



## CHALLENGES IN PROTECTION OF MICROGRID SYSTEMS

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**ABSTRACT**—Microgrids comprise low voltage distribution systems with distributed energy resources (DER) and controllable loads which can operate connected to the medium voltage grid or islanded in a controlled coordinated way. This concept aims to move from “connect and forget” philosophy towards a full integration of DERs. Microgrids can provide clear economic and environmental benefits for end-customers, utilities and society. However, their implementation poses great technical challenges, such as a new philosophy in design of protection systems. Local generation in a combination with a possible islanded operation results into higher protection sensitivity and selectivity problems in case of fault depending on the relay settings. Also, bidirectional power flows become a common practice causing troubles to the existing power system protection. This paper explores challenges behind the protection of microgrids and describes new solutions based on existing digital relaying and advanced communication.