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Ingenuity for life



**Spectrum Power™
Active Network Management**

Stable grid operation through targeted monitoring
and fast control

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

The challenge: Unpredictability of energy infeed into the distribution grid

The entire energy system is in motion. Decentralized power generation from renewable sources is being expanded more intensely and integrated into the distribution grids. Energy is no longer fed into the distribution grid exclusively via the transmission grid but also directly from different – often volatile – generators.

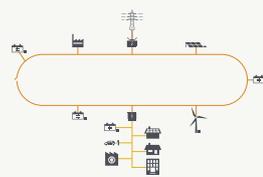
Grid management is facing challenges like an unclear, fluctuating direction of load flow and, more and more often, critical voltage violations. There is a growing risk of voltage range infringement and thus malfunctions or even damaged equipment on the consumer side. At the same time, the danger of overloads on lines, transformers and other equipment is growing, which can even result in grid failure.

The solution: Voltage and capacity management including visualization

Processes in the distribution grids must be made visible at all times in order to reliably assess the status and take efficient countermeasures before critical situations arise. The Spectrum Power™ Active Network Management (ANM), Siemens' flexible software solution, is a smart tool for distribution grids. It supports a wide range of equipment – from transformer tap changers and capacitor banks to controllable loads and generators including battery storage.

The Spectrum Power™ ANM displays the current load flow directions and calculated load values as well as voltage range violations and overload situations. This also includes integrated analysis and archiving functions, allowing automatic result validation and comparison as well as reports and facilitating meaningful short-term and long-term views.

State Estimation



Estimate

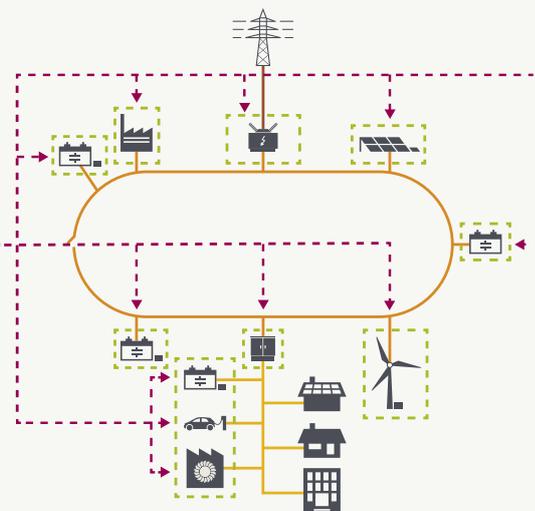
Topology
change

Significant
measure-
ment
change

Configured
Cycle

Voltage
Violations
Overloads

Volt/Var Control



The Spectrum Power™ ANM also provides functions for convenient voltage range and capacity utilization management. This makes it easier to predict voltage violations and equipment overloads – and substantially reduce them in connection with control algorithms. And what about losses on the distribution grid? You can minimize them with distinct voltage, reactive power and active power control. Our software gives you a reliable basis for making these decisions, whether automatically or in manual mode.

The benefits: Higher efficiency and secure and stable supply thanks to the Spectrum Power™ ANM

The Spectrum Power™ ANM from Siemens is an effective lever for operating distribution grids more efficiently and with greater control – especially if you have a growing proportion of renewables in your energy mix.

Your benefits at a glance

- Load flow values and load flow directions are reliably monitored. Voltage violations and equipment overloads are detected quickly and accurately.
- Voltage range deviations and asset overloads are recognized fast and secure.
- Balancing measures primarily for maintaining grid stability and for protecting equipment can be initiated at an early point.
- Distribution losses can be effectively reduced.
- An optional automatic mode allows transformer tap changers, capacitor banks, loads and generators, including battery storage, to be controlled without operator intervention.

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