

# HSR GUIDANCE

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## OUTDOOR WORKS DURING LIGHTNING STORMS

**A lightning storm is one of the most dangerous weather conditions to be working in. Steel and metal are highly conductive of electricity, meaning any strike to any steel and/or metal object can potentially seriously injure or kill workers.**

This guidance provides information for Health and Safety Representatives (HSRs) to help:

1. identify the risks to health and safety when working outdoors during thunderstorms; and
2. determine what employers must do to eliminate or minimise the risks to workers.

### EMPLOYER DUTIES

Victorian OHS laws require employers in consultation with workers and HSRs, to apply a risk management process where there is a risk to workers' health and safety.

Employers must have safe systems of work in place to ensure the safety of workers in the event of a lightning storm. As part of the risk management process, employers, in consultation with HSR's and workers need to:

- identify hazards associated with lightning, assess the risk and implement control measures to prevent workers being exposed to lightning;
- monitor the latest weather forecast and warnings and take action when required;
- provide instruction and training to outdoor workers on lightning risks and actions to be taken when lightning is forecast or occurs; and
- develop a plan detailing actions to be followed when outdoor work is affected by lightning.



## IDENTIFYING THE HAZARD

### LIGHTNING DETECTION

Employers must use an adequate tracking system to detect lightning. To improve the accuracy of detection, the employer should adopt a variety of techniques, including a lightning tracking system and training workers to identify the signs of an oncoming storm.

**Lightning can cause injuries or death in a number of ways, including:**

**Direct Strike** – when a person is directly struck by lightning;

**Contact Voltage** – when a person is in direct contact with a conductor that has been struck by lightning, either inside or outside a structure or piece of plant;

**Side Flash** – when a person is struck by an arc or flash from a conductor carrying a lightning strike near the person;

**Ground Current** – injuries can occur when standing in the area of a lightning strike as the current can flow through the ground and enter and exit the body through the feet.

**Hearing Impairment** – Lightning can be up to 170db – far greater than the human hearing pain threshold which could potentially result in temporary or permanent hearing loss.

**Damaged Vision** – potential damage due to infra-red and ultra-violet radiation caused by lightning.

## ASSESSING THE RISKS OF HARM

If lightning is detected, the employer must assess the likelihood that lightning could strike workers and/or plant or equipment and the degree of harm that this could cause.

Lightning can carry a current of up to 10000 amps at 100 million volts. It can also travel long distances in electrical conducting materials such as metal wires, fences, pipes, plumbing or other metal surfaces. Metal does not attract lightning, but it does provide a path for the lightning to follow. This makes the potential for serious injury or loss of life very high.



The key signs to look out for when identifying a storm are dense clouds that build up before lightning, wind and/or rain occurs. These type of conditions can sometimes be missed by meteorology bureaus and other weather forecasting services.



## ASSESSING THE DISTANCE OF LIGHTNING

Sound travels at approximately 330m/s. Therefore, the time between the flash and the bang gives an estimate of how close the lightning is. Three seconds represents roughly one kilometre. The risk of being struck by lightning increases when there is less than 30 seconds between the flash and the bang.

The table below can be used as a general guide to estimate how far away a lightning strike might be. However, the general rule is if you have seen lightning or heard thunder – outdoor workers are already at risk.

### IF THUNDER IS HEARD... THE LIGHTNING IS...

3 seconds after flash	1 Km away
6 seconds after flash	2 Km away
9 seconds after flash	3 Km away
12 seconds after flash	4 Km away
15 seconds after flash	5 Km away
30 seconds after flash	10 Km away
60 seconds after flash	20 Km away

*Source: Crane Association of New Zealand, Thunderstorms & Lightning*

## CONTROLLING THE RISKS AND PRECAUTIONS

**Elimination is the primary and highest control method when storm activity has been identified.**

The CFMEU's position is that where lightning is detected within a 30km radius of the site, all outdoor operations must cease and only resume

30 minutes after the last flash of lightning. A v tracking system and/or using the chart above, can help determine the distance.

## ADDITIONAL PRECAUTIONS AND CONTROLS

Employers must always ensure there are measures in place to prepare the workplace in the event of a storm - including a plan of what to do when lightning is detected.

The plan needs to:

- direct workers to seek appropriate and safe shelter; and
- include important safety instructions. For example, avoid touching, handling and being in the proximity of potential conductors (e.g. metal objects and plant) that may become part of the discharge path.

## REVIEWING THE HAZARDS AND CONTROL MEASURES

Employers must continue to review the impact that lightning storms can have on workers and evaluate whether controls are effective in keeping workers safe.

Ensure that your Lightning Plan is always accurate, up to date and provides the highest level of protection.



## GETTING HELP

If you have any questions about this guidance or need help, contact the CFMEU OHS Team.

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## SOURCES AND FURTHER INFORMATION

- Crane Association of New Zealand - Thunderstorms & Lightning .
- Crane Industry Council of Australia Vic/Tas Branch, Crane Safety Bulletin #268 June 2020.
- Government of WA, Department of Mines, Industry Regulation and Safety, Lightning and outdoor work.
- AS 1768: 2021 – Lightning Protection.



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