

**RESPONSE TO PUBLIC COMMENTS ON DRAFT STANDARD REVIEW PLAN SECTIONS FROM CHAPTERS 3 and 5:
Design of Structures, Components, Equipment, and Systems, and Reactor Coolant System and Connected Systems**

On August 25, 2015, a Notice of Opportunity for Public Comment was published in the Federal Register (80 FR 51614) on proposed revisions to certain sections in NUREG-0800, Standard Review Plan (SRP), Chapters 3 and 5. These sections have been revised to assist NRC staff review the design of structures, components, equipment, and systems, as well as assess compliance with codes, standards, and code cases for the reactor coolant system and connected systems under Title 10 of the Code of Federal Regulations (10 CFR) Parts 50 and 52. The revisions to these SRP sections reflect no changes in staff position; rather they clarify the original intent of these SRP sections using plain language throughout in accordance with the NRC's Plain Writing Action Plan. Additionally, these revisions reflect operating experience, lessons learned, and updated guidance since the last revision, and address the applicability of regulatory treatment of non-safety systems where appropriate. Comments were received from two (2) organizations, both commenters referred only to Section 3.10, draft Revision 4.

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The NRC staff's review and disposition of the comments is provided in the following table.

Table 1: Section 3.10, Seismic and Dynamic Qualification of Mechanical and Electrical Equipment

No.	Reference	Comment Submissions	NRC Resolution
IEEE 1	General	<p>Reference is made throughout SRP 3.10 to IEEE Std. 344-2004 and ASME QME-2007. This reference is not appropriate for all plants. The applicable revision level for the plant should be based on the design basis for the plant.</p> <p>Proposed Resolution: A note should be added stating that the revision level for industry standards and regulatory requirements under review are controlled by the plant current licensing design basis including the final safety analysis report (FSAR).</p>	<p>As indicated at the bottom of the first page of each Standard Review Plan (SRP) section, the SRP establishes criteria that the NRC staff will use to review applications to construct and operate nuclear power plants. Therefore, the SRP reflects the most recent accepted edition of IEEE and ASME standards for use in the NRC review. For licensed plants, the revisions for industry standards and regulatory documents are controlled by the plant current licensing design basis. The staff does not consider a change to the SRP boiler plate language to be necessary.</p>
IEEE 2	Pg. 3.10-1 / Section I / 3rd Paragraph / 1 st Sentence	<p>Editorial: The first sentence starts out with "The primary review organization...". The sentence talks about "...the licensee's analysis of seismic and dynamic input motion of pipe mounted equipment."</p> <p>Active components are qualified by test or combined test and analysis, not analysis alone.</p> <p>Is this sentence referring to qualification techniques, or about how to derive the appropriate required response spectra?</p> <p>Proposed Resolution: Recommend clarification be added to prevent future misunderstandings.</p>	<p>The NRC agrees with the comment and has revised the statement to clarify that the review is for the derivation of the dynamic input motion.</p>

No.	Reference	Comment Submissions	NRC Resolution
IEEE 3	Pg. 3.10-1 / Section I / 1. "Qualification Criteria"	<p>Editorial: The first sentence starts out with "Qualification criteria are..." is a repeat of the subsection title and is used again in the same sentence</p> <p>Proposed Resolution: Recommend the first sentence starts as follows: "The criteria for qualification..."</p>	The NRC agrees with the comments and has made the recommended change.
IEEE 4	Pg. 3.10-2 / Section I / 2. "Structural Integrity and Functionality of Mechanical and Electrical Equipment"	<p>Safe-shutdown and operating-basis earthquakes are shown as compound words when they are not. The NRC definition for these words shows them as "safe shutdown" and "operating basis".</p> <p>Proposed Resolution: Change spelling to "safe shutdown" and "operating basis".</p>	The NRC agrees with the comment and has made the recommended change.
IEEE 5	Pg. 3.10-3 / Section I / 4. "Experience Database"	<p>The meaning of the following new text is not clear..."the applicant's justification to use an experience-based approach..." The qualification method always needs to adequately demonstrate the necessary qualification. Is this text suggesting that additional justification is necessary to apply an experience-based approach?</p> <p>Proposed Resolution: Remove the additional text or clarify what the "justification" needs to address.</p>	The NRC agrees with the comment and has made the recommended change.
IEEE 6	Pg. 3.10-3 / Section I / Review Interfaces / 4.	<p>The description of the content of SRP 3.7.2 and 3.7.3 may require additional detail.</p> <p>Proposed Resolution: Recommend the following revision:</p> <p>"SRP Sections 3.7.2 and 3.7.3 address the seismic and dynamic input motions for all seismic Category I Seismic System Analysis and Seismic Subsystem Analysis, e.g., all floor-, wall-, and pipe- mounted equipment.</p>	The NRC agrees with the comment and has made the recommended change.

