

A TO V GUIDE TO NETWORK SAFETY

The safety of our people and the communities we serve is our first priority.

A wide range of devices are built into the network to protect the community if something goes wrong. These are supported by cyclic inspection and maintenance programs to ensure everything is operating as it should.

Our team works year-round to keep our network safe and reliable. But there will still be times when something out of the ordinary happens and leads to a power outage such as when a car hits a pole, or strong winds blow a whole tree into a powerline.

When that happens, it will be detected by our protective devices. These will shut down power quickly to either individual homes or whole communities depending on where the fault occurs. This is designed to keep people safe and prevent damage to appliances and properties.

Some devices are designed to send signals back to our network control room, providing the network operators with immediate insight into what's happening on our infrastructure. This helps field crews to find faults fast and restore power for customers.

This factsheet provides a guide to some of the most common safety devices or inspection activities you'll see on or around our networks or hear about. They represent just part of our comprehensive approach to network safety.

Our guide to safety devices and controls

Aerial inspection: Helicopters fitted with advanced laser detection technology inspect the entire network of powerlines every year. They are scanning and detecting vegetation growing near powerlines to inform our tree cutting program.

Armour Rods and Vibration Dampers: Armour rods are designed to protect overhead electricity cables against abrasion, bending, compression or flash-overs. Vibration dampers reduce vibrations on powerlines that can be caused by high winds. This form of vibration can reduce the reliability of power supplies and the service life of the powerlines.

Auto Circuit Recloser (ACR): These devices are circuit breakers for Single Wire Earth Return (SWER) lines and other types of powerlines. If an object, such as an animal or tree branch, falls on a wire, the ACR will turn off and on for a few short periods until the object falls clear of the line and supply is restored. If the object does not clear, the power will remain off until a crew locates and repairs the fault. During Total Fire Ban (TFB) days, ACRs are remotely set to operate at higher fault detection sensitivities and if a fault is detected, power will be turned off. This is to help prevent fire starts from fallen powerlines.

Circuit breaker: A device found in or near a zone substation that will activate if a fault occurs on a feeder line. The circuit breaker will reduce the number of customers going off supply and protect powerlines, cables and transformers.

Covered conductors: These are overhead lines which have an insulated covering around them. They are being rolled out in targeted high bushfire risk areas where powerlines can also be affected by extreme weather like strong winds, salt spray, moisture or frost. By protecting powerlines, the covers also help reduce the likelihood of faults and fires.

Drones: Remotely piloted aerial inspection services are being used in hard to reach or heavily forested areas in our network. The drones take photographs of the assets which are then analysed to make sure everything is in working order.

Fuses: There are thousands of fuses located on poles across both our high and low voltage networks. These are designed to cut power in response to a fault or if demand is too high for the local network. By shutting off power in a small area, the fuse is able to reduce any damage occurring to the wider network and helps minimise the size and impact of a power outage.

Ground patrols: These crews make detailed observations of poles, transformers, powerlines, switchgear, insulators and other infrastructure as well as surrounding vegetation, by looking from the ground up. This includes inspecting Private Overhead Electric Lines (POELs). Sometimes these patrols are done from slow moving vehicles. But with poles often in hard-to-reach places, crews often hike the length of the powerlines to check these assets. They are often supported from above by drones.

Insulators: Attached to poles and support the powerlines, providing insulation and restricting electric current flowing through the pole to ground.

Line spreaders: Line spreaders are in place on some bare low voltage powerlines in high risk bushfire areas. They physically maintain distances between conductors to avoid them clashing together during high winds.

Pole inspections: Our power pole inspection process determines when a pole needs to be repaired or replaced.

Trained and qualified inspectors conduct a regular cycle of above and below ground inspections. They determine each pole's condition, the amount of sound wood, if there is any rot or termites, size and number of splits in the timber, height and diameter measurements.

Rapid Earth Fault Current Limiter (REFCL): These work like a large safety switch, reducing the risk of fires starting from faults on 22kV, multi-wire powerlines. When a powerline comes into contact with the ground or a tree, the energy released can cause a large spark. The REFCL will detect when a line has fallen and instantly reduce the voltage. After a few moments, the device checks if the fault is still present. If it is, power to all three lines will be shut off to protect against fire risk and make it safe for our crews to fix. During Total Fire Ban (TFB) days REFCLs are remotely set to operate at higher fault detection sensitivities to help prevent fire starts from fallen powerlines.

