



U.S. NUCLEAR REGULATORY COMMISSION  
**STANDARD REVIEW PLAN**  
OFFICE OF NUCLEAR REACTOR REGULATION

### 3.2.1 SEISMIC CLASSIFICATION

#### REVIEW RESPONSIBILITIES

Primary - Mechanical Engineering Branch (EMEB)<sup>1</sup>

Secondary - Civil Engineering and Geosciences Branch (ECGB)<sup>2</sup>

#### I. AREAS OF REVIEW

General Design Criterion 2 of 10 CFR Part 50, Appendix A, in part, requires that structures, systems, and components (SSCs)<sup>3</sup> important to safety be designed to withstand the effects of earthquakes without loss of capability to perform their safety functions. The earthquake for which these plant features are designed is defined as the safe shutdown earthquake (SSE) in 10 CFR Part 100, Appendix A. The SSE is based upon an evaluation of the maximum earthquake potential and is that earthquake which produces the maximum vibratory ground motion for which structures, systems, and components<sup>4</sup> important to safety are designed to remain functional. Those plant features that are designed to remain functional if an SSE occurs are designated seismic Category I in Regulatory Guide 1.29.

The EMEB<sup>5</sup> reviews the seismic classification of those structures, systems, and components<sup>6</sup> (including their foundations and supports) which are important to safety and are designed to withstand, without loss of function, the effects of a SSE and specified as seismic Category I by the applicant's<sup>7</sup> in his safety analysis report (SAR). The review covers identification of SSCs that are not required to remain functional following a seismic event, but whose failure could reduce the functioning of any Category I SSCs to an unacceptable safety level, or could result in incapacitating injury to control room occupants, and therefore must be seismically qualified.<sup>8</sup> In addition, the EMEB reviews the identification of radioactive waste

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#### USNRC STANDARD REVIEW PLAN

Standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for the review of applications to construct and operate nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. The standard review plan sections are keyed to the Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants. Not all sections of the Standard Format have a corresponding review plan.

Published standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555.

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management SSCs that require seismic design considerations as specified in Regulatory Guide 1.143.<sup>9</sup>

This review which is coordinated with each branch that has primary review responsibility for these plant features is performed for both construction permit (CP) and operating license (OL) applications. The EMEB<sup>10</sup> review of seismic Category I items includes the following plant features: structures, dams, ponds, cooling towers, reactor internals, fluid systems important to safety that are identified in Regulatory Guide 1.26, safety-related instrument sensing lines that are identified in Regulatory Guide 1.151,<sup>11</sup> ventilation systems, standby diesel generator auxiliary systems, fuel handling systems, and cranes.

The applicant's proposed seismic classification may in part be presented in the form of a table<sup>(1)12</sup> which identifies those SSCs~~structures, systems and components~~<sup>13</sup> that are designated seismic Category I. The table should identify all activities affecting the safety-related functions of these seismic Category I plant features which should also meet General Design Criterion 1 and<sup>14</sup> the pertinent quality assurance requirements of 10 CFR Part 50, Appendix B. Details of the seismic classification of these plant features may be shown on plot plans, general arrangement drawings, and piping and instrumentation diagrams.

Where portions of structures and fluid systems are seismic Category I they also must be clearly identified. For fluid systems important to safety, the classification tables in the SAR should identify system components such as pressure vessels, heat exchangers, storage tanks, pumps, piping, and valves, have suitable footnotes defining interfaces, and be in sufficient detail so that there is a clear understanding of the extent of those portions of the system that are classified as seismic Category I.

#### Review Interfaces:<sup>15</sup>

The EMEB<sup>16</sup> also performs the following reviews for the SRP sections indicated:

1. Determines the acceptability of the quality group classification of system components in accordance with SRP Section 3.2.2. This information may be combined with the information in this SRP section which may result in cross-referencing rather than repetition of the information.
2. Verifies that systems and components important to safety that are designated as seismic Category I items are designed in accordance with the regulatory guides, industry codes and standards that are referenced in SRP Sections 3.2.2, and 3.9.1 through 3.9.3,~~and~~<sup>17</sup>
3. Determines the adequacy of the inservice testing program for pumps and valves in accordance with SRP Section 3.9.6.

