

## 高电压技术

### 铁塔横担侧向避雷针的绕击保护效果分析

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#### 摘要:

为评估在杆塔横担上安装侧向避雷针的防雷电绕击效果, 提出建立三维的电气几何模型, 计算侧向避雷针对导线的绕击保护距离, 并总结了其安装和使用的规律。针对110~500 kV典型杆塔线路的计算表明: 侧向避雷针能较好地保护杆塔附近的重点绕击危险区域, 从而可以有效地降低线路的绕击跳闸率。研究还表明, 侧向避雷针对导线的保护效果会受到针杆长度和安装位置的影响, 针杆的长度应大于2m, 并且尽量架设在避雷线保护角较大的导线横担上。实际工程的运行经验表明, 侧向避雷针确实可以在输电线路起到较好的防雷效果, 其有效性已得到证明。因此, 对于雷害严重的高杆塔、山区输电线路, 在杆塔的横担上安装侧向避雷针是线路防绕击治理的有效途径。

**关键词:** 侧向避雷针 绕击 横担 杆塔 保护范围 电气几何模型 防雷

### Analysis on Effect of Protecting Transmission Lines From Shielding Failure by Sideward Rods Installed Onto Crossarm of Towers

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#### Abstract:

To assess the effect of protecting transmission lines from shielding failure by sideward rods installed onto crossarm of towers, a three-dimensional electrogeometrical model is proposed to calculate the protection range of sideward rod that protects transmission line from shielding failure, and the rule for its application and installation are summarized. Calculation results of typical transmission tower, which transmission lines in voltage classes from 110kV to 500kV are erected on, show that the sideward rod can effectively protect transmission lines, which are located in the dangerous area near the tower head, from shielding failure, thus the shielding failure trip-out rate can be decreased. Research results also show that the protective effect of sideward rod will be influenced by both rod length and installation position, so the length of the rod should be longer than two meters and have to be intalled onto the corssarm under larger angle of shade of overhead ground wire. Practical operational experiences show that the sideward rod can assuredly play an effective role in protecting transmission lines from shielding failure. Thus, it is an effective approach of protecting transmission line from shileding failure to install sideward rods onto the crossarms of transmission towers located in the regions with severe lightning damages such as mountain area and so on as well as onto the crossarms of tall transmission tower.

**Keywords:** sideward rod shielding failure crossarm transmission tower protection range electrogeometric model (EGM) lightning protection

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