
Preview IEEE Standard PC37.98

“Standard for Seismic Qualification of Protective
Relays and Auxiliaries for Nuclear Facilities”

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Las Vegas, NV

Suresh Channarasappa, Co-Chair
(NPEC and PSRC Joint Working Group SC-2.6 and I10)

Preview IEEE Std PC37.98 Project Overview/Detail

Jointly Sponsored Standard

- Nuclear Power Engineering Committee (NPEC) /
SC-2/Working Group 2.6
- Power System Relay Committee (PSRC)/
Relaying Practices - I Subcommittee/
Working Group I10

Preview IEEE Std PC37.98 Project Overview/Detail - Joint Working Group

Joint Working Group Formed April 2008

NPEC Sub-Committee 2 – Qualification WG- 2.6	PSRC WG-I – Relaying Practices WG-I10
Suresh Channarasappa – Co-Chair, Westinghouse Electric Company	Marie Nemier – Co-Chair, QualTech NP
Melanie Brown , Southern Nuclear Company	Roy Ball , Mersen
Tom Koshy , IAEA	Jeff Burnworth , Basler Electric
Dan Mikow , QualTech NP	Mario Ranieri , Electro Switch
Arnold Offner , Phoenix Contact Sheila Ray , USNRC	

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- Working Group Meetings held:
 - Initial Project Status Presented to SC2 – 11/12/08
 - WG Kick Off (Teleconference) Meeting – 12/3/08
 - WG SC2.6/I10 Regular Meetings: 8
 - WG SC2.6/I10 Teleconference Meetings: 18

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- This project will update IEEE Std C37.98-1987 (R1996).
 - *The standard has not been updated since 1987 and while the overall test methods have not changed, there have been upgrades in the equipment available. There is also a need to expand the standard to address the testing of multifunction relays.*
- **PAR approved: 27-MAR-2008.**
- **PAR expires: 31-DEC-2012**
- Amendment to PAR Approved in March 2012

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- C37.98 Draft 5 Rev0 approved by **PSRC I-Sub Committee-Relaying Practices** to ballot upon approval from SC2 and NPEC.
- **PSRC Main committee** authorized to ballot upon approval from SC2 and NPEC.
- Received approval IEEE to form a ballot pool to expedite the balloting process



Preview IEEE Std PC37.98 Update/Changes: Title

- Based on discussions joint working group decided to seek a PAR revision to support a change in PC37.98 title to better meet user needs.
- **Old Title:** Standard Seismic Testing of Relays
- **New Title:** Standard for Seismic Qualification Testing of Protective Relays and Auxiliaries for Nuclear Facilities.



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- Clause 1: Overview
 - Scope and Purpose revised to address new title
- Clause 2: Normative references
 - Made needed changes to update References
- Clause 3: Definitions
 - Added Definition of Relay Capacity Level
 - Deleted Standard Response Spectrum Definition
 - Corrected ZPA definition to be consistent with IEEE 344
 - Clarified ZPA definition for use in this standard
 - Added Triaxial Test

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- Clause 4: Test Preparation
 - This Clause was reorganized and edited for Clarity. This clause contains following Sub Clauses:
 - ❖ Clause 4.1 Laboratory conditions (Formerly Environmental Conditions)
 - ❖ Clause 4.2 Selection and preparation of samples (Moved from Clause 5.1)
 - ❖ Clause 4.3 Method of mounting
 - ❖ Clause 4.4 Instrumentation

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- Clause 5: Test setup (formerly Test Condition)
 - This Clause was reorganized and edited for Clarity. This clause contains following Sub Clauses:
 - ❖ Clause 5.1 State of the protective and auxiliary relay under test (Previous Title: State of the relay under test). Updated Table 1 Relay settings and inputs to be consistent with IEEE Std C37.105, “IEEE Standard for Qualifying Class 1E Protective Relays and Auxiliaries for Nuclear Power Generating Stations” .

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- Clause 5: Test setup-continued (formerly Test Condition)
 - ❖ Clause 5.2 Protective and auxiliary relay output
(Previous Title: Relay Output)
 - ❖ **Clause 5.2.1 Contact Monitoring:** Revised this section to address multi-contact relay configuration and monitoring required for testing. Made provisions to test selected relay contacts, if justified.
 - ❖ **Clause 5.2.3 Control Power:** Revised to require degraded voltage (80% or manufacture minimum) during testing



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- Clause 5: Test setup (formerly Test Condition)
 - ❖ **Clause 5.2.4 Relay Operate Time:** Provided clarification on how to measure relay operate time.
 - ❖ Clause 5.3 Adjustment of relay during test (Previous Title: Maintenance and adjustment of relay during test)
This section was revised to be consistent with IEEE 344

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- Clause 6: Test methods and acceptance criteria (formerly Test Methods)
 - Reorganized this clause to identify acceptable test methods and acceptance criteria. Moved test response spectra details to Annex B (Normative) and deleted multi-frequency standard response details as it was not needed. This clause contain following sub clauses:
 - ❖ Clause 6.1 Fragility testing
 - ❖ Clause 6.2 Proof testing
 - ❖ Clause 6.3 Generic testing
 - ❖ Clause 6.4 Test acceptance criteria



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- Clause 7: Documentation
 - This clause contain following sub clauses:
 - ❖ Clause 7.1 General
 - ❖ Clause 7.2 Test plan and specifications (added this clause)
 - ❖ Clause 7.3 Test report

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- Clause 8: Generalization of test results
 - Revised this clause for clarity
- Annex A (Informative) Applicable IEC standards [Added]
- Annex B (Normative) Fragility test [Added]
 - Relevant information related to fragility testing moved from Section 6 (Fragility Test Spectra, etc). This Annex contains following sub clauses:
 - ❖ B.1 Introduction
 - ❖ B.2 Seismic test spectra and requirements
 - ❖ B.2 Application of fragility test levels.

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Questions/Comments

