POWER-HARDWARE-IN-THE-LOOP SIMULATIONS FOR ELECTRICAL GENERATORS IN LV GRIDS

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ABSTRACT

Power Hardware-in-the-Loop (PHIL) simulations are presented in this contribution for the dedicated use to conduct investigations on single or multiple connected generators connected to LV grids. In principle, it is possible to emulate the behaviour of different electrical components together with various types of loads integrated into a well-defined grid by the means of PHIL simulation. The limits of PHIL simulations are thereby given by the complexity of the simulated grid, which means that the implemented topology, the impedance configuration or the number of nodes are decisive elements. Their applicability is restricted by technical issues such as limiting source power, safety measures and stability considerations. Representative examples for PHIL simulations of low voltage grids are given in the experimental part and the active reactive power control behaviour of generators connected to different nodes of the simulated grid is discussed.

1 AIT Austrian Institute of Technology is founding member of the Association of European Distributed Energy Resources Laboratories (DERlab). DERlab is the association of leading laboratories and research institutes in the field of distributed energy resources equipment and systems. The association develops joint requirements and quality criteria for the connection and operation of distributed energy resources (DER) and strongly supports the consistent development of DER technologies. DERlab offers testing and consulting services for distributed generation (DG) to support the transition towards more decentralised power systems.