

新能源与分布式发电

风电并网时基于需求侧响应的输电规划模型

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摘要:

在输电规划中引入需求侧响应机制,能够促使用户根据实时供用电情况改变电量消费行为,有利于提高电网运行的灵活性,是应对风电并网不确定性问题的有效手段。综合考虑了风电机组出力的不确定性,建立了风电出力估算模型,并在输电规划目标函数中引入需求侧响应成本,建立基于需求侧响应机制的输电规划模型,利用贪婪随机自适应搜索算法(GRASP)建立模型求解流程。通过Garver 6节点和IEEE-24节点系统,测算基于需求侧响应机制的输电规划模型,并通过与一般输电规划模型对比,验证了基于需求侧响应机制的输电规划模型的有效性。

关键词: 风电并网 需求侧响应 输电规划 贪婪随机自适应搜索过程

A Demand-Side Response-Based Transmission Planning Model With Grid-Connected Wind Farms

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Abstract:

The introduction of demand response mechanism into transmission planning problem can encourage users to adjust their consumption behavior according the real-time situation of electricity supply and demand, and help to improve the flexibility of grid operation. Thus, the demand response mechanism plays an important role in dealing with uncertainty of wind power. The estimation model of wind power output is established on the consideration of the wind turbine output uncertainty. Then, demand response cost is concerned in the objective function of transmission planning, and a transmission planning model based on demand response mechanism is made. The model is solved by the greedy randomized adaptive search algorithm. Finally, the model is tested through IEEE Garver-6 bus and IEEE -24 bus system, and is compared to the traditional transmission planning model, verifying the practical of model.

Keywords: grid-connected wind farms demand-side response transmission planning greedy randomized adaptive search procedure (GRASP)

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