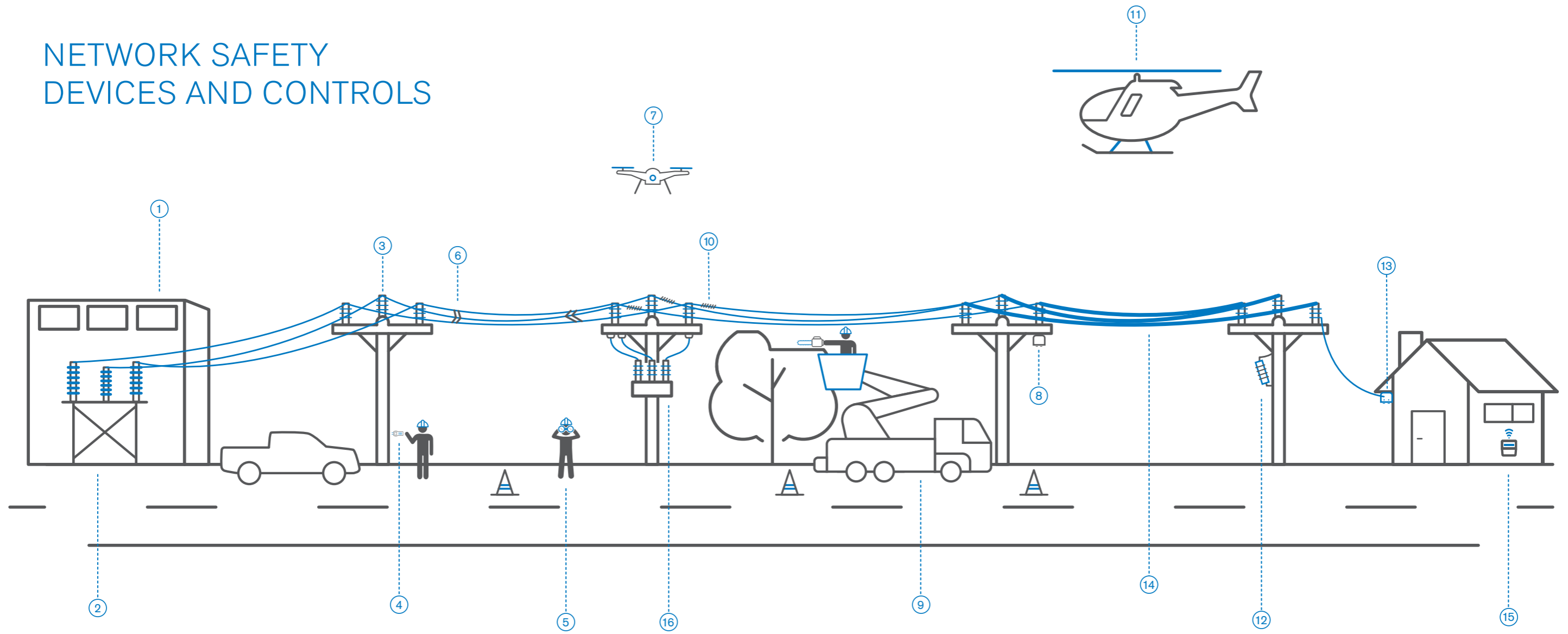
Service fuse: Service fuses are located on a pole or at the connection point to customer premises. They are designed to switch off power to homes or small businesses in response to a fault, protecting the premises from potential damage. Every home or small business in the network is usually connected through a service fuse.

Smart Meter: About 97% of our customers have smart meters. As well as providing accurate data on how much electricity you use in your home or business, the information they collect also helps us define and detect potential faults or connection issues before they happen. In these cases, we may remotely turn off power to the premises to ensure it is safe and will mobilise a crew to assess the issue and, if required, repair the fault.

Surge arresters: A device designed to minimise damage to electrical equipment caused by high voltage events, such as lightning strikes.

Vegetation management: We are required to make sure the area around powerlines is clear and safe. Branches falling or flying loose in strong winds can bring down powerlines and cause power outages or grass fires. We regularly inspect vegetation around our poles and wires and cut it back if necessary in line with regulated clearance distances. Councils are responsible for maintaining tree clearances in some urban areas.

NETWORK SAFETY DEVICES AND CONTROLS



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About CitiPower and Powercor

CitiPower and Powercor are distribution businesses responsible for operating and maintaining the electricity network that transports electricity to more than 1.1 million homes and businesses across western Victoria and Melbourne's CBD and inner suburbs.

Our customers expect us to deliver the electricity they need to power their lives and we work all year round to make sure our network is reliable.

Australian Energy Regulator benchmarking ranks us among the most reliable networks in Australia. In the Powercor network, electricity is available for more than 99.97 per cent of the year, equating to customers on average being without power for about 2.5 hours a year. In the CitiPower area, electricity is available for 99.99 per cent of the year, or the equivalent of being without power for 20 minutes.

For illustrative purposes, this diagram does not distinguish between the low and high voltage networks.