



IEEE Standard for Qualification of Safety-Related Actuators for Nuclear Power Generating Stations

IEEE Power Engineering Society

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Nuclear Power Engineering Committee

382TM

IEEE
3 Park Avenue
New York, NY 10016-5997, USA
15 March 2007

IEEE Std 382TM-2006
(Revision of IEEE Std 382-1996)

IEEE Standard for Qualification of Safety-Related Actuators for Nuclear Power Generating Stations

Sponsor

**Nuclear Power Engineering Committee
of the
IEEE Power Engineering Society**

Approved 6 December 2006

IEEE-SA Standards Board

Abstract: Direction for the implementation of the requirements of IEEE Std 323™-2003 as they apply to the specific features of safety-related actuator qualification are provided. This standard establishes criteria for qualification of safety-related actuators, and actuator components, in Nuclear Power Generating Stations in order to demonstrate their ability to perform their intended safety functions under all required conditions.

Keywords: actuator components, AOV, HOV, MOV, nuclear power generating stations, safety-related actuators, SOV

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Print: ISBN 0-7381-5292-7 SH95602
PDF: ISBN 0-7381-5293-5 SS95602

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Introduction

This introduction is not part of IEEE Std 382-2006, IEEE Standard for Qualification of Safety-Related Actuators for Nuclear Power Generating Stations.

IEEE Std 382-2006, a revision of IEEE Std 382-1996, is based on a review of IEEE Std 382-1996, present practices in equipment qualification, as well as, recent updates to mother standards IEEE Std 323TM-2003 and IEEE Std 344TM-2004.^a

The following issues were clarified or changed in this revision:

- a) Removed “Qualification cases” and Annex B. The environmental parameters provided conflicted with IEEE Std 323-2003, which eliminated double peaks and values for environmental conditions. Moreover, the values provided were not relevant for new plant construction.
- b) Removed Annex C “Rational for normal thermal aging.” The methodology presented in Annex C is not unique to actuators and is covered by IEEE Std 323-2003, IEEE Std 1205TM-2000, and IEEE Std 101TM-1987.
- c) Revised Clause 2 “References.” Updated the references to reflect current revisions of IEEE Std 323-2003 and IEEE Std 344-2004, and added IEEE Std 1205-2000 and IEEE Std 101-1987 to compensate for the removal of Annex C from IEEE Std 382.
- d) Revised 6.3.2 “Test sequence and requirements.” Eliminated the requirement that the test sequence be performed in the sequence presented and clarified that the purpose of the test sequence is to place the actuator in its worst case end-of-life condition prior to the design basis event. Added intermediate inspections between each step in the test sequence to reflect current practices and provide data for condition monitoring. Added cycle aging to the test sequence whereas they were implicitly in the “Qualification cases” Part II of IEEE Std 382-1996.
- e) Added new clause entitled “Cycle aging test” to Part II “Tests” section of this standard to provide guidance as to the purpose and test requirements for the cycle aging test. Added flexibility for the number of cycles performed with the main requirement being that the number of cycles be representative for the application. Added guidance for how to incorporate manufacturer’s recommended maintenance intervals into the qualification process.
- f) Moved definitions that are shared with IEEE Std 323-2003 and IEEE Std 344-2004 to the Glossary in Annex D.
- g) Revised Clause 1 and Clause 4 of this standard to use the same wording and methods as presented in the mother standard IEEE Std 323-2003.
- h) Revised 6.1 “Type test parameter values” to reflect the fact that the environmental parameters have been removed from this standard (i.e., Part II “Qualification cases,” and Annex B of IEEE Std 382-1996 were deleted). This section is now better aligned with IEEE Std 323-2003.

^aInformation on references can be found in Part I, Clause 2.

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IEEE Standard for Qualification of Safety-Related Actuators for Nuclear Power Generating Stations

Part I—Process

1. Overview

1.1 Scope

This standard establishes criteria for qualification of safety-related actuators, and actuator components, in Nuclear Power Generating Stations in order to demonstrate their ability to perform their intended safety functions.

1.2 Purpose

The purpose of this standard is to provide direction for the implementation of the requirements of IEEE Std 323™-2003 as they apply to the specific features of safety-related actuator qualification.

2. Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments or corrigenda) applies.

Code of Federal Regulations, Title 10, Energy-Nuclear Regulatory Commission, Part 100, Jan. 1996.¹

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