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WORKING GROUP
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Working Group
on Monitoring
and control of LV networks

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Background

The low voltage (LV) distribution network, traditionally radial with basic protections and a low observability level, is facing a deep evolution due to the development of distributed energy resources and information and communication technologies. Depending on how they are operated, the LV assets can bring technical limitations to the low voltage network up to the medium voltage (MV) one. Nevertheless, smart devices, such as smart meters can bring data, opening doors to advanced monitoring and control of the LV system and its assets. Many benefits are expected such as the improvement of reliability, maintenance and investment allocation, the increase of hosting capacity and even the provision of services to the MV network.

Scope

The objective of this working group is to formulate the requirements for real-time monitoring of the LV network – fault location, current and voltage constraints – and LV control functions (voltage, demand response, vehicle-to-grid) highlighting specifications in terms of new devices, information and communication infrastructures, algorithms but also standardization and security issues. This report was enriched with the learnings and experience gathered from existing demonstration or real projects.

Structure of the final report

This report enumerates the pre-requisites for LV monitoring, has a section with the results of a survey made to 20 DSOs around the world, which was used to detail a state of the art monitoring and control of LV network. The report also focus on:

- Monitoring of LV networks as a way to improve power quality and to support network planning;
- Four control functions: voltage control, self-healing function, active power management and automatic phase balancing.

The last section of the report provides the final recommendations for their deployment on the field.



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