

An American National Standard

IEEE Recommended Practice for Insulation Testing of Large AC Rotating Machinery with High Voltage at Very Low Frequency

Sponsor

**Rotating Machinery Committee
of the
IEEE Power Engineering Society**

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IEEE Standards Board

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WARNING

Due to High Voltage Used, Dielectric Tests Should Be Conducted Only by Experienced Personnel, and Adequate Safety Precautions Should Be Taken to Avoid Injury to Personnel and Damage to Property

Foreword

(This foreword is not a part of IEEE Std 433-1974. Recommended Practice for Insulation Testing of Large AC Rotating Machinery with High Voltage at Very Low Frequency.)

The Working Group on Very Low Frequency Testing was organized by J. C. Botts, then Chairman of the Insulation Subcommittee, Rotating Machinery Committee of the IEEE Power Engineering Society. Mr Botts served as the initial Chairman of the group that first met October 6, 1970. After considering existing literature, available test equipment, and known test experience, the work of the group proceeded. Following the format of IEEE Std 95-1962, Guide for Insulation Testing of Large AC Rotating Machinery with High Direct Voltage, responsibility to draft the several sections was accepted individually by several participants. R. J. Hillen accepted the chairman position of the group at the February 3, 1971, meeting. Progress has been steady, and in this sixth revision, it is hoped a workable, useful document has been prepared.

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CLAUSE	PAGE
1. Scope and Purpose	1
2. Definitions.....	2
3. Preparations for Test	2
3.1 Air-Cooled Machines	2
3.2 Hydrogen-Cooled Machines	3
3.3 Liquid-Cooled Armature Windings	3
3.4 Isolation of the Winding from Cables and Auxiliary Equipment	3
3.5 Sectionalizing the Winding	3
4. Safety Considerations	3
4.1 Area Isolation	3
4.2 Grounding Precautions.....	4
4.3 Grounding Provisions	4
4.4 Safety Checklist	4
5. General Test Considerations	4
5.1 Possibility of Failure to Pass Test	4
5.2 Condition of Winding	4
5.3 Test-Voltage Determination.....	5
6. Test Equipment	5
6.1 Equipment Specifications	5
6.2 Instrumentation	5
6.3 Protection of Equipment and Test Specimen	5
6.4 Power Source to the VLF-Test Equipment	5
6.5 Operation Check	5
7. Test Connections.....	6
7.1 Ground Connections	6
7.2 High-Voltage-Test Connections	6
8. Test Procedure.....	6
8.1 Voltage Application	6
8.2 Fault Detection.....	7
9. Test Results	7
9.1 Interpretation.....	7
9.2 Suggested Test Record.....	7
9.3 Comments to Be Recorded	7
10. Standards References	8
11. Bibliography.....	8

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1. Scope and Purpose

Design innovations and rating increases of rotating machines continuously increase the need to develop improved methods of testing insulation for serviceability. Research in the last 15 years evolved a method of 1/10 Hz over-potential testing to supplement traditional power-frequency testing and to complement direct-voltage testing. A background for VLF (very low frequency) testing is available in the technical literature. (See Section 11.)

VLF testing permits advantageous application of more easily transportable equipment both in weight and size as compared to non-resonant power-frequency testing.

This document provides a uniform method of VLF testing in order to obtain consistent results, accumulate meaningful experience, and lead to establishment of standards of test level.

References as listed in Section 10. are necessarily those which have been issued at the time this document was written. When subsequent revisions of the references are issued, they should be used in place of those indicated unless, due to a change in scope, they no longer apply.

The purposes of this recommended practice are:

- 1) To define terms that have a specific meaning in VLF testing
- 2) To describe VLF-test equipment and wave shape
- 3) To provide a uniform procedure for testing the armature insulation of large ac machines with VLF voltage
- 4) To recommend constants for relating VLF tests to power-frequency and direct-voltage tests to obtain equally effective test levels

This document applies to large ac rotating machines rated at 10 000 kVA or greater and rated 6000 V or higher.¹ It covers acceptance testing of new equipment in the factory or on-site after erection. This recommended practice also covers routine maintenance testing of machines that have been in service.

¹VLF test may be applicable to rotating machines of lower rating and other electrical equipment.