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Assessing the potential of MV automation for distribution network reliability improvement

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Abstract-

Distribution network automation is a key functionality in the evolution towards smarter electricity grids. The main driver to deploy this kind of smart grid solutions is the improvement of continuity of supply (CoS) for network users thanks to the fact that an enhanced network monitoring and telecontrol can improve the fault management process carried out by Distribution System Operators (DSOs). However, the parameters that affect their successful implementation are not completely understood yet. Addressing this gap, this paper presents a detailed analysis to identify the main factors affecting the implementation of automation at medium voltage (MV) distribution networks and discusses the regulatory implications. Several realistic case studies are analyzed, corresponding to a number distribution networks that resemble the architectural characteristics representative of the European distribution grids in different contexts. Hence, the results allow deriving general conclusions that can be widely applicable to European distribution networks.

Index Terms- Automation, electric power distribution, fault detection, isolation and service restoration (FDIR), reliability, smart grid.

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