

国家重点基础研究项目

基于灰色模糊综合评判的断路器维修排序方法

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摘要

电力设备维修决策的发展方向是以可靠性为中心的维修(reliability-centered maintenance, RCM), 对设备进行重要性分析是RCM的关键环节。文章针对断路器重要性评判因素具有模糊性和灰色性的特点, 提出一种基于灰色模糊理论的重要性分析方法。该方法在确定影响断路器重要性的8个主要因素的基础上, 建立了包含4个评判等级的重要性评判体系。通过三角隶属度函数来描述评判因素与重要性等级间的模糊关系, 并引入点灰度来描述模糊关系的不可信程度。在此基础上进行灰色模糊综合评判, 得到了更贴近实际的评判结果。最后以某供电局断路器为例进行重要性分析, 验证了该方法的有效性。

关键词 [断路器; 以可靠性为中心的维修; 重要性分析; 灰色模糊综合评判](#)

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Research on Sequence of Maintenance of Circuit Breakers Based on Grey Fuzzy Comprehensive Evaluation

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Abstract

Reliability-centered maintenance (RCM) is the development trend of maintenance decision for electrical equipments. Importance analysis on the equipments is the key procedure during RCM. Because the evaluation factors possess gray and fuzzy features while the importance analysis on circuit breakers is performed, the authors propose a gray fuzzy theory based importance analysis approach. On the basis of deciding eight principal factors of circuit breaker importance, an importance evaluation system including four evaluation grades is established. The triangular membership function is built up to describe the fuzzy relation among evaluation factors and importance grades and the unlikelihood extent of fuzzy relation is described by leading in gray scale value of pixel. On this basis the gray fuzzy comprehensive evaluation is conducted and the evaluation result more near to the practice is achieved. Taking the circuit breaker of a certain power supply company for example, the importance analysis is carried out and the effectiveness of the proposed method is validated.

Key words [circuit breakers; reliability-centered maintenance \(RCM\); importance analysis; gray fuzzy comprehensive evaluation](#)

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