

## 新能源与分布式发电

### 电池储能系统-静止同步补偿器集成单元模型在风电场并网计算中的应用

张飞, 鲍海

华北电力大学 电气与电子工程学院, 北京市 昌平区 102206

#### 摘要:

为有效提高风电场的并网运行能力, 将电池储能系统(battery energy storage system, BESS)-静止同步补偿器(static compensator, STATCOM)串联集成单元与风力发电单元相结合, 建立基于Park变换的BESS-STATCOM集成单元和基于异步发电机风力发电系统的整体动态数学模型, 通过理论推导和基于仿真平台PSCAD对不同风速时风电场的出力及并网点的电压进行计算, 结果表明, BESS-STATCOM集成单元具有快速功率调节能力, 使风力发电单元可作为调度机组单元运行; 在求解包含风电场的电力系统潮流时, 可以将其视为PV节点, 而且能够显著提高电网的运行稳定性和供电可靠性。

#### 关键词:

### Application of Element Model Integrating Battery Energy Storage System With Static Compensator in Grid-Connected Wind Farm Calculation

ZHANG Fei ,BAO Hai

School of Electrical and Electronic Engineering, North China Electric Power University, Changping District, Beijing 102206, China

#### Abstract:

To effectively improve grid-connected operation ability of wind farm, by means of combining an integrated element, which is composed by battery energy storage system (BESS) connected in series with static compensator (STATCOM), with wind power generation unit, an overall dynamic mathematical model of Park transform-based integrated element of BESS-STATCOM and wind power generation based on induction generators is built. Through theoretical derivation and based on PSCAD simulation platform, the output of wind farm under different wind speeds and the voltage of the point, where wind farm is connected with power grid, are calculated. Calculation results show that the integrated element of BESS-STATCOM possesses the ability of rapidly adjusting power output, thus wind power generation unit can be operated as scheduling unit; and it can be regarded as PV node while the power flow of power grid containing wind farm is solved, and this integrated element can evidently improve operation stability and power supply reliability of power grid.

#### Keywords:

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通讯作者: 鲍海

#### 作者简介:

作者Email: hdbh@vip.sina.com

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