

中国电机工程学报 2009, 29(4) 1-7 DOI: ISSN: 0258-8013 CN: 11-2107/TM

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论文**电力系统精细规则的研究**

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摘要:

在分析传统运行规则的基本形式和弊端的基础上, 进一步阐述精细规则的概念。针对系统输电断面, 提出建立精细规则的方法: 针对静态安全, 精细规则的建立基于灵敏度技术; 针对暂态安全, 精细规则的建立采用数据挖掘技术, 由建立训练集、特征选择、知识表示等步骤组成, 其中训练集采用基于连续潮流的极限传输容量计算方法, 特征选择采用一种新的基于信息理论的方法, 知识表示采用最小二乘拟合。对四机双区域测试系统和某省级电网分别进行精细规则的算例研究, 结果表明, 精细规则考虑了更精细的电网特征状态, 对在线运行方式的适应能力更强, 可在保证系统安全的前提下有效挖掘输电走廊的输电潜力, 提供的灵敏度还有助于控制决策。

关键词: 精细规则 极限传输容量 数据挖掘 信息理论 特征选择**Fine Operational Rule of Power System**

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Abstract:

Based on analysis of the structure and shortcomings of conventional operational rule, the concept of the fine operational rule is presented and depicted in more detail. A method is proposed to create the fine operational rule for transmission corridors. The new rule for static security is simply created through sensitivity of power flow, while that for transient security is created by data mining technology which comprises three steps, i.e. sample generation, feature selection and rule construction. A method for calculation of total transfer capability (TTC) based on the continuation power flow is adopted to generate samples. An information theory based method is proposed for feature selection. And a least square method is used for rule construction. Case study on construction of the fine operational rule is carried out for a 4-generator 2-area test system as well as a real-life large-scale power system. The result shows that more key features about power system security can be considered in the fine operational rule, which is more suitable for power system operation. With the supporting of the fine operational rule, the capacity of the transmission corridor can be utilized more efficiently, and the control sensitivity contained in the operational fine rule is helpful for decision.

Keywords: fine operational rule total transfer capability data mining information theory feature selection

收稿日期 2008-02-04 修回日期 2008-06-13 网络版发布日期 2009-03-05

DOI:**基金项目:**

国家自然科学基金项目(50877043); 国家重点基础研究发展计划项目(973项目)(2004CB217904); 国家863高技术基金项目(2006AA05Z217)。

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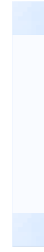
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