

**DETECTION AND POSITION LOCATION OF PARTIAL DISCHARGE
IN TRANSFORMER OIL**

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ABSTRACT

Power transformers are one of the most important and most expensive components in the electric power system. Therefore a huge interest for monitoring and diagnosis systems to evaluate the condition of the transformer is necessary to analyse the actual status of the insulation system. Acoustic detection is one of the methods to detect partial discharge (PD) of the insulation of the power equipment. The primary advantage of Acoustic detection is that position information is readily available from acoustic systems using sensors at multiple locations. This position information can help to identify the type of partial discharge as well as the location and severity of an insulation fault. The position information can also help plant technicians locate faults in insulation for repair purposes. Therefore in this paper, acoustic detection method will be use to detect and locate partial discharge in transformer oil using MATLAB software to simulate the partial discharge activity in transformer oil. Results showed that the method employed is suitable and can provide for correct location of partial discharge in transformer oil.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Most power transformers in electric power system are in the age of 30 to 35 years which are still in operation with an impact of ageing and possible damages [1, 2]. The failure risk for these transformers is now increasing according to the well known failure curve as function of service time [1]. One of the common reasons for power transformer degradation is presence and activation of partial discharges (PD). Partial discharges in the high voltage insulation are local breakdowns of the insulation which does not result in a complete failure of insulation, and hence, the discharges are called partial.

Measurements of the acoustic partial discharge in power transformer are focused on partial discharge position location estimation by using acoustic emission sensor [3]. Partial discharges are simulated in 500 x 500 x 500 mm³ transformer oil filled tank, this partial discharge will be detected by using four acoustic sensors located at the each side of outer layer of the transformer oil tank. The acoustic waveform from each sensor will detect the partial discharge in the tank and the position location of the partial discharge is solved numerically using positioning algorithm method in the MATLAB software.