No.	Reference	Comment Submissions	NRC Resolution
IEEE 7	Pg. 3.10-4 / Section I / Review Interfaces/ 10.	Suggest changing "performed under" to "based on" for clarification. Proposed Resolution: Recommend changing; "...is performed under SPR Chapter 8." to "...is based on SRP Chapter 8."	The NRC agrees with the comment and has made the recommended change.
IEEE 8	Pg. 3.10-4 / Section II / Requirements / 3.	This SRP Section is intended to address seismic and dynamic qualification activities. The change in this paragraph appears to bring in the "environmental conditions" under GDC 4 "as well as dynamic affects". Proposed Resolution: In this SRP Section, it would seem more appropriate to focus on the dynamic affects. The environmental conditions are addressed elsewhere. It is possible that the "relevant requirements" portion of the introductory phrase of this numbered list might direct the focus to the dynamic affects but why create the confusion. Clarification is needed.	The NRC agrees with the comment and has clarified the statement to limit review scope to dynamic effects.
IEEE 9	Pg. 3.10-5 / Section II / Requirements / 6.	This SRP 3.10 should be dealing specifically with seismic and dynamic qualification requirements. Environmental qualification requirements should be addressed in SRP 3.11. Proposed Resolution: Recommend revising the wording to; "...as it relates to seismic and dynamic qualification required for the electric equipment."	The NRC agrees with the comment and has removed 10 Code of Federal Regulation 50.49, "Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants" from the requirement.
IEEE 10	Pg. 3.10-5 / Section II / Requirements / 10	Atomic Energy Act is first defined as an "acronym in subsection II. Requirements (9.)" Proposed Resolution: Recommend replacing the wording "Atomic Energy Act" with "AEA."	The NRC agrees with the comment and has replace "AEA" with "Atomic Energy Act."

No.	Reference	Comment Submissions	NRC Resolution
IEEE 11	Pg. 3.10-8 / Section II / SRP Acceptance Criteria / 1.A.viii	Suggest changing "fixture" to "test fixture" for clarity Proposed Resolution: Recommend changed; 'The fixture design...' to "The test fixture design..."	The NRC agrees with the comment and has changed "fixture" to "test fixture" for clarity.
IEEE 12	Pg. 3.10-8 / Section II / SRP Acceptance Criteria / 1.A.xiii	Reference to RG 1.61 is for the selection of damping values for equipment to be seismically qualified by analysis. The damping values found in RG 1.61 are not applicable to seismic qualification by test. IEEE Std 344-1987 should not be deleted as a source document for damping values. The IEEE Std 344 is the source document for damping used in seismic qualification testing. Proposed Resolution: Recommend reinstating IEEE Std 344-1987 as a source document for damping values used in test. Recommend revising the wording to "Selection of damping values for equipment to be seismically qualified by analysis should be made in accordance with RG 1.61,..."	The NRC agrees with the comment that damping values in RG 1.61 are for equipment to be seismically qualified by analysis, and has referenced IEEE Std 344-2004 for damping values used in equipment seismic qualification testing.
IEEE 13	Pg. 3.10-10 / Section II / SRP Acceptance Criteria / 1.B.iii	Statement is made: "Supports should be tested with equipment installed or with a dummy simulating the equivalent equipment inertial mass effects and dynamic coupling to the support." This statement implies that structural support systems should always be seismically tested with equipment installed or with dummy masses in place. There are instances where the support system can be seismically analyzed instead of including it in a seismic test. In this scenario seismic qualification consists of a combination of analysis and testing. There are some support structures that are either too large and/or too heavy to be accommodated on a shake table.	The NRC agrees with the comment and has made the changed as suggested.

