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IEEE Guide for the Preparation of Excitation System Specifications

IEEE Power and Energy Society

Sponsored by the
Energy Development and Power Generation Committee

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Abstract: This guide is intended to provide to the specification writer the information to prepare a specification for the purchase of an excitation system. This guide is presented in narrative form with descriptions of functions typical of excitation systems. Narrative is provided describing types of excitation systems and information required for sizing the excitation system.

Keywords: communications, compound exciters, digital, excitation guide, exciter types, IEEE 421.4™, potential integral derivative (PID), potential source exciters, power system stabilizers, redundant controllers, rotating exciters

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Introduction

This introduction is not part of IEEE Std 421.4™-2014, IEEE Guide for the Preparation of Excitation System Specifications.

This guide is intended as resource material for writers preparing a specification for procurement of an excitation system for a synchronous machine. It is intended that IEEE Std 421.1™, IEEE Std 421.2™, IEEE Std 421.3™, and IEEE Std 421.5™ be used in conjunction with this guide in preparing the specification. This guide is not intended to be a fill-in-the-blanks guide but a narrative description of items and functions that should be considered in preparing excitation system specifications. Some of the information presented in this guide may be unnecessary for the writer's particular specification. One should judge the applicability of information to be included in the writer's specification and remove all inapplicable portions. Some tutorial material is included for the user who may be relatively inexperienced in selecting parameters and requirements for each particular application.

It should also be noted that this document defines an excitation control system as one that includes the synchronous machine. The definition is included here for clarity as the term is not defined in IEEE Std 421.1™; however, it is included in IEEE 100, The Authoritative Dictionary of IEEE Standards Terms, Seventh Edition.

Suggestions for improvement of this specification guide are welcomed. They should be sent to the Secretary, IEEE Standards Board Institute of Electrical and Electronics Engineers, 445 Hoes Lane, Piscataway, NJ 08854, USA.

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IEEE Guide for the Preparation of Excitation System Specifications

1. Overview

1.1 Scope

This guide provides the necessary material to the specification writer in order to prepare the specification for the procurement of an excitation system for a synchronous machine. The information presented in this guide is given in narrative form with the descriptions and functions of particular features that should be examined in preparing the specifications. This guide also identifies the most modernized industry functions as it pertains to preparing specifications for the procurement.

1.2 Purpose

The specific intent of this guide is to provide the user with guidelines and background data required to specify excitation systems. This guide will illustrate properly specified equipment used in specifying excitation systems. The benefit is to properly specify equipment that meets end user needs.

1.3 Background

This guide is intended to provide to the specification writer the necessary material for preparing a specification for the procurement of an excitation system for a synchronous machine. The information presented in this guide is given in narrative form with the descriptions and functions of particular items that