论文

基于主变互联关系的配电系统供电能力计算方法

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摘要：

针对传统基于输电能力定义的供电能力计算方法的不足，该文提出一种基于主变互联关系和N-1准则的供电能力计算方法。首先将配电系统简化为一系列主变互联的联络单元，然后对各个联络单元进行N-1分析，以得到各台主变的最大负载率，最后综合各个联络单元的主变负载率计算结果得到各台主变的最大允许负载率，从而求得整个配电系统的供电能力。通过实际算例验证该文方法的正确性和有效性。实际算例表明，该文提出的基于主变互联关系和N-1准则的供电能力计算方法，思路清晰，分析过程简单，计算结果具体，不失为一种简捷实用的配电系统计算方法，同时，该方法易于得到配电系统的联络瓶颈和负荷转移瓶颈，可为城市电网的优化规划提供有效参考依据。

关键词： 配电系统　供电能力　主变互联　联络单元

An Evaluation Method for Power Supply Capability of Distribution System Based on Analyzing Interconnections of Main Transformers

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Abstract:

To improve insufficiency of traditional method based on the load supply capacity referring to the transmission system planning, this paper proposed a straightforward method to evaluate the power supply capability of distribution network, which is based on the interconnections among main transformers considering the N-1 guideline. Firstly, a series of interconnection schemes will be drawn from the connection analysis of distribution system. Secondly, the maximum load rate of each main transformer can be got by analyzing each interconnection schemes according to the N-1 guideline. Finally, based on a comprehensive analysis of the above results, the maximum permissible load rate of each main transformer can be obtained, and then the power supply capability of the entire distribution system can be calculated. Through the application of this method in a district of Shanghai, China, the effectiveness and the accuracy of the method are demonstrated. In summary, the method proposed in this paper based on the N-1 guideline and the interconnections among main transformers is a simple and practical tool to evaluate the power capability of a distribution system; besides, the interconnection bottlenecks of the distribution system and the load transferring bottlenecks can be identified easily by the method, thus providing effective references for urban distribution network planning.

Keywords: distribution system　power supply capability　interconnections among main transformers interconnection scheme

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