

Stray Electric Current Safety Checklist for Marinas and Yacht Clubs

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Chubb Marine Facilities' loss control specialists are pleased to share with you this exclusive publication on basics for maintaining electrically sound docks. Whether you are gearing up for the high season or conducting routine maintenance, these tips may help you identify and reduce the likelihood of an electrical incident that could result in property damage, bodily injury or loss of life.

To learn more about Chubb Marine Facilities' insurance products and resources for commercial marinas and yacht clubs, please contact MarineFacilitiesInfo@chubb.com.

What is Stray Electric Current?

Stray electric current is that portion of a current that flows over a path other than the intended path. There are two types of stray current. Both are cause for immediate concern and action by marina and yacht club owners and operators when boats are plugged into their shore power systems.

Stray Direct Current (DC)

- Can cause major damage to a boat, including hull fittings, shafts, props, rudders and anything connected to the hull bonding system.
- If aluminum-hulled, can cause extensive damage to entire hull.
- In severe cases, can result in boat sinking.

Stray Alternating Current (AC)

- Introduces lethal electrical currents into the water surrounding a boat, but does not damage boats.

- Can cause injury to human beings swimming around boats, including electrocution, particularly when the marina is in fresh water.

What is Electric Shock Drowning (ESD)?

ESD is a term that references in-water injuries or fatalities resulting from electrical shock. ESD often occurs when low levels of AC current pass through a person's body, causing paralysis of their muscular and skeletal systems while swimming or otherwise immersed in fresh water. When so paralyzed, the victim is unable to swim or move to safety and, as a result, the victim ultimately drowns. Higher levels of AC current in an ESD incident may result in electrocution.

What you should know about ESD:

- While ESD incidents may occur anywhere electricity is provided near water, it appears most reported incidents of ESD occur at freshwater public and private marinas and docks.
- Reported incidents of ESD often involve children swimming in or around a marina or dock where electricity is provided.
- Electrical wiring of the dock or marina itself can be the source for electricity entering the water, leading to an ESD incident.
- Electrical wiring of boats and electrical connections between a boat and a marina's or dock's power supply can be another source for electricity entering the water, leading to an ESD incident.

For more information about ESD, visit the Electric Shock Drowning Prevention Association website, www.electricshockdrowning.org.

Best Practices to Avoid Injuries or Damage Caused by Stray Electric Current

- No swimming within marine facilities at any time.
- No diving operations without prior approval of the marine facility.
- Install all electrical equipment at marine facilities in accordance with applicable standards, including:
 - National Fire Protection Association (NFPA) 303, Fire Protection Standards for Marinas and Boatyards; 2011 Edition
 - NFPA 70, National Electrical Code; 2014 Edition
- Install GFCI's on all shore power pedestals and on all marina wiring circuits.
 - Require that all vessels berthed at a marine facility have a Condition and Valuation survey conducted, in accordance with ABYC Recommendations and NFPA 302, Fire Protection Standard for Pleasure and Commercial Motor Craft.
 - Ensure surveys are conducted by a NAMS certified or SAMS accredited marine surveyor.
- Have a signed copy of a current docking agreement on file for each vessel; the agreement should include the following provisions:
 - All vessels are capable of maneuvering under their own power
 - No disabling of main propulsion systems without the prior approval of the facility
- Slip rental agreements should include language that notifies vessel owners that boats will be checked periodically for stray electric current, as well as the consequences if dangerous levels of current leakage are found in the boat owner's shore power connection. For example, a marina operator may want to address the following:
 - Conditions under which the marina will disconnect a connected boat from the marina's electrical system
 - Type and timing of notice a boat

owner will receive from the marina regarding repairs that must be affected immediately

- Limiting marina's liability for damage as a result of this disconnection
- Ground continuity from the shore power inlet grounding terminal to all non-current-carrying underwater metals on a boat that are likely to become energized. Perform continuity testing annually.
- Maintain compliance with NFPA 302 Standards, specifically Section 5.20 and Section A.5.12.1.
 - Require an electrical inspection be conducted at least annually, including testing of grounding continuity.
 - Provide a written third party report to underwriters documenting this inspection.

For information on the National Fire Protection Association or NFPA standards, visit <http://www.nfpa.org/>.

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