

Case study

Conductor temperature monitoring with Smart Navigator 2.0 HV

Overhead line monitoring | WEMAG Netz GmbH

Efficient feed-in & distribution of electricity generated from renewable sources - WEMAG optimises high-voltage grid with Smart Navigator 2.0 HV

Challenge

WEMAG Netz GmbH, a German distribution grid operator, faces the challenge of efficiently managing the increasing feed-in from renewable energies such as wind and solar power without jeopardising grid stability as part of the energy transition.

The limitation on transmission capacity caused by the conductor temperature, which is dependent on the outside temperature and the transmitted current, is particularly problematic. Photovoltaic and wind power plants often need to be throttled back to avoid overheating the lines when there is a lot of wind and solar power being fed in relative to the outside temperature. This leads to sub-optimal use of the available network capacities. In addition, the traditional method of using weather station data to determine the necessary power reductions has often proven inaccurate.

Solution

WEMAG Netz GmbH has implemented an innovative solution in collaboration with Horstmann GmbH for efficient management of the increasing feed-in of power from renewable sources.

A two-year pilot project has seen the introduction of the "Smart Navigator 2.0 HV", an innovative overhead line-short-circuit indicator which also accurately measures the temperature of the conductor via an integrated temperature sensor. This precise temperature measurement facilitates improved monitoring of network capacities and prevents the lines from overheating. With the Smart Navigator 2.0, it was possible to increase the feed-in capacity significantly, especially in critical periods such as spring and autumn. Continuous monitoring helps to avoid unnecessary power reductions in photovoltaic and wind power systems. This not only reduces redispatch costs, but also ensures more stable and efficient utilisation of the electricity grid. In view of the positive results, WEMAG Netz GmbH is integrating this technology in the long term to support the energy transition.

Smart Navigator 2.0 HV

The overhead line short-circuit indicator measures the line current and determines the load flow direction and the conductor temperature. Detected faults, events and measurements are transmitted spontaneously and cyclically by mobile communication so that incidents can be identified quickly and clearly.



Product features

- ▶ Digital fault detection – Reduces outage times
- ▶ Overhead line monitoring – Data for the evaluation of the network condition
- ▶ Energy Harvesting – Low-maintenance field devices
- ▶ Innovative installation – Quickly installed and fixed in place for the long term
- ▶ Remote maintenance – Import configuration and updates remotely



Customer benefits

With the Smart Navigator 2.0 HV, WEMAG Netz GmbH has found a simple solution for expanding the network monitoring of its high-voltage lines. This is also important in view of the proposed expansion of the connected load from renewable energy and for feed-in management. Feed-in have to be reduced when the transmission capacity of the grid is reached. The conductor temperature measured by Smart Navigator 2.0 HV can be used to determine the transmission capacity more precisely so that the lines can be utilised more efficiently.

In addition to further grid expansion, the increased high feed-in requires systems for optimising the use of existing capacities by implementing innovative solutions for monitoring.

Tom Rönneburg

Group Manager Secondary Plants WEMAG Netz GmbH



About WEMAG Netz GmbH

WEMAG Netz GmbH is based in Schwerin and operates an electricity supply network in western Mecklenburg and parts of Brandenburg and Lower Saxony. The network area covers approx. 8,000 square kilometres. 16,000 kilometres of power lines are used to distribute electricity safely and with the required quality. WEMAG Netz GmbH is a subsidiary of WEMAG AG, which has been majority-owned by the municipalities in the supply area since January 2010.

About Horstmann GmbH

Dipl.-Ing. H. Horstmann GmbH is a medium-sized company based in Heiligenhaus near Düsseldorf (Germany). The company was founded in 1946 by Heinrich Horstmann, and since that time it has been a successful family-owned company. Due to its long experience and continuous investment in research and product development Dipl.-Ing. H. Horstmann GmbH is today recognized as a leading manufacturer in medium voltage technology for:

- ▶ Short-circuit and earth fault indicators
- ▶ Voltage testers and voltage detecting systems
- ▶ Earthing devices and accessories

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