Farmsafe AUSTRALIA

Toolbox Talks

A Practical Guide

Electrical Powerlines and Systems

Electrical powerlines and systems are a common sight across Australian landscapes. Powerlines on farms pose a serious hazard to farmers, workers, and visitors. Exposure to electrical currents can cause serious injury or death. It is possible to receive a fatal electric shock even without directly touching an electrical wire. Electricity can arc a considerable distance from a powerline to any kind of conductive material, such as the metal of a machine or tool, or to your body, in the right conditions.

We all need to remember

- If you are unsure of anything or feel that something you have been asked to do is dangerous, DO NOT begin the task. ASK for assistance or more information and we will work together to find a safe way to do the job or solve the problem.
- Ensure you are aware of the location of the nearest First Aid Kit.
- Make sure everyone is fit for work, free from signs of fatigue, drugs or alcohol. If in doubt, ask or talk to your manager.
- This farm is a workplace, but may also be a place of residence for the owner, their managers and employees. Be vigilant for children and bystanders at all times. Refer to *Child Safety on Farms*.
- The safety, health and wellbeing of all who live on, work on and visit this farm is the most important responsibility we all share.

Even if we are busy and under time or financial pressures, safety MUST come first.

The Hazards and Risks

Electrocution and Electric Shock

The primary hazard related to electrical powerlines and systems on the farm is the risk of electrical shock or electrocution. Electrocution can occur from coming into contact with electrical currents from live electrical wires, or an item of equipment, or machinery that is acting as a conductor for live electricity. Electrocution can result in serious injury or even death. Electric shock can cause other injuries like burns, muscle contractions, and falls, leading to injuries that may have long-lasting consequences.

Fires

Electrical faults or accidental contact with powerlines can trigger fires, endangering lives and property.

Equipment Damage

Contact with powerlines can cause damage to the internal components of farm machinery and equipment causing it to become unsafe to operate.

Tyre Explosions

Contact with a high voltage of electricity can cause a sudden increase in the temperature inside of a machine's tyres. This increase in temperature may cause tyres to explode immediately but it can also start a chemical reaction inside of the tyre called Pyrolisis. Pyrolisis is not immediately obvious but can cause a build up of flammable gasses and pressure within the tyre, which has the potential to cause a tyre explosion at a later time, even up to 24 hours later.

Tyre explosions are a significant hazard. The enormous amount of energy released has the potential to cause equipment damage, serious physical injuries or fatalities.

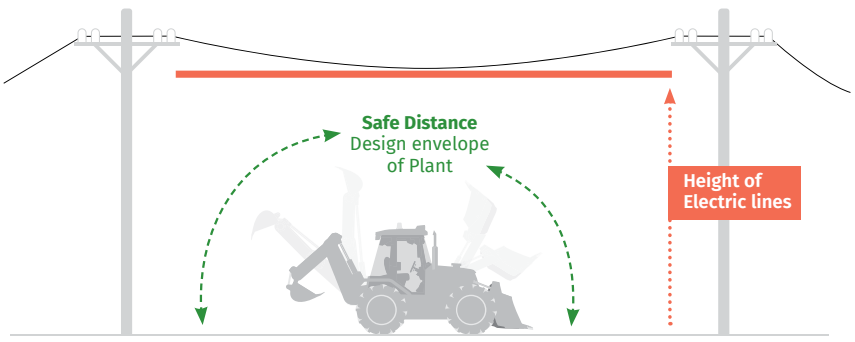
Reducing the Risk

Overhead Powerlines

Identify Hazards

- Familiarise yourself with the location of all powerlines and electrical systems on the farm.
- Make use of maps or diagrams that indicate the positions of powerlines.
- Plan work to take into account safe approach distances to powerlines. An approach distance is the minimum space from an energised overhead electric line that should be maintained by:
  - a person, or
  - an object held by or in contact with that person.
- If the voltage of a powerline is unknown or you don't know how to determine a safe approach distance then keep a minimum distance of 10 meters from any powerlines.

Powerline Safe Distance



EMERGENCY CONTACTS

In case of emergency, CALL 000 or your local emergency service provider, then call your manager or supervisor.

POISONS 13 11 26
Poisons Information Centre

AS AT NOVEMBER 2023

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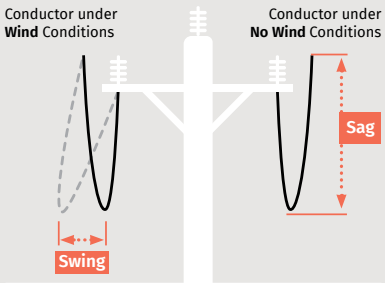
Maintain Safe Distances

Establish No Go Zones for people, plant, and equipment when working around powerlines.

