Research on Distributed Generation Optimization and the Design of Micro-grid Architecture

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Abstract

In globe, we are facing many important problems, such as the shortage of energy resources, increasing in supply pressure, the contradiction in environmental protection, low energy efficiency, improving utilization of rural energy and so on. Distributed generation(DG) connected to the power network increases the transmission margin of transmission and distribution system, raising the power supply reliability, solving the electricity difficult problems of remote areas, where the grid can not be extended, but the randomness and volatility of renewable energy bring many difficulties on power grid planning and operation, protection, control, etc. Based on the reasonable planning system layout and capacity of each type of distributed generation units in proportion, this paper presents a Optimal Sectionalization scheme of distributed power supply, energy storage and load, effectively raising adaptability of the grid for DG, improving power supply reliability, reducing energy storage configuration requirements. This paper proposes a method of DG Optimal Sectionalization /microgrid architecture design. By building flexible topology, it achieves the coordinated control of polymorphism distribution network operation mode and flexible network structure between the distributed power supply, microgrid and distribution network, explores the typical construction of economy applicable mode.