A real case of a self-healing network

Benchmark demands drive DONG energy to implement intelligent substations to reduce SAIDI and SAIFI, using 10kV circuit breakers and logic, evaluating local information only, to reenergize customers within one minute after a fault.

The SACSe concept is activated on a voltage drop, and based on digital information from relays and voltage presence indicators it decides whether the fault is upstream or downstream and react upon this information to sectionalize the faulted section and reenergize the rest from access to a backup feeder.

Two SACSe substations applied strategically on to an actual feeder will divide the feeder in to four fault sections. When a fault occurs only one fault section will experience an outage. And that fault section is known by the field crew on arrival thus minimising the remaining insulation and resupply time. Those two installations reduce SAIDI with 73% and SAIFI with 52% on the feeder.

This system is a very cheap alternative to reinvestments in the cable grid. And it reacts on all faults, both technical and man-made.

The SACSe pilots have been submitted to a very extensive test, where a mark-up feeder were established in a power lab and submitted to actual faults, thus enabling the test of every possible scenario.

DONG energy now has 4 fully operational SACSe pilot installations and within one year that figure will be about 40 installations all upgraded with experience gained from the pilots. The long-term target is approximately 200 installations, corresponding to 3 % of the substations or 1/3 off all feeders equiped.

The SACSe substation is for DONG energy the fast way to respond to tightening benchmark demands and a cost-efficient tool in the smartgrid of the future.