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(1) ~~See Appendices C and D, SRP Section 3.2.2 - "System Quality Group Classification," for guidance.~~

4. Assesses the seismic qualification of equipment in accordance with SRP Section 3.10.<sup>18</sup>

In addition, the EMEB will coordinate with other branches' evaluations that interface with the overall review as follows:

1. The Plant Systems Branch (SPLB) reviews the radioactive waste management SSCs in accordance with SRP Sections 11.2 through 11.4. The SPLB also reviews the seismic design of fire protection systems installed in safety related areas under SRP Section 9.5.1.<sup>19</sup>
2. The Quality Assurance and Maintenance Branch (HQMB) reviews the quality assurance programs for design, construction and operation in accordance SRP Sections 17.1, 17.2 and 17.3, respectively.<sup>20</sup>

For those areas of review identified above as being part of the review under other SRP sections, the acceptance criteria necessary for the review and the methods of their application are contained in the referenced SRP sections.<sup>21</sup>

## II. ACCEPTANCE CRITERIA

Acceptability ~~criteria~~<sup>22</sup> is based on meeting the relevant requirements of the following regulations:

1. General Design Criterion 1, and the pertinent quality assurance requirements of 10 CFR Part 50, Appendix B, as they relate to applying quality assurance requirements to activities affecting the safety-related functions of SSCs designated as seismic Category I commensurate with their importance to safety.<sup>23</sup>
- ~~12.~~<sup>24</sup> ~~10 CFR Part 50, Appendix A,~~<sup>25</sup> General Design Criterion 2, as it relates to the requirements that SSCs ~~structures, systems, and components~~<sup>26</sup> important to safety shall be designed to withstand the effects of earthquakes without loss of capability to perform necessary safety functions.
3. General Design Criterion 61, as it relates to the design of radioactive waste systems, and other systems which may contain radioactivity, to assure adequate safety under normal and postulated accident conditions.<sup>27</sup>
- ~~24.~~<sup>28</sup> 10 CFR Part 100, Appendix A, as it relates to certain SSCs ~~structures, systems, and components~~<sup>29</sup> being designed to withstand the Safe Shutdown Earthquake (SSE) and remain functional. ~~These plant features are those necessary to assure:~~
  - ~~a. the integrity of the reactor coolant pressure boundary,~~
  - ~~b. the capability to shut down the reactor and maintain it in a safe shutdown condition,~~
  - ~~c. the capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to the guideline exposures of 10 CFR Part 100.~~<sup>30</sup>

To meet the requirements of General Design Criterion 2 and 10 CFR Part 100, Appendix A, ~~the following regulatory guide is used:~~ Regulatory Guide 1.29, "Seismic Design Classification" is used.<sup>31</sup> This guide describes an acceptable method of identifying and classifying those plant features that should be designed to withstand the effects of the SSE. Regulatory Guide 1.151 provides guidance with regard to seismic design requirements and classification of safety-related instrumentation sensing lines.<sup>32</sup>

Regulatory Guide 1.143 provides guidance used to establish the seismic design requirements of radioactive waste management SSCs to meet the requirements of GDCs 2 and 61 as they relate to designing these SSCs to withstand earthquakes. The guide identifies several radioactive waste SSCs requiring some level of seismic design consideration.<sup>33</sup>

#### Technical Rationale:<sup>34</sup>

The technical rationale for application of the above acceptance criteria to seismic classification is discussed in the following paragraphs.

