



Lightning Safety

CAGC INFORMATION ALERT

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The following information is not a definitive guide to government legislation and does not release users of this document from their responsibilities under applicable legislation.

This safety bulletin is released to the membership in response to the possibility of workers encountering a thunder and lightning storm when conducting geophysical seismic activities.

Lightning Safety

The key to lightning safety is to avoid being in the wrong place at the right time. The generation of lightning is done on a very large scale and to date, there has been no proof offered that shows a person 'attracts' lightning no matter what he / she is wearing or carrying. Since lightning is generated on too large of a scale (by thunderstorms several kilometers high and tens of kilometers wide) to be influenced by small objects on the ground, people who have been hit by lightning would have been hit anyway regardless of any metal objects they may have been wearing / carrying or in close proximity to.

Therefore the focus on protecting yourself from lightning shouldn't be on the objects that you are wearing, carrying or standing by but rather on avoiding the locations where lightning can strike.

Lightning Warning Signs:

In addition to the obvious warning of an ominous darkening sky, there are certain conditions that can alert you to a lightning danger before a strike occurs.

- Raindrops or hail: Rain of any intensity (more so with heavy rain) may signify the presence of a thunderstorm overhead even if has not produced lightning or thunder. Large 'fat' raindrops are a telltale sign that a storm cell has the potential to produce a lightning strike at any second;
- Audible thunder or visible flashes: If you can see lightning or hear thunder you are within range of a possible strike. In most cases, thunder is a very good advance warning of lightning in your area. If you hear thunder, the associated lightning is within ten to fourteen kilometers of your position. If you see lightning but do not hear thunder, the threat is farther away than what is considered normal human hearing range;
- Large towering clouds: Cumulonimbus (thunderstorm) clouds can develop quickly. Numerous cumulonimbus clouds often develop in clusters and lines (rows), so a row appearing in the distance could signify that another one could quickly appear or pass overhead. A growing cumulonimbus will usually look hard and rounded, like a cauliflower, as it protrudes skyward;
- Static on an AM radio: Distinctive crackling and popping sounds are indicative of nearby lightning activity;
- Lightning Detectors: There are several lightning detectors on the market and can be purchased for a reasonable price. These units are handheld and operate on batteries;

- Weather forecasts: If available, check your local forecast for the potential of lightning activity in your area. Remember that the information given is a prediction based on available data and not a guarantee of what actually may occur.

If Indoors:

The safest place to be in a thunderstorm is indoors. The fact that buildings usually have multiple grounding paths generally makes them a safe lightning shelter. However, remember not to physically touch the grounding paths i.e. steel plumbing, steel framework as you can be injured as an indirect result of a lightning strike. Also stay away from the openings in a building during a thunderstorm (windows and open doors). Lightning has been known to travel through these openings seeking a ground or 'earth'.

When in a Vehicle:

If there are no structural shelters available, hard topped vehicles offer sufficient protection from lightning. Vehicles with a soft top i.e. golf cart or a convertible automobile; do not provide any protection from a lightning strike. If you are in a vehicle, remember to roll your windows up and to not touch any part of the vehicles metal frame including a the steering wheel, a plugged in cellular phone or a hard wired field radio. If lightning does strike the vehicle the electrical charge will travel the frame of the vehicle and usually jump over or through the tires to reach the ground. Most incidents to vehicles result in one or more flat tires and damage to the electrical system but no injury to the occupants. If lightning does strike your vehicle it is recommended that you stop and abandon it immediately. It is not uncommon for the fuel to ignite which will result in a fire or explosion. Once you determine that it is safe you can return to your vehicle.

When Outdoors:

You are in equal danger of a lightning injury outdoors regardless of whether or not you are standing near, carrying or wearing any metal objects. As mentioned before, lightning is a large scale event that is not influenced by small objects on the ground. Metal objects i.e. golf clubs, will attract a lightning channel only if the strike is within a few metres. Large scale objects i.e. long strings of connected Recording cables especially when laid out in a 3D configuration stand a high probability of being struck by lightning. While not a 'large scale event' a seismic drill with its mast up in the open away from trees or buildings can also be a strong attractant for a potential lightning strike. Remember though, contrary to myth, lightning does not always strike the tallest or most conductive object – it can strike anywhere.

