

# What electrical safety risks exist around transmission lines?

Coming into contact with high voltage transmission lines can cause serious injury or death. This is why TransGrid imposes restrictions on certain activities and developments in and around transmission line easements – to keep you and our staff safe. The main risks from TransGrid’s high voltage transmission lines are described below.

## Maintaining electrical clearances

Transmission lines are designed to ensure there are safe distances between the energised conductors (live wires) and objects that the lines could touch, either:

- > when the conductors sag due to heat;
- > when the conductors swing sideways in high wind conditions; or
- > in an extreme event, if conductors fall.

**Risk:** *Activities and developments within transmission line easements - such as the erection of certain structures, changes in ground level, and vegetation growth – can reduce the electrical clearances. This can result in contact with high voltage lines or electrical current being transferred, which can cause death, injury, or start a bush fire.*

To manage these public safety risks, TransGrid designs its transmission lines and restricts activities within easements to meet international safe clearance standards.



Figure 1: Maintaining electrical clearances

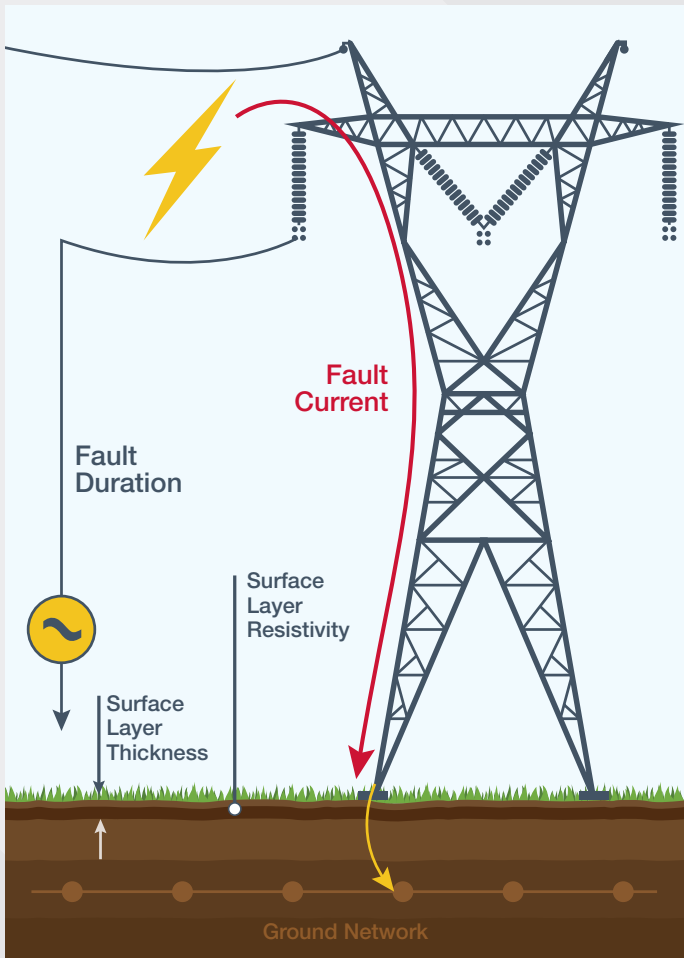


Figure 2: Earth potential rise

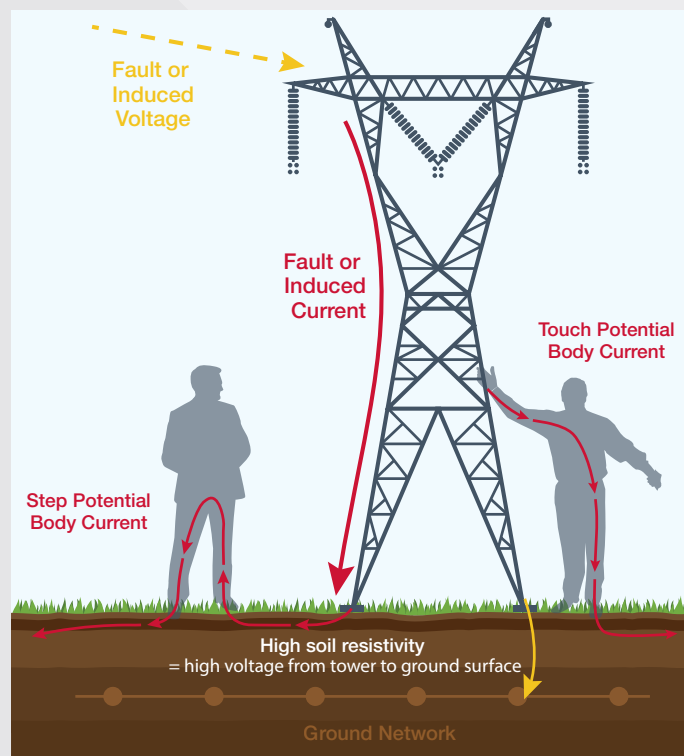


Figure 3: Touch and step voltages

## Earth potential rise

Earth potential rise can occur when there is a fault on a transmission line – such as a lightning strike or conductor drop – resulting in a large electrical current transferring a voltage to the surrounding area of earth. This voltage is strongest at the point where it meets the earth, and then dissipates rapidly across the ground.

Earth potential rise can lead to touch and step voltages:

- > ‘touch voltage’ is the voltage difference between a person’s feet and hands as they touch a metallic object; and
- > ‘step voltage’ is the voltage difference between the points of contact for each foot as a person takes a step.

**Risk:** *If a transmission line fault occurs, earth potential rise can result in dangerous touch and step voltages around transmission structures and potentially along the transmission line. Electric shocks can result when contact (i.e. an object is touched or a step is taken) between two points of different voltage potential, which could result in death, or serious injury.*

*Some installations – such as fences or sheds (particularly where power is connected) – can transfer dangerous voltages away from the area around the structure and create an additional hazard.*

TransGrid manages these risks to public safety by placing restrictions on the types of activities and developments that may be undertaken in the vicinity of transmission assets.

