



# Floods and High Voltage Safety



POWERLINK QUEENSLAND INFORMATION SHEET

The safety of members of the community and emergency services is our number one priority.

## KEY POINTS

- ! BE SAFE.** Always assume fallen powerlines are live - do not approach them. If powerlines are blown over or damaged by a cyclone, severe storm or flood water they can be dangerous. If powerlines are touching the ground or closer to the ground due to damage or flood heights, it is important to keep well away. Electricity from powerlines can jump or 'arc' through the air and travel to earth through your body, resulting in electrocution.
- ! STAY AWAY.** Powerlines have a statutory exclusion zone which must be maintained at all times. To find out how far you need to be from the exclusion zone phone the Electrical Safety Office on 1300 650 662.
- ! KEEP PEOPLE AWAY.** If you are the first person to notice the fallen towers or powerlines, try and keep people away from the area. Explain that until the lines are tested and proven safe by an Electricity Authority they have the potential to injure people because of the electrical hazards.
- ! NEVER APPROACH.** High voltages (up to as high as 500,000 volts are distributed over the transmission network and can cause flashover ("jump"), to earth which can result in injury or death and damage to equipment, and property.
- ! VEHICLES AND BOATS.** You can still be exposed to electrical risks even within vehicles or boats. If a fallen powerline lands on an occupied vehicle or boat or gets caught under a vehicle always stay in the vehicle until the lines are proven safe. If it is a life threatening position, such as the car bursts into flames, jump out and land with both feet together, then hop away so that both feet are always together.

### EMERGENCY CONTACT

**For life threatening situations call 000 and for any lines or towers that have blown down or if lines are much lower than usual call Powerlink 1800 353 031.**

## FLOOD SAFETY RISKS

After the flood, be aware that towers and poles carrying power lines may have suffered damage and can be dangerous. Stay away from them until they have been proven safe.

Electricity towers and poles may become unstable, fall or cause overhead lines to sag, as a result of flood waters. Sagging overheads lines may still be "live". Underground cables may become exposed by erosion or damaged. Any of these can pose risk of electrical shock to boats in flood waters and to vehicles and machinery.

All our transmission structures have signs to indicate that they are a Powerlink asset with contact details. Beware that during flooding these signs may be under water or illegible due to damage caused by flooding.

## SAFE BEHAVIOUR IN FLOOD WATERS

Treat all electrical equipment as live until advised otherwise by the electricity authority. Boat users must exercise greater caution when approaching overhead power lines. Boats used in flood conditions may unintentionally come closer to overhead powerlines than in normal conditions. As flood levels change, boat users are urged to look out for any powerlines in particular fallen or sagging powerlines. Maintain a safe distance from powerlines at all times.

Do not steer your boat across powerlines that are in the water. There is risk of entanglement, the possible presence of electricity, and the potential that the powerlines may spring or shoot upwards due to the lines still being under tension.

If your boat is wooden or fibreglass, do not touch the water or metallic parts of the motor when near fallen wires or poles. There is potential that the electricity is still present and may present a further danger. Trees fallen across the power lines could also be "live". Do not try to pull trees or branches clear. It is not safe to use an oar to push away, lift or move powerlines.

Only cross under overhead lines where there is plenty of clearance distance between the highest point between the boat and the lines. The acceptable clearance distance depends on the voltage of the overhead line. A general rule of thumb is that you maintain an 8 metres clearance distance. In some circumstances Powerlink might approve a reduced clearance down to as low as 2.4 metres. However, this would only be where the network is deemed to be electrically intact, and where Powerlink has fully assessed other relevant factors.

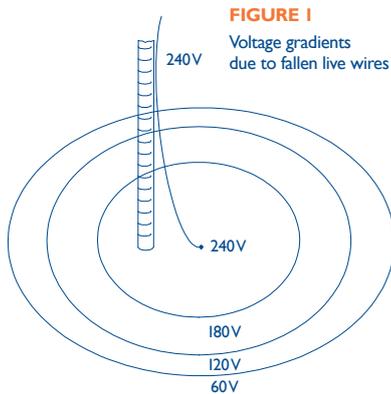
If you are in a boat and the powerlines fall into or across your boat, do not touch them. Do not get out of the boat as you may be creating an electrical path for the electricity to pass through to ground. Call emergency services on 000.

