

35 kV架空输电线路并联间隙防雷装置单相接地故障电弧自熄特性研究

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摘要

35 kV架空线路并联间隙防雷装置能有效保护绝缘子串和导线免于雷击引起的工频续流电弧的烧蚀, 但该装置的安装是否会影响架空线路单相接地故障电弧的自熄特性尚需探讨。设计了2组模拟试验, 分别研究了系统中性点不接地、单相接地故障电容电流为10 A和系统中性点经消弧线圈接地、单相接地故障电容电流为15 A、消弧线圈过补偿、故障点残流为10 A的试验条件下, 架空线路安装并联间隙防雷装置后, 单相接地故障电弧的自熄情况。结果表明, 在这2种试验条件下, 单相接地故障电弧均具有较高的自熄概率; 并联间隙防雷装置的安装并不影响单相接地故障电弧的自熄特性。

关键词 [并联间隙; 防雷装置; 单相接地故障; 电弧自熄特性; 35 kV架空线路; 高电压技术](#)

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Study on Self-Extinguished Characteristic of Single-Phase-to-Ground Fault Arc of Parallel Gap Lightning Protection Device on 35 kV Overhead Transmission Lines

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Abstract

The parallel gap lightning protection device on 35kV overhead transmission lines can prevent insulators and conductors from being burned by power frequency arc caused by lightning stroke. However, it needs to be investigated whether the installation of such device affects the self-extinguished characteristic of single-phase-to-ground fault arc. For this reason, two simulation tests are designed to research self-extinguished characteristic of single-phase- to-ground fault arc under two testing situations while the parallel gap lightning protection device has been installed on overhead transmission line. One of the testing situations is that the system neutral point is not grounded and the capacitance current of single-phase-to-ground fault is 10A; the other testing situation includes two sub-cases: one is that the neutral point of power system is grounded via arc suppression coil and the capacitance current of single-phase-to-ground fault is 15A, another is that the arc suppression coil operates in overcompensated condition and the residual current at faulty point is 10A. Simulation results show that under above-mentioned testing situations the self-extinguishing probability of overhead transmission line equipped with parallel gap lightning protection device is higher; and the installation of parallel gap lightning protection device does not affect the self-extinguished characteristic of single-phase- to-ground fault arc.

Key words [parallel gap; lightning protection device; single-phase-to-ground fault; self-extinguished characteristic of arc; 35 kV overhead line; high voltage engineering](#)

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