عنوان مقاله:

An Intelligent Droop Control for Simultaneous Voltage and Frequency Regulation in Islanded Microgrids

محل انتشار:

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خلاصه مقاله:

Voltage and frequency of microgrids (MGs) are strongly impressionable from the active and reactive load fluc tuations. Often, there are several voltage source inverters VSIs based distributed generations (DGs) with a specific local droop characteristic for each DG in a MG. A load change in a MG may lead to imbalance between generation and consumption and it changes the output voltage and frequency of the VSIs according to the droop characteristics. If the load change is adequately large, the DGs may be unable to stabilize the MG. In the present paper, following a brief survey on the conventional voltage/frequency droop control, a generalized droop control (GDC) scheme for a wide range of load change scenarios is developed. Then to remove its dependency to the line parameters and to propose a model-free based GDC, a new framework based on adaptive neuro-fuzzy inference system (ANFIS) is developed. It is shown that the proposed intelligent control structure carefully tracks the GDC dynamic behavior, and exhibits high performance and desirable response for different load change scenarios. It is also shown that the ANFIS controller can be effectively used instead of the GDC. The proposed methodology is examined on several MG test systems

کلمات کلیدی:

ANFIS, DG, droop control, frequency control, mi- crogrid, voltage control