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用于AGC容量预测和机组选择的动态统一模型及方法

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摘要
在电力市场环境下，作为一项重要的辅助服务，自动发电控制(AGC)对维持系统频率稳定、联络线交易具有重要作用。文中建立了AGC容量预测和机组选择的动态统一模型。首先从概率学角度，利用机组历史发电数据，并考虑短
期负荷预测等因素，初步确定系统所需的AGC调节容量，
然后利用层次分析法对AGC机组的报价、机组性能进行综

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合评估排序；在一定AGC调节容量下，权衡AGC容量购
买费用和联络线处罚费率，最终建立兼顾系统运行安全性和
经济性的AGC容量预测和机组选择的动态统一模型；最后，通过算例验证了模型的有效性。

关键词 自动发电控制；容量预测；机组选择；层次分析法

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Dynamical Unified Model and Approach for AGC Capacity Forecasting and Unit Selection

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Abstract
In competitive electricity markets, automatic generation control (AGC) is one of important auxiliary services that plays an important role in maintaining system frequency stability and keeping tie-line transaction. The authors build up a dynamic unified model for AGC capacity forecasting and unit selection. Firstly, from the viewpoint of probability theory, the adjustable capacity of AGC that power system needs is preliminarily determined by use of historical power generation data of units and considering the factors such as short-term load forecasting; then using analytic hierarchy process (AHP), the comprehensive evaluation and sequencing of biddings of units with AGC and unit performance are conducted; and then under a certain adjustable capacity of AGC the purchasing cost of AGC capacity and penalty rate of tie-line are weighed; finally, a dynamic unified model for AGC capacity forecasting is established in which the consideration is given to both system security and economy. The effectiveness of the proposed model is validated by calculation example.

Key words automatic generation control；capacity forecast；unit selection；analytic hierarchy process

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