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IEEE Guide for Diagnostic Field Testing of Fluid-Filled Power Transformers, Regulators, and Reactors

IEEE Power and Energy Society

Sponsored by the
Transformers Committee

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IEEE Std C57.152™-2013
(Revision of
IEEE Std 62™-1995)

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Abstract: Diagnostic tests and measurements that are performed in the field on fluid-filled power transformers and regulators are described. Whenever possible, shunt reactors are treated in a similar manner to transformers. Tests are presented systematically in categories depending on the subsystem of the unit being examined. A diagnostic chart is included as an aid to identify the various subsystems. Additional information is provided regarding specialized test and measuring techniques. Interpretive discussions are also included in several areas to provide additional insight on the particular test or to provide guidance on acceptance criteria. These discussions are based on the authors' judgment of accepted practice. It should be noted that the results of several types of tests should be interpreted together to diagnose a problem. Manufacturers' acceptance criteria should also be consulted as it may take precedence over the criteria in this guide.
Keywords: bushing, core, diagnostic evaluation, field testing, fluid-filled transformer, IEEE C57.152™, insulating liquid, off-line testing, reactor, regulator, safety, tank, tap changer, winding

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Introduction

This introduction is not part of IEEE Std C57.152-2013, IEEE Guide for Diagnostic Field Testing of Fluid-Filled Power Transformers, Regulators, and Reactors.

Power transformers usually represent one of the most important and single most costly items in substations. Furthermore, particularly for large transformers, their failures usually result in lengthy outages or downgrading of electric service reliability. For these reasons, a high degree of care is required to properly field test this equipment to confirm equipment status and identify problems.

Because of these considerations, IEEE and other standards development organizations have published, since at least the early 1920s, various recommendations for testing and maintaining transformers. This guide replaces IEEE Std 62™-1995 [B33], since it primarily deals with power transformers, regulators, and reactors, which are devices covered by the Transformers Committee.[a]

New sections have been added on safety; tank vacuum testing; visual inspection; a chart providing commissioning, routine, and after-fault testing guidance; and informational annexes. Also, new technologies have been identified that are available for use in field testing.

[a] The numbers in brackets correspond to those of the bibliography in Annex J.

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IEEE Guide for Diagnostic Field Testing of Fluid-Filled Power Transformers, Regulators, and Reactors

1. Scope

This guide describes diagnostic field tests and measurements that are performed on fluid-filled power transformers and regulators. Whenever possible, shunt reactors are treated in a similar manner to transformers. The tests are presented systematically in categories depending on the subsystem of the unit being examined. A diagnostic chart is included as an aid to identifying the various subsystems. Additional information is provided regarding specialized test and measuring techniques.

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