- Be aware that certain powerlines may have higher voltage and require a greater exclusion zone or approach distance.
- Clearly mark No Go Zones with signs and flags so that everyone is aware of the hazard.
- When operating tall equipment, like tractors with raised implements, keep an even greater distance from powerlines.
- Remember to consider swing and sag when establishing approach distances and No Go Zones.
  - **Swing:** Wind can make the electric lines swing from side to side.
  - **Sag:** Powerlines expand when they heat up, and contract when they cool down. This can cause them to sag more in hot weather and less in cold weather. An expansion will result in gravity causing the electric lines to sag downwards.
  - If the height or voltage of the overhead electric lines cannot be accurately determined ask your Electricity Supply Authority for advice.



Links and Resources

SafeWork Australia - General Guide for Working in the Vicinity of Overhead & Underground Electric Lines
safeworkaustralia.gov.au

Worksafe Victoria - Managing the Risks of Overhead Powerlines
worksafe.vic.gov.au

Model Code of Practice: Managing Electrical Risks in the Workplace
safeworkaustralia.gov.au

Reducing the Risk

Underground Powerlines

- Be aware of the location of underground powerlines. If in doubt, contact your service provider or Before You Dig Australia to help confirm locations of underground infrastructure.
- Mark the location of underground powerlines. This can be done with flags, paint, or other markers, and should be marked on all farm maps.
- Avoid excavating or working near underground powerlines. If you must work near underground powerlines, take steps to protect yourself and others from electrical hazards. This may include using hand tools instead of power tools or using insulated tools and equipment.
- Be careful when using equipment that could come into contact with underground powerlines, such as backhoes and excavators.
- If you see a damaged or exposed underground powerline, stay away and call your local power company immediately.

Use Safe Work Practices

- Always assume that powerlines are live, even if they appear to be insulated or inactive.
- Lower equipment, such as irrigation pipes, before moving under powerlines.
- When handling long or tall equipment, have a spotter to help you maintain a safe distance from powerlines.

Emergency Response

- Establish an emergency response suitable for your farm.

An example generic emergency response may be:

- In case of accidental contact with powerlines, do not leave the vehicle that you are in.
- Stay inside and call for help immediately.
- Turn off the engine and ignition switch.
- Advise bystanders not to approach.
- If you must exit due to fire, jump clear of the equipment, ensuring you don't touch the ground and equipment simultaneously.
- Either hop or shuffle, keeping both feet together and in contact with the ground at the same time, until at least 10 meters away.
- Do not return to the vehicle.
- Never try to rescue someone in contact with electrical wires; call for professional help instead.

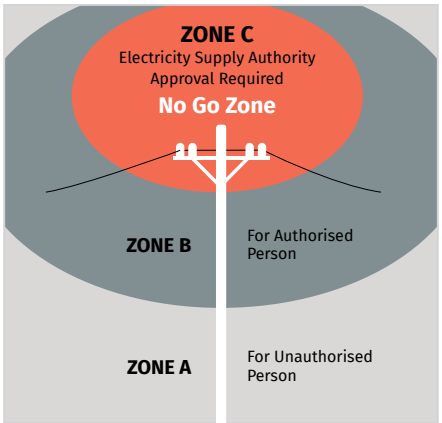
Report Issues

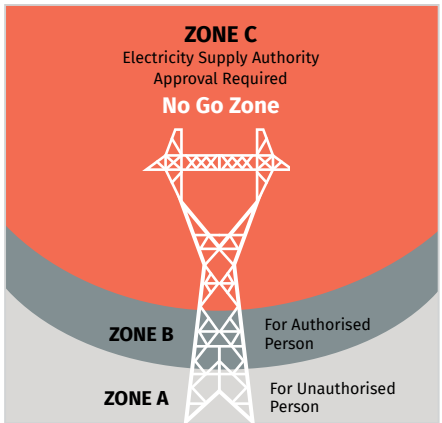
- Call 000 to report an immediate Emergency with a risk to life.
- Damaged lines and poles, or exposed underground wires should be reported to the relevant electricity provider.

Safety Equipment

- Ensure all workers have access to appropriate personal protective equipment, such as non-conductive gloves and footwear.
- Ladders and equipment used in the vicinity of electrical powerlines should be made from non-conductive materials.

Work Zones / Overhead Electric Lines





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Toolbox Talks Facilitator Guide

A Practical Guide

Electrical Powerlines and Systems

INSTRUCTIONS

The information sheet is background information ONLY. Be sure to customise your talk to your operation and facilities.

