

# AGRICULTURAL WORK NEAR OVERHEAD ELECTRIC LINES INFORMATION SHEET

## Overview

This Information Sheet provides advice for small businesses and workers on managing the risks of agricultural work carried out near energised overhead electric lines and associated electrical equipment. For example:

- moving or operating irrigation pipes
- using lifting or elevating plant or equipment e.g. grain augers, hay bale elevators, travelling irrigators or harvesters
- moving or relocating agricultural plant e.g. folding cultivators where the transit or stowed height of the equipment is greater than its operating height
- building levee banks or dams
- transporting or moving structures e.g. grain silos
- installing agricultural netting
- ground based crop spraying, or
- other work that involves the risk of a person or anything attached to or held by a person coming into contact with overhead electric lines.



More information is in the *General guide for working in the vicinity of overhead and underground electric lines* and associated material for:

- operating cranes and mobile plant
- tree and vegetation management
- scaffolding work
- working near low voltage overhead electric lines near structures, and
- transporting high loads.



## What are the risks?

Contact with energised electric lines by agricultural plant, equipment, structures or materials can cause death, electric shock or other injury caused directly or indirectly by electricity. An electric shock can also occur without contact with overhead electric lines. A close approach to line conductors may allow a 'flashover' to occur. The risk of flashover increases as the line voltage increases.

People have been electrocuted when metal parts of agricultural plant like augers, field bins, harvesters or tip trucks contact or come close to energised electric lines. Often the operator has not lowered the equipment before moving it or has raised the mobile plant upwards into the energised overhead electric lines.

## What do I need to do?

You must manage the risks of carrying out agricultural work near energised electric lines and associated electrical equipment by:

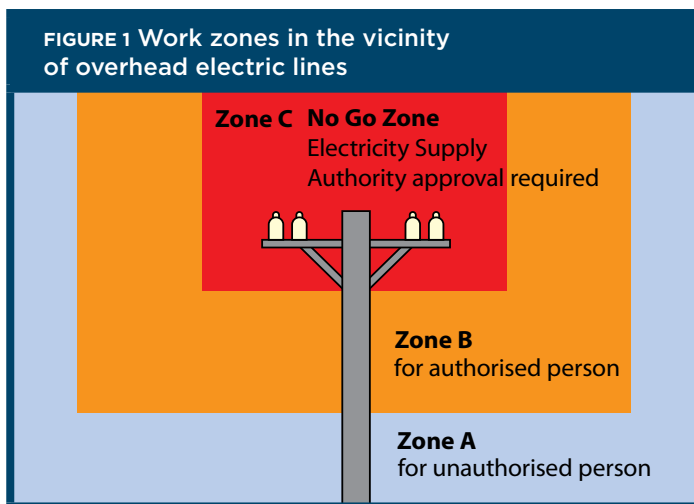
- identifying potential hazards
- consulting workers and asset owners e.g. the Electricity Supply Authority or the person with management or control of the electric line or premises, and
- deciding what work zones and approach distances and are required for safe operations.

When assessing the risks consider:

- whether machinery with tall attachments will be driven through paddocks where overhead electric lines exist
- whether tipper trucks, mobile silos, field bins, harvesters or other large rural machinery like cotton harvesters and field irrigators are operated or moved under or near energised overhead electric lines
- whether long metallic irrigation pipes are moved or rearranged
- the proximity of stationary or fixed plant and equipment to the overhead electric lines e.g. grain silos and stock crate gantries
- the location, height, arrangement and visibility of overhead electric lines and supporting structures e.g. poles, towers and stay wires
- the voltage of electric lines and exposed energised parts and whether they are insulated or bare
- possible sway or sag of the electric lines
- environmental conditions e.g. storm activity, heavy rain, hail and lightning
- site conditions e.g. wind strength and direction, terrain, ground surface and vehicular traffic



- type of plant and machinery required –design envelope, stability, dimensions and operating characteristics, minimum clearance distances and manoeuvrability
- the nature, size and shape of loads to be moved e.g. load stability, whether loads are conductive and how loads are secured
- the type of work activities required and the frequency of work tasks
- qualifications, competency, skill and experience of people doing the work
- the setting up and packing up processes, and
- safe work practices and procedures e.g. a safety observer and ‘permit to work.’



### Approach distances

Approach distances are one way of separating people from hazards. The approach distance for each work zone will vary depending on the voltage of the overhead electric line and the level of authorisation of each person doing the work. As the risk increases a greater approach distance is required. There are three work zones shown in Figure 1:

**Zone C** is a No Go Zone where Electricity Supply Authority approval is required. A ‘permit to work’ may be issued with specific condition that must be met. If a SWMS is not required a written safe system of work based on a risk assessment is required.

