

## Protocol for Diving on Boats at Docks Using Electrical Power September 2018 (updated October 2019)

Electric Shock Drowning (ESD) is a significant safety concern for anyone swimming around or near dock using electrical power for any purpose (lights, appliances, boats, etc.). The danger is associated with electrical currents that may be in the water near a person in the water.

When electrical current passes through the body, it can cause muscular paralysis or stop the heart and the breathing process. Paralysis causes the inability to swim and stay afloat, resulting in drowning.

The Electric Shock Drowning Prevention Association (ESDPA) strongly encourages NO SWIMMING around docks using electrical power. It recommends not swimming within 150 feet of such docks and is mainly concerned with recreational swimming.

Routine maintenance on boats generally includes underwater inspections and bottom cleaning. It is usually more cost efficient to do some of this maintenance waterborne, hence the need to be in the water near to and even touching the boat's underwater surfaces. This presents a potential hazard to those doing this maintenance in the presence of electricity.

There are, however, some steps that professional divers can take to reduce their risk of electric shock injury and ESD. Their safety may also include working with marina and boatyard management to properly coordinate and manage diving operations to enhance safety.

1. Marinas and boatyards should be aware of any diving operations in their facilities. They should require divers to formally check in and check out with marina staff. They should ensure that the boat involved in the diving operations is completely unplugged from any potential source of electricity ashore before permitting any diving on that boat. It is also recommended that the boats immediately adjacent to or across from the intended boat be unplugged for diver's safety.
2. Marinas and boatyards should consider the use of "diving windows" on a periodic basis (e.g. bimonthly) to facilitate diving operations. During this window, diving could be permitted on a complete dock or section of dock by turning off the feeder breakers supplying electricity to these areas. The windows could be published to enable planning for routine maintenance.
3. Marinas should consider using measuring techniques in the immediate area of diving operations AFTER power is removed as recommended in paragraph 1 above. This could include use of developed test device or direct measurements for voltage gradients in the water. A quick "sweep" of the area would reduce risk for diving personnel.
4. Marinas and boatyards should have a plan to deal with electrical shock in the water around their facilities.

- a. This would include knowing precise locations and having direct access to shutting off electrical power where necessary in an emergency.
  - b. It would also include emergency notifications (911 call) and a plan to rescue anyone in the water incapacitated or being shocked.
  - c. A long sturdy non-conductive pole should be readily available to push a victim AWAY from the dock to get them farther from the electrical source.
  - d. Throwable life rings should be at the ready (but should not be used to pull a person back to the dock or boat to avoid getting them closer to the electrical source.
  - e. Facilities should consider installing emergency electrical cut-off switches in key locations such as at the head of a dock.
  - f. Marinas and boatyards should periodically train for electric shock scenarios and include local first responders in this training. It is imperative that the staff and first responders know how to turn power off in an emergency (and before rescuers attempt to get into the water for a rescue).
5. Divers should consider taking the following steps to reduce their risk of injury or death in the presence of electricity while diving on boat in facilities using electrical power.
- a. Ensure, as a minimum, that the boat they are diving on is UNPLUGGED (not just turned off at the pedestal). Hang a “lockout” tag on the receptacle and breaker to preclude a passerby or the owner from plugging boat in while diving operations are in progress
  - b. Unplug boats adjacent to the one(s) being worked on.
  - c. Wear a rubber wetsuit to include gloves and booties to improve insulation to electrical current.
  - d. Check into the marina or boatyard facility so somebody knows where you will be diving. Strongly consider having a buddy stationed on the dock who knows where to secure dock power, and who can call 911 if required.
  - e. If you feel even the slightest of tingling sensations when entering the water, STOP and leave the water. Report the situation to the facility for investigation.

5. Diving contractors, and those who employ divers for their services should provide electrical safety and ESD training to personnel conducting diving services. This should include, as a minimum, the information presented above.

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