

论文

智能电网经济运行的多目标调度优化策略

郑漳华, 艾芊, 徐伟华, 施婕, 解大, 韩利

上海交通大学 电子信息与电气工程学院, 上海市 闵行区 200240

摘要:

探讨了新形势下电网监控调度和优化运行的问题。根据智能电网安全、经济、清洁的特点,以有功网损、污染气体排放量和系统电压稳定程度3个指标对电网的安全性、经济性和环保性进行量化评估,并将双馈感应发电机的模型加入到潮流计算的模型中,考虑了大容量风电并网对系统的影响,将上述指标作为优化目标,用强度Pareto进化算法对优化模型进行求解,并对上述3个优化目标进行寻优,很好地解决了智能电网中多方面的监测和多目标优化运行问题,为智能电网的监控运行提供了思路。

关键词: 智能电网 监控指标 双馈感应发电机 强度Pareto进化算法 多目标优化

A Multiobjective Dispatch Optimization Strategy for Economic Operation of Smart Grids

ZHENG Zhang-hua ,AI Qian, ,XU Wei-hua ,SHI Jie ,XIE Da ,HAN Li

School of Electronic, Information and Electrical Engineering, Shanghai Jiao Tong University, Minhang District, Shanghai 200240, China

Abstract:

Monitoring, dispatching and optimal operation of power grids under new circumstances are discussed. Moreover, the security, economy and cleanliness for smart grids are evaluated with quantitative indices such as active power loss, emission pollution and voltage stability. Doubly fed induction generator (DFIG) model is integrated with the traditional optimal power flow (OPF) model in algorithm presented in this paper, and the impact of large-scale wind power integration on power systems is considered. Taking the above-mentioned indices as optimization objectives, the algorithm adopts strength Pareto evolutionary algorithm (SPEA2) to get solution for the optimization model. It is shown that the algorithm enables multi-objective optimization and multiple aspects for monitoring in smart grids. Therefore, it provides new thoughts for monitoring in smart grids.

Keywords: smart grid monitoring indices doubly fed induction generator (DFIG) strength Pareto evolutionary algorithm (SPEA2) multi-objective optimization

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通讯作者: 郑漳华

作者简介:

作者Email: Lokey@sjtu.edu.cn; Mentis001@126.com

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