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IEEE Standard for Seismic Qualification Testing of Protective Relays and Auxiliaries for Nuclear Facilities

IEEE Power and Energy Society

Sponsored by the
Power System Relaying Committee
and the
Nuclear Power Engineering Committee

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USA

IEEE Std C37.98™-2013
(Revision of
IEEE Std C37.98-1987)

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Abstract: The methods and conditions for seismic qualification of protective relays and auxiliaries such as test and control switches, terminal blocks, and indicating lamps for use in nuclear facilities are described in this standard. The primary intent of this standard is to focus on fragility testing and seismic qualification, also known as proof testing (either to generic levels or specific levels). This standard covers relays used in nuclear facilities, but may also be applied to any area in which the seismic response of relays is a design consideration. The prerequisites for the seismic test are defined in IEEE Std C37.105™.

Keywords: auxiliaries, chatter, fragility, generic testing, IEEE C37.98™, nuclear, operating basis earthquake, proof testing, protective, qualification, relay, required response spectrum, response spectra, safe shutdown earthquake, safety function, seismic, seismic test, test, test response spectrum

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Introduction

This introduction is not part of IEEE Std C37.98™-2013, IEEE Standard for Seismic Qualification Testing of Protective Relays and Auxiliaries for Nuclear Facilities.

This standard describes the methods and conditions for seismic qualification of protective relays and auxiliaries such as test and control switches, terminal blocks, and indicating lamps for use in nuclear facilities. Earlier standards had an emphasis on fragility testing of relays. The primary intent of this standard is to focus on seismic qualification, also known as proof testing (either to generic levels or specific levels), rather than fragility testing. This standard covers relays used in nuclear facilities, but may also be applied to any area in which the seismic response of relays is a design consideration.

This standard is generic in nature. Required response spectra peak and ZPA levels are influenced by in-structure response. Application-unique requirements must be considered in the testing of relays and auxiliaries. The information presented in this standard is to be used with plant licensing basis documents and other industry standards and requirements as applicable.

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IEEE Standard for Seismic Qualification Testing of Protective Relays and Auxiliaries for Nuclear Facilities

1. Overview

1.1 Scope

This standard specifies test methods and conditions to be used in the seismic qualification testing of protective relays and auxiliaries such as test and control switches, terminal blocks, and indicating lamps for use in nuclear facilities.

1.2 Purpose

The purpose of this standard is to establish test methods and conditions for determining the seismic capability and to demonstrate seismic qualification of protective relays and auxiliaries specified in IEEE Std C37.105™-2010. The prerequisites for the qualification testing are defined in IEEE Std C37.105™-2010. These test methods are divided into three main categories, as described in IEEE Std 344™-2004; fragility, proof, and generic testing. To define the specific conditions for seismic testing of protective relays, the following parameters shall be specified:

a) The settings and electrical inputs to the protective relay and auxiliaries, and other pertinent information as detailed in this standard required to define its condition during the test