

特高压工程设计

1 000 kV同塔双回输电线路潜供电流研究

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摘要:

分析总结了1 000 kV 同塔双回线路的特点及潜供电弧与单相重合闸时间的关系。利用电磁暂态程序,计算分析了线路长度、运行方式、高抗中性点小电抗阻值及输送潮流等因素对上述线路单相重合闸过程中潜供电流的影响。研究表明:对于有高抗补偿的线路,当采用1 s左右的重合闸时间时,单相重合闸过程中的潜供电流值控制在35 A以内;特高压同塔双回线双回与单回运行时,导线耦合作用的不同加大了高抗中性点小电抗合适阻值的选择难度;当同塔双回系统具有线路长、输送潮流大等特点时,潜供电弧可能难以自熄灭。目前,工程中常采用导线逆相序换位方式。但该方式无法完全消除回路间的耦合,因而无法从根本上解决上述问题。

关键词: 同塔双回线路;潜供电流;单相重合闸;潮流;特高压

Research on Secondary Arc Current of 1 000 kV Double-Circuit Transmission Lines on the Same Tower

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Abstract:

This paper summarizes the characteristics of 1 000 kV double-circuit lines, and the relationship between secondary arc and single-phase reclosing time. And by using EMTP, it calculates and analyzes effect of various factors on secondary arc current during single-phase reclosure of the above lines. The factors include length of line, operation mode, scale of power flow, and value of small reactance on neutral point of shunt reactor. Based on results from calculation and analysis, the following can be concluded: for lines with shunt reactor compensation, when the reclosing time adopted is about 1 s, value of secondary arc current during single-phase reclosure should be less than 35 A; for UHV double-circuit lines, coupling effects of conductors under double-circuit and single-circuit operation modes are different, which makes it difficult to select a suitable value for small reactance on neutral point of shunt reactor; for lines with long length, when they are transmitting heavy power flow, it may be hard for secondary arc to self-extinguish. At present, method of line transposition with reverse-phase sequence commonly adopted cannot completely eliminate coupling between loops. Therefore the method cannot solve the problems related with secondary arc from the root.

Keywords: double-circuit lines on the same tower; secondary arc current; single-phase reclosure; power flow; UHV

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