When driving power vehicles across flooded or water logged areas do not drive your vehicle across the fallen lines. If powerlines have fallen across or become entangled in your vehicle, remain inside your vehicle and call for help. If you are in immediate danger, (i.e. the wires are crackling or moving, or your vehicle is on fire), open the door and jump clear keeping your hands off the vehicle and both your feet together, and hop away until at least 10 metres away from your vehicle. Warn everyone to stay away from vehicles where power lines may have fallen across the vehicle.

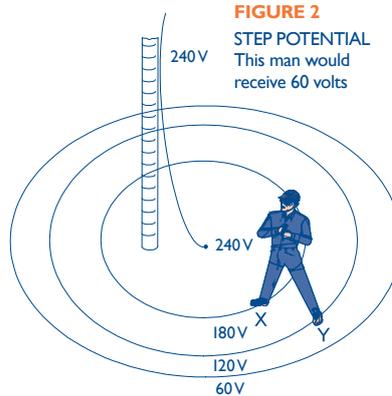


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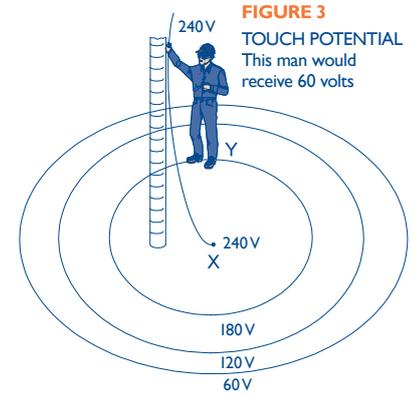
## Dangerous Voltage Gradience



## Dangerous Step Potential



## Dangerous Touch Potential



The above figures are provided to show the difference in potential which may place a person at electrical risk.

## FALLEN LIVE WIRES ARE DANGEROUS

If a "live" wire is on the ground it creates a voltage gradient. Basically this can be considered as electricity fanning out from the point of contact. Consequently, there is a rippling effect that can be likened to dropping a pebble into calm water. The wave created at the point of contact gets smaller as it rings out. Similarly, in this 'pool' of electricity, the energy is at full system voltage at the point of ground contact, but as you move away from the contact point, the voltage drops progressively. This is represented in Figure 1 above. This effect is known as 'ground gradient'. The voltages present depend on a number of factors such as ground type or how much moisture is in the soil. This ground gradient or voltage difference creates two problems known as step and touch potential.

## STEP POTENTIAL

Let us assume that a live wire is touching the ground and has created a "pool" of electricity. If a person had one foot near the point of ground contact (at x voltage) and the other foot a step away (at y voltage), this difference in voltage would cause electricity (an electric current) to flow through their body driven by a voltage of (x-y) volts. This effect is referred to as 'step potential'. See figure 2 above.

## FLASHOVER

A "flashover" is when electricity, especially at higher voltages, jumps across an air gap to create a conductive path. A flashover may occur between wires or from wires to the ground - this may be seen as a flash or heard as an explosion or loud 'crack'.

Flashovers are potentially life threatening to a person standing in the near vicinity of the flashover (much like when lightning strikes the ground near a person). Flashovers can also cause damage to nearby equipment and the powerline, and can cause possible interruptions to power supply to homes and industry.

## TOUCH POTENTIAL

If a person were to place their hand on an energised source, while their feet were at some distance from the source it would create a difference in voltage potential. The difference in voltage in this case is referred to as 'touch potential' (x-y). See figure 3 above. This difference in voltage would cause electricity (an electric current) to flow through their body driven by a voltage of (x-y) volts and cause an electric shock or electrocution.

**REMEMBER ELECTRICITY ALWAYS LOOKS FOR THE EASIEST PATH TO EARTH**

### About Powerlink

Powerlink Queensland is a State Government-owned Corporation that owns, develops and maintains Queensland's high voltage transmission network, which stretches 1,700 km from Cairns in North Queensland to the New South Wales border.

Through this network, Powerlink transport high voltage electricity from power stations where it is generated, to major industries and electricity distribution networks owned by Energex and Ergon Energy, which in turn supply electricity to more than 1.8 million customers.

### More Information

For more information on fires near or under transmission lines, please contact Powerlink:

Phone: Freecall information line 1800 353 031

Send an email: [website.enquiries@powerlink.com.au](mailto:website.enquiries@powerlink.com.au)

Write: Powerlink Queensland, PO Box 1193, Virginia QLD 4014

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