



## Distribution feeder automation

---

Since outages in distribution networks have a much less widespread effect than those on transmission systems, the electricity supply industry has implemented the most sophisticated plant control for power transmission at the highest voltages. However most faults that cause loss of power to customers occur within distribution networks at much lower voltages.

With the current regulatory regimes, distribution network suppliers are now looking for ways to minimise outages due to distribution faults. Power is distributed from a primary substation on a feeder, which may be configured as mesh, radial or ring-based with an 'open' point at some location. When a fault occurs on this feeder, the circuit breaker at the substation trips to isolate the network. The network must then be reconfigured so that the fault is isolated and as many customers as possible are re-energised. This is normally carried out by field crews, but is slow and expensive.

We can provide remote monitoring and control to first locate an outage then reconfigure and re-energise the section.

network

sophistication



### Solution

By incorporating powered actuators and fault passage indicators supporting remote monitoring and control at the switching points (open points), reconfiguration can be made more efficient. The actuator may be a standard part of the switch or may be retrofitted. The remote monitoring and control is provided by a remote terminal unit (RTU) equipped with a battery supply to operate the switch when no power is available.

The RTU may interface to a central control system through dial-up or permanent communications media. To minimise costs, automation schemes use wireless communication such as GSM, GPRS, Paknet or an existing company Private Mobile Radio (PMR) network. Alternative strategies can use a low power (licence-free) radio to the nearest primary substation which has a high-speed link to the control centre.

Operation is simple and quick. When the circuit breaker trip is detected, the fault passage indicators are used to determine which feeder section is faulty, then the open points are moved by remote control to energise as much of the feeder as possible.

These actions can be carried out in conjunction with operation of auto-reclosing devices at the primary substation and on overhead switches.

An RTU may be installed in an area which is difficult to access when the feeder is energised. Bluetooth connectivity allows commissioning and diagnosis from outside the dangerous area.

### Benefits

- Fast determination of an outage and the location of the faulty section
- Rapid reconfiguration and re-energisation, to reduce customer minutes lost (CML) statistics
- Saving of field crew costs visiting sites at which no action is required to determine the fault location
- Generation of records of the switching activity through the control centre logs
- The ability for a mobile engineer to combine field investigations with local control, using a wireless connected laptop

### Our capability

Schneider Electric has provided thousands of RTUs for secondary automation, including devices for installation in various types of sectionalising switches and auto-reclosers. These may be configured with local operation panels. Where required, we have also provided suitable actuators for the switchgear.

We have the knowledge and skills to design and turnkey supply an entire scheme for a feeder. As one of the largest suppliers of automation schemes, we can also offer a range of additional local automatic facilities to enhance the remote operation.

Our experience covers both distribution and related sub-transmission schemes up to 33kV.

