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新能源与分布式发电

分布式光伏发电对配电网电压的影响及电压越限的解决方案

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摘要：

从电网电压降落角度研究光伏发电接入配电网前后电网电压的变化，分别分析单个和多个光伏发电接入对配电网电压的影响，得出了光伏发电接入后将使线路电压升高，且线路某点电压变化趋势与该点后所有负荷大小和光伏发电出力有直接关系的结论，探讨了影响电压变化的各种因素，如光伏出力大小、接入位置、电网线路参数、负荷大小等。通过算例验证了上述分析的正确性，并提出了解决分布式光伏发电引起电压越限的措施和方案，包括电抗器补偿、线路中央控制和逆变器无功控制结合、安装储能装置等。

关键词：

Influence of Distributed Photovoltaic Generation on Voltage in Distribution Network and Solution of Voltage Beyond Limits

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Abstract:

From the viewpoint of voltage drop in power network, the voltage variation mechanism of distribution network before and after the connection of photovoltaic (PV) generation to distribution network is researched. The influences of connecting single PV generation and multi PV generation to distribution network on voltage of distribution network are analyzed respectively, and the obtained conclusions are as following: connecting PV generation to distribution network makes line voltage of distribution network arisen, and the voltage variation at a certain position directly relates to the sum of all loads subsequent to this position and the output of PV generation. The factor influencing voltage variation, such as output power of PV generation, the position where PV generation is connected with, parameters of distribution network, load power and so on. The correctness of above-mentioned analysis is verified by two calculation examples, meanwhile, the measures and schemes to cope with the voltage beyond limits due to connecting single or multi PV generation with distribution network, such as adopting compensation reactor, combining central control of transmission lines with reactor power control of inverters, installing energy storage devices and so on, are put forward.

Keywords:

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