Abstract

Health or criticality index of power transformer is computed by utilizing the heuristic knowledge, employed on massive parametric data. For assessment purpose, it is unreasonable to collect the huge data of monitoring and test equipments frequently. As a first information source, dissolved gases-in-oil is secured in interpreting the transformer condition. The major seven dissolved gases are referred as key gases in IEEE/IEC gas guide. Dissolved Combustible Gases (TDCG) standard for state assessment uses caution levels of key gases for condition judgment. The phenomenon of dissolved-gas-in-oil observed analogous to grey system, as one can use this partial information about transformer for health index determination. Grey system theory deals with the incomplete information in system analysis. The objective of this paper is, to evaluate the health index of transformers by means of Grey Incidence Analysis (GIA) and Grey Relational Analysis (GRA) for absolute and relative scaling respectively. Synthetic degree of GIA is employed for absolute scaling, where the test samples are compared with industry standard.
However, test samples are compared without applying any standard model in GRA by means of approaching degree. The assessment results from grey analysis are further examined by Adaptive Neuro-Fuzzy Inference System (ANFIS) and Network Fitting (NF) tool. The proposed measurement is promising in priority based maintenance activities of power transformer.

References

Concentration Prediction Based on Genetic Algorithm and Improved Gray Verhulst Model", International conference on Artificial Intelligence and Computational Intelligence, 2009. AICI'09, pp. 575 –579.


Index Terms

Computer Science

Applied Sciences
Keywords

Key gases, DGA, Health Index of PT, Grey Incidence Analysis, Grey Relational Analysis, Absolute and Relative scaling.