How to deliver an effective Toolbox Talk

- Know your Topic. If you don't understand the material it will be hard to explain and make it relevant.
- Print copies of the Toolbox Talk Info sheet for yourself and each of the participants.
- Hold the talk in a location relevant to the topic being discussed.
- Explain why the Toolbox Talk is being held.
- Stay on topic and keep it simple.
- Encourage conversation and participation.
- Be sure to give real life examples whenever possible.
- Be open to questions.
- Read through the provided cases studies.
- After each study ask attendees what could have been done to prevent this situation.
- Conclude with a brief review of the main points or a summary based on the discussion.
- Record the details of the Toolbox Talk including the location, date and names of attendees.

Note: *This Facilitator Guide is intended to provide a basic structure for conducting a Toolbox Talk. Customise it as needed to suit your specific audience and objectives. Always prioritise safety and ensure that participants have a clear understanding of the information presented.*

Introduction

- Welcome and introduction to the session.
- Briefly outline the importance of working safely are powerlines and electrical infrastructure.

Icebreaker Consider starting with a brief question or scenario related to powerlines on farms to engage participants. For example, "What tasks do we do around this farm that expose us to overhead powerlines?"

Distribution of Resources
Handout printed Toolbox Talk Information Sheets and any other resources related to power line safety.

Key Points

Types of Hazards and Risks

Discuss the key hazards and risks associated with electricity, such as:

- Electrocution
- Electrical shock
- Arcing
- Fire
- Damage to internal components of machines and vehicles.

Safe Practices

Provide tips on how to stay safe around powerlines and electrical equipment, such as:

- Being aware of the location of powerlines.
- Planning work carefully when working near powerlines.
- Using insulated tools and equipment.

Emergency Plans

- Talk through your farm's emergency plan.
- Conduct a demonstration of the emergency response procedure.

Interactive Discussion and Case Studies

Encourage participants to share their experiences, challenges, or questions related to work in the vicinity of powerlines.

Use visual aids or diagrams if available to illustrate key points.

Use the Case Studies on the next page to prompt conversation. Read the case studies out loud and ask participants for their thoughts.

Q&A Session

Allow participants to ask questions and seek clarification on any topics covered.

Conclusion

Summarise the main takeaways from the talk: keeping safe, keeping others safe, and emergency response.

Reiterate the importance of everyone's commitment to safety on the farm.

Closing Remarks

Thank participants for their time and attention.

Remind them to apply the knowledge gained from this Toolbox Talk in their daily work.

Feedback

Ask for feedback on the Toolbox Talk content and delivery to improve future sessions.

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Toolbox Talks Facilitator Guide

CASE STUDIES

CASE STUDY 1 John's Dangerous Mistake

Scenario

John is a farmer who has been working on the same farm for many years. Today he will be digging some new drainage in the excavator. He believes that he knows where the underground powerlines are, but he's never actually called Before You Dig or confirmed with the local electricity carrier the location of underground lines in the area. Should he proceed?

QUESTION	ANSWER
Is John correct in this assumption?	No, John should not proceed without calling Before You Dig or speaking to the local electrical providers. It is important to take all of the necessary safety precautions when working near powerlines, regardless of experience level. Powerlines are extremely dangerous and even a small mistake can have fatal consequences.

CASE STUDY 2 Powerline Complacency

Scenario

Tom is moving a grain auger across the farm on a very hot summer day. He has used this road many times through the winter without issue. Today, as he is driving underneath the powerline, the auger makes contact creating a potentially hazardous situation. Tom had done everything today the same way that he has done it in the past. What could have caused the grain auger to hit the powerlines on this day?

QUESTION	ANSWER
What could have caused the grain auger to hit the powerlines on this day?	There are a few possible reasons why Tom's grain auger hit the powerlines on this day, even though he had used the same road many times in the past without issue: **Line Sag:** Powerlines can sag in hot weather, especially if they are old or damaged. This means that they can get closer to the ground and pose a greater danger to people and equipment. **Vehicle Height:** If Tom's grain auger is taller than it used to be, due to new tires or other modifications, it may now be hitting the powerlines. This question should be used to highlight the need to remain vigilant and aware of your surroundings. Don't just assume that everything is the same as it was yesterday.

CASE STUDY 3 Touch and Go

Scenario

Mary is moving a tractor from one field to the next. She has checked the height of her tractor cabin and she will be 4 meters away from a high voltage powerline that she needs to go under. She will have irrigation pipes on the tractor. Mary isn't certain but she thinks that the irrigation pipes will be around 1 meter away from the powerline when she drives underneath.

