

HSR GUIDANCE

FEBRUARY 2023

CRANE OPERATIONS DURING LIGHTNING STORMS

A lightning storm is one of the most dangerous weather conditions to be operating a crane in. Steel is highly conductive of electricity, meaning any strike to a crane can seriously injure or kill workers if the operator is inside the cabin.

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

- identify the risks to health and safety when operating cranes during thunderstorms; and
- determine what employers must do to eliminate or minimise the risks to workers.

EMPLOYER DUTIES

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

Employers need to have systems in place to ensure the safety of workers operating cranes in the event of a lightning storm. As part of the risk management process, employers need to:

- identify hazards associated with lightning, assess the risk and implement control measures to prevent workers exposure 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 forecasted or occurs; and
- develop an evacuation 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.

The key signs to look out for when spotting a storm are **dense clouds** that build up before the lightning, **wind and/or rain**. These types of conditions can sometimes be missed by meteorology bureaus and other weather forecasting services or **reported on when the crane operator is already on site**.

ASSESSING THE RISKS OF HARM

If lightning is detected, the employer must assess the likelihood that lightning could strike workers operating cranes and the degree of harm that it could cause.

Lightning can carry a current of up to 10000 Amps at 100million 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 provides a path for the lightning to follow. This makes the potential for serious injury or loss of life very high.

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;

side flash – when a person is struck by an arc or flash from a conductor carrying a lightning strike near the person; and

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.



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, workers are already in danger.

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
90 seconds after flash 30 Km away

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Source: Crane Association of New Zealand, Thunderstorms & Lightning

CONTROLLING THE RISKS AND PRECAUTIONS

Elimination as the primary control method

When storm activity has been identified and the risk has been assessed, where reasonably practicable, **the risk to health and safety must be eliminated.**

The CFMEU's position is that, where lightning is detected within a 30km radius of the crane, operations must cease and only resume 30 minutes after the last flash of lightning. A lightning tracking system or the chart above can be used to determine the distance.

There may be cases where the employer disagrees with the HSR about shutting down the site and derigging cranes in the event of a lightning storm. **If you have a disagreement with your employer about whether work should cease, contact your organiser or the CFMEU OHS Team immediately.**

ADDITIONAL PRECAUTIONS AND CONTROLS

Employers must always ensure that there are precautionary 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 should:

- direct workers to seek shelter in substantial building or a metal-bodied car when the lightning-thunder gap is less than 30 seconds; and
- include important safety instructions. For example, avoiding touching, handling and

proximity to metal objects that may become part of the discharge path, for example towers, mobile plant, power lines, fences and pipes.

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.

As the HSR, your employer is legally obligated include you in the risk assessment process and allow all workers to provide feedback.



GETTING HELP

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

For any enquiries regarding workplace accidents and workers' compensation, contact the CFMEU's in-house workplace injury lawyer, Simone Ellis, on 0491 690 865.

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APPENDIX A

RISK MANAGEMENT PROCESS

Identify hazards – find out what could cause harm.

Assess risks – if necessary—understand the nature of the harm that could be caused by the hazard, how serious the harm could be and the likelihood of it happening. This step may not be necessary if you are dealing with a known risk with known controls.

Control risks – implement the most effective control measure that is reasonably practicable in the circumstances and ensure it remains effective over time.

Review hazards and control measures to ensure they are working as planned.

APPENDIX B

SOURCES AND FURTHER READING

Information contained in this document can be referenced to the sources below.

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](#)

FOR FURTHER ADVICE AND/OR INFORMATION
CONTACT THE CFMEU ON 93413444

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