No.	Reference	Comment Submissions	NRC Resolution
		<p>There also is the issue of cost since seismically testing an elaborate structural support system may be much more expensive than seismic analysis.</p> <p>Proposed Resolution: Recommend revise the statement to read: "Supports, if qualified by testing, should be tested with equipment installed or with a dummy simulating the equivalent equipment inertial mass effects and dynamic coupling to the support. If the equipment is installed in a nonoperational mode for the support test, the response in the test at the equipment mounting location should be monitored and characterized in the manner stated in Subsection 1.1.A.iii above. In such a case, equipment should be tested separately for functionality, and the actual input motion to the equipment in this test should be higher in amplitude and frequency content than the monitored response from the support test. If the support structure or dummy is too large and/or too heavy for shake table test then only equipment may be seismic tested based on simulated seismic input response at the equipment/support interface mounting location. The support structure may then be seismically analyzed.</p>	
IEEE 14	Pg. 3.10-10 / Section II / SRP Acceptance Criteria / 1.B.iii / 2nd Sentence	<p>Editorial. Subsection "1.1.A.iii" should be "II.1.A.iii".</p> <p>Proposed Resolution: Recommend changing Subsection "1.1.A.iii" should be "II.1.A.iii".</p>	The NRC agrees with the comment and has made the change as suggested.
IEEE 15	Pg. 3.10-11 / Section II / SRP Acceptance Criteria/ 3. / 2nd Paragraph.	<p>The new paragraph starting with "The qualification of equipment by earthquake and/or test experience approach should not be used without adequate justification." appears to add new, arbitrary criteria on the use of earthquake experience-based methods. The IEEE 344 Standard provides detailed, measurable criteria for using the method and the applicant either meets those criteria or not. If the criteria in the Standard are met, then the method is acceptable. If the criteria are not met, then the method shouldn't be used. Describing a method as "difficult" to implement is not "helpful regulatory language. The IEEE 344 Standard specifies how much data is necessary so</p>	The NRC agrees with the comment. The NRC's position on the use of both earthquake and test experience approaches are already laid out in Regulatory Guide (RG) 1.100, Revision 3, "Seismic Qualification of Electric and Mechanical Equipment for Nuclear Power Plants." Draft Revision 4 of this SRP has been

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		<p>there is little value in the SRP suggesting that ""generally, there is not sufficient credible information"". The editorial comments in the SRP do not provide information that helps the user understand how the qualification method will be reviewed. Seismic qualification of SSCs using seismic test experience (similarity approach) is used quite often today as well as in the past without such elaboration in this standard. Utilities and 3'd party suppliers and OEMs often look at their existing seismic qualification test records and ascertain if they have sufficient reasonable assurance that the SSC being seismically qualified in a specific case can be credited as being traceable to the prior seismic test record of an identical or similar SSC. The group performing this qualification by test experience is obligated to provide objective evidence that such traceability exists between the SSC test previously and the SSC crediting the seismic test done in the past as the basis for its seismic qualification today. The use of seismic qualification via previous seismic test experience should be acknowledged separately from the method of seismic qualification via earthquake experience.</p> <p>Proposed Resolution: The SRP should identify the acceptance criteria necessary to evaluate the application. IEEE 344 Standard already identifies the acceptance criteria and therefore, this paragraph should be removed. Recommendation: Add a separate new SRP section for seismic qualification by test experience and if there is specific guidance by NRC on use of previous seismic testing then this would be the place to identify what those conditions are. Seismic qualification by previous testing shall be kept separate from seismic qualification by earthquake experience.</p>	<p>revised to replace the new language with a pointer to RG 1.100.</p>

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IEEE 16	Pg. 3.10-11 / Section II / 3	<p>Statement is made;...most importantly, (4) generally, there is not sufficient credible information from the earthquake experience database to provide assurance that certain active mechanical and electrical equipment will function properly during earthquakes. "</p> <p>This statement is an opinion instead of a rule, and lacks a factual basis behind it. As written, if one were to agree with this opinion, it implies that one cannot use earthquake experience to seismically qualify passive mechanical and electrical equipment.</p> <p>Proposed Resolution: Recommend removing item 4 from the seismic record.</p>	The NRC agrees with the comment and has revised draft Revision 4 of this SRP to remove item 4.
IEEE 17	Pg. 3.10-13 / Section II / 6.A.ii	<p>Statement is made; "Note: Earthquake and/or test experience data should not be used without adequate justification, and use of this seismic qualification of mechanical and electrical equipment is subject to more detailed review by the NRC staff. "</p> <p>Proposed Resolution: Recommend deleting the concept of test experience data from this discussion.</p> <p>Separate seismic qualification via seismic test experience from that of earthquake experience. Use of previous seismic test experience is an industry-recognized approach and, when used, it is up to the 10 CFR 50 Appendix B supplier/OEM to provide the reasonable assurance that the seismic test results apply to a new SSC being seismically qualified via a previous seismic test.</p>	The NRC agrees with the comment and has replaced the note in draft Revision 4 of this SRP with a pointer to RG 1.100, Revision 3, which discusses the concerns of using test experience data. This NRC position in RG 1.100 has been in place since 2009.
IEEE 18	Pg. 3.10-13 / Section II / SRP Acceptance Criteria / 6.C.iii / 2nd Paragraph / 2n Sentence.	<p>Editorial. "item 11.6.A. ii" should be "Subsection 11.6.A.ii".</p> <p>Proposed Resolution: Recommend changing "item" to Subsection".</p>	The NRC staff agrees with the comment and has revised the SRP as suggested.

