some devices are currently being marketed to alert a dock owner of voltage present in the water. These are fine to alert the owner of a dangerous situation requiring immediate attention for safety. But these are reactive, not predictive devices. Anyone in the water when the light turns from green to red could be injured or worse.

What you should know

Lost to ESD



1. [Read the NFPA and ESFI article and watch their video](#) (click on the link or the image above). They joined forces to remind people about the potential electrical hazards in swimming pools, hot tubs and spas, on board boats, and in the waters surrounding boats, marinas and launch ramps. It contains:

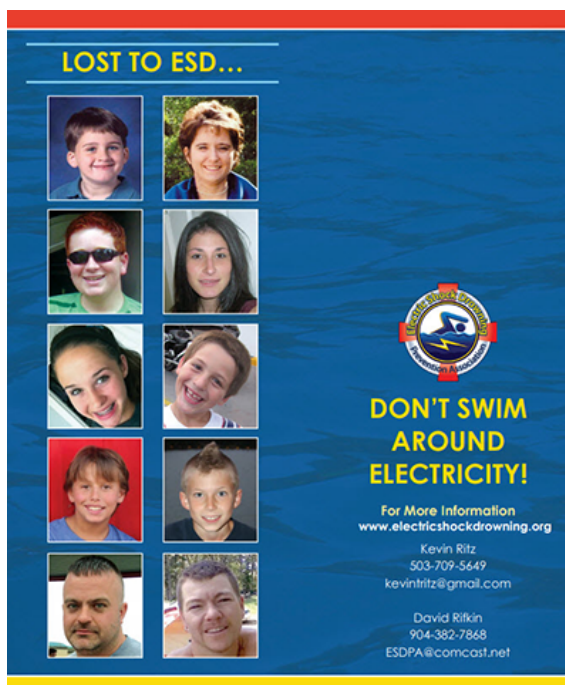
- Tips for swimmers
- Tips for pool owners

- Tips for boat owners

2. Visit the [Boat U.S. website](#) - it's a valuable resource for general information on what to do to stay safe in marinas and lakes. They feature an article by Beth Leonard called [What Every Boater needs to know about Electric Shock Drowning](#), and they have a downloadable PDF version.

3. Check out the [Electric Shock Drowning Prevention Association \(ESDPA\) website](#). This is a great destination website for ESD information. They explain in detail what Electric Shock Drowning is and why it's considered a "silent killer".

4. Understand the NEC Requirements. Read and download [Mike Holt's free PDF, Article 555, Marinas, Boatyards, and Commercial and Noncommercial Docking Facilities, Based on the 2017 NEC.](#)



Read the Quality Marine Services Electric Shock Drownings Report. It is updated each year by editors James Shafer and Capt. David Rifkin. Their 2019 Report (updated 4-2019) can be found [here](#). The enormity of the issue is reflected in the long list of incidents in their reports. Sadly, two additional tragedies have occurred since their 2018 report.

[Updated 2019 Electric Shock Drowning Incident List](#)

Ed Lethert and David Rifkin contributed to this article. Contact them for questions or additional information.

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Additional Resources:

[Electric Shock Drowning: Causes and Prevention](#) by G.S. Cargill III

[Electric Shock Drowning Prevention Association Website](#)

[ESDPA PDF - Electric Shock Drowning, A Silent Killer. What you MUST Know to Protect your Family.](#)

[Mike Holt's free PDF - Article 555 Marinas, Boatyards, and Commercial and Noncommercial Docking Facilities, based on the 2017 NEC](#)

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"... as for me and my house, we will serve the Lord." [Joshua 24:15]