

Rapid Earth Fault Current Limiter



Introducing best knowledge and technology

The Victorian Government's Powerline Bushfire Safety Program is pursuing best practice bushfire safety through its comprehensive research and development program to identify and foster the development of powerline risk reduction technologies.

The focus on new technologies follows the recommendations of the Victorian Bushfires Royal Commission (Recommendation 27) to consider how powerline bushfire risk can be better prevented.

The program researched new protection technology which reduces bushfire risk and minimises the impact on customers called a Rapid Earth Fault Current Limiter (REFCL).

As its name suggests, the REFCL is a device that rapidly limits energy release in certain types of powerline faults on multi-wire powerlines.

In a series of world-first trials, the Victorian Government together with the electricity distribution businesses and research experts demonstrated that REFCLs can suppress arc-induced bushfire ignitions from wire-to-earth faults on 22kV powerlines.

The technology was successfully tested under worst-case bushfire conditions, confirming critical fault detection and suppression standards, which are necessary to stop downed powerlines from starting bushfires, and further determining the optimal safety settings of these devices to reduce the risk of powerlines-started fires.

The test program demonstrated that REFCLs provide over 10-times better protection than the current best network protection technology.

These standards were mandated for 22 kV powerlines proceeding from 45 zone substations by the Government's 1 May 2016 amendments to the *Electricity Safety (Bushfire Mitigation) Regulations*.

REFCLs are a demonstrated technology which reduces a fault within milliseconds of detecting a wire-to-earth powerline fault, reducing the risk of a resulting fire and minimising supply interruption.



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Powerline Bushfire Safety Program



Rapid Earth Fault Current Limiter

Rapid Earth Fault Current Limiter (REFCL)

Installation

Once installed at zone substations, REFCLs will be used to reduce fault currents to very low levels within a millisecond of a wire-to-earth fault, minimising the chance of a fire starting. This action will also minimise supply disruption to customers.

The Victorian Government brought the *Electricity (Bushfire Mitigation) Amendment Regulations* into effect on 1 May 2016. This introduced heightened safety standards to ensure electricity distribution businesses invest in this powerline safety technology to reduce the risk of bushfires starting from electricity infrastructure.

Within the next seven years, REFCLs will be installed into 45 zone-substations identified across regional and rural Victoria to protect high-risk bushfire areas.

The electricity distribution businesses will be preparing work schedules to coordinate the installation of REFCLs into their existing networks to minimise any installation disruptions when changing over to optimal operational settings.

Benefits

Victoria will be the first place in the world to employ REFCLs for the purpose of saving lives by stopping bushfires being started by powerlines.

REFCLs will protect many kilometres of high voltage powerlines, detecting and suppressing energy from dangerous faults within milliseconds.



By applying resonant earthing technology to overhead powerlines, REFCLs have proven to be ten times more effective in reducing bushfire risk than existing best practice.

For further information please visit delwp.vic.gov.au/refcl