1. Compliance with General Design Criterion 1 and 10 CFR Part 50, Appendix B, require that SSCs important to safety be designed, fabricated, erected, and tested to quality standards commensurate with the importance of the safety functions to be performed. GDC 1 requires, in part, that a Quality Assurance Program be established and implemented in order to provide adequate assurance that SSCs important to safety will satisfactorily perform their safety functions. 10 CFR 50, Appendix B, establishes quality assurance program requirements for the design, construction, and operation of SSCs important to safety. The requirements of 10 CFR 50, Appendix B apply to activities affecting the safety-related functions of those SSCs, including those SSCs defined by the guidance of Regulatory Guide 1.29 as seismic Category I SSCs. Specifying and using proven quality standards and requirements for the design of SSCs important to safety minimizes the potential for failures of those SSCs, including seismic Category I SSCs, that prevent or mitigate the consequences of postulated accidents that could cause undue risk to the health and safety of the public.
2. Compliance with General Design Criterion 2 requires that nuclear power plant SSCs important to safety be designed to withstand the effects of natural phenomena, including earthquakes, without loss of capability to perform their safety functions. Also, compliance with 10 CFR Part 100, Appendix A, requires that certain SSCs be designed to withstand the Safe Shutdown Earthquake (SSE) and remain functional. The SSCs are those necessary to ensure: (1) the integrity of the reactor coolant pressure boundary; (2) the capability to shut down the reactor and maintain it in a safe shutdown condition; or (3) the capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to the guideline exposures of 10 CFR Part 100. Regulatory Guide 1.29 describes an acceptable method of identification and classification of those SSCs that should be designed to withstand the SSE.<sup>35</sup> Regulatory Guide 1.29 states that systems and components required for safe shutdown, including their foundations and supports, are designated as seismic Category I and should be designed to withstand the effects of the SSE and remain functional. In addition, this guide recommends that systems, other than radioactive waste management systems, that

contain, or may contain, radioactive material and whose postulated failure would result in potential offsite whole body (or equivalent) doses that are more than 0.005 Sv (0.5 rem)<sup>36</sup>, should also be classified as seismic Category I. Compliance with Regulatory Guide 1.29 assures that, by designing the SSCs identified in the guide to withstand the effects of an SSE, a designed-in safety margin is provided for bringing the reactor to a safe, shutdown condition, while also reducing potential offsite doses from seismic events. Regulatory Guide 1.151 positions C.2 and C.3 provide guidance for the proper seismic classification of safety-related instrumentation sensing lines. Application of this guidance ensures that the instrument sensing lines used to actuate or monitor safety-related systems will be appropriately classified and will be capable of withstanding the effects of the SSE. Compliance with the above requirements and guidance assures that the SSCs important to safety that are required to function during an SSE are properly classified as seismic Category I and will function during such events enabling accomplishment of the safety functions described above.

3. Compliance with General Design Criterion 61 requires that radioactive waste management systems, and other systems which may contain radioactivity, be designed to assure adequate safety under normal and postulated accident conditions. Postulated conditions considered with respect to seismic design and classification of SSCs include losses of SSC integrity and potential radioactive releases as a result of seismic events. Regulatory Guide 1.143 provides acceptable methods and guidance relative to seismic design and classification for radioactive waste management SSCs. This Regulatory Guide provides classification information and design criteria to assure that components and structures used in radioactive waste management systems are designed, constructed, installed and tested in a manner that protects the health and safety of the public and the plant operating personnel. Designing and constructing the radioactive waste management SSCs to meet the requirements of GDC 61 and the guidance on seismic design and classification contained in Regulatory Guide 1.143 provides assurance that SSCs containing radioactivity will be properly classified and radiation exposures as a result of seismic events will be as low as reasonably achievable.

### III. REVIEW PROCEDURES

Selection and emphasis of various aspects of the areas covered by this SRP section will be made by the reviewer on each case. The judgment on the areas to be given attention during the review is to be based on an inspection of the material presented, the similarity of the material to that recently reviewed on other plants, and whether items of special safety significance are involved.

