Dynamic Reactive Power Compensator (DRPC) for Unbalance Load Reactive Power Compensation

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Abstract

Unbalance in power system caused by the addition of single phase and dynamically varying loads are unavoidable. Due to this reason the load reactive power is no longer balanced, which causes voltage fluctuation, line overloading and high transmission line losses. Researchers have come up with technologies to compensate the load reactive power using mostly by CUSTOM power devices at distribution level and few FACTS devices at transmission level. This paper discusses the unbalance reactive power compensation using Dynamic Reactive Power Compensator (DRPC), as one of the CUSTOM power device. The DRPC explained here uses an extended version of the conventional power theory, to measure unbalance reactive power associated with each phases separately. A control system was developed to compensate unbalance reactive power and it was simulated using PSCAD/EMTDC. Finally the results are provided to demonstrate the operation of DRPC. Simulation results confirm that the DRPC compensates unbalance reactive power at the load.