

利用光伏发电系统抑制电网功率振荡的研究

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摘要

由于功率振荡严重威胁电网的安全稳定运行, 基于光伏发电系统能独立控制其注入电网有功、无功的特点, 提出了利用光伏发电系统来抑制电网功率振荡的方法, 首先在理论上分析了单机无穷大系统中基于光伏电池的功率振荡抑制的原理, 然后对单机无穷大系统带光伏发电系统运行进行了仿真分析。理论分析表明通过有功和无功的附加控制, 光伏并网系统能够增加系统的阻尼。仿真结果进一步验证了其在单机无穷大系统中抑制振荡的有效性。得出大容量并网光伏发电系统可作为抑制系统振荡有效装置的结论。

关键词 [光伏发电系统](#); [功率振荡](#); [系统阻尼](#); [电力系统稳定](#)

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A Study on Damping Power System Oscillations Based on Photovoltaic System

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Abstract

Power system security and stability are seriously affected by power oscillations. According to the feature of photovoltaic (PV) system that the active and reactive power being injected into power network by PV system can be controlled independently, the authors propose a method to restrain power oscillation in power network by use of PV system. Firstly, the principle of restraining power oscillation in single machine infinite bus system by PV system is theoretically analyzed; then by means of simulation software PSCAD the simulation of single machine infinite bus system containing PV system is conducted. Theoretical analysis shows that by means of additional control of active and reactive power PV system connected with power network can increase system damping. The effectiveness of restraining power oscillation occurred in single machine infinite bus system is verified by simulation results, thus the conclusion that large capacity PV system connected with power network can be used as an effective device to restrain power oscillation is obtained.

Key words [photovoltaic system](#); [power oscillations](#); [system damping](#); [power system stability](#)

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