



# **Ballot Preview Presentation – P344**

IEEE NPEC / SC-2 (12-01) Meeting  
May 22, 2012

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**“Recommended Practice for  
Seismic Qualification of  
Equipment for Nuclear Power  
Generating Stations”**

# **SC-2 Ballot Preview – P344**

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# **SC-2 Ballot Preview – P344**

## **1. History of IEEE Std 344**

- **Originally issued in 1971**
- **Revised in 1975**
- **Revised in 1987**
- **Revised in 2004**
- **Reaffirmed in 2009**
- **PAR for revision approved June 17, 2010**
- **PAR valid through December 31, 2014.**

# **SC-2 Ballot Preview – P344**

## **2. P344 PAR Summary**

### **Scope of Proposed Revision:**

- **This document describes recommended practices for establishing seismic qualification procedures that will yield quantitative data to demonstrate that the equipment can meet its performance requirements during and/or following one safe shutdown earthquake (SSE) event preceded by a number of operating basis earthquake (OBE) events. The test, analysis, or experienced-based evaluation methods described herein may be used to yield data to demonstrate equipment performance claims or to evaluate and verify performance of devices and assemblies as part of an overall qualification effort.**

# **SC-2 Ballot Preview – P344**

## **2. P344 PAR Summary (Continued)**

### **Purpose of Proposed Revision:**

- **This document provides recommended practices and documentation requirements for seismic qualification of equipment to verify the equipment's ability to perform its safety function during and/or after the specified seismic motions.**

# **SC-2 Ballot Preview – P344**

## **2. P344 PAR Summary (Continued)**

### **Need (Purpose) for the Revision Project:**

- **This project will provide guidance on use of seismic qualification methods and high frequency motion for nuclear power plants.**
- **Address comments received from the U.S. NRC in R.G. 1.100, Rev. 3**
- **Update the standard references as required**
- **To comply with the IEEE 5-year review plan.**

# **SC-2 Ballot Preview – P344**

## **3. Approach**

- **The SC-2.5 WG consists of 25 members with seismic qualification experience and nuclear power plant knowledge.**
  - Majority of WG membership were also members for the 2004 version.
  - 17 Active WG members
  - 8 Corresponding WG members
  - 4 New WG members
  - 1 International WG member
- **P344 draft was developed in accordance with IEEE-SA Style Manual**



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## **3. Approach**

- **IEEE P344 Meetings Held**

- **Five P344 Teleconference WG meetings and one face-to-face meeting was held in 2011 to update the IEEE P344 Draft.**
- **Three P344 Teleconference WG meetings were held in 2012.**
- **Last WG meeting was held on Tuesday, March 20, 2012.**



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## 4. Working Group Membership

25 members

User (11), Producer (5), Consultant (8), Government/Military (1)  
Academic (0) ,General Interest (0)

James Parello, Chair (P)		
Mostafa. Ahmed* (P)	Steve Eisenberg (U)	Karla-Davina Liebig* (P)
Paul D. Baughman (C)	Robert Enis (U)	Bruce M. Lory (C)
Melanie Hamner Brown (U)	Gregory Ferguson* (U)	Marie Nemier (U)
Howard Butler (U)	Gregory Hardy* (U)	Karur S. Parthasarathy* (C)
Suresh Channarasappa (P)	Paul Ibanez* (C)	Daniel J. Pomerening (U)
Garry V. Chapman (U)	Robert Kassawara* (C)	John M. Richards (U)
Pei-Ying Chen (G/M)	Mohsin Khan (C)	Donald Smith (U)
Walter Djordjevic (C)	William LaPay (P)	Richard G. Starck* (C)
*Non-voting members		

# **SC-2 Ballot Preview – P344**

## **5. P344 Table of Contents**

- **Major clause titles:**

- 1. Overview**
- 2. Normative references**
- 3. Definitions**
- 4. General discussion of earthquake environment and equipment response**
- 5. Seismic qualification approach**
- 6. Damping**
- 7. Analysis**
- 8. Testing**

# **SC-2 Ballot Preview – P344**

## **5. P344 Table of Contents (Continued)**

- **Major clause titles:**

**9. Combined analysis and testing**

**10. Experience**

**11. Documentation**

**Annex A. Measurement of ZPA**

**Annex B. Frequency content and stationarity**

**Annex C. Fragility testing**

**Annex D. Test duration and number of cycles**

**Annex E. Statistically independent motions**

**Annex F. Bibliography**

# **SC-2 Ballot Preview – P344**

## **6. Summary of Changes**

- **Revision intended to provide additional guidance on use of experienced based seismic qualification and high frequency motion for nuclear power plants.**
- **Changes Incorporates:**
  - **Revised the Introduction to identify changed areas in the document.**
  - **Class 1E was removed from the title, scope and purpose so the standard can be used to address safety, important to safety, and non-safety equipment.**
  - **Added a definition for seismic category II equipment.**
  - **Updated normative references**

# **SC-2 Ballot Preview – P344**

## **6. Summary of Changes (Continued)**

- **Changes Incorporated (Continued):**

- **Guidance provided to address seismic qualification of equipment for sites with high frequency ground motion.**
- **Clause 7 (Analysis) was expanded to add discussion of the different treatment of rigid and flexible equipment, and to clarify the differences between analysis methods.**
- **Guidance provided in Annex C to determination of equipment fragility level.**
- **Guidance provided in Annex D to address the number of equivalent peak stress for motion frequency beyond 40 Hz.**



# SC-2 Ballot Preview – P344

## 7. Schedule

Date	Event
05/22/12	Preview at SC-2; request permission to preview at NPEC
07/25/12	Preview at NPEC; request permission to ballot
08/2012	Document submittal to IEEE Technical Editors
08/2012	Complete ballot pool
11/2012	Complete ballot
12/2012	Resolve ballot comments
12/2012	Implement Recirculation ballot (if needed)
1/2013	Submit proposed revised standard to RevCom
2013	Publish IEEE Std 344

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## **8. Conclusion**

- **SC-2.5 WG has developed a draft revision to IEEE Std 344-2004 in compliance with its approved PAR.**
- **SC-2.5 WG requests SC-2 permission to proceed to IEEE NPEC for a ballot preview leading to permission to ballot.**