

TerranearPMC Safety Share

Week of June 20, 2016 – Lightning Safety

Did you know that lightning strikes the United States about 25 million times a year? Although most lightning occurs in the summer, people can be struck at any time of year. Lightning kills an average of 49 people in the United States each year, and hundreds more are severely injured.

As we all know, lightning can occur anywhere there is a thunderstorm. Lightning is a rapid discharge of electrical energy in the atmosphere. That loud clap of thunder that sometimes startles us is the result of a shock wave created by the rapid heating and cooling of the air in the lightning channel.

During a thunderstorm, winds within the thunderstorm cloud cause collisions between the various precipitation particles within the storm cloud. These collisions cause very small ice crystals to lose electrons while larger particles of soft hail gain electrons. Upward winds within the cloud redistribute these particles and the charges they carry. The soft hail causes a negative charge build up near the middle and lower part of the storm cloud which, in turn, causes a positive charge to build up on the ground beneath the storm cloud. Eventually, when the charge difference between the negative charge in the cloud and the positive charge on the ground become large, the negative charge starts moving toward the ground. As it moves, it creates a conductive path toward the ground. This path follows a zigzag shape as the negative charge jumps through segments in the air. When the negative charge from the cloud makes a connection with the positive charge on the ground, current surges through the jagged path, creating a visible flash of lightning.

Most lightning casualties occur at the beginning of an approaching storm. That's because, in general, people do not take immediate shelter when the first signs of lightning approach. Thunder, high winds, darkening skies, rainfall and brilliant flashes of light in the distance are warning signs for lightning strikes. The onset of an approaching storm may happen very suddenly and catch people by surprise and therefore, are vulnerable to the storms' devastating effects. However, a significant number of lightning deaths also occur *after* the thunderstorm has passed. This happens because people think the storm has passed and feel it is safe to leave their shelter. However, if thunder is audible, then the storm is still close enough for a lightning strike. It is very important to remain sheltered until you are sure the storm has passed. This why many organizations use what is called as the 30/30 rule. That is, if the time difference between a visible lightning strike and the thunder clap is less than 30 seconds, lightning is within six miles. This means that persons must remain sheltered. Only when this interval is greater than 30 seconds for a 30 minute period, is it acceptable to leave the shelter.

When you hear thunder or see lightning, you should immediately seek safe shelter. Appropriate shelter locations can be a building with electricity and/or plumbing or a metal-topped vehicle with the windows closed. Picnic shelters, dugouts, small buildings without plumbing or electricity are not safe. Once inside, follow these important safety tips:

- Stay off corded phones. You can use cellular or cord less phones.
- Don't touch electrical equipment or cords.
- Avoid plumbing. Do not wash your hands, take a shower or wash dishes.



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- Stay away from windows and doors, and stay off porches.
- Do not lie on concrete floors or lean against concrete walls.
- Remain in the shelter for at least 30 minutes after hearing the last sound of thunder.

Organizers of outdoor events such as picnics and baseball games, should monitor the weather and evacuate participants as soon as they hear thunder. This means keeping an eye on the sky, listen for thunder, and keep up to date with the latest National Weather Service (NWS) forecasts. Smart phones can download specific apps to help identify approaching adverse weather conditions. Some examples are: *Weather Bug*, *NOAA Weather and Radar Alerts*, *The Weather Channel*, and *IWeather Widget*. These apps are free to download, but may be specific for either Android phones or iPhones. Some provide forecasts while other show the exact location and time of the last lightning strike.

Prior to beginning any outdoor work, check National Oceanic and Atmospheric Administration's (NOAA's) weather reports (or a smartphone app) as well as radio forecasts for possible weather hazards. OSHA recommends that employers consider rescheduling jobs to avoid workers being caught outside in hazardous weather conditions.

In addition to an awareness for adverse weather conditions, businesses need to have a written Emergency Action Plan or EAP (as outlined in 29 CFR 1910.38 or 29 CFR 1926.35). The EAP should include a written lightning safety protocol for outdoor workers and should include the following:

- Inform supervisors and workers to take action after hearing thunder, seeing lightning, or perceiving any other warning signs of approaching thunderstorms.
- Indicate how workers are notified about lightning safety warnings.
- Identify locations and requirements for safe shelters.
- Indicate response times necessary for all workers to reach safe shelters.
- Specify approaches for determining when to suspend outdoor work activities, and when to resume outdoor work activities.

It is imperative to account for the time required to evacuate personnel for the purpose of reaching an appropriate shelter (which should be designated in the EAP). All employees should be trained on how to follow the EAP, including the lightning safety procedures.

Under the General Duty Clause, Section 5(a)(1) of the Occupational Safety and Health Act of 1970 (OSH Act), employers are required to provide their employees with a place of employment that "is free from recognizable hazards that are causing or likely to cause death or serious harm to employees." The courts have interpreted OSHA's general duty clause to mean that an employer has a legal obligation to provide a workplace free of conditions or activities that either the employer or industry recognizes as hazardous and that cause, or are likely to cause, death or serious physical harm to employees when there is a feasible method to abate the hazard. This includes lightning hazards that can cause death or serious bodily harm.

The most common way people give up their power is by thinking they don't have any Alice Walker (American Novelist and Poet)





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