

**DETECTION OF TRANSFORMER WINDING FAULT USING
FREQUENCY RESPONSE ANALYSIS (FRA)**

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ABSTRACT

Transformer is the important equipment in order to step up or step down the current or voltage. Besides that, transformer is specified to withstand the mechanical forces from both transportation and in-service events like faults and lightning. Due to its function, it is a must to take a good care or concern about its condition for long lifetime. In order to avoid it from breakdown or do not function properly, transformer need to be examined. This paper presents a method for detection of the transformer winding fault. Analysis was made on healthy and unhealthy transformer by visualization and cross correlation coefficient using Frequency Response Analysis (FRA). From the shape of waveform and value of cross correlation, the condition of the transformer will be determined. By using MATLAB software, the shape of the waveform based on the given data has been plotted. Also, the value of cross correlation has been obtained by using Microsoft EXCEL.

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Power transformers are specified to withstand the mechanical forces from both transportation and in-service events such as faults and lightning. However, mechanical forces sometimes may exceed the specified limits during severe incidents or when the insulation mechanical strength has weakened due to aging. It will lead to mechanical damage or deformations to the transformer windings. For example, radial buckling or axial deformation may occur due to excessive forces. When the transformer has been damaged even it is a slightly damage, the ability to withstand further short circuits is reduced. Hence, it is important to effectively detect and identified such damages. Visual inspections on power transformer are not economical and sometimes inconclusive. Moreover, a complete tear down is required to identify the problem. Therefore, an alternative technique is required to detect any mechanical distortions of the core-winding in power transformers. Frequency Response Analysis (FRA) is the diagnostic technique which is widely used and proven in order to determine the mechanical distortion [1]