## Avoiding electrical induction

Metallic objects such as pipes, fences and sheds, in the vicinity of transmission lines, can become electrified due to electrical induction. This can occur as the result of the electromagnetic or electrostatic effect of a nearby transmission line. For smaller objects (such as a metallic clothes line) the induction may only produce nuisance shocks. For longer objects like pipes and fences, particularly where they run parallel to the transmission line for long distances, the induced voltage can reach dangerous levels.

**Risk:** *Small amounts of induction may cause people ‘nuisance shocks’ when touching metallic objects, whereas larger amounts of induction will become hazardous and have the potential to cause serious injury or death.*

TransGrid manages the risk of electrical induction by placing controls and conditions on activities and developments that may be undertaken in the vicinity of transmission assets.





Figure 4: Transmission asset damage

### Preventing damage to transmission assets

TransGrid is committed to providing a reliable, safe supply of energy. Transmission assets can be damaged by:

- > interference with / or impact to structures or transmission lines from unauthorised activities or vegetation;
- > damage to underground assets (such as cables) from earth works; or
- > fire damage (such as from flammable or explosive materials).

**Risk:** *Damage to transmission assets could result in structures collapsing, conductors falling or other damage which could result in prolonged electricity outages for the community.*

TransGrid manages the risk of damage to transmission assets by controlling activities within the vicinity of its assets, and carrying out regular maintenance inspections and vegetation clearance.

### Transmission asset failures

Extreme events such as high winds, severe storms or bush fires can cause failures to TransGrid's network. While TransGrid maintains its assets in accordance with industry practice, such extreme events are outside of

TransGrid's control. These can result in prolonged network outages which in turn, could result in critical services (such as hospitals) losing power.

**Risk:** *Asset failures can be catastrophic with the potential to cause both serious direct and / or indirect injuries such as death.*

TransGrid manages this risk by controlling what can and can't be done in the vicinity of transmission assets, and keeping the area around transmission assets clear of any obstructions. This reduces the risk of injury, death or damage to property and allows rapid repair work to be undertaken.

### For more information

please go to [www.transgrid.com.au](http://www.transgrid.com.au) or contact TransGrid on:

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