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Power Quality Improvement Using UPQC Integrated with Distributed Generation Network

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Abstract : The increasing demand of electric power is giving an emphasis on the need for the maximum utilization of renewable energy sources. On the other hand maintaining power quality to satisfaction of utility is an essential requirement. In this paper the design aspects of a Unified Power Quality Conditioner integrated with photovoltaic system in a distributed generation is presented. The proposed system consist of series inverter, shunt inverter are connected back to back on the dc side and share a common dc-link capacitor with Distributed Generation through a boost converter. The primary task of UPQC is to minimize grid voltage and load current disturbances along with reactive and harmonic power compensation. In addition to primary tasks of UPQC, other functionalities such as compensation of voltage interruption and active power transfer to the load and grid in both islanding and interconnected mode have been addressed. The simulation model is design in MATLAB/ Simulation environment and the results are in good agreement with the published work.

Keywords : distributed generation (DG), interconnected mode, islanding mode, maximum power point tracking (mppt), power quality (PQ), unified power quality conditioner (UPQC), photovoltaic array (PV)
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