Regulatory Guide 1.29, which identifies ~~structures, systems, and components~~ SSCs<sup>37</sup> of light-water-cooled reactors on a functional basis, is the principal document used for identifying those plant features important to safety which, as a minimum, should be designed to seismic Category I requirements. Regulatory Guide 1.151 provides guidance for the seismic classification of safety-related instrument sensing lines.<sup>38</sup> Regulatory Guide 1.29 also recommends that systems, other than radioactive waste management systems, that contain, or may contain, radioactive material and whose postulated failure would result in conservatively calculated potential offsite whole body (or equivalent to any part of the body) doses that are

more than 0.005 Sv (0.5 rem)<sup>39</sup>, should also be classified as seismic Category I. Regulatory Guide 1.143 provides seismic design requirements for radioactive waste management system SSCs. Those radioactive waste management systems requiring seismic design considerations should be clearly identified.<sup>40</sup>

The staff review should establish whether the applicant has indicated compliance with Regulatory Guides 1.29, 1.143 and 1.151<sup>41</sup> in the SAR. Where there are differences with respect to the Guides, these differences should be identified. ~~For General Electric BWR/6 main steam lines and main feedwater lines, an acceptable alternate seismic classification to that currently specified in Position C.1.e of Regulatory Guide 1.29, is provided in Figure B-1 attached to Appendix B of SRP Section 3.2.2.~~<sup>42</sup>

The information in the SAR identifying seismic Category I ~~structures, systems, and components~~SSCs<sup>43</sup> is reviewed for completeness and to assure there is sufficient detail to permit identification of specific items. This may include a review of the SAR text, tables, plot plans, general arrangement drawings, structural drawings, and piping and instrumentation diagrams, as appropriate. Where portions of a system are classified seismic Category I, the boundary limits of that portion of the system designed to Category I requirements ~~is~~are<sup>44</sup> reviewed on the piping and instrumentation diagrams. For fluid systems which are partially seismic Category I, the Category I portion of the system should extend to the first seismic restraint beyond the isolation valves which isolate that part which is seismic Category I from the non-seismic portion of the system. At the interface between seismic and non-seismic Category I piping systems, the seismic Category I dynamic analysis will be extended to either the first anchor point in the non-seismic system or to sufficient distance in the non-seismic system so as not to degrade the validity of the seismic Category I analysis.<sup>45</sup> In addition, where portions of a structure are classified seismic Category I, those portions of the building foundations and supports designed to Category I requirements are identified on the plant arrangement drawings. The interfaces between components and associated support structures designed to seismic Category I requirements are then checked to assure compatibility.

The reviewer verifies that the seismic classification of safety-related instrumentation sensing lines is in accordance with the guidance contained in Regulatory Guide 1.151 positions C.2 and C.3.<sup>46</sup>

~~Structures, systems, and components~~SSCs<sup>47</sup> that are classified seismic Category I are also reviewed to assure that these plant features are within the scope of an applicant's Quality Assurance Program. This Quality Assurance Program should be in compliance with the pertinent Quality Assurance requirements of 10 CFR Part 50, Appendix B. ~~Regulatory Guide 1.29 is used for identifying those plant features important to safety that are within the scope of this Appendix B Quality Assurance Program.~~ In accordance with Regulatory Guide 1.29, the pertinent quality assurance requirements of Appendix B to 10 CFR Part 50 should be applied to all activities affecting the safety-related functions of seismic Category I SSCs.<sup>48</sup> If there are items designated seismic Category I that are not identified as within the scope of the Appendix B Quality Assurance Program, this information is transmitted to the ~~Quality Assurance Branch~~HQMB<sup>49</sup> for resolution of the issue. The seismic classification review of ~~structures, systems, and components~~SSCs<sup>50</sup> important to safety and the review verifying that these plant features are constructed in accordance with a 10 CFR Part 50, Appendix B Quality Assurance

Program is normally performed concurrently with the quality group classification review of SRP Section 3.2.2.

