Sundsvall elnät – New RTUs in the network stations

Participants: Sundsvall elnät, Addsecure
IEA categories: Wide-area monitoring and control, Advanced metering infrastructure
Time plan: Starting in 2019
Contact person: Anders Söderberg, Sundsvall elnät
Location: Sundsvall with surroundings
Possible to visit: Yes

Background

In the upcoming years there will be a new generation of smart meters installed throughout Sweden at all electricity customers. Sundsvall elnät will begin installation of these meters in the near future and has decided to upgrade their network stations at the same time. One reason behind this is that the new smart meters will generate more data than the current generation, which is something Sundsvall elnät wants to take advantage of. Another reason is that an increase in micro generation, mostly solar, generate new power flows that are more intermittent in their nature. By upgrading all network stations and adapt to the new meters and power flows, Sundsvall elnät wants to rethink their metering system from something that is used for measuring only, to an active and integrated part of daily grid operation.

Implementation of the project

By installing new remote terminal units (RTUs) from Addsecure in each network station and upgrade the communication system at the same time, the grid operator will get instant warnings about different issues in the low voltage grid. The new RTUs also have the ability to handle and transfer more data than the existing system, which means that more information will be readily available than what is possible today. Much data that has been possible to retrieve only by physically visiting the network station, will instead be transmitted to the operator by 4G or fibre.

Examples of data that will be available remotely are:

- Indications about grounded faults and overcurrent faults in the 11-kV electricity grid.
- Indication that the network station door has been opened.
- Data from the power quality meters that are present in a large number of network stations.
- Data from energy meters in the network station, that can be compared to the total electricity consumption by customers in the area.
- Transformer temperature.
- Position of the indicator switch.

In addition to this, switches and breakers at strategic points in the 11-kV grid will be installed to make it possible to operate remotely, which makes it possible to isolate faults quicker.

Benefits

Sundsvall elnät does this upgrade of their network stations in order to gain a better knowledge about the status of their low voltage grid. The upgraded network stations combined with the new generation of smart meters and other technology investments that have been made in recent years, gives the operator of the grid a much more accurate and updated picture of the current situation. This is both due to an increase in data available and the fact that much more of this data is sent in real time to the operator instead of being stored at the station.

One goal of the project is that relevant data should be available to the operator in charge within one second. This will be obtained by fitting every network station with fibre.

Scalability

The scalability of this kind of project is more of an economical question than a technical one. In principle there is no technical limitation to the number of network stations that could be included in a project such as this one.

Interoperability

In recent years, Sundsvall elnät has repeatedly upgraded the technology in their grid, which means that many components are relatively new and go well with the new RTUs. In a local grid with more old components, this implementation could have been more complicated depending on the exact circumstances.

Investment horizon

By obtaining a better picture of the low voltage grid and detect problems or faults earlier, Sundsvall elnät expects the investment to be viable in a few years.

International potential

Where appropriate infrastructure and data is available, the installation of modern RTUs in all network stations is possible in a similar manner.