

特高压半波长输电系列论文

特高压半波长交流输电线路稳态特性研究

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摘要:

基于特高压半波长交流输电系统的正弦稳态解析解, 分析了系统接感性负载和容性负载2种情况下, 负载特性、功率因数对稳态运行特性的影响。结果表明: 在不出现严重过载的正常工况下, 半波长交流输电系统的线路过电压水平较低, 线路损耗和电晕损耗较低, 送端和受端的电压和电流的有效值差很小, 相位基本反相; 在过载情况下, 线路中间段出现过电压现象; 负载功率因数越高, 线路的电压和电流越稳定。

关键词: 特高压 半波长交流输电 线路损耗 电晕损耗 稳态运行特性

Research on Steady-State Operation Characteristics of UHV Half-wavelength AC Power Transmission Line

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Abstract:

Based on sinusoidal steady-state analytical solution of UHV half-wavelength AC power transmission (HWACT) line, the impacts of load characteristics and power factor on its steady-state operation characteristics under inductive load and capacitive load are respectively analyzed. Analysis results show that under normal operation condition, namely severe overload does not occur, the overvoltage level as well as line loss and corona loss of HWACT line are lower than those of traditional transmission lines; the differences of effective values of voltage and current at sending end and receiving end are small, and phase angle of voltage as well that of current at sending end and receiving end are basically reversed. Under the condition of overload, overvoltage appears at the middle of HWACT line. The higher the power factor, the more stable the voltage and current of HWACT line.

Keywords: UHV half-wavelength AC power transmission (HWACT) lines loss corona loss steady-state operation characteristics

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