Other SSCs that may be required for operation of the facility (excluding electrical features) need not be designed to seismic Category I requirements. Those SSCs not required to be designed to seismic Category I requirements include those portions of seismic Category I systems such as vent lines, drain lines, fill lines and test lines on the downstream side of isolation valves and those portions of the system not required to perform a safety function.<sup>51</sup>

Classification guidelines for selected BWR main steam system SSCs are addressed in SRP Section 3.2.2 Appendix A. For General Electric BWR/6 main steam lines and main feedwater lines, an acceptable alternate seismic classification to that currently specified in Position C.1.e of Regulatory Guide 1.29 is provided in Figure B-1 attached to Appendix B of SRP Section 3.2.2. For BWRs that do not include a main steam isolation valve leakage control system, and for which main steam line fission product hold-up and retention is credited in the analysis of design basis accident radiological consequences, an acceptable alternative seismic classification for the main steam lines and associated systems is provided in Appendix A of SRP Section 3.2.2.<sup>52</sup>

The information in the SAR is reviewed to identify SSCs whose continued function is not required following a seismic event, but whose failure could reduce the functioning of any seismic Category I feature to an unacceptable safety level, or could result in incapacitating injury to control room personnel, to assure that such items will be analyzed and designed to maintain their integrity under seismic loading from the SSE.<sup>53</sup>

The information in the SAR is also reviewed to identify radioactive waste management system SSCs to assure that those SSCs requiring seismic design considerations have been identified consistent with those systems specified in Regulatory Guide 1.143.<sup>54</sup>

In the event an applicant intends to take exception to Regulatory Guides 1.29, 1.143 and/or 1.151, but<sup>55</sup> has not provided an adequate justification for his resultant proposed seismic classifications<sup>56</sup>, questions are prepared by the staff which may require additional documentation or analysis to establish an acceptable basis for his-the<sup>57</sup> proposed seismic classification. Staff comments may also be prepared requesting clarification in order to assure a clear understanding of the seismic classification assigned to a system by the applicant.

If the staff's questions are not resolved in a satisfactory manner, a staff position is taken requiring conformance to Regulatory Guides 1.29, 1.143, 1.151 and with the positions discussed in the above Review Procedures.<sup>58</sup>

For standard design certification reviews under 10 CFR Part 52, the procedures above should be followed, as modified by the procedures in SRP Section 14.3 (proposed), to verify that the design set forth in the standard safety analysis report, including inspections, tests, analysis, and acceptance criteria (ITAAC), site interface requirements and combined license action items, meet the acceptance criteria given in subsection II. SRP Section 14.3 (proposed) contains procedures for the review of certified design material (CDM) for the standard design, including the site parameters, interface criteria, and ITAAC.<sup>59</sup>

#### IV. EVALUATION FINDINGS

The staff's review should verify that adequate and sufficient information is contained in the SAR and amendments to arrive at conclusions of the following type, which are to be included in the staff's safety evaluation report:

Structures, systems and components (SSCs)<sup>60</sup> (excluding electrical features) that are important to safety and that are required to withstand the effects of a safe shutdown earthquake and remain functional have been classified as seismic Category I items and have been identified in an acceptable manner in Tables 3.X.X and 3.X.X, and on system piping and instrumentation diagrams in the SAR. Other structures, systems and components<sup>61</sup> that may be required for operation of the facility (excluding electrical features) need not be designed to not identified as seismic Category I requirements, but whose failure could reduce the functioning of any seismic Category I feature to an unacceptable safety level or injure control room personnel, are identified for analysis to assure the SSE will not cause such failures. The structures, systems and components not required to be designed to seismic Category I include those portions of Category I systems such as vent lines, drain lines, fill lines and test lines on the downstream side of isolation valves and those portions of the systems which are not required to perform a safety function.<sup>62</sup>

The staff concludes that the structures, systems and components<sup>63</sup> important to safety that are within the scope of the Mechanical Engineering Branch this review have been properly classified, are within the scope of the applicant's Quality Assurance Program, as seismic Category I items and thus meet the relevant requirements of General Design Criteria 1, 2, "Design Bases for Protection Against Natural Phenomena" and 61, 10 CFR Part 50, Appendix B, and 10 CFR Part 100, Appendix A, "Seismic and Geologic Siting Criteria for Nuclear Power Plants."<sup>64</sup>

This conclusion is based on:

1. The applicant having met the requirements of General Design Criterion 1 by providing a commitment in the SAR that seismic Category I SSCs will be designed, constructed and operated under a Quality Assurance Program, in compliance with the requirements of 10 CFR Part 50, Appendix B.<sup>65</sup>
2. The applicant having met the requirements of General Design Criterion 2, and 10 CFR Part 100, Appendix A, by having properly classified their structures, systems and components (SSCs)<sup>66</sup> important to safety as seismic Category I items in accordance with the positions of Regulatory Guide 1.29, "Seismic Design Classification," and Regulatory Guide 1.151, "Instrument Sensing Lines."<sup>67</sup> and by our conclusion that<sup>68</sup> The identified SSCs are those<sup>69</sup> plant features necessary to assure (1) the integrity of the reactor coolant pressure boundary, (2) the capability to shutdown the reactor and maintain it in a safe shutdown condition, and (3) the capability to prevent and mitigate the consequences of accidents which could result in potential offsite exposures comparable to the guideline exposures of 10 CFR Part 100.



3. Those SSCs not identified as seismic Category I, but whose failure could reduce the functioning of any seismic Category I feature to an unacceptable safety level or result in incapacitating injury to control room personnel, are identified for analysis to assure they will not fail during a SSE.<sup>70</sup>
4. Radioactive waste system SSCs requiring seismic design considerations have been identified consistent with the positions of Regulatory Guide 1.143.<sup>71</sup>
5. (For BWRs, also include the following finding) The applicant has properly classified the main steam and associated systems in accordance with the guidance contained in Appendices A and B of SRP Section 3.2.2.<sup>72</sup>

For design certification reviews, the findings will also summarize, to the extent that the review is not discussed in other safety evaluation report sections, the staff's evaluation of inspections, tests, analyses, and acceptance criteria (ITAAC), including design acceptance criteria (DAC), site interface requirements, and combined license action items that are relevant to this SRP section.<sup>73</sup>

## V. IMPLEMENTATION

The following is intended to provide guidance to applicants and licensees regarding the NRC staff's plan for using this SRP Section.

This SRP section will be used by the staff when performing safety evaluations of license applications submitted by applicants pursuant to 10 CFR 50 or 10 CFR 52.<sup>74</sup> Except in those cases in which the applicant proposes an acceptable alternative method for complying with specified portions of the Commission's regulations, the method described herein will be used by the staff in its evaluation of conformance with Commission regulations.

The provisions of this SRP section apply to reviews of applications docketed six months or more after the date of issuance of this SRP section.<sup>75</sup>

Implementation schedules for conformance to parts of the method discussed herein are contained in the referenced Regulatory Guides.<sup>76</sup>

## VI. REFERENCES

1. 10 CFR Part 50, Appendix A, General Design Criterion 1, "Quality Standards and Records."<sup>77</sup>
- 2.<sup>78</sup> 10 CFR Part 50, Appendix A, General Design Criterion 2, "Design Bases for Protection Against Natural Phenomena."
3. 10 CFR Part 50, Appendix A, General Design Criterion 61, "Fuel Storage and Handling and Radioactivity Control."<sup>79</sup>

4. 10 CFR Part 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants."<sup>80</sup>
- 25.<sup>81</sup> 10 CFR Part 100, Appendix A, "Seismic and Geologic Siting Criteria for Nuclear Power Plants."
- 36.<sup>82</sup> Regulatory Guide 1.29, "Seismic Design Classification."
7. Regulatory Guide 1.143, "Design Guidance for Radioactive Waste Management Systems, Structures, and Components Installed in Light-Water-Cooled Nuclear Power Plants."<sup>83</sup>
8. Regulatory Guide 1.151, "Instrument Sensing lines."<sup>84</sup>

**SRP Draft Section 3.2.1**  
Attachment A - Proposed Changes in Order of Occurrence

Item numbers in the following table correspond to superscript numbers in the redline/strikeout copy of the draft SRP section.

