

# INDUSTRY WIDE LABOR-MANAGEMENT SAFETY COMMITTEE

## **SAFETY BULLETIN #38**

### **GUIDELINES FOR INCLEMENT OR SEVERE WEATHER** **ADDENDUM "A" – LIGHTNING SAFETY**

This Addendum is designed to help reduce the risk of lightning-related threats through increased awareness and improved preparedness by Production Management, cast, and crew. Production Management should check the local weather forecast at least one day before the scheduled work for possible thunderstorms that may develop at the location. Television news coverage, mobile weather apps, commercial weather services, National Oceanic and Atmospheric Administration (NOAA) weather radio, and National Weather Service (NWS) are all tools that can be used.

Thunderstorms and severe weather forecasts are also online at <https://www.spc.noaa.gov/>.

According to NOAA, a thunderstorm is a rain shower during which you hear thunder. Since thunder is a by-product of lightning, all thunderstorms contain lightning.

If thunderstorms are forecast, Production Management will designate a person who is responsible for monitoring potential lightning activity and should notify Production Management, according to the action plan, of the status of any thunderstorm that may threaten the safety of the cast and crew. Again, production should have a reliable means of receiving weather forecasts, watches, advisories, and warnings such as NOAA weather radio or app.

**Causes:** Lightning results from the buildup and discharge of electrical energy in clouds. Lightning is unpredictable and can strike outside the heaviest rainfall areas several miles from an associated thunderstorm even when no clouds or rain are present.

#### **Potential Hazards:**

- Electrocutation
- Burns
- Falling debris
- Concussion
- Fire
- Equipment damage/destruction

#### **Lightning Safety for Outdoor Workers:**

Prior to beginning any outdoor work, Production Management and supervisors should check NOAA weather reports and radio forecasts for potential lightning at the working location. When working outdoors, Production Management, supervisors, and workers should continuously monitor weather conditions. Watch for darkening clouds and increasing wind speeds, which can indicate developing thunderstorms.

#### **Preparation:**

- Identify areas of safe shelter in advance.

- Avoid places with little or no protection from lightning such as sheds, unprotected tents, and temporary shelters.
- Seek shelter in substantial buildings that are enclosed and grounded with wiring and plumbing. This includes enclosed, grounded, metal buildings, or tents with an installed lightning protection system.
- If a substantial building or structure is unavailable, seek shelter in a hardtop automobile, bus, or truck with the windows rolled up.
- If signs of approaching thunderstorms occur, employees working outdoors should not begin any task they cannot quickly stop and seek shelter.
- Activate the **action plan** when there is a potential for lightning.

### Monitoring:

- When working in lightning-prone areas, use weather monitoring tools such as a mobile smartphone application, lightning detector/meter, or subscribe to a commercial notification system.
- It is also possible to estimate the distance of lightning by timing the sound of thunder using the Flash to Bang method. When lightning is seen, count the seconds until thunder is heard and then divide the seconds counted by five to obtain the approximate distance in miles.

### Action Plan:

- When lightning is reported to be 20 miles away, inform the cast and crew of a potential weather interruption, especially those involved with the use of scaffolding, aerial lifts, (MEWPs), overhead frameworks, camera jibs/cranes, and construction cranes.
- When lightning is reported to be 15 miles away, consider the option to secure equipment and prepare to evacuate exposed, elevated, and outdoor locations.
- When lightning is reported to be 6 to 10 miles away, cease all outdoor operations and evacuate to safe locations. Check with your production/safety department for the specific lightning storm distances that would require an outdoor evacuation.

