

智能电网

电压源换相HVDC站内交流母线故障特性及保护配合

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摘要:

基于电压源型换流器的高压直流输电(voltage sourced converter based HVDC, VSC-HVDC)是一种以电压源换流器、自关断器件为基础的高压直流输电技术,其换流阀价格昂贵,需要进行必要合理的保护来保证换流阀的安全运行。内部交流母线故障是换流站内部一种严重的故障形式,因此,有必要对该故障进行分析从而进行保护设计。分析了内部交流母线故障的故障机制,同时针对故障换流站不同控制方式、不同运行模式下,非故障站的动作配合进行了深入的研究。通过在PSCAD/EMTDC中建立相应的电磁暂态模型,对内部交流母线故障进行了详细的模拟,给出了分析验证。结合不同应用下的系统运行要求,提出了故障后相应的两站保护动作配合要求。

关键词: 基于电压源型换流器的高压直流输电 故障特性 内部交流母线 滤波器母线 换流器出口母线 零序通路 保护配合

Internal AC Bus Fault Characteristics of VSC-HVDC System and Protection Coordination

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Abstract:

Voltage sourced converter based HVDC (VSC- HVDC) is a new power transmission technology based on voltage sourced converter and self turn-off devices. The valves of VSC-HVDC are comparatively expensive. Consequently, the necessarily reasonable protection should be taken to ensure the secure operation of the valves. Hence, the internal AC bus fault which is a severe fault type should be studied to design corresponding protection. This paper analyzed the mechanism of internal AC bus fault and demonstrates the protection coordination between two converters, considering different control configuration and operation conditions of the fault converter. By establishing an electromagnetic transient model in PSCAD/EMTDC, the performance under internal AC bus fault was simulated to testify the analysis. Based on the system operation demand of different applications, the protection coordination requirements was proposed.

Keywords: voltage sourced converter based HVDC (VSC-HVDC) fault characteristic internal AC bus filter bus converter terminal bus zero sequence path protection coordination

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