

多能互补配网台区直流柔性互联系统建设及设计方案 【上架时间： 2023-03-30】



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分类	:	论文		
价格	:	¥0.00		

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详细信息

【标题】多能互补配网台区直流柔性互联系统建设及设计方案

【Title】Construction and Design Scheme of DC Flexible Interconnection System in Substation Area of Multi-Energy Complementary Distribution Network

【摘要】未来中低压配电网的组态将是由多个电压等级组成多维度的环状网、交直流网络耦合互联、拥有标准统一的耦合互联应用端口、基于高层次网络或系统理论灵活自组网的框架模式。多能互补配网台区直流柔性互联系统是未来新型电力系统、能源互联网、智能配电网建设与应用的基础支撑环节，以柔性直流技术、交直流灵活耦合互联技术为代表的中低压配电网也会是未来的发展方向之一。文中基于工程建设应用视角从建设、设计方案2个方面介绍了多能互补配网台区直流柔性互联系统。在阐述多能互补配网台区直流柔性互联系统建设的意义基础上，分析了台区直流柔性互联系统建设目标，并对台区直流柔性互联系统建设内容进行了概述。进一步地文中从系统拓扑结构、系统方案特点、系统保护配置、系统运行控制策略4个方面剖析了台区直流柔性互联系统设计方案。最后对台区直流柔性互联建设及设计方案开展总结及展望，可以预期，配网台区直流柔性互联技术的发展势必会为技术创新和综合效益提升带来新的路径和手段，为中低压智能配网技术的发展应用提供有效的技术保障。

【Abstract】In the future, the configuration of medium and low voltage distribution network will be multi-dimensional ring network composed of multiple voltage levels, AC-DC network coupling interconnection, with unified standard coupling interconnection application ports, and flexible AC-DC hoc network frame mode based on high-level network or system theory. Flexible DC interconnection system of multi-energy complementary distribution network is the basic support link for construction and application of new power system, energy Internet and intelligent distribution network in the future. The medium and low voltage distribution network represented by flexible DC technology and AC-DC flexible coupling interconnection technology will also be one of the development directions in the future. From the perspective of engineering construction and application, DC flexible interconnection system of multi-energy complementary distribution network from two aspects of construction and design scheme are introduced. Based on the significance of the construction of DC flexible interconnection system in the multi-energy complementary distribution network, the construction objectives of DC flexible interconnection system in the station are analyzed, and the construction contents of DC flexible interconnection system in the station are summarized. Furthermore, the design scheme of DC flexible interconnection system from four aspects: system topology structure, system scheme characteristics, system protection configuration and system operation control strategy are analyzed. Finally, the construction and design scheme of DC flexible interconnection in the distribution area are summarized and prospected. It can be expected that the development of DC flexible interconnection technology in distribution network area is bound to bring new paths and means for technological innovation and comprehensive benefit improvement, and provide effective technical guarantee for development and application of medium and low voltage intelligent distribution network technology.

【关键词】多能互补；配电网；台区；柔性直流技术；设计方案；配网自动化

【Keywords】Multi-energy complementary; distribution network; substation area; flexible DC technology; design scheme; distribution automation

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【来源】2022年中国电机工程学会年会论文集

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