

## ±800 kV向家坝—上海特高压直流输电工程谐波阻抗等值研究

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### 摘要

谐波阻抗等值在很大程度上决定了换流站交流滤波器的配置方案, 直接影响换流站的平面布置、占地、投资等技术经济指标。在完善发电机、变压器、滤波器、线路等电气元件阻抗频率模型的基础上, 采用NIMSCAN阻抗频率扫描程序对向家坝—上海±800 kV特高压直流输电工程进行了谐波阻抗等值计算。对两端电网典型运行方式及开断方式进行了优化, 等值中考虑的最严重运行方式为N&#61485;2方式, 并对3、5、7次及高次特征谐波进行分区统计处理。采用详细的元件阻抗频率模型和分区统计可显著减小各次谐波阻抗, 进而优化滤波器设计并简化滤波器配置方案。

关键词 [±800 kV直流特高压输电](#); [谐波阻抗等值](#); [阻抗频率模型](#); [交流滤波器](#)

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## Study on Harmonic Impedance Equivalentents Used for AC Filter Design of ±800 kV UHVDC Transmission Project from Xiangjiaba to Shanghai

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### Abstract

The configuration scheme of AC filter for converter station greatly depends on harmonic impedance equivalentents that directly impacts the techno-economical index of converter station such as its plan layout, land occupation and total investment. After the impedance frequency models of electric elements including generators, transformers, filters and transmission lines are completed, by means of network impedance frequency scanning program (NIMSCAN) the harmonic impedance equivalent calculation for ±800 kV UHVDC transmission demonstration project from Xiangjiaba to Shanghai is carried out. Typical operating modes of power grids at both ends of the project as well as the break patterns are optimized. The most serious operating mode considered in the equivalentents is the N-2 mode, and the partitioning statistical process of the third-, fifth- and seventh-harmonics as well as high order characteristic harmonics are conducted. By use of detailed element impedance frequency models and partitioning statistics can reduce harmonic impedances of various harmonics, and then the design of filter can be optimized and the filter configuration scheme can be simplified.

Key words [±800 kV UHVDC transmission](#); [harmonic impedance equivalentence](#); [impedance frequency model](#); [AC filter](#)

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