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新能源与分布式发电

通过串联制动电阻改善恒速异步发电机风电场的暂态稳定性

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摘要：

研究了用串联制动电阻(series dynamic braking resistors，SDBR)改善恒速异步风机(fixed speed induction generator，FSIG)风电场的暂态稳定性。在Matlab/Simulink中搭建了风电场及相关电网模型；从不同故障形式和负荷功率因数出发，讨论了SDBR在促进风电场故障后电压恢复和抑制风机转速上升方面的作用；探讨了SDBR的投切控制策略，比较了母线电压和转子转速2种控制信号对投切效果的影响。仿真结果表明，SDBR能有效帮助风电机组在电网故障后恢复机端电压，提升风电场的故障穿越能力，可用于对现有恒速异步风电场的改进升级。

关键词：

Improving Transient Stability of Wind Farm Consisting of Fixed Speed Induction Generator by Series Connected Dynamic Braking Resistors

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Abstract:

A new method to improve transient stability of fixed speed induction generator (FSIG)-based wind farm by series-connected dynamic braking resistors (SDBR) is researched. On the platform of Matlab/Simulink the models of wind farm with capacity of 36MW and correlative power network are built. Based on different fault types and load power factors the actions of SDBR in promoting post-fault voltage recovery of wind farm and restraining the speed rise of wind turbine are analyzed. The switching control strategy of SDBR is researched and the influences of busbar voltage and rotor speed on the effect of switching are compared. Simulation results show that SDBR can effectively help the terminal voltage recovery of wind power generation units after the fault of power network and improve the fault ride-through capability of wind farm. The proposed switching strategy of SDBR is available for the improvement and upgrade of existing FSIG-based wind farms.

Keywords:

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