A Fault Detection and Protection Scheme for a 200 MVA Transformer using Fuzzy Logic

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Abstract: *The paper elucidates a fault detection and protection scheme for a 200MVA transformer using Fuzzy logic. Fuzzy logic (FL) tool box in MATLAB/ SIMULINK software was utilized in the simulation system that diagnosed transformer faults and also monitors its operating conditions. Current and rate of change of current with time have been identified as the input variables, duly represented in the programme as "Error" and "Error-Dot". These variables have their universe of discourse from -1.5 to 1.5 and from -10 to 10 respectively. Fuzzy logic sensor is designed to monitor the current (i) conditions of the transformer at both ambient and full load. The results from the research show that whenever the output response is zero the current in transformer is normal. This is obtained when input values of [0] and [0] are injected into the system to produce a response of "6e-017" which is approximately zero. Whereas if the output response is greater than zero it implies that the transformer current is rising beyond normal and protection scheme should be alerted. This condition is achieved when input values of [-1.5] and [5] are used on the system to give a response of "+5". However, if the response is less than zero then the transformer current is below normal, hence the protection scheme should be alerted. To investigate this, input values of [1.5] and [-5] gives a response of "-5".*

Keywords: Fault, detection, current, voltage, controller

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