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IEEE Guide for the Application and Interpretation of Frequency Response Analysis for Oil-Immersed Transformers

IEEE Power and Energy Society

Sponsored by the
Transformers Committee

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IEEE Std C57.149™-2012

8 March 2013

IEEE Guide for the Application and Interpretation of Frequency Response Analysis for Oil-Immersed Transformers

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of the
IEEE Power and Energy Society

Approved 5 December 2012

IEEE-SA Standards Board

Abstract: The measurement of Frequency Response Analysis (FRA) of oil-immersed power transformers is applicable in this guide. It is intended to provide the user with the requirements and specifications for instrumentation, procedures for performing the tests, techniques for analyzing the data, and recommendations for long-term storage of the data and results.
Keywords: admittance, attenuation, Bode Plot, deviation, frequency domain, Frequency Response Analysis (FRA), IEEE C57.149™, impedance, magnitude, phase angle, resonance, RLC network, transfer function

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PDF: ISBN 978-0-7381-8226-1 STD98137
Print: ISBN 978-0-7381-8227-8 STDPD98137

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Introduction

This introduction is not part of IEEE Std C57.149-2012, IEEE Guide for the Application and Interpretation of Frequency Response Analysis for Oil-Immersed Transformers.

Frequency Response Analysis (FRA) testing has gained popularity for assessing the mechanical integrity of oil immersed transformers. Due to limited understanding and available information regarding FRA requirements and specifications for instrumentation, procedures for performing the tests, and analysis of results, the Performance Characteristics Subcommittee formed the Working Group PC57.149. The primary objective of the Working Group PC57.149 was to compile and validate FRA experiences and techniques to develop a FRA application and interpretation guide that would benefit the industry.

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IEEE Guide for the Application and Interpretation of Frequency Response Analysis for Oil-Immersed Transformers

1. Overview

1.1 Scope

This guide is applicable to the measurement of Frequency Response Analysis (FRA) of an oil-immersed power transformer. The guide will include the requirements and specifications for instrumentation, procedures for performing the tests, techniques for analyzing the data, and recommendations for long-term storage of the data and results. This guide can be used in both field and factory applications.

1.2 Purpose

The purpose of this guide is to provide the user with information that will assist in making frequency response measurements and interpreting the results from these measurements. It will provide guidance for all current methods employed in taking these measurements.