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IEEE Recommended Practice for the Specification and Design of Field Discharge Equipment for Synchronous Machines

IEEE Power and Energy Society

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Energy Development and Power Generation Committee

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Abstract: A basic reference for the specification and design of field discharge circuits for synchronous machines is provided in this document. Detailed information about field discharge that complements standards IEEE Std 421.4™-2004, IEEE Guide for Preparation of Excitation System Specification, and includes many aspects of the withdrawn standard ANSI/IEEE C37.18-1979, IEEE Standard Enclosed Field Discharge Circuit Breakers, is also provided. This document shows the most employed field discharge circuits and defines the main design criteria and conditions for the main components of field discharge circuit for synchronous machines.

Keywords: crowbar, de-excitation, field breaker, field discharge equipment, field discharge of synchronous machines, field discharge resistor, field suppression, IEEE 421.6™

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Introduction

This introduction is not part of IEEE Std 421.6-2017, IEEE Recommended Practice for the Specification and Design of Field Discharge Equipment for Synchronous Machines.

This recommended practice serves as basic reference for the specification and design of field discharge circuits for synchronous machines. It also provides detailed information about field discharge that complements IEEE 421.4-2004 IEEE Guide for Preparation of Excitation System Specification. This document includes many aspects of the withdrawn standard ANSI/IEEE C37.18.1979 IEEE Standard Enclosed Field Discharge Circuit Breakers [B1].

Contents

IEEE Recommended Practice for the Specification and Design of Field Discharge Equipment for Synchronous Machines

1. Scope

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2. Normative references

The following referenced documents are indispensable for the application of this document (i.e., they must be understood and used, so 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.

ANSI C37.16™-2000, American National Standard Low-voltage Power Circuit Breakers and AC Power Circuit Protectors Preferred Ratings, Related Requirements, and Application Recommendations.

IEEE Std 421.4™-2004, IEEE Guide for the Preparation of Excitation System Specifications.[2,3]

3. Definitions

For the purposes of this document, the following terms and definitions apply. The *IEEE Standards Dictionary Online* should be consulted for terms not defined in this clause.[4]

field breaker arcing voltage: Established voltage between breaker main contact(s) during the arcing period. The arcing voltage is an intrinsic characteristic of the circuit breaker and depends on the typical arc admittance and arc current intensity.

[1]The numbers in brackets correspond to those of the bibliography in Annex B.
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