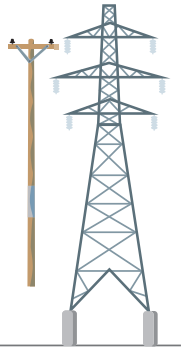
Power lines on rural properties



Power lines carry electricity essential to the daily running of the farm. Electricity should always be treated with respect and care, especially when working near power lines.

KEY POINTS

> Touching a powerline is dangerous and can result in serious personal injury or death.

> Make sure tall equipment is kept well clear of overhead power lines.

> People climbing over stock trucks or high loads of hay must avoid overhead lines.

> Keep power lines on your property in good condition. If repairs are necessary contact a registered electrician or your electricity supplier immediately.

INCIDENTS

A number of electrical incidents have occurred on rural properties.

> A farmer died while fencing when the fence tape he was running contacted the overhead 6.6kv power lines. Initially it was thought he had a heart attack because no one witnessed what had happened. Subsequently, while waiting for the police to arrive, a neighbour picked up the electric fence tape and was also electrocuted.

> Another incident resulted when a single wire ('Single Wire Earth Return' or SWER) line dropped to within 1.5 metres of the ground when a fault on the line caused the wooden power pole to ignite and burn down the pole, releasing the power line bracket. The farm manager drove his quad bike over to investigate three cattle beasts that contacted the line and died. He also made contact with the line and died, and his wife received severe burn injuries when she went to his aid.

INFORMATION

Estimating the distance between power lines and the ground is difficult when viewed against a clear sky; the background gives no relative clues to predict the distance of the lines.

A single conductor wire is more difficult to distinguish than multiple wires. Even if the wire

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is ‘seen’ by our eyes, our brain needs to perceive this information as important before we attain awareness of the wire. Individual perception is affected by past experience, training and knowledge. If power lines (or in this instance a single conductor) are not part of a person’s experience, training or knowledge, they may not recognise the potential for harm.

SWER LINES

SWER distribution systems are widely used in rural areas of New Zealand; remote rural locations tend to favour the use of wooden power poles.

SWER systems differ significantly from conventional electrical distribution systems. In a SWER system a single line is used as the ‘supply’ pathway, and the ‘return’ pathway is via the mass of the earth.

In a conventional electrical distribution system the supply current would be via a ‘live’ conductor and the return current would be via a ‘neutral’ conductor. The electrical potential of the conductors can be monitored relative to the earth’s conductive surface and protective devices employed to interrupt the electrical current if a fault condition occurs. This is not possible with a SWER system because the earth fault current is too small to detect. This means dropped SWER lines are more likely to remain live than multi-conductor lines.

POWER POLES

The wooden pole involved in the second incident was manufactured from Corsican Pine (softwood). Softwood poles are relatively flammable compared to hardwood, but concrete poles are non-flammable.

All wooden poles can conduct a sufficient amount of electricity to catch fire when there is an electrical fault to earth at the top of the pole.

ADVICE

Landowners and PCBUs should identify **all** overhead power lines as a risk, and implement controls to manage the hazards effectively.

These could include finding alternative methods of work so workers cannot come into contact with overhead power lines.

If working near an overhead power line cannot be avoided, there is a standard for electric fences for animal control.

The standard is called *AS/NZS 3014 – Electrical installations – Electric fences*, and is available from www.standards.co.nz. This standard gives specific details on how to safely manage the installation of electric fences below power lines.

PCBUs should ensure their workers are aware of overhead power lines, and more particularly the common rural use and risks of SWER lines.

The minimum safe approach distance for working near any overhead power line is four metres as recommended by the *New Zealand Electrical Code of Practice for Electrical Safe Distances (NZECP 34:2001)*.

PCBUs should add requirements such as ensuring additional distances to compensate for factors like inadvertent movement of machines, and the use of safety observers to ensure safety when repetitive tasks are being performed.

A dropped line can still be active, and even if a person doesn’t connect with the line, electricity can arc and reach earth through the person.

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