Abstract

This paper presents an intelligent fault classification approach for power transformer dissolved gas analysis (DGA). Fault diagnosis methods by the DGA and artificial intelligence (AI) techniques are implemented to improve the interpretation accuracy for DGA of power transformers. The DGA traditional methods are utilized to choose the most appropriate gas signature. AI techniques are applied to establish classification features for faults in the transformers based on the collected gas data. The features are applied as input data to fuzzy logic, artificial neural network (ANN) and support vector machine (SVM) classifiers for faults classification. The experimental data from Tunisian Company of Electricity and Gas (STEG) is used to evaluate the performance of proposed method. The results of the various DGA methods are classified using AI techniques and the results are compared with the empirical test. In comparison to the results obtained from the AI techniques, the ratios DGA method has been shown to possess the most excellent performance in identifying the transformer fault type. The test results indicate that the SVM approach can significantly improve the diagnosis accuracies for power transformer fault classification.
References

- V. Miranda, A. Rosa Garcez Castro, " Improving the IEC Table for Transformer Failure Diagnosis With Knowledge Extraction From Neural Networks", IEEE transactions on power delivery, Vol. 20, No. 4, October 2005, 2509- 2516.
- Standard IEC 60599, 2007, "Guide for the interpretation of dissolved gas analysis and gas-free".
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transformer fault diagnosis