Abstract

In the expanding world the demand of electricity is increasing day by day. The power utilities are making continuous efforts to reduce the gap between supply and demand. The effect of various faults in power system leads to unplanned outages in power system, which makes the situation still worse. Power transformers are the heart of power system. They are the key apparatus in power system. Any fault on transformer leads to unnecessary outages and huge loss to electric utility. For proper and reliable operation of power transformer, continuous condition monitoring is being required. From the last few decades, a lot of research work is going in the area of condition monitoring of transformers. Number of techniques are proposed
by various researchers from time to time such as Dielectric Loss Angle (DLA or $\tan\delta$) of winding, Recovery Voltage Monitoring (RVM), Sweep Frequency Response Analysis (SFRA), Dielectric Frequency Response (DFR), Polarization Depolarization (PDC), Partial Discharge Measurement and Dissolved Gas Analysis (DGA) etc. Dissolved Gas Analysis (DGA) has got the highest attention and attraction from the researchers. DGA is used in oil filled transformers. The mineral oil in the transformers under the effect of various thermal and electrical stresses decomposes into number of gases compounds such as H2, O2, N2, CO, CO2, CH4, C2H6, C2H4, C2H2 and C2H8. These gases are further analyzed to investigate presence of the fault in the transformer. A number of DGA interpretation techniques such as Dornenburg’s Method, Roger Ratio Method, Duval Triangle Method, Nomograph Method etc. are available to investigate the gases evolved in the transformer. The accuracy and diagnosis of condition monitoring of transformers can be increased manifold by combination of conventional DGA interpretation techniques with the artificial intelligence techniques. This paper deals with Fuzzy Logic Model development to monitor the condition of power transformer. Fuzzy inference for condition monitoring using compositional rules have been designed and developed.

References


Index Terms

Computer Science Artificial Intelligence

Keywords
Condition Monitoring Dissolved Gas Analysis Power Transformer Diagnosis Fuzzy Logic