电力系统

基于小生境的配电网多目标分布式电源规划

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摘要：

针对分布式电源接入位置及其配置容量的优化问题，建立了含最小化投资成本、最小化配电网网损、最大化静态电压稳定性3个目标的多目标优化配置模型。在此基础上，应用基于目标序列排序矩阵评价个体适应度及小生境技术的多目标遗传算法，求解得到分布式电源接入位置及其配置容量的Pareto最优解集，实现多目标优化。最后，以IEEE37节点配电网为例进行仿真计算，结果表明，该方法能得到合理的分布式电源接入位置及其容量配置方案，验证了所建模型及求解算法的可行性和有效性。

关键词：

Niche-Based Multi-Objective Distributed Generators Planning in Distribution Network

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Abstract:

In allusion to the optimization of network- connecting positions of distributed generators (DGs) in distribution network and their configured capacity, a multi- objective optimal configuration model of DGs, in which the minimization of investment cost and network loss as well as optimal stability of steady state voltage are taken as objectives, is built. On this basis, by use of niche-based multi-objective genetic algorithm, in which the adaptability of individuals is evaluated by objective series-based sorting matrix, the optimal Pareto solution set of network-connecting positions of DGs and the configured capacity of DGs are solved, thus the multi-objective optimization is implemented. Taking IEEE 37-bus distribution system for example, the proposed model and solving algorithm are simulated and simulation results show that the proposed model and algorithm are feasible and available.

Keywords:

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