No.	Reference	Comment Submissions	NRC Resolution
IEEE 19	Pg. 3.10-14 / Section II / Technical Rationale / 2. / 1st Paragraph	<p>SSCs important to safety are designed to withstand the effects of design basis natural phenomena as defined in Plant FSAR. Presently the wording is open ended and the wording "design basis" should be added as a minimum.</p> <p>Proposed Resolution: Recommend revising the wording to; "Compliance with GDC 2 requires that SSCs important to safety be designed to withstand the effects of design basis natural phenomena.</p>	The NRC staff agrees with the comment and has revised the SRP as suggested.
IEEE 20	Pg. 3.10-16 / Section III	<p>Statement is made;"...most importantly, (4) generally, there is not sufficient credible information from the earthquake experience database to provide assurance that certain active mechanical and electrical equipment will function properly during earthquakes."</p> <p>This statement is an opinion instead of a rule, and lacks a factual basis behind it. As written, if one were to agree with this opinion, it implies that one cannot use earthquake experience to seismically qualify passive mechanical and electrical equipment.</p> <p>Proposed Resolution: Remove the additional justification requirements.</p>	See response to IEEE 16 above.
IEEE 21	Pg. 3.10-16 / Section II / Technical Rational / 6. / 2"d Paragraph.	<p>Editorial.</p> <p>1.) Subsection "I.1" should be "II.1"</p> <p>2.) "Subsection I.3" should be "II.3"</p> <p>Proposed Resolution: Recommend changing ;</p> <p>1.) Subsection "I.1" should be "II.1"</p> <p>2.) "Subsection I.3" should be "II.3"</p>	The NRC staff agrees with the comment and has revised the SRP as suggested.

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IEEE 22	Pg. 3.10-18 / Section III / 2.E	<p>Editorial.</p> <p>References 10 and 11 are not the correct references for evaluating the functional assurance programs. Reference should be made to References 12 and 13.</p> <p>Proposed Resolution: Recommend changing References "10 and 11" to "12 and 13".</p>	The NRC staff agrees with the comment and has revised the SRP as suggested.
IEEE 23	Pg. 3.10-18 / Section III / 2.F	<p>Editorial.</p> <p>Subsection "II.2.E" should be "III.2.E".</p> <p>Proposed Resolution: Recommend Changing;</p> <p>Subsection "II.2.E" should be "III.2.E".</p>	The NRC staff agrees with the comment and has revised the SRP as suggested.
Westinghouse 1	Pg. 3.10-1 / Section I / 1. "Qualification Criteria"	<p>Editorial Comment - It is not necessary to start the first sentence "Qualification criteria are..." since the subsection title is "Qualification Criteria" and these words are used later in the first sentence as "criteria for qualification"..</p> <p>Recommended Change - Remove the redundant use of the words "qualification criteria" by starting the first sentence with: "The criteria for qualification..."</p>	See Comment IEEE 3 above
Westinghouse 2	Pg. 3.10-2 / Section II / 2. "Structural Integrity and Functionality of Mechanical and Electrical Equipment"	<p>Editorial Comment - Safe shutdown and operating basis earthquakes are used in this document as compound words within this document but in IEEE Std 344, other industry/regulatory documents, and NRC Definitions document they are not specified as compound words.</p> <p>Recommended Change - Spelling change: a.) "safe-shutdown" to "safe shutdown" and b.) "operating-basis" to "operating basis"</p>	See Comment IEEE 4 above

