

Loss Control Insights

THUNDERSTORM AND LIGHTNING HAZARDS

Introduction

Thunderstorms and lightning are most likely to develop on hot, humid days and can be very dangerous to construction workers. Thunder is the sound generated by lightning and is usually a good warning of lightning approaching. Lightning kills about 80 people each year and injures hundreds. Construction workers, laborers, equipment operators, engineers, surveyors, and inspectors have been struck on the job.

Generally, lightning hits most often in the late afternoon in the spring and summer. It can strike anyone and can strike the same place many times. Lightning seeks “ground” to discharge its energy and will complete the circuit by striking the tallest objects (trees, utility poles, and towers, or a person standing in an open field). It will also strike metal objects and water. There are a number of ways that lightning can injure a worker with differing injuries as the results. Some of these injuries may not appear until months after the event.

Injuries And Other Hazards

The ways in which lightning can injure or kill people are as follows:

- (1) A direct strike usually results in cardiac arrest and/or stoppage of breathing. If the current passes through the heart or the brain, death may occur.
- (2) A side flash may occur when the body of a person provides an alternate or parallel path for the current.
- (3) Conducted current from a lightning flash or strike may range from a tingling shock to a massive current diverted from a poorly grounded utility pole through the power grid system.
- (4) Step voltage radiates out through the ground from a struck tree or utility pole affecting any person or animal close to the pole. Many livestock deaths are attributed to this affect.
- (5) Fires, fallen trees or poles, and wires, are other hazards which are secondary effects that also cause injuries.

Protection During Storms

The ways to protect yourself during a storm are as follows:

- (1) If you see lightning and hear thunder act immediately, especially if hearing the thunder less than 30 seconds after seeing the lightning flash. If the elapsed time between the thunder and the lightning flash is decreasing, the storm is moving closer. Although rare, lightning has been known to strike, out of a sunny sky, 10 or more miles ahead of a storm. An early indicator of an imminent lightning strike is when body hair “stands up” on arms and head. This is due to the electrical charge in the air and is a good prediction that lightning will strike. If this happens, drop any tools and don’t lean or hold onto any object which may “ground” your body. Your worksite should have a plan for what to do

and where to seek shelter in a lightning storm. Any planned work (such as paving) that may be affected by foul weather in the forecast, should address a contingency or shut down plan if the storm event takes place. Criteria for temporary or permanent work stoppage shall be established by the contractor and the EIC before the work begins to avoid judgment disputes and promote the worker's safety.

- (2) If given advance warning on a lightning storm, some preparations can be made to minimize risks. Power tools and electrical chords should be disconnected from their power sources. Windows in buildings should be closed. Avoid use of telephones and computers including wireless models. Move away from metal objects including scaffolding, and plumbing systems. Move away from water sources. All of the above are preventative measures to reduce or eliminate the path where lightning current could travel and injure a worker.
- (3) If caught in a lightning storm without warning, put down any objects which could conduct electricity such as rakes, shovels or other magnetic tools. Seek shelter in an enclosed building. Isolated, open air structures such as bus shelters and tents should be avoided since they are often struck by lightning. Vehicles can be used as a shelter; however, the windows and doors should be closed. A secondary concern with vehicles is that they are often parked under utility lines and trees and the occupant could risk injuries from fallen wires or trees. Consider this when selecting a vehicle as shelter from the storm. If caught out in the open seek lower elevations like a ditch or gully, keep your body low to the ground but only let your feet touch the ground. To reduce your risk of being struck by lightning, do not sit or lie down as this will increase your conductivity.
- (4) Once the storm has passed allow 30 minutes to elapse from the last lightning strike to commence work. This time provides assurance that the risk has passed.

Responses To Injuries And Storm Damage

In the event that damage and injuries result from the storm, take the following actions:

- (1) If a person has been struck by lightning, call 911 immediately for Emergency Response. Victims will not remain electrified and can be touched immediately without risk. They may have burns, nervous system damage, broken bones, loss of hearing or eyesight, confusion, and loss of memory. If properly trained in first- aid, check the victim immediately for pulse and breathing. If victim is not breathing but has a pulse, begin mouth-to- mouth resuscitation. If there is no pulse begin CPR. Check for fractures and act accordingly to allow resuscitation. Do not move if spinal injury is suspected. Cover burns with dry sterile dressing. If one burn is discovered there will usually be a second. One is from the entry and the other is from the exit of the electrical current. Keep victim cool until medical help arrives. If the victim appears only stunned or otherwise unhurt, medical attention is still required to assess for other internal or nervous system injuries.
- (2) If fallen wires and fires result from the storm, call 911 immediately for Emergency Response. If wires have fallen on an occupied vehicle, the driver should remain in the car until help arrives. Trying to leave the car may result in electrocution and should not be attempted. If electrical fires occur at any tools, the power should be disconnected and a Class C extinguisher used to fight the fire.