

高电压技术

高压直流避雷器研发中的关键技术

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摘要:

中国正在建设±500/±660/±800 kV等电压等级的高压直流输变电工程, 并在努力实现电力设备的国产化。研发了大容量电阻片、阀避雷器和母线/线路避雷器类型的高压直流避雷器, 已经或即将投运于各个高压直流输变电实际工程, 介绍这些直流避雷器的研发技术和结果。大容量电阻片实现各种直流避雷器通用, 也实现了交/直流避雷器通用, 已实际应用于1000/750/500 kV等电压等级的瓷套型避雷器。阀避雷器采用复合外套, 基于良好的多柱避雷器电流分布、整只避雷器电位分布, 解决了压力释放和机械强度等难点问题。母线/线路避雷器采用复合外套/瓷外套2种结构。复合外套型, 在压力安全释放的基础上, 解决了抗弯强度问题; 瓷套型, 采用等径深棱伞以提高避雷器的耐污秽能力, 应用减震技术(装置)大幅度减小瓷套根部应力, 从而满足抗地震要求。

关键词:

Key Technologies Applied in Research and Development of HVDC Surge Arresters

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Abstract:

The HVDC transmission and transformation projects, which operate in voltage grades of ±500 kV, ±660 kV and ±800 kV, are being constructed in China, meanwhile the localization of power equipments for these projects are being pulled off. High capacity resistors, valve type surge arresters and the arresters for HVDC buses and transmission lines are studied out, and have been or will be put into use in actual HVDC power transmission and transformation projects. The generality of high capacity resistors for various types of DC arresters as well as the generality of high capacity resistors for both AC and DC arresters are realized, for instance high capacity resistors have been actually applied in porcelain-housed surge arresters with rated voltage of 1000 kV, 750 kV and 500 kV respectively. Polymeric housing is used to the valve type surge arresters and based on appropriate current distribution of multi-column arrester and as well as appropriate potential distribution of whole arrester the difficult problems such as mechanical strength, pressure release and so on are solved. Two kind of structures, i.e., polymeric housing and porcelain housing are used to bus arresters and line arresters respectively; on basis of releasing the pressure safely the trouble in bending strength is solved by use of polymeric housing, and the pollution-resistant capacity of porcelain-housed arrester is enhanced by use of deep edge and even diameter umbrella. To meet the demand of anti-earthquake, the damping technology and devices are used to reduce the root stress of porcelain housing considerably.

Keywords:

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