QUESTION	ANSWER
Is it safe for Mary to drive under the powerline?	No, it is not safe for Mary to drive under the powerline with the irrigation pipes on the tractor. Even though the tractor cabin will be 4 meters away, Mary isn't sure of the clearance of the irrigation pipes. The irrigation pipes could easily reach the power-line, or the electricity could arc and create a hazardous situation. Powerlines can carry thousands of volts of electricity, and even a small contact can be fatal. It is important to maintain a safe distance from powerlines at all times, regardless of the type of equipment you are operating. There are other factors that Mary should consider, such as: **Wind:** Wind can cause the irrigation pipes to sway, which could bring them into contact with the powerline. **Uneven Terrain:** If the tractor is operating on uneven terrain, the irrigation pipes may bounce up and down, which could bring them into contact with the powerline. **Powerline Sag:** Powerlines can sag in hot weather, especially if they are old or damaged. This means that they can get closer to the ground and pose a greater danger to people and equipment. Mary should avoid driving under the powerline with the irrigation pipes on the tractor.

RISK

Risk Management Tools

DOWNLOAD ONLINE MATRIX

Use this simple and effective tool to assess and manage the risk of your farming activities prior to commencing. All team members can join in and contribute, developing different ways to manage risks on your farm. Doing a risk assessment helps determine hazards and develop appropriate control measures to lessen risks.

farmsafe.org.au
P. +61 2 6269 5622 | E. ***info@farmsafe.org.au***

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Toolbox Talks *Facilitator Guide*

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Electrical Powerlines and Systems

On-farm Toolbox Talk
Sign-off Sheet

INSTRUCTIONS

This sign-off template is available for you to use as part of your training packages. You will need to attach all evidence of all information given to the person that you have spoken with regarding this specific Toolbox Talk. This may include checklists, policies, safe operating procedures or notes about the conversations had, questions asked and other information provided.

Holding Toolbox Talks or safety meetings are not just about checking a box - they need to be tailored to your farming environment, meet the legislative requirements, and designed to support your employee, contractor, family member or visitor throughout the time that they spend living or working on your property. Inductions are only the first step in your WHS journey and it is important that you continue to create a safety culture on your farm by continuing to engage with your employees on any matters that may affect their health, safety and wellbeing.

The employee/contractor/visitor/family member that you have had this conversation with should acknowledge that they have received, discussed and understood all the relevant information that has been presented to them and attached and sign in the relevant space provided. A good practice is to ensure that the employee initials or signs each relevant piece of information that is attached and retains a copy of each for their own information. Records of WHS conversations should be kept alongside records of employment or in your work, health and safety management system and be updated as needed or as required by law.

Please list and/or attach all documents that have been provided including checklists, policies, safe operating procedures, etc.

On-farm Toolbox Talk Participants

EMPLOYER – DETAILS	
☐ I confirm that I have provided a relevant safety meeting to our farming business and that the employee has received, discussed and understood the listed and attached information.	
Given Name(s)	
Surname	
Property Name	
Date	
Signature	

1. EMPLOYEE / CONTRACTOR / VISITOR / FAMILY MEMBER – DETAILS	
☐ I confirm that I have received, discussed and understood all information that has been listed and attached to this document.	
Given Name(s)	
Surname	
Property Name	
Date	
Signature	

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Toolbox Talks Facilitator Guide

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On-farm Toolbox Talk
Sign-off Sheet

CONTINUED

2. EMPLOYEE / CONTRACTOR / VISITOR / FAMILY MEMBER – DETAILS

☐ I confirm that I have received, discussed and understood all information that has been listed and attached to this document.

Given Name(s)	
Surname	
Property Name	
Date	
Signature	

3. EMPLOYEE / CONTRACTOR / VISITOR / FAMILY MEMBER – DETAILS

☐ I confirm that I have received, discussed and understood all information that has been listed and attached to this document.

Given Name(s)	
Surname	
Property Name	
Date	
Signature	

4. EMPLOYEE / CONTRACTOR / VISITOR / FAMILY MEMBER – DETAILS

☐ I confirm that I have received, discussed and understood all information that has been listed and attached to this document.

Given Name(s)	
Surname	
Property Name	
Date	
Signature	

5. EMPLOYEE / CONTRACTOR / VISITOR / FAMILY MEMBER – DETAILS

☐ I confirm that I have received, discussed and understood all information that has been listed and attached to this document.

Given Name(s)	
Surname	
Property Name	
Date	
Signature	

Australian Government
Department of Agriculture, Fisheries and Forestry

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