



IEEE Guide for Test Procedures for Synchronous Machines Including Acceptance and Performance Testing and Parameter Determination for Dynamic Analysis

IEEE Power and Energy Society

Developed by the
Electric Machinery Committee

IEEE Std 115™-2019
(Revision of IEEE Std 115-2009)

STANDARDS

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Approved 7 November 2019

IEEE SA Standards Board

Abstract: Instructions for conducting generally applicable and accepted tests to determine the performance characteristics of synchronous machines are contained in this guide. Although the tests described are applicable in general to synchronous generators, synchronous motors (larger than fractional horsepower), synchronous condensers, and synchronous frequency changers, the descriptions make reference primarily to synchronous generators and synchronous motors.

Keywords: acceptance and performance testing, dynamic analysis, IEEE 115™, parameter determination, synchronous machines

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Introduction

This introduction is not part of IEEE Std 115-2019, IEEE Guide for Test Procedures for Synchronous Machines Including Acceptance and Performance Testing and Parameter Determination for Dynamic Analysis

IEEE Std 115-2019 incorporates and updates the contents of the 2009 edition.

The first AIEE “Test Code” for Synchronous Machines (#503) was issued in 1945 and formed the basis for the subsequent IEEE Std 115, which was first published in 1965.

The Generator Subcommittee’s Working Group (WG) #7, which produced this guide, was formed in July 2015 at the IEEE PES General Meeting, and the Project Authorization Request (PAR) was approved by the IEEE SA Standards Board in December 2015. This PAR included a proposal by the WG to update the entire document to reflect the state-of-the-art practices and technology. All corrections sent by users of the standard to IEEE SA were reviewed by the WG and implemented as needed.

The WG decided to keep the format and titles of the guide the same as in the previous edition.

During editorial review, it was recommended that the working group discontinue the title in two parts and make one title including the previous separate titles.

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1. Overview

1.1 Scope

This guide contains instructions for conducting generally applicable and accepted tests to determine the performance characteristics of synchronous machines. Although the tests described are applicable in general to synchronous generators, synchronous motors (larger than fractional horsepower), synchronous condensers, and synchronous frequency changers, the descriptions make reference primarily to synchronous generators and synchronous motors. The tests described may be applied to motors and generators, as needed, and no attempt is made to partition this guide into clauses applying to motors and clauses applying to generators. It is not intended that this guide shall cover all possible tests or tests of a research nature, but only general methods that may be used to obtain performance data. The schedule of factory and field tests, which may be required on new equipment, is normally specified by applicable standards or by contract specifications. This guide should not be interpreted as requiring any specific test in a given transaction or implying any guarantee about specific performance indices or operating conditions.

The term *specified conditions* for tests as used in this guide will be considered as rated conditions unless otherwise agreed upon. Rated conditions apply usually to the quantities listed on the machine nameplate.

1.2 Organization of the guide

The guide consists of 12 clauses. Each clause is organized into subclauses.

Alternative methods of making many of the tests covered in this guide are described and are suitable for different sizes and types of machines and different conditions. In some cases, the preferred method is indicated. The manufacturer's choice of method for factory or field tests on new equipment will govern in the absence of prior agreement or contract specification.