If You Suspect that Lightning is Present, do the Following:

- Stay away from shore lines (water is an excellent conductor), railway tracks, metal fences, laid out Recording cables, etc. as any one of these could bring a distant lightning strike to you;
- Disconnect Recording cables from the 'Dog House';
- Lower the seismic drill mast;
- Lower GPS or Recording radio antenna masts;
- Stay away from fence lines;
- Stay away from recording cables;

LIGHTNING SAFETY

- Helicopters should shut down or at the least avoid storm cells entirely;
- If working in an inland marine situation, return to shore, secure and leave the boats;
- Seek shelter, dense woods do supply a modicum of protection due to the large number of trees which decrease the chance of a lightning strike to a tree next to you. However, in this and any other case do not stand close to any of the trees;
- Avoid high ground; seeking lower ground will lessen the chances of a strike;
- Avoid large open areas

Telltale Signs of an Imminent Strike:

- A soft or loud buzzing, clicking, hissing or cracking sound;
- A tingling sensation;
- Hairs on your arm or head standing on end;
- Nearby metal objects emitting a soft, blue-white glow (known as 'St. Elmo's Fire')

These signs indicate that a direct strike may occur within seconds. In most cases, you will not be able to react quickly enough. However, if you do experience any of the above signs, quickly try to assume the following position:

- Move your feet close together, crouch down and grab your ankles. Tuck your head as far down between your knees as possible. Do not lie down on the ground.

What You Should Know if You Have Been Struck by Lightning:

A lightning strike sends a strong electrical charge either through the body or over its surface. If it hits you or something close to you, lightning can cause serious injury. You may get burned if you have any metal on your body (a belt buckle, a zipper, or coins, for example). After a mild lightning injury, you will usually feel better within hours or days. A severe injury, however, can cause lasting damage to the brain, nerves, eyes, or ears, and may even be fatal.

Signs/Symptoms:

In some cases, you may be hit by lightning and not even know it. A mild strike may cause pain, headache, confusion, tingling, numbness, or weakness, sometimes accompanied by difficulties with vision, hearing, and memory. In a severe strike, the blast of electricity may tear the clothing or shoes from your body. Burns may not be visible at first, but may appear hours later. You may have broken bones, and if the heart is severely injured, it may stop.

Care:

Seek professional medical attention as soon as possible. Even if the injury is mild, you should check with your doctor. You may need medicine for pain and swelling, and the doctor may feel you need a tetanus shot. A severe lightning injury is an **EMERGENCY**. The victim may need CPR if the heartbeat or breathing has stopped. Hospitalization is needed for tests and treatment

Call Your Doctor If:

- You have increasing pain, blurred vision, trouble hearing, worsening headaches, numbness or tingling in your arms or legs, or increasing weakness—even long after the injury. Some of these problems may not show up right away;
- You develop a rapid heartbeat, your heart skips beats, or you have chest pain.

Seek Care Immediately If:

- You cannot move your arms or legs, lose your vision, lose consciousness, or have sudden or severe headaches.

In Conclusion:

At present the statistic on victim survival rate after a lightning strike is ninety percent+. While this is an encouraging statistic, some problems that one may have to deal after a lightning strike, for the rest of their life are as follows:

- Intense, incurable chronic pain or steady pain (in various body parts) which can only be managed by the taking of constant painkiller medication;
- Chronic headache, dizziness, nausea, seizures and/or vomiting;
- Varying degrees of impairment to memory and various cognitive skills;
- Vision, hearing and / or other various sensory loss or impairments;
- Other symptoms to numerous to list.

As a reminder, it is part of the due diligence process to review this safety bulletin with your workers.

Acknowledgements:

West Virginia Lightning – ‘Lightning Safety’

National Lightning Safety Institute – ‘Backcountry Safety Reminders’