### Generators:

- Unless alternative means of protection are used, when appropriate and if safe for the production to do so, shut down generators in accordance with the action plan and company procedures. Using alternative means of protection should only be considered in certain circumstances and may require advanced planning, qualifications, and additional training.
- Alternative Means of Protection:
  - Generators placed in a “Zone of Protection” (as defined in the Glossary below).
  - Generators with a lightning protection system (or Catenary Ground System) installed as defined in National Fire Protection Association (NFPA) 780 “*Lightning Protection Systems*”. Any lightning protection system should follow the national safety standards and requirements of the Lightning Protection Institute, NFPA, and Underwriters Laboratories (UL) and must be installed by qualified person(s). (See “Glossary” below for further information).
  - Generators placed in a well-ventilated, sheltered area (e.g., parking garage, carport).
  - Protection of portable feeders. Adequate surge protection devices installed when

supplying equipment inside a building, stage, or structure. These portable feeders should also have a main disconnecting means located indoors that is readily accessible.

- Do not go outdoors to service any portable generators, air conditioning units, or other equipment left running outdoors during the thunderstorm. You should only go outside to service and/or restart the equipment when the “all clear” signal has been given by a regulatory authority or Production Management.
- Check with the local Authority Having Jurisdiction (AHJ), when necessary, to determine any additional requirements.

**When working indoors during a thunderstorm, instruct all employees to:**

- Avoid contact with anything that can conduct electricity (e.g., electrical equipment or cables, plumbing fixtures, production lighting). Do not touch metal frames, beams, or any walls during a storm.
- Avoid using a corded telephone. Wireless microphones, cordless phones, or cellular phones may be used safely.
- Avoid contact with electrical equipment or appliances connected to the building or generator electrical distribution system during potential lightning strikes.
- Shelter in place and do not go outdoors during a thunderstorm.
- Do not go outdoors to service any equipment during a thunderstorm.

**If caught in a lightning storm outdoors with no shelter available:**

- Seek depressed areas – avoid mountaintops, hilltops, peaks, ridges, and other high places.
- Seek shelter in wooded areas with thick small trees. Avoid isolated trees.
- Avoid high ground and keep clear of tall objects, towers, aerial lifts, camerabooms, scaffolding, fences, or other metal equipment.
- Avoid contact with any body of water.
- If caught in an exposed area, make yourself as low and compact as possible to minimize the risk of a direct strike. Kneel on the ground, keep your feet together, and do not place your hands in contact with earth. **Do not lie flat.**
- If required to leave the location, only move to the pre-determined evacuation area when instructed.

**Post Lightning Activity:**

- Do not attempt to return to the area until an “all clear” signal has been effectively communicated by production, which is usually **30 minutes after the last thunderclap is heard, or there are no detected lightning strikes within a distance of the site as designated by Production Management using appropriate weather services or tools.**
- Individuals who may have been struck by lightning do not carry an electrical charge and are safe to assist. Get emergency help immediately. If you are qualified, administer first aid and/or CPR.

## Glossary:

**1. “Zone of Protection”:** Buildings that have lightning protection systems installed on the highest, most prominent elements provide some level of protection in the lower areas around the building, known as the “zone of protection”. Zone of protection is described in NFPA 780 as using a 150-foot radius sphere model to identify items under the protection of higher system elements. This is equivalent to rolling a 300-foot diameter ball from grade up against and then over a building to the opposite grade level in every conceivable direction. A generator located in the area created by the sphere between a strike terminal and grade would be protected. A Zone of Protection can also be provided by a single metal mast, or multiple metal masts surrounding equipment, which are grounded per NFPA 780.

**2. “Catenary Ground System”:** A ½” minimum diameter overhead ground wire supported by two conductive masts, and connected to ground rods at each end, provides protection for equipment located underneath it. The ground wire and masts must be at least 6' from any surface of the equipment. Materials and components used should be listed for lightning protection and installed by qualified person(s).

**3. “Surge Protective Device”:** A surge protective device (SPD) is a protective device for limiting transient voltages caused by lightning strikes by diverting or limiting surge current and is capable of repeating these functions as specified by the manufacturer. Surge protective devices should be installed on all conductive feeders and cables originating outside a building and run into the interior of the building and connected to equipment used by productions.