

Öresundskraft – self healing grid

Participants: Öresundskraft, Schneider Electric and NetControl

Category: Distribution management

Time plan: Started autumn 2018

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Location: Helsingborg

Possible to visit: Yes

Background

In this project, new technology is installed in Öresundskraft's grid in Helsingborg to enable better fault detection and response. Two medium voltage loops are included in the project, with two different types of functionality. In one of the loops, the new equipment should be able to make the grid heal automatically, by re-routing power flows when there is a fault. In the second loop, detection equipment will be installed in order to detect and pinpoint faults with a higher degree of precision.

The new installations will limit the downtime of the grid when there is a fault, as the system automatically will find a new way for electricity to pass the fault or make location of the fault easier. This will reduce downtime for the customers and make more stable operation of the grid possible.

Implementation of the project

Installation of the smart power loops begun in 2018, with the intention to put them into service early 2019. New software and hardware in the respective loops were installed by Netcontrol and Schneider.

In the so-called H+ loop, Netcontrol has installed a system that allows for the system to heal itself. The control equipment detects cable faults and immediately isolate the fault by switching connections and re-routing the power flow. This is made automatically, without the need for any human interference.

In the Northern Helsingborg loop, Schneider has installed fault detection equipment, that indicates the fault location with better precision than conventional equipment does. This means that measures to deal with the fault can be taken in a more straightforward manner and will decrease the time where there is no power.

Benefits

The main benefit of the project is to shorten downtimes in the grid, and to limit the time customers are without electricity when there is a cable fault. As the new self-healing system automatically detects and handles the fault, the impact for the customers is held to a minimum. The system also enables the grid operator to detect and deal with faults with better precision, as better data regarding the fault and its location is obtained.

While the second system included in the project does not have the same self-healing properties, it equally increases network availability. Even if the grid in this case does not handle the fault by automation, more precise data about the fault and its location makes it possible for the system operator to repair the fault faster.

Scalability

One important aim in the project is to evaluate scalability of the self-healing technology, and the benefits of the new installation. One of the loops is situated in downtown Helsingborg and is one of the most heavily used lines in the Öresundskraft local grid. This means that results from this loop tell much about the scalability in densely populated urban areas.

Interoperability

The self-healing loop is intended to work seamlessly with more traditionally built parts of the grid.

Investment horizon

A self-healing grid is more expensive than a traditionally built grid without the added technology. However, Öresundskraft believes that the higher investment cost will be paid back by shortening down-times of the grid and increase the power availability for the customers. The two different loops are at two different tiers in Öresundskrafts three-tier investment program for smart grids, where one is at the top tier and one is at the middle tier.

International potential

That Öresundskraft installs a grid loop with a high degree of automation and self-healing properties in a densely populated area is something that is likely to attract attention.