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IEEE Standard Seismic Testing of Relays

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Secretariat

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Foreword

(This Foreword is not a part of IEEE C37.98-1987, IEEE Standard Seismic Testing of Relays.)

This standard is for developing data related to the seismic capabilities of relays. This standard complements IEEE Std 344-1987, IEEE Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations, which provides general guidelines for developing data related to seismic qualification of equipment used in nuclear generating plants.

Data must be developed by testing rather than analytical means since protective relays fall into the category of complex devices as described in Section 5 of IEEE Std 344-1987; however, analysis may be used in data reduction, reconciling response spectra, justifying methods of evaluating changes, and justifying seismic qualifications of relays of similar construction.

It should be emphasized that while a primary purpose in preparing this standard was to cover the application of relays to nuclear generating plants, the standard is not restricted to this application. This standard may be applied to any area in which the seismic response of relays is a design consideration.

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IEEE Standard Seismic Testing of Relays

1. Scope and References

1.1 Scope

1.1.1 Introduction

This standard specifies the procedures to be used in the seismic testing of relays used in power system facilities. The standard is concerned with the determination of the seismic fragility level of relays and also gives recommendations for proof testing.

1.1.2 Purpose

The purpose of this standard is to establish procedures for determining the seismic capabilities of protective and auxiliary relays. These procedures employ what has been called fragility testing in IEEE Std 344-1987 [3].¹ To define the conditions for fragility testing of relays, parameters in three separate areas must be specified. In general, they are

- 1) The electrical settings and inputs to the relay, and other information to define its conditions during the test.
- 2) The change in state, deviation in operating characteristics or tolerances, or other change of performance of the relay that constitutes failure.
- 3) The seismic vibration environment to be imposed during the test.

Since it is not possible to define the conditions for every conceivable application for all relays, those parameters, which in practice encompass the majority of applications, have been specified in this standard. When the application of the relay is other than as specified under any of (1), (2), and (3), or if it is not practical to apply existing results of fragility tests to that new application, then proof testing must be performed for that new case. The use of these capability data will assist in the selection of relays. One number will be used to catalog the seismic capability of a relay. This number is the zero period acceleration level, and is understood to refer to the standard response spectrum shape as defined in this standard. The capability data will help designers of generating stations, substations, and various other power system installations to incorporate the seismic capabilities of the relays into the overall design of these facilities.

¹The numbers in brackets correspond to those of the references in 1.2.