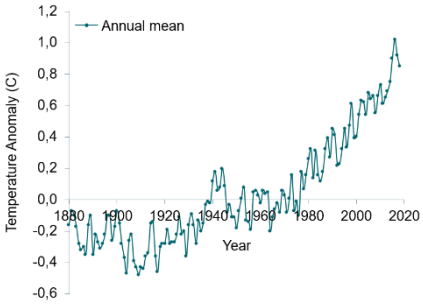
SIEMENS
Ingenuity for life

Trench ARCC

Trench's Advanced Residual Current Compensation (ARCC) provides utilities with the security they need to operate electricity networks in an environment subjected to global warming

trenchgroup.com/coils



Global land-ocean temperature index (Source: NASA's Goddard Institute for Space Studies (GISS))

Global warming and increased risks of wildfires

It is a fact that the earth's climate is changing. Average temperatures are increasing and thus, the probability for wildfires. Some of these wildfires are caused by failures in overhead lines. The electrical arc which can result from a faulty overhead line might start wildfires, especially in very dry areas, where drought has dried vegetation to an extent where it easily catches fire.

Measures to minimize risk of wildfire

To minimize the risk of wildfires initiated by overhead lines, different measures have been implemented by utilities around the world.

Measures:

- Shutting down of lines during high risk seasons
- Rigorous vegetation management
- Network hardening
- **Compensation of Ground-Fault Currents**

Trench ARCC system reduces the risk of wildfires

The Trench ARCC system

Trench's Advanced Residual Current Compensation System (ARCC) compensates for ground-fault currents and thus reduces fire hazard risks. Compensating ground-fault currents is a known solution in European Distribution networks, but the traditional system does not address the residual ohmic portion of the current. This ohmic portion of the current can be enough to start wildfires.

Did you know there is a way to have a failure in the system without a fault current?

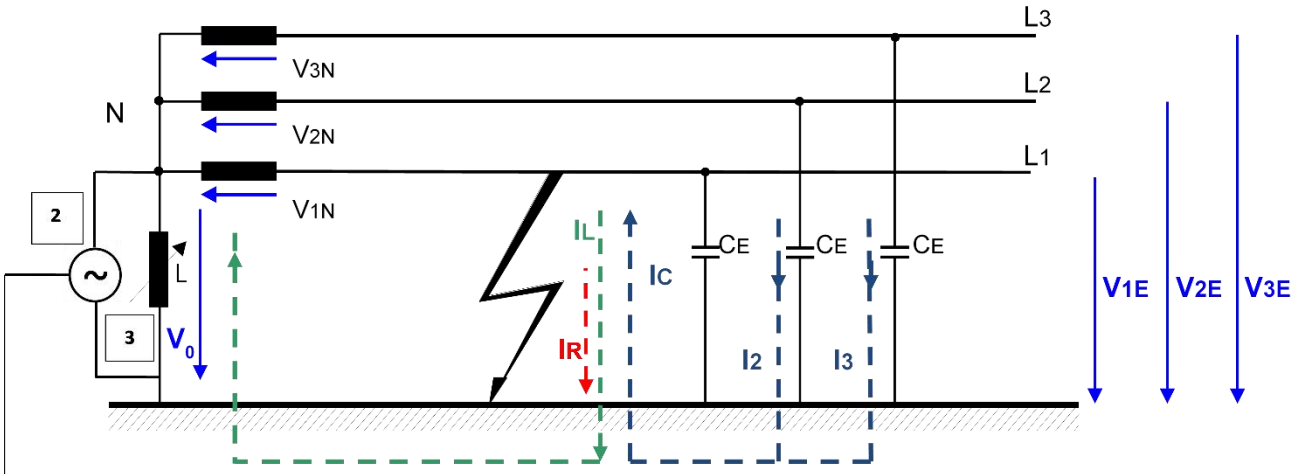
To avoid electrical arc, it is essential to minimize fault currents to an absolute minimum. The Trench ARCC System is providing a solution to this problem. The current at the fault location is composed by a capacitive portion and a resistive portion. The capacitive portion is compensated by a tuneable inductance and the resistive portion is compensated by an inverter which injects a 180° phase-shifted current into the neutral point of the network.

The inverter and tuneable inductance are both controlled by the EFD 500 cc. The EFD 500 cc is the "brain" of the system, which allows for an extremely fast real-time response to faults in the network with the highest precision.

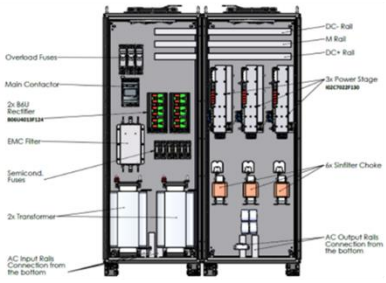
Application Case Australia

Wildfires across Victoria have caused many fatalities and widespread destruction. Some of these more recent major bushfires were caused by powerlines coming into contact with dry vegetation during hot, dry and windy conditions.

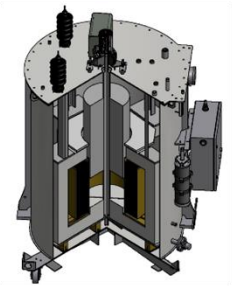
For more than three years, Trench has been working to develop, test and supply such wildfire mitigation equipment (ARCC). After factory and field tests in Austria, the first installation was tested in October 2019 in Victoria. The system confirmed its outstanding capabilities in preventing line-to-ground fault-initiated wildfires.



1) EFD 500 cc (control device)



2) ARCC Inverter



3) ASC Tune-Able inductance

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