Item	Source	Description
1.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB names and responsibilities for this SRP section.
2.	Current PRB names and abbreviations.	Added the Civil Engineering and Geosciences Branch (ECGB) as the secondary review branch to reflect current PRB names and responsibilities for SRP section 3.2.1.
3.	Editorial.	Added the definition of the acronym SSCs for "structures, systems and components" to the first usage of this phrase.
4.	Editorial.	Deleted the phrase "structures, systems and components" and substituted the acronym SSCs.
5.	Current PRB names and responsibilities.	Editorial change made to reflect current PRB names and responsibilities for this SRP section.
6.	Editorial.	Deleted the phrase "structures, systems and components" and substituted the acronym SSCs.
7.	Editorial	Made minor editorial change to make the SRP gender neutral.
8.	<b>Integrated Impact #84</b>	Revised areas of review to indicate the review of SSCs that are not required to remain functional following seismic events, but whose failure could reduce the functioning of a Category I SSC.
9.	<b>Integrated Impact #84</b>	Revised the areas of review section to add a discussion of radioactive waste management systems identified in RG 1.143 to be consistent with the coordinated reviews performed for systems that may contain radioactive material as documented in SRP section 11.2.
10.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB names and responsibilities for this SRP section.
11.	<b>Integrated Impact #553.</b>	Added safety-related instrument sensing lines identified in Regulatory Guide 1.151 to the list of seismic Category I plant features to be reviewed by EMEB in this SRP section.
12.	Editorial	Updated to reflect the SRP-UDP draft revision of SRP Section 3.2.2 which does not provide guidance for development of a table identifying seismic Category I SSCs in Appendices C and D but does provide guidance for an SSC table in subsections I and III (Areas of Review and Review Procedures).

**SRP Draft Section 3.2.1**  
Attachment A - Proposed Changes in Order of Occurrence

Item	Source	Description
13.	Editorial.	Deleted the phrase "structures, systems and components" and substituted the acronym SSCs.
14.	<b>Integrated Impact #83</b>	Revised Areas of Review to include GDC 1 when discussing the pertinent quality assurance requirements. This is consistent with the addition of GDC 1 to the Acceptance Criteria.
15.	SRP-UDP format item.	Revised review interface section of Areas of Review to be consistent with SRP-UDP required format that uses a number/paragraph format to distinguish how EMEB reviews aspects of seismic classification under other SRP sections and how other branches support the review of seismic classification.
16.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB names and responsibilities for this SRP section.
17.	Editorial.	Editorial change to move the "and" at the end of the sentence and correct the punctuation for consistency with the other review interfaces in the list.
18.	Current PRB names and abbreviations and SRP-UDP format item.	Added a review interface to SRP section 3.10 for the review of seismic and dynamic qualification of equipment. The review performed in SRP Section 3.10 is performed by EMEB. The area of seismic qualification is relevant to the review described in this SRP section concerning seismic classification. See Potential Impact 10832.
19.	<b>Integrated Impact #84</b> , Current PRB names and abbreviations and SRP-UDP format item.	Added a review interface for the reviews performed by the SPLB in regard to the radioactive waste management systems performed in SRP sections 11.2 through 11.4 and the fire protection system reviews performed in SRP section 9.5.1. These areas are important to the reviews performed in this section to determine proper classification of non-seismic Category I SSCs that must be designed to maintain integrity during specified seismic events.
20.	Current PRB names and abbreviations and SRP-UDP format item.	Added a review interface for the reviews performed by the HQMB in regard to the quality assurance programs performed under SRP sections 17.1 through 17.3. This review interface was added to formalize the interface described in the review procedures on including safety-related seismic Category I SSCs in the scope of the Appendix B Quality Assurance Program.
21.	SRP-UDP format item	Added standard SRP-UDP discussion of the criteria and reviews detailed in other SRP Sections.
22.	Editorial.	Editorial change to replace "acceptance criteria" with "acceptability" to achieve subject agreement with the following verb.

