



LOCATION OF PARTIAL DISCHARGES IN POWER TRANSFORMERS BY USING APPARENT CHARGE MEASUREMENTS

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Abstract —The number of failures in high voltage power transformers caused by problems in bushing and winding insulation validate the studies and the development of methodology for diagnosing incipient failures, making possible to avoid long unavailability periods, and its consequences.

The aim of this work is to add in the detection and measurement procedures, mainly concerning the estimation of position of partial discharge inside the transformer, in order to assess the degree of danger for the equipment. The methodology is based on the measurement of partial discharges from the transformer bushing, in a noninvasive manner. The position of the partial discharge source is estimated considering the transformer winding model, together with the measurement and analysis of the response to the partial discharge pulses. By means of a proper modeling, measurement and interpretation, the assessment of the position of the problem can be done. For the measurements, the conventional detection technique proposed by IEC 270 Standard [2] complemented by digitalization equipment was used, making possible to obtain amplitude, frequency of occurrence and phase angle for the partial discharges. In this way, in order to verify the proposed modeling, measurements on a specially prepared transformer were made. The tests were performed by injecting simulated partial discharges in several places on the transformer winding, while measurements on the bushing were made. The obtained results were compared with the expected values according to the proposed model. The initial results show good agreement and good evidence of the suitability of the model.