**Zone B** is for authorised persons only who must be trained in overhead electric line hazards. A written safe system of work based on a risk assessment is required e.g. using a safety observer.

**Zone A** is for unauthorised persons who do not have sufficient training or experience to be able to avoid electrical dangers.

More information on approach distances is in the *General guide for working in the vicinity of overhead and underground electric lines* or by contacting your state or territory [Electricity Supply Authority](#) or [Electricity Regulator](#).



### How do I control the risks?

The best way to eliminate the hazard is by preventing people, plant, equipment and materials from coming close enough to energised overhead electric lines for direct contact or ‘flashover’ to occur. Consider:

- de-energising the electric line
- isolating and earthing the line for the duration of the work
- re-routing the electric line away from the work area, or
- relocating plant or structures away from the overhead electric lines e.g.:
  - relocating silos or lowering augers before transport, or
  - keeping mobile irrigator sprayed water at least 8 metres away from overhead electric lines.

De-energising or moving electric lines should be arranged with the [Electricity Supply Authority](#) as soon as possible.

Where elimination is not reasonably practicable minimise the risks by substituting the hazard or work practice with something safer, for example by:

- filling a silo through a ground-level filler pipe on the silo rather than using a truck-mounted auger
- using alternative plant that cannot enter an unsafe zone
- using non-conductive tools, or
- using ultrasonic measuring devices to measure the height of overhead lines.

Consider isolating the hazard from people by erecting a physical barrier to prevent any part of the plant, equipment or a person entering Zone B.

Use engineering controls like:

- limiting movement of plant with mechanical stops
- fitting plant with programmable zone limiting devices
- mechanically limiting the slew speed of a crane to slow, and

- using electrically insulated plant and equipment.

If a risk still remains use administrative controls like:

- developing work procedures and travel routes for equipment and vehicles to ensure workers, their equipment and containers e.g. field bins, stock and tipper trucks do not operate near or under energised electric lines
- fitting proximity sensors and a warning device to plant to alert operators when they are about to enter Zone B
- making hazards more visible e.g. use warning signs or tiger tails
- installing warning signs on gates and paddocks or on the roadways where overhead electric lines exist
- managing and supervising the work, and
- defining areas where plant should not enter e.g. rigid tape barriers or use high visibility bunting.

Also consider the use of personal protective equipment (PPE) including:

- electrically tested insulating gloves, rubber soled boots and safety helmets
- rubber insulating mats or equipotential conductive mats for workers to stand on, and
- dry clothes especially in wet or humid conditions.

A combination of the above controls can be used if a single control is not enough to minimise the risks.



### Particular circumstances

Where plant consists of a vehicle with an attached trailer do not drive the plant under an overhead electric line unless:

- the plant has a fully-enclosed driver's cabin
- the driver remains completely within the cabin
- a clearance distance between the plant or attached equipment and the overhead electric line is maintained at all times and does not exceed Zone A, and
- no other person is in, or on the plant or attached equipment, or in contact with the plant or attached equipment or at risk of entering Zone B and moving or extendable parts for either plant or attached equipment are retracted and secured.

### Safety observer

A safety observer should be used whenever the work activity is done in Zone B or the work activity in Zone A can enter Zone B.

The safety observer should alert workers and crane or plant operators when approach distances are likely to be breached or other unsafe conditions arise.

A safety observer must be able to communicate effectively at all times with crane and mobile plant operators and warn them about an approach to Zone B.

Safety observers should monitor the work activity and have the authority to stop the work at any time.

### Safe work method statements (SWMS)

A SWMS is required for energised electrical work and high risk construction work carried out on or near energised electrical installations or services. A written SWMS should be based on a risk assessment. The SWMS and risk assessment should be available to workers on site for the duration of the work.

### Training and competence

Authorised persons who work closer than Zone B and safety observers who observe the work should have successfully completed a relevant training course provided by a registered training authority. They should be assessed as competent to carry out their work tasks in the vicinity of energised electric lines and exposed parts. Written certification should be verified.

Safety observers must be competent to implement control measures in an emergency and to rescue and resuscitate a worker if necessary. Authorised persons and safety observers must be re-assessed annually.



Information and examples of what can go wrong when approach distances are not maintained are in [Case studies – Incidents and scenarios](#).

For further information see the [Safe Work Australia](#) website ([www.swa.gov.au](http://www.swa.gov.au)).