

电力系统

基于证据融合理论的配电网经济运行指标权重的闭环计算方法

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摘要:

为有效评价配电网经济运行指标, 需要确定合理的运行指标权重, 为此提出了基于证据融合理论的配电网经济运行指标权重闭环计算方法。首先邀请专家给出指标主观权重, 剔除离异程度大的专家意见, 并对不可靠意见进行折扣处理, 利用证据融合理论确定专家主观权重。若该主观权重符合证据充分条件, 则该权重即为最终权重; 否则利用熵值法和主成分分析法确定指标客观权重, 并利用证据融合理论确定综合客观权重。检验主、客观权重是否满足一致性要求, 若不满足, 则对权重进行闭环调整, 直至主、客观权重满足一致性要求。

关键词: 配电网经济运行 证据融合 斯皮尔曼等级相关系数 指标权重 闭环调整

A Closed-Loop Approach to Calculate Economical Operation Indices of Distribution Network Based on Dempster-Shafer Evidence Theory

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Abstract:

To evaluate economical operation indices of distribution network effectively it is necessary to determine reasonable weights of operation indices, for this reason, based on Dempster-Shafer evidence theory and Spearman method a closed-loop approach to calculate the weights of economical operation indices is put forward. Firstly, the subjective index weights from experts are collected and the conflict expert opinions are rejected, and the unreliable expert opinions are processed by discount for the reliability of the evidence; then using Dempster-Shafer evidence theory the subjective weights of experts are determined. If the determined subjective weights match the sufficient conditions of evidence, these subjective weights are taken as final weights; or else the entropy method and principal component analysis are utilized to determine objective index weights, and by use of Dempster-Shafer evidence theory the comprehensive objective weights are decided. Then it is necessary to check whether the subjective weights and objective weights can meet the demand of consistency, if not, the closed-loop adjustment of weights should be performed till both subjective weights and objective weights can meet the demand of consistency.

Keywords: economical operation of distribution system evidences fusion Spearman rank correlation coefficient index weight closed-loop adjustment

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