Lightning at sea: Dangerous and unpredictable

by Ann Backus, MS
Director of Outreach
Department of Environmental Health
Harvard School of Public Health, Boston MA
Phone (617) 432-3327;
E-mail <abackus@hohp.harvard.edu>

A sudden and intense lightening and thunderstorm moved over the waters around Stonington, ME on the morning of Aug. 21, 2004.

Kyle Jones, a young lobsterman fishing alone from his 30' boat, waited out what seemed to be the worst of the storm then started to haul traps again. He was struck with an electrical charge through the pot warp as it ran through his davit and pot hauler when lightening apparently hit the water near his boat. The force of the thunder that followed the lightning strike knocked him down.

Luckily, a lobsterman nearby realized there was trouble and called Jones' father, who was also out fishing. Another fisherman radioed for an ambulance to meet Jones and his dad at the wharf.

Once ashore, the victim's temperature was 92°F, signaling serious shock and hypothermia. Medics warmed him with wraps on the way to the hospital, where he spent the day. A lack of pulse in arms and legs indicated his peripheral circulation had shut down, which is the body's way of sustaining the blood supply to vital internal organs such as the heart, lungs, brain, and liver.

Thankfully, Jones suffered no lasting harm or injuries from the incident. The fisherman who had been nearby to the accident reported damage to some of his electronics.

Care for victim

In cases of shock from electricity, you should not touch the victim until the source of electricity is turned off. However, when the culprit is a lightning strike, the responder can and should begin immediately to touch and help the victim.

High voltage electricity passing through the body can be fatal. Even if the initial jolt doesn't kill, it likely will put the victim into shock, which is defined as "a state of acute circulatory insufficiency of the blood."

Treatment for shock involves keeping the victim flat and warm, stopping any bleeding, and administering artificial respiration if breathing ceases.

Even though the person's temperature may be very low, it is important to warm the body slowly.

Lightning protection

Although there is no way to prevent a lightning strike, organizations like the National Fire Protection Association and the American Boat and Yacht Council publish standards and recommended practices for protecting a boat and the people in it.

A helpful University of Florida bulletin, titled "Boating-Lightning Protection," is available on the Internet at <www.cdc.gov/nasd/menu/state/florida.html>. Scroll down to "General Topics" and click on "Boating-Lightning Protection."

Lightning prefers to travel downward in a straight line, so the goal of lightning protection is to provide a direct path to the ground or, in the case of a vessel at sea, water. A lightning protection system consists of an air terminal, downward conductor, and ground plate. To this basic system are attached various other metal items such as the engine, through-hull ports, electronics, etc.

There are numerous suggestions regarding ways to assemble the system and what materials to use. However, lightning is not well-understood and very little research has been done on lightning protection systems on boats.

And, while the system may provide some protection for the persons on board, it may not prevent lightning from blowing holes in the hull or from damaging the electronics.

In a 1991 article titled "A Critical Assessment of the US Code for Lightning Protection of Boats," author Ewen Thomson reported on a survey of sailors whose boats had sustained a direct hit.

He found that 50% of protected boats and 50% of unprotected boats in salt water suffered damage to *some* electronics. His results showed that 41% of the protected boats and 42% of the unprotected boats suffered damage to *all* electronics during a direct hit.

Thomson concluded that "the present state of lightning protection is particularly ineffective for marine electronics."

He postulated that high-voltage streamers – caused by electricity reaching toward the clouds – from locations within the "cone of protection" thought to encircle a "protected boat" actually can damage electronics.

Thomson also suggested that a magnetic field, set up when lightning travels along a downward conductor to ground, can induce currents that can damage electronics located within the magnetic field.

Clearly, there is still a lot to learn about how best to protect a boat and crew from the destructive power of lightning.

As lightning is both dangerous and unpredictable, it should be taken seriously on the water as well as on land. Every attempt should be made to avoid a storm while on the water and every precaution should be taken to reduce the risk to crew, boat, and electronics. Fishermen should read up on lightning whether or not their boats are lightning protected.

FISH SAFE:

- Avoid lightning storms by listening to weather reports and watching for thunder clouds.
- Stay undercover in the middle of the boat and stop fishing during the storm.
- Avoid touching or using electronic equipment except in an emergency.
- Look out for others on the water and be ready to assist with First Aid and CPR.
- Check out all electronic equipment and compasses after a storm.

The Bait Lady