Innovation type:
Methods

Innovation:

TRL: # 6

Year: 2024

Contact:
Per-Oddvar Osland, Glitre Nett

Maren Istad, SINTEF Energi

Potential users:

User	X
DSO, TSO	X
Technology provider	
Member organisation	
Market operator	
Research/consultancy	
Teaching	

Screen shot showing information from sensors in secondary substations

Pilot project: Digital Inspection Glitre Nett

In this pilot the main goal is to test and evaluate the usefulness of monitoring with various sensors in the secondary substation.

Challenge

Glitre Nett had no monitoring of components or the environment in substations, prior to this pilot. Checking doors, temperature, humidity, and other factors requires a physical visit. Can sensors be useful and reduce use of recourses`?

Solution

Hence, sensors were installed in 39 secondary substations monitoring temperature, doors, air humidity and water level (flooding issue) from Disruptive Technologies. Virtual temperature sensors, based on an AI-model was also tested. Three dashboards were made based on sensor data making them easily available, including also data about weather and loading. Making sensor data and other relevant data available in the same dashboard enables operators to more quickly identify necessary actions that must be performed.

Potential

The potential was evaluated using a risk-based approach and whether or not the sensors can reduce the risk of a relatively frequent unwanted. This is partly to monitor particularly vulnerable components in the grid, and partly to collect data that can be used for the development of virtual sensors. A full-scale implementation of sensors in secondary substations is not planned. This is because only a small number of substations (a few percent) require this, and there are significant costs associated with the instrumentation and operation of a sensor network.

Type	Useful-ness	Innovation
Temperature sensor	High	Method to use temperature measurement to identify overloading and corresponding maintenance needs
Door sensor	Low	
Water sensor	Low	
Air humidity	Low	
Virtual temperature sensor	Medium	ML-method to estimate transformer temperature

Reference in CINELDI

- Pilot "Digital Inspection Glitre Nett" report (in Norwegian)