



云广云广±800 kV直流输电系统过电压与绝缘配合研究

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摘要: 研究了云南—广东±800kV直流系统交、直流侧以及直流线路的过电压水平和换流站避雷器保护方案。重点分析了孤岛运行过电压, 不同平波电抗器布置方式和避雷器方案对过电压的影响以及±800kV直流的绝缘配合方法。推荐两个避雷器配置方案以降低最高电位换流变压器阀侧绝缘水平。建议线路中部10 km范围内操作过电压按1.85 p.u. 标准, 10 km以外按1.70 p.u. 标准。通过合理配置, ±800kV直流极线侧设备绝缘水平可降低至现有±500kV直流工程极线侧设备绝缘水平线性外推值的75%左右。

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关键词: 特高压直流输电; 换流站; 过电压; 绝缘配合; 绝缘水平

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Study on the Overvoltage and Insulation Coordination of Yunnan-Guangdong ±800kV UHVDC Transmission System

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Abstract: The overvoltage and insulation coordination of Yunnan-Guangdong ±800kV UHVDC transmission system are studied with focus on the following subjects: the overvoltage in the island operation mode, the influence of different smoothing reactors arrangement, and the insulation coordination method for the UHVDC transmission system. Two schemes of arrester configuration are put forward in order to reduce the insulation requirement of the highest potential valve side of converter transformer. Meanwhile it is suggested that the switch impulse overvoltage level could be adopted as 1.85p.u. for the middle section of the 10 km transmission line, and 1.70p.u. for the other. By adopting appropriate configuration, the equipment insulation level of ±800kV UHVDC pole line side can be limited to about 75% of the extrapolated value from 500 kV to 800 kV based on the linear relationship between the insulation level and the DC voltage.

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Key words: UHVDC; converter station; overvoltage; insulation coordination; insulation level

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