

220kV 变电站及其无功补偿装置设计

中文摘要

该设计主要涉及无功补偿部分、相应电气一次部分，是本文对 220kV 变电站的主要阐述部分。首先根据要求，考虑变电站电压等级和出线数，设计电气一次主接线，并从可靠性、灵活性、经济性这三方面，对设计方案进行了考量，从而得到最优设计方案。结合负荷信息，通过计算选出合适的主变压器的型号和容量。结合选取的主变压器的容量，根据已知的站用电率，选出合适的站用变压器。之后按照短路要求选取合适的短路点，通过化简电路进行短路电流和冲击电流的计算。相应的变电一次设备，如断路器、隔离开关、电流互感器、电压互感器、避雷器、电抗器、熔断器、母线等应根据选取设备的要求选取相应型号，并进行了热稳定性、动稳定性等属性参数的校验，且应校验合格。该变电站有拥有 35kV、110kV、220kV 三个电压等级，其中低压侧配电装置选用室内配电装置，中压及高压侧配电装置选用室外配电装置。最后，在 35kV 电压等级侧要装配无功补偿装置。首先明确 35kV 侧无功补偿装置以分两组并联电容器进行无功补偿的形式实现，之后计算需要补偿的容量，计算每组需要并联的电容器台数、每台电容器的额定容量及电容值，最终确定每台电容器型号。

关键词：电气主接线；短路电流；设备选择；无功补偿

Abstract

This design mainly involves the reactive power compensation part and the corresponding electrical primary part, which is the main part of the 220kV substation in this paper. First, according to the requirements, considering the voltage level and the number of outgoing lines of the substation, the primary electrical connection is designed, and the design scheme is considered from the reliability, flexibility and economy, so as to get the optimal design scheme. Combined with the load information, the proper model and capacity of the main transformer are selected by calculation. Combined with the capacity of the selected main transformer, according to the known station power consumption rate, select the appropriate station transformer. Then according to the short-circuit requirements, select the appropriate short-circuit point, and calculate the short-circuit current and impulse current by simplifying the circuit. Corresponding transformer primary equipment, such as circuit breaker, disconnecter, current transformer, voltage transformer, lightning arrester, reactor, fuse, bus, etc., shall be selected according to the requirements of the selected equipment, and the thermal stability, dynamic stability and other attribute parameters shall be verified, which shall be qualified. The substation has three voltage levels of 35kV, 110kV and 220kV, among which indoor distribution device is selected for low-voltage side distribution device and outdoor distribution device is selected for medium voltage and high-voltage side distribution device. Finally, the reactive power compensation device should be installed on the 35kV voltage level side. Firstly, it is clear that the 35kV side reactive power compensation device is realized in the form of two groups of parallel capacitors for reactive power compensation, then calculate the capacity to be compensated, the number of capacitors to be paralleled in each group, the rated capacity and capacitance value of each capacitor, and finally determine the model of each capacitor.

Key words: Main electrical wiring; Short-circuit current; Equipment selection; Reactive power compensation

以上内容仅为本文档的试下载部分，为可阅读页数的一半内容。

如要下载或阅读全文，请访问：

<https://d.book118.com/396225034015010142>