

## Lightning Safety for Outdoor Workers

According to the Center for Disease Control approximately 28 fatalities occur each year in the United States due to lightning strikes (data from 2006 through 2021). Workers account for about one-third of the total number of people struck by lightning; roofers, construction workers, road crews, pipe fitters and farm workers are especially at high risk.

Lightning typically strikes tall objects, including people standing on open ground or a roof. Work sites should have a plan in place to keep workers safe in case of a lightning storm.

### Lightning Safety Policy for Outdoor Work Sites

It is important to have lightning safety policies in place to protect outdoor workers. Use these lightning safety tips when developing your policies:

- Monitor weather conditions in the early morning for reports of impending severe weather in your area. If warranted, continue to monitor weather conditions throughout the day. An inexpensive portable weather radio can provide timely storm data from local weather forecasts.
- All employees should understand what lightning safety plans are in place, including what shelters are available to them at that particular site.
- Determine when to take shelter. If you hear thunder, the associated lightning is within 8 miles. Suspend activities, allowing sufficient time to get to shelter. A good lightning safety motto is: "If you can see it (lightning), flee it; if you can hear it (thunder), clear it."
- If you feel your hair standing on end, and/or hear "crackling noises," you are in the lightning electrical field. If caught outside during a lightning storm, immediately remove all metal objects (including hats), place your feet together, duck your head and crouch down low in baseball catcher's stance with hands covering your ears.
- Wait a minimum of 30 minutes from the last observed lightning or thunder before resuming normal work activities. Be extra cautious during this phase, as the storm may not be over.

- If someone has been struck by lightning, get emergency help promptly and apply first aid. It is a myth that lightning victims carry a charge after the strike—they are safe to handle and may need first aid immediately.

## **Employees Must Take the Following Steps to Protect Themselves**

**Check the forecast-** Know the daily weather forecast so you are prepared and know what weather to expect during the day.

**Watch for signs of potential lightning strikes-** Pay attention to early weather signs of potential lightning strikes, such as high winds, dark clouds, or distant thunder or lightning. When these occur, don't start any activity that you can't quickly stop.

**Assess the threat-** Although no place outside is safe during a storm, you can minimize your risk by assessing the lightning threat early and taking appropriate actions. For example, if you hear thunder, lightning is close enough to strike you. Stop what you are doing and seek safety in a building or hard-top vehicle with the windows rolled up. When lightning strikes a hard-top metal vehicle, it goes through the metal frame, through the tires, and into the ground.

**Avoid tall structures-** Avoid anything tall or high, including rooftops, scaffolding, utility poles, cell phone towers, ladders, trees, and large equipment, such as bulldozers, cranes, and tractors.

**Avoid conductive materials-** Do NOT touch materials or surfaces that conduct electricity, including metal scaffolding, metal equipment, utility lines, water, water pipes, or plumbing.

## **Safe Places to be During Lightning**

Ordinary wood buildings provided for worker lunch breaks or shelter from rain or sun are not safe from lightning. Similarly, small post-supported structures, such as bus stops or picnic shelters, are not safe either and cannot be made safe for people.

Fully enclosed metal vehicles are safe shelters, as well as other all-metal, mobile equipment. This includes airplanes, buses, vans and construction equipment with enclosed metal cabs, provided the "outer metal shield" is fully intact. All windows must be rolled up and people inside should avoid touching all objects that penetrate from inside to outside (e.g., radio dials, metal door handles, two-way radio microphones, etc.).

Unsafe vehicles include those made of fiberglass and other plastics, plus small riding machinery or vehicles without enclosed canopies, such as motorcycles, farm tractors, golf carts and ATVs.

Metal shipping containers and old railroad box cars can be easily modified to become inexpensive, effective, portable and rapidly deployable shelters. Double walls are preferable over single walls. Openings should be cut out for ventilation and two separate doorways should be provided. Containers do not need to be grounded.



### **Safe Lightning Shelters**

- Fully enclosed metal vehicles with windows up
- Fully enclosed buildings with plumbing and/or electrical service
- Low ground, ditches, or clumps of bushes
- Trees of uniform height, such as a forest

### **Unsafe Lightning Shelters**

- Outdoor areas with metal objects such as power poles, fences, high-mast light poles, metal bleachers, electrical equipment, mowing and road machinery.
- Solitary trees
- Bodies of water, open fields, high ground, and caves

