

电力系统

高压直流输电直流滤波系统综合优化设计

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摘要

换流站直流滤波装置的设计关系到高压直流输电系统的安全与经济性。该文将同样具有滤波作用的平波电抗器、直流滤波器和中性点电容器作为一个整体,对这个直流滤波系统实施综合优化设计。提出了以直流滤波系统总投资费用最小和年运行费用最低为目标、等效干扰电流满足直流工程限值要求为约束条件的多目标优化设计方法,建立了相应的综合优化数学模型。仿真计算产生两组优化设计方案。经与三峡-常州直流输电工程直流滤波系统的对比分析,表明两组优化设计方案均具有更好的经济性和滤波效果,进而验证了所建优化数学模型的正确性。

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Integrated Optimizing Design of Filtering Equipments at DC Side of HVDC Transmission System

Abstract

The design of filtering equipments at dc side of the converter substations is relative to the security and economy of the high voltage direct current (HVDC) transmission system. A multi-objective optimizing design method for dc filtering system composed of filtering equipments, such as smoothing reactor, dc filters and neutral capacitor is put forward in which result function is minimum of total investment and annual operation costs of dc filtering system and restricted condition is equivalent interfering current less the limit for HVDC transmission project. An integrated optimizing mathematical model for the design is established. Two optimizing design schemes for dc filtering system are obtained by the simulation based on the optimizing mathematical model. The better economy and filtering effect of the two optimizing design schemes for dc filtering system are verified by the comparison with practical dc filtering system of San-Chang HVDC transmission project. So the correctness of the presented optimizing mathematical model is confirmed.

Key words [HVDC](#) [multi-object program- ming](#) [integrated optimizing design](#) [equivalent interfering current](#) [filtering equipments](#)

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