

特高压输电

特高压输电线路潜供电弧的物理模拟与建模综述

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摘要:

基于潜供电弧模拟试验的等价性, 阐述了试验回路设计、引弧材料选取、短路电流值及其持续时间选择、风速风向模拟与调节等技术, 总结了现有模拟试验中遇到的难题与不足之处, 介绍了潜供电弧的现场试验的步骤与过程, 特别是国内外特高压等级输电线路潜供电弧的试验成果, 给出了现有潜供电弧熄灭时间的有关经验公式。分析了潜供电弧数学建模的研究现状, 从简化的黑盒模型以及基于能量守恒的等离子体模型出发, 比较分析了各种模型的优势与缺陷, 指出了潜供电弧内在作用机制和等效模型研究中存在的关键难题。在上述基础上, 结合新型输电方式的发展, 分析了不同工况下潜供电弧的新特点, 给出了潜供电弧试验与建模的参考性建议。

关键词:

Survey on Physical Simulation and Mathematical Modelling for Secondary Arcs of UHV Transmission Lines

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Abstract:

In spite of elucidating the general design of the test circuit, the layout of the arc ignition equipment, the choice of the value and duration for the short currents, the wind velocity and its direction were all summarized to the question of equivalence of simulating test for secondary arcs, including the obstacles and the deficiency of it. The setup and the procedure of the field test for secondary arcs were introduced, especially for that of ultra high voltage transmission lines home and abroad. The empirical formula for the secondary arc duration nowadays were put forward. While describing and comparing the advantages and deficiencies of the existing black-box model and the physical models, the research status for modeling the secondary arcs were introduced. The key issues encountered while revealing the inherent mechanism and modeling of the secondary arcs were elaborated. On this basis, the characteristics of the secondary arcs under different conditions of novel transmission lines were analyzed. Referential suggestions for the secondary arc test and modeling were also presented.

Keywords:

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