

FAULT RESPONSE OF INVERTER DOMINATED MICROGRIDS

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ABSTRACT

This paper analyzes the fault behaviour of islanded microgrids supplied by Distributed Generation (DG) units with a power electronics interface. After an introductory description of the microgrid paradigm, the paper focuses on the analysis of the different aspects of microgrids which are relevant to the issue of fault behaviour. Different inverter interfaces between the DG sources and the network are described considering both stand-alone and parallel connected topologies. Then a description of microgrid earthing systems is given. As the behaviour of inverter dominated microgrids is strongly dependent on the inverters control, the different types of control strategies based on dq0 coordinates, phase coordinates, $\alpha\beta\gamma$ coordinates and droop control are described. Finally, three case studies with different inverter models supplying a microgrid network are built in the PSCAD/EMTDC software package and their behaviour during different types of fault is simulated. It is shown that the way in which the inverter control is designed, strongly affects the response of the system in the event of a fault.