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高电压技术

紧凑型输电线路带电作业方式及安全防护

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摘要

由于紧凑型线路塔头尺寸紧凑，相间和相对地距离较小，对带电作业间距、组合间隙及作业人员进出高电位路径带来了较大的限制。为确保带电作业人员的安全，对影响紧凑型线路带电作业安全间距的诸因素进行了分析讨论，通过试验提出了针对不同过电压水平的紧凑型线路带电作业安全距离、绝缘工具最小有效长度和最小组合间隙；分析了保护间隙的原理及设计原则，提出了500 kV紧凑型线路加装保护间隙的作业方式及安全措施，并通过试验得出了相关技术参数。结合现场实际，提出对于进出等电位的带电作业，过电压幅值大于1.80 pu且作业人员从塔身进出等电位时，应采用加装保护间隙的作业方式。

关键词

紧凑型输电线路；带电作业；保护间隙；安全距离；组合间隙；高电压技术

分类号 TM755；TM81

扩展功能

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Live Working Ways for Compact Transmission Lines and Relevant Safety Protection

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Abstract

As for the compact transmission lines, the compact size of tower head, the smaller phase-to-phase distance and phase-to-earth distance bring a variety of limits to live working spacings, complex gaps and the paths via which the operating personnel enters and leaves the high potential region. To ensure the safety of live working operating personnel, the factors impacting the safe spacing of live working on compact transmission lines are analyzed and by means of tests the safe distances of live working on compact transmission line under different over-voltage levels, the minimum usable length of insulating tools and the minimum complex gaps are proposed; the principle of portable protective gap (PPG) and its design principle are analyzed, the working ways as well as the safety manners for adding PPG to 500kV compact transmission line are put forward, and the relevant parameters are obtained by tests. Combining with on-site condition, when operating personnel enters or leaves the high potential region, it is proposed to adopt the working way of adding PPG to compact lines while the over-voltage amplitude is higher than 1.80 per unit and the operating personnel enters or leaves the high potential region via the tower body.

Key words compact transmission lines；live working； portable protective gap；safe distance；complex gaps；high voltage engineering

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