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IEEE Guide for Dielectric Frequency Response Test

IEEE Power and Energy Society

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Transformers Committee

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IEEE Guide for Dielectric Frequency Response Test

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of the
IEEE Power and Energy Society

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Abstract: Dielectric Frequency Response (DFR) test methods of liquid immersed transformers are discussed in this guide. The guide includes recommendations for instrumentation, procedures for performing the tests, and techniques for analyzing the data.

This guide describes factors affecting the DFR test moisture estimate including winding configuration and measurement set-up, cellulose material type, low molecular weight acids, and background ac/dc noise interference.

This guide is applicable to both field and factory applications. The purpose of this guide is to provide the user with information that will assist in performing Dielectric Frequency Response measurements and interpreting the results from these measurements.

Keywords: dielectric frequency response, dissipation factor, IEEE C57.161™, moisture estimation, oil conductivity

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Introduction

This introduction is not part of IEEE Std C57.161-2018, IEEE Guide for Dielectric Frequency Response Test.

DFR testing has been used worldwide for several years. This guide provides a review of the DFR methodology and guidance in the practical application and interpretation of the results. This guide also helps users to perform DFR testing in a recommended consistent manner to allow for a better trending and comparison of the data.

This guide is applicable to the methods of Dielectric Frequency Response (DFR) of liquid-immersed transformers. The guide includes recommendations for instrumentation, procedures for performing the tests, and techniques for analyzing the data. This guide can be used in both field and factory applications. The purpose of this guide is to provide the user with information that will assist in performing Dielectric Frequency Response measurements and interpreting the results from these measurements.

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IEEE Guide for Dielectric Frequency Response Test

1. Overview

1.1 Scope

This guide is applicable to the methods of Dielectric Frequency Response (DFR) of liquid-immersed transformers. The guide includes recommendations for instrumentation, procedures for performing the tests, and techniques for analyzing the data. 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 performing Dielectric Frequency Response measurements and interpreting the results from these measurements.

2. Normative references

The following referenced documents are indispensable for the application of this document (i.e., they must be understood and used, such that each referenced document is cited in text and its relationship to this document is explained). For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments or corrigenda) applies.

IEEE Std C57.152™-2013, IEEE Guide for Diagnostic Field Testing of Fluid-Filled Power Transformers, Regulators, and Reactors.[1, 2]

3. Definitions

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