



# MINISTRY PROTECTION MEMO "LIGHTNING"

Ministry Protection Tips for PACT Leaders

Volume 6

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Lightning, one of nature's most beautiful and powerful phenomena, is also one of its deadliest. In the U. S., lightning kills more people than any other weather hazard except flash floods. For example, between 1959 and 1994, lightning killed an annual average of 87 people. During this same time period, the average yearly death from flash and river floods was 139; for tornadoes, 82; and hurricanes, 27. With deaths from lightning strikes so prevalent, why don't we hear more about its dangers? Most lightning deaths involve a single person and often are only publicized locally unless the victim is a professional golfer, a famous mountain climber, or some other well-known figure. On the other hand, a tornado ripping through the Midwest or a hurricane blowing inland affects thousands of people in many ways. So the media responds immediately and in full force. Lightning is deadly, but you can protect yourself by learning as much as you can about it.

## How Can I Avoid Injuries Caused By Lightning?

1. Plan ahead when outdoors. Know where you can quickly find safe cover if a lightning situation develops.
2. Know the weather forecast when planning outdoor activities. If thunderstorms are predicted, be ready to:
  - Take cover indoors when possible.
  - Take cover in a metal-topped vehicle when it is not possible to go inside a building. Do not touch any exposed metal parts of the vehicle.
3. Avoid the following locations during a thunderstorm:
  - Places that provide little or no protection from lightning: open sheds, tents, open boats, open-topped automobiles, and temporary shelters:

- Exposed areas: golf courses, athletic fields, and tennis courts;
- Bodies of water: swimming pools, lakes, ponds, rivers and seashores;
- Isolated trees;
- High ground, hilltops, and ridges;
- Roofs of buildings;
- Places near wire fences, clotheslines, overhead wires, and railroad tracks.



4. If you are outside and good lightning protection is not available:
  - Seek shelter in well-grounded structures that provide cover.
  - Stay away from metal objects and tall objects, such as telephone poles, light standards, antennas, and tall trees.
5. Stay under cover until the danger passes. The rain may have stopped, but lightning can still strike.
  - If you hear thunder, you are close enough to get struck by lightning.
6. Avoid using or coming in contact with: electrical appliances and equipment, telephones and modems (unless it is an emergency), or plumbing fixtures, such as shower heads or faucets.

**If your skin tingles or your hair stands on end, lightning is about to strike, so crouch on the balls of your feet. Place your hands on your knees and your head between them. Make yourself the smallest target possible.**

**Do not lie flat on the ground.**

## Lightning Facts and Fiction



**Fiction:** You can tell the distance to lightning by counting one second per mile between the flash and the thunder.

**Fact:** The sound of thunder travels about one mile in five seconds. So, count five seconds for one mile, 10 seconds for two miles, and so on. For example, if you see a lightning flash and hear thunder 15 seconds later, the storm is about three miles away.

**Fiction:** If it isn't raining, you don't have to worry about lightning.

**Fact:** Lightning often strikes outside of heavy rain and may occur as far as 10 miles from the nearest rainfall.

**Fiction:** More people are killed at the peak of a lightning storm's intensity than at any other time during the storm.

**Fact:** While the peak of a thunderstorm may produce a greater number of lightning strikes than less intense times, it is still dangerous to be exposed during the beginning and end of a thunderstorm. In fact, more people are struck toward the start and end of a thunderstorm than at any other time.

The information above was extracted from a safety brochure entitled *High Voltage: Lightning Safety*, published by the CPCU Society. Malvern, PA; 800-932-CPCU, and is reprinted here with permission.

## LIGHTNING – THE THREAT TO PROPERTY

In addition to the threat of life, lightning is one of the primary causes of fires and damage to electrical equipment in church buildings. Lightning has been known to account for up to 30% of all church fires in the United States. The fire hazard can be reduced by the proper installation of lightning protection systems. These systems capture the lightning bolt, and direct it through a cable, harmlessly to the

ground, thereby protecting the structure from damage.

## How Can I Avoid Fires and Equipment Damage Caused by Lightning?

1. **Install an effective lightning rod system.** This will provide both an attractive target for the lightning and a path of least resistance for the current to take as it seeks its ultimate destination – the earth.

In a properly installed system, a rod will only attract lightning that comes into the area to be protected, like a church steeple or roof. When the random motion of the lightning gets into a zone around the lightning rod, it begins to “see” the rod and is attracted to it. The zone of protection, upon which the design of the system is based, is meant to envelop the building. In a properly designed system, the “attraction” provided by the lightning rod is not enough to deter a lightning bolt heading for a neighboring structure.

2. **Be prepared for the cost of installation.** Generally, the cost of a church lightning protection system starts around \$2,000. In a typical installation, lightning rods or “air terminals” as the experts call them, are installed on the roof of the church as handy targets for lightning bolts looking for a landing zone. The “terminals” are brass or copper, about 10 inches high, and are set about 20 feet apart. The number of terminals are then connected to one another and to any metal on the roof or steeple by a cable that can be inconspicuously rooted between the gutters or eaves. The cable is then “grounded” by two or more metal rods driven at least 10 feet into the earth.
3. **Provide an effective maintenance and inspection program.** It is important that the electrical ground is maintained over the years. Over time, the cable or grounding rods may deteriorate to the point where the path to the ground is affected. Under these conditions, the system ceases to work at all or at best, attracts the lightning bolt, but fails to complete its

mission. As an example, lightning traveling down the cable of a faulty system has been known to change its path, passing through wood or some other combustible material offering a better path to ground. The resulting fires can be as serious as those occurring in unprotected buildings.

4. **Protect against the added threat, electrical surges.** Twenty years ago a typical church might have had a few appliances. Now, it's common to find computers, television, and security systems in place. The damage that can occur to these expensive electronic systems can be phenomenal considering that the current in a lightning bolt can be as high as 40,000 amps. An effect even more formidable when delivered in the short time span of 1/10,000 of a second. This surge of concentrated energy that can split an oak tree, or pulverize a chimney, can easily destroy the hard drive of the church computer.

Even if no fire damage takes place, thousands of dollars in electrical equipment can still be destroyed by rapid spikes of electrical current. To help prevent this possibility, experts strongly recommend electrical surge protection as a required supplement to any lightning protection system installed.

The best protection against lightning damage is unplugging electrical equipment when not in use. Surge protectors are not able to prevent damage to electrical equipment when a direct lightning strike occurs to a power source or telephone equipment.

### **Additional Information**

The brochure "*Lightning Protection for Home/Family/Property and a list of "Dealer Contractors"*" for lightning protection equipment may be obtained by sending a request with a self-addressed, stamped envelope to:

Lightning Protection Institute  
3335 North Arlington Heights Road, Suite E  
Arlington Heights, IL 60004



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