

电力系统

基于PMU量测数据和SCADA数据融合的电力系统状态估计方法

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摘要

针对传统静态状态估计方法的缺点, 提出了一种改进的电力系统状态估计方法, 即将部分节点相量测量单元(phasor measurement unit, PMU)量测数据与监控数据采集(supervisory control and data acquisition, SCADA)量测数据融合进行电力系统的全网状态估计。该方法简化了系统的雅可比矩阵, 缩短了计算时间。文章研究了PMU和SCADA系统融合改进后的快速分解法, 针对SCADA量测数据的缺点, 通过历史数据库对潮流数据进行预测, 并依据PMU量测量对系统进行分析, 继而进行系统全网状态的动态监测。通过算例证明, 与传统的估计方法相比, 该方法改善了状态估计的精确性, 减少了迭代次数, 细致地描绘了电网状态的变化过程, 为调度中心下一步的决策提供了依据。

关键词 [状态估计](#) [相量测量单元\(PMU\)](#) [全球定位系统\(GPS\)](#) [潮流预测](#) [快速分解法](#)

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A Novel Power System State Estimation Method Based on Merging PMU-Measured Data Into SCADA Data

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Abstract

To remedy the defect of traditional static state estimation methods, an improved power system state estimation method, which merges the data of partial nodes measured by PMU into SCADA data then perform whole system state estimation, is proposed. The proposed method simplifies Jacobian matrix of power system and saves calculation time. For this purpose, after merging the voltage and current data measured by PMU into SCADA data a fast-decouple method is researched. According to the disadvantages of SCADA data, the power flow data is forecasted by historical database and the power system state is analyzed by PMU-measured data, then the dynamic monitoring of whole system state is performed. Tested by example and results, the new method improves the accuracy of results, reduces the number of iteration, and describes the variety process of power systems state accurately compared to traditional methods, which provide more information for control center to make the next decision making.

Key words [state estimation](#) [Phasor Measurement Unit\(PMU\)](#) [Global Position System\(GPS\)](#) [The forecast of the flow in power system](#) [The Fast- decoupled Meth](#)

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