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Westinghouse 3	Pg. 3.10-4 / Section II / Requirements / 3.	<p>Technical Comment - It is unclear why this subsection of SRP 3.10 is crossing over into SRP 3.11. This SRP as it relates to GDC 4 should be focused on dynamic qualification activities. SRP 3.11 is used to address environmental conditions and environmental qualification.</p> <p>Recommended Change - Clarify wording to address significant dynamic effects as identified in GDC 4.</p>	See Comment IEEE 9 above
Westinghouse 4	Pg. 3.10-6 / Section II / SRP Acceptance Criteria / 1.	<p>Technical Comment - Reference is made in this subsection to IEEE Std. 344-2004 and ASME QME-2007 and in other subsections. These industry documents may be the latest revisions accepted by the NRC for implementation but they are not the required design basis for all nuclear plants.</p> <p>Recommended Change - Additional wording is needed to direct the reader to the design basis of the plant (e.g. Plant Final Safety Analysis Report (FSAR)) for specific applicable regulatory and industry requirements.</p>	See IEEE Comment 1 above
Westinghouse 5	Pg. 3.10-8 / Section II / SRP Acceptance Criteria / 1.A.xiii	<p>Technical Comment - It is unclear why was IEEE Std 344-1987 deleted as a source for damping values? RG 1.61 defines the damping values for equipment to be seismically qualified by analysis. The damping values found in RG 1.61 are not applicable to seismic qualification by test. IEEE Std 344-1987 defines the recommended damping value for seismic testing.</p> <p>Recommended Change - IEEE Std 344-1987 should not be deleted as a source for damping. If the intent is to make the wording for qualification by analysis then the following wording should be considered: "Selection of damping values for equipment to be seismically qualified by analysis should be made in accordance with RG 1.61, "Damping Values for Seismic Design of Nuclear Power Plants.""</p>	See IEEE Comment 12 above

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Westinghouse 6	Pg. 3.10-10 / Section II / SRP Acceptance Criteria / 1.B.iii	<p>Technical Comment - Equipment may not be tested with the supports installed or with a dummy mass simulation due to shake table limitations. When test alone is not possible then the equipment qualification is based on test and analysis. In this case the support structure is seismically analyzed to demonstrate acceptance.</p> <p>Recommended Change - Wording should be revised to allow the equipment and its supports to be qualified by testing and analysis.</p>	See Comment IEEE 13 above
Westinghouse 7	Pg. 3.10-10 / Section II / SRP Acceptance Criteria / 1.B.iii / 2nd Sentence	<p>Editorial Comment - Subsection "I.1.A.iii" should be "II.1.A.iii".</p> <p>Recommended Change - Change: Subsection "I.1.A.iii" to "II.1.A.iii".</p>	See Comment IEEE 14 above
Westinghouse 8	Pg. 3.10-13 / Section II / SRP Acceptance Criteria / 6.C.iv.	<p>Editorial Comment - Subsection "item II.6.A.ii" should be "Subsection II.6.A.ii".</p> <p>Recommended Change - Change: "item" to Subsection"</p>	See Comment IEEE 18 above
Westinghouse 9	Pg. 3.10-14 / Section II / Technical Rationale / 2. /11st Paragraph	<p>Technical Comment - The wording changed from "designed to withstand the effects of expected natural phenomena" to "designed to withstand the effects of natural phenomena"? The word "expected" was deleted which removes a connection to the plant design basis. Structures, Systems, and Components (SSCs) are designed to withstand the effects of design basis natural phenomena as defined in plant design basis documentation.</p> <p>Recommended Change - Change back to the original wording or change to "designed to withstand the effects of design basis natural phenomena"</p>	See Comment IEEE 19 above

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Westinghouse 10	Pg. 3.10-16 / Section II / Technical Rational / 6./ 2nd Paragraph.	Editorial Comment – a.) Subsection "I.1" should be "II.1" and b.) "Subsection I.3" should be "II.3" Recommended Change - Change: a.) Subsection "I.1" to "II.1" and b.) "Subsection I.3" to "II.3"	See Comment IEEE 21 above
Westinghouse 11	Pg. 3.10-18 / Section III / 2.E	Editorial Comment - Reference should be References 12 and 13 for evaluation of functional assurance programs. Presently References 10 and 11 are defined. Recommended Change - Change: "References 10 and 11" to "Reference 12 and 13".	See Comment IEEE 22 above
Westinghouse 12	Pg. 3.10-18 / Section III / 2.F	Editorial Comment - Subsection "II.2.E" should be "III.2.E". Recommended Change - Change: Subsection "II.2.E" to "III.2.E".	See Comment IEEE 23 above