



Classification of Power Quality Monitoring Point Based on Fuzzy Cluster Analysis

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ABSTRACT

Power Quality (PQ) has assumed great importance in the past years in electrical system operation. Evaluation of PQ has become more and more crucial, especially when other PQ technologies have achieved great improvement. This paper presents a classification of power quality monitoring point based on Fuzzy Cluster Analysis (FCA). After a series of conversions for fuzzy similar matrix and operations, different clustering of power quality can be obtained. With the dynamic clustering diagram, the power qualities of different monitoring places were sorted and evaluated. Some typical example analysis shows that the FCA is practicable for the synthetic evaluation of power quality, and it is also a new idea. As a matter of fact, the FCA overcomes evaluation standard limitation too definitely on evaluation results, takes into the effect of general elements on power quality and ensures objective and precision. The FCA offers a scientific basis for customers to select power suppliers and price according to power quality.

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CHAPTER 1

INTRODUCTION

1.0 INTRODUCTION

In deregulated power markets, the issue of power quality (PQ) has become more and more important for the justice of power market. To adapt the request of market, such as completely assessing power quality, amending the price of power, and finally realize "higher quality, higher price", the traditional Power Quality Evaluation (PQE) method should be changed so that the evaluation could be more extensive in meaning, more integrated in framework, and more realizable in characterization.

This thesis presents a classification of power quality monitoring point based on Fuzzy Cluster Analysis (FCA). FCA is a common mathematic classification method based on mathematical statistics' multi-analysis method. FCA is to classify the objectives through establishing fuzzy similarity relationship, which is subject to characteristic, proximity and similarity between objectives. FCA takes into account fuzziness and randomness as elements comprehensively. It is generally applied to quality assessment of atmospheric and water environment. Similarly there are a large number of uncertainties, and obvious randomness, which impact on power quality. Since a big problem arises in studying fuzzy problem with the precise mathematics approaches. This work is based on classification, making an evaluation of power quality and offering certain guideline in selecting power suppliers.