

عنوان مقاله:

Optimal Distribution Voltage Control through a Sub-framework in the Reactive Power Management on the Smart Grid

محل انتشار:

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خلاصه مقاله:

The large-scale deployment of the Smart Grid will support the evolution of conventional electrical power systems toward active, flexible and automatic troubleshooter energy networks composed of renewable energy resources. With the increasing penetration of renewable energies as distributed generation (DG) in smart grid scheme, technical problems arise in both distribution and transmission system level. The undesirable voltage is the main problem for connection of DGs in distribution systems, while excessive reactive power demand from transmission system is the major concern for Transmission System Operators (TSO). This paper presents a new subframework in the reactive power management to optimal control of voltage in the suitable range by decreasing the voltage deviation and obtain high voltage stability margin, simultaneously. In this work, the required voltage profile, by set of controllable variables in power system such as tap of transformers, value of capacitors is investigated. To determine the value of elements in the mentioned subframework, the Particle Swarm Optimization (PSO) method is employed to rapidly obtain the optimum parameters due to improvement of voltage profile. Finally, the proposed method is implemented on the standard IEEE-24 bus and IEEE-16 bus distribution system the results are compared to each other.

کلمات کلیدی:

Smart Grid, Distribution Generation, Reactive Power Management, Voltage Stability Margin, Voltage Deviation, Particle Swarm Optimization

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