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虚拟电厂优化调度综述

Summary on Optimal Dispatch of Virtual Power Plant

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关键词:

虚拟电厂; 分布式电源; 优化调度; Virtual Power Plant; Distributed Generations; Optimal Dispatch

摘要:

虚拟电厂将多个分布式电源、储能装置和负荷等分布式单元通过先进的通信技术和控制策略有效集成为可控的独立发电厂, 以规模化的手段有效解决分布式电源并网的控制调度问题。本文分别从信息交互架构、运行管理架构、辅助服务、优化调度等方面对虚拟电厂进行了全面综述并深入探讨了虚拟电厂能量管理优化调度问题。对虚拟电厂优化调度问题主要从优化模型中的优化目标、调度周期以及虚拟电厂内不确定性因素的处理3个方面进行了详细分析。文章最后还指出对虚拟电厂组织构成、调度管理、运行控制等各方面的研究仍需深入探索, 形成可实用化的理论框架。

Virtual Power Plant integrated large numbers of distributed generations, energy storage devices and loads into a controllable independent power plant by advanced communication technologies and control strategies. It can solve the control and dispatch problems of distributed generations connecting to network effectively by a series of large-scale means. In this paper, we made a comprehensive review on virtual power plant from the aspects of information exchange architectures, operation and management structures, ancillary services and optimal scheduling respectively as well as explored the energy management optimization scheduling problems of virtual power plant deeply. For the optimal scheduling problems, we analyzed in detail mainly from three aspects of optimization goals, scheduling periods and the uncertainties in virtual power plant. Finally, some suggestions are given for further studies of virtual power plant on organizational structure, scheduling management, operational control and so on, so as to form a practical theoretical framework.

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