

SIEMENS

Ingenuity for life

Self-healing grid for a reliable power supply

Rotterdam, The Netherlands

[siemens.com/stedin](https://www.siemens.com/stedin)

High grid stability through improved outage management

The increased energy demand – in conjunction with strict regulations on the quality and reliability of supply – intensifies the pressure on distribution network operators to keep grid networks in a faultless operating mode.

In addition to the high penalty costs paid by network operators in the event of a power outage, there are also safety factors to be considered for particular customers (for example, hospitals).

Stedin, one of the largest distribution network operators in The Netherlands, has a total of 21,240 secondary substations in service and serves approximately two million customers in the Randstad region, one of the largest conurbations in Europe.

The Rotterdam harbor district lies within this region and is one of Stedin's primary customers – and so naturally it is of the utmost importance that they deliver an uninterrupted energy supply to ensure undisturbed operations.

However, the possibility of a failure cannot be completely eliminated, and therefore it is necessary to minimize the impact on customers as much as possible and keep outage times as few and as brief as possible.

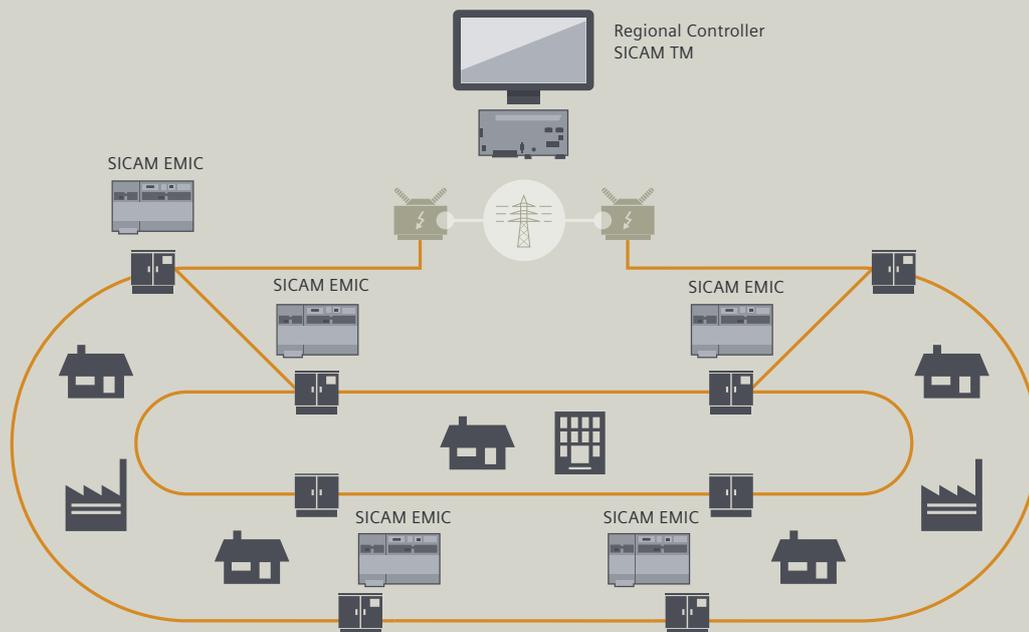
That's why it is important to localize the faulty section of the distribution grid as quickly as possible, so that normal operation can be resumed quickly.



Local control unit for self-healing grid

“The self-healing algorithm is elegant, simple, and robust and works for almost all grid structures. The applied RTUs and the developed software are very stable.”

Dr. E. J. Coster, Expert Asset Manager Stedin



System configuration of a self-healing grid with a regional controller

Challenges for Stedin

In the past, Stedin has experienced power failures in its distribution grid. In addition to displeased customers, those events entailed expensive compensation payments for Stedin. Reliable energy distribution has always been Stedin's core task, and so their main objective is to significantly reduce the SAIDI (system average interruption duration index) in their medium-voltage grids.

Our solution

In collaboration with Stedin, Siemens developed a self-healing network solution. Substation automation was upgraded by implementing new distribution grid automation functions. The solution, which is based on a "regional controller" on the level of the substation, ensures automatic fault localization, isolation and restoration.

The regional controller serves as an interface to the control center, which collects data from the distribution grid and hosts the regional, centralized applications of Stedin's self-healing grid.

Part of the solution consists of an intelligent local substation. Upgrade kits were installed to modernize older ring main units (RMUs), or where that was not possible, older RMUs were replaced with new RMUs.

Benefits for Stedin

With the innovative self-healing grid solution installed, Stedin will significantly reduce its SAIDI and re-supply most of its customers with power in less than a minute in the event of a power outage.

This will result in both satisfied customers as well as considerable cost savings by minimizing the heavy contractual penalties that must be paid in case of power outages.

Published by
Siemens AG 2016
Energy Management
Freyeslebenstrasse 1
91058 Erlangen,
Germany

Article-No. EMDG-B10108-00-7600
Printed in Germany
Dispo 06200
gB160646 WS 0816

Subject to changes and errors. The information given in this document only contains general descriptions and/or performance features which may not always specifically reflect those described, or which may undergo modification in the course of further development of the products. The requested performance features are binding only when they are expressly agreed upon in the concluded contract.