

Power sharing in islanded microgrid with adaptive droop controller

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Abstract

Microgrid, which can be considered as an integration of various dispersed resources (DRS), is characterized by the number of DRs interfaced through the power electronics converters. The microgrid comprising these DRs is often operated in an islanded mode. The droop control method is traditionally adopted to distribute active and reactive power among the DRS operating in parallel. However, the accuracy of distribution of reactive power among the DRS controlled by the conventional droop control approach is highly dependent on the value of line impedance, R/X i.e. resistance to reactance ratio of the line, voltage setting of inverters etc. In this paper, a control strategy has been presented to improve the reactive power sharing among distributed generation units in the islanded microgrids. The proposed control method is based on exerting reactive current injection to correct the output reference voltage is the common method of droop control. Reactive power distribution error is reduced by modifying the reference voltage. To evaluate the performance and effectiveness of the proposed control strategy, it is implemented on an island microgrid consisting of three distributed generation units. The simulation results show the proper performance and efficiency of the proposed method.

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