

Active Islanding Detection Method Using Intelligent Controller

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Abstract : An active islanding detection method using disturbance signal injection with intelligent controller is proposed in this study. First, a DC/AC power inverter is emulated in the distributed generator (DG) system to implement the tracking control of active power, reactive power outputs and the islanding detection. The proposed active islanding detection method is based on injecting a disturbance signal into the power inverter system through the d -axis current which leads to a frequency deviation at the terminal of the RLC load when the utility power is disconnected. Moreover, in order to improve the transient and steady-state responses of the active power and reactive power outputs of the power inverter, and to further improve the performance of the islanding detection method, two probabilistic fuzzy neural networks (PFNN) are adopted to replace the traditional proportional-integral (PI) controllers for the tracking control and the islanding detection. Furthermore, the network structure and the online learning algorithm of the PFNN are introduced in detail. Finally, the feasibility and effectiveness of the tracking control and the proposed active islanding detection method are verified with experimental results.

Keywords : distributed generators, probabilistic fuzzy neural network, islanding detection, non-detection zone

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