

RISK MANAGEMENT

When Lightning Strikes

Should you close your indoor pool when lightning approaches? The answer may surprise you

By Tom Griffiths and Matthew Griffith | November/December 2008



While there are many urban legends in the world of aquatics, one is by far the greatest of all — lightning and indoor swimming. The practice of clearing indoor pools during outside thunderstorms does not keep people safe and, in many cases, may put them in more danger. Delving deeper into the issue reveals why adopting a policy of clearing indoor pools for lightning is completely unfounded.

First of all, the safety record of indoor pool facilities as it relates to lightning cannot be discounted. No death has been recorded during indoor swimming activities. The [U.S. Consumer Product Safety Commission](#) reported 60 swimming pool electrocutions between 1992 and 2007, none were from lightning.

Furthermore, CPSC could find no reports or documentation of fatality related to lightning for indoor pools. This fact alone is enough for an aquatics manager question the closing of indoor pools during thunderstorms, but there are other reasons, too.

The National Electric Code, which has been adopted by every governmental body in the United States, requires all buildings to be protected from the voltage generated by a lightning strike. The structure must have a complete lightning protection system, and be properly grounded.

"If the electric wiring/grounding in your facility is up to the required code, no indoor area should close during outdoor thunderstorms," says Dr. Weiss, a regular lap swimmer in Maryland. "In fact, a pool closure policy is in violation of the National Electric Code section 250.104, which is subject to regulatory enforcement." Dr. Weiss adds that facility operators must understand they are breaking the law by closing the pool alone. Her efforts have been supported by two local regulatory agencies, Howard County, Md., electrical inspectors and the [Montgomery County and Health Administration](#). As a result, Montgomery County, Md., recently changed their swimming pool codes to reflect this.

There's confusion about what grounding, bonding and lightning protection systems do. Generally, the following must be bonded and grounded: all metal surrounding pools, along with their electrical support equipment. In basic terms, bonding includes interconnecting all pool metal parts to everything to the same earth potential.

Once bonded, all metal also must be grounded. Grounding usually is done by way of wire to a grounding electrode or rod driven into the earth. These two systems help protect swimmers from many shock hazards.

Outdoor pools are also required to be properly bonded and grounded, but they are exposed to direct strike possibility from lightning. This is documented. This is not the case for indoor pools that are enclosed by a protective structure with a complete lightning protection system designed to protect structures and the people occupying them, lightning protection systems provide a safe pathway to earth for lightning strikes. Contrary to one widely held belief, they do not prevent lightning strikes.

The basic components of a lightning protection system include air terminals ("lightning rods"), main conductor cables, ground rods and down conductors installed to protect electrical equipment from surges. A lightning protection system provides a means for controlling a lightning strike, preventing damage to the building components (including indoor swimming pools).

The discussion of lightning and indoor pools must include addressing the nature of humans. Human nature actually puts facility operators in a statistically shown to be of higher risk when they are forced to leave indoor pools during thunderstorms. When an indoor pool is closed, people go to the locker rooms, where they shower before changing. There have been numerous cases of reported shocks and electrocutions in bathtubs, or at sinks, washing their hands. Just standing near metallic plumbing systems and metallic drainage systems carries a risk (actual documented cases).

Also, there are inevitably children who need to call for a ride home. Again, there are reports every year of people injured from lightning strikes on landline telephones. (This is the mechanism most frequently used by lightning to enter a building.) Even if these practices are discouraged, people are still allowed to leave the facility.

In 98 percent (44 out of 45) of the fatalities attributed to lightning in the United States during 2007, the people were outside. When they leave the pool and run across the parking lot to their car, they are exposed to a direct strike. Car accidents increase as well during thunderstorm conditions. It is clear that closing indoor pools actually puts people at higher risk of being injured by lightning than allowing them to stay in the pool.

Interestingly, many "aquatic safety consultants" and the [National Lightning Safety Institute](#) have been promoting the mistaken practice of closing indoor facilities for years. Based on their "recommendations" to evacuate indoor pools during electrical storms, some of the major life insurance companies jumped on the bandwagon.

Because there's never been a documented fatality as a result of lightning at an indoor pool, those who are closing indoor pools based on any evidence nor sound risk management practices, but rather on an urban myth that evokes strong emotion.

It should be noted that in a position statement published by the National Lightning Safety Institute (which has become widely document on the subject), several groups are misquoted and misrepresented. In the paper, [USA Swimming](#) is quoted as having activity suspension when nearby thunderstorms threaten." USAS makes no such recommendations. According to Mick Nelson, director, USA Swimming averages about an inquiry a week regarding lightning and indoor swimming pools. "We have no policy electrical storms," Nelson says. "We defer to each aquatics facility manager to make that decision. They must do due diligence policy. Lightning should not be a problem for pools that are grounded."

The National Lightning Safety Institute also claims that the [National Collegiate Athletic Association](#) recognizes "building interior thunderstorms threaten." The truth is, they do not.

The *NCAA Swimming and Diving Rule Book*, *NCAA Sports Medicine Handbook*, and NCAA Championships Severe Weather Policy they do not have an indoor pool policy. The two largest governing bodies for competitive swimming in the United States have a protocol that they clearly do not.

Still, many steps need to be taken to keep swimmers safe at indoor pools during outdoor thunderstorms. First, assuming the pool to meet national standards, a qualified electrician should conduct a comprehensive inspection of both on a regular basis. Pool members should be trained to recognize and report potential electrical issues as part of their daily facility check. During thunderstorms, windows to the outside from the pool area should be kept closed. Also, staff and guests must not be allowed to talk on landline during this time, and people should be encouraged to stay in the building.

For facility managers who are still skeptical, a compromise might be to let individual swimmers decide. A brief announcement explaining that "severe weather is approaching and if you fear for your safety, please enter the locker rooms and be seated in the showers. If a decision is taken, guests must be kept out of showers and off landline telephones. They also should stay in the building because being in the pool is the most dangerous place during electrical storms.

Ultimately, aquatics and recreation professionals must remember why people come to the facility: to have fun! It's impossible to have fun associated with pools without also eliminating the numerous benefits also associated with them. Competent operators and managers should be focusing on actual risks that are known to cause catastrophic injury and death, not on an urban myth that has no substance. Remember, hundreds of indoor pools are open every day during thunderstorms, and there's never been a documented case of a fatality. Remember, too, that people swimming indoors during a thunderstorm are as safe as they can be.