**SRP Draft Section 3.2.1**  
Attachment A - Proposed Changes in Order of Occurrence

Item	Source	Description
23.	<b>Integrated Impact #83.</b>	Added GDC 1 and 10 CFR Part 50, Appendix B, to the Acceptance Criteria, to provide confirmation that those SSCs classified as seismic Category I items are within the quality assurance requirements.
24.	Editorial.	Renumbered the acceptance criteria to reflect the addition of GDC 1 and 61.
25.	Editorial.	Modified the citation of General Design Criteria 2 to meet the editorial style for CFR citations contained in the SRP-UDP procedures. Two new General Design Criteria (1 and 61) were added to the acceptance criteria, therefore, to ensure a consistent editorial style "10 CFR Part 50, Appendix A," was deleted from the citation of GDC 2.
26.	Editorial.	Deleted the phrase "structures, systems and components" and substituted the acronym SSCs.
27.	<b>Integrated Impact #84</b>	Added GDC 61 to the Acceptance Criteria as it relates to the review of the seismic classification of SSCs which may contain radioactive materials.
28.	Editorial.	Renumbered the acceptance criteria to reflect the addition of GDC 1 and 61.
29.	Editorial.	Deleted the phrase "structures, systems and components" and substituted the acronym SSCs.
30.	Editorial and SRP-UDP format item.	Moved the list of safety-related features from the acceptance criteria to the new technical rationale subsection. This detail is more appropriately covered under technical rationale.
31.	Editorial.	Corrected a grammar and punctuation error. A colon is normally used to introduce a series of items. The existing sentence had only one item, Regulatory Guide 1.29, listed.
32.	<b>Integrated Impact #553.</b>	New Acceptance Criteria was added for the guidance contained in Regulatory Guide 1.151 regarding the seismic classification of safety-related instrumentation sensing lines.
33.	<b>Integrated Impact #84</b>	Added Regulatory Guide 1.43 to the Acceptance Criteria to provide guidance for use in determining the seismic classification of radioactive waste management SSCs.

**SRP Draft Section 3.2.1**  
Attachment A - Proposed Changes in Order of Occurrence

Item	Source	Description
34.	SRP-UDP format item, adding technical rationale and <b>Integrated Impact #82.</b>	Technical Rationale were developed and added for the following Acceptance Criteria: GDC 1 and 10 CFR Part 50 Appendix B, GDC 2, GDC 61, 10 CFR Part 100 Appendix A, Regulatory Guide 1.29, Regulatory Guide 1.143 and Regulatory Guide 1.151. The SRP-UDP requires that technical rationale be developed for each of the Acceptance Criteria.
35.	<b>Integrated Impacts #82 and #83.</b>	Added a technical rationale discussion addressing the guidance of Regulatory Guide 1.29 in accordance with the recommendations of these Integrated Impacts and with the methods described in the SRP-UDP program.
36.	Metrication Conversion.	Converted 0.5 rem to 0.005 Sv and presented in a dual unit format consistent with the NRC Metrication policy.
37.	Editorial.	Deleted the phrase "structures, systems and components" and substituted the acronym SSCs.
38.	<b>Integrated Impact #553.</b>	Added a sentence on the seismic classification of instrument sensing lines in accordance with the guidance contained in Regulatory Guide 1.151.
39.	Metrication Conversion.	Converted 0.5 rem to 0.005 Sv and presented in a dual unit format consistent with the NRC Metrication policy.
40.	<b>Integrated Impacts #86 and #84.</b>	Added new sentences to Review Procedures to provide review guidance for classification, as seismic Category I, systems that contain or could contain radioactive material and whose failure could result in offsite whole body (or equivalent) exposures greater than .005 Sv (0.5 Rem). A reference to Regulatory Guide 1.143 was also added to clarify the location of guidance for radioactive waste management systems.
41.	<b>Integrated Impacts #84 and #553.</b>	A reference to Regulatory Guides 1.143 and 1.151 was added to the discussion regarding whether an applicant has indicated compliance with the applicable Regulatory Guides. Regulatory Guide 1.143 and 1.151 contain seismic qualification guidance similar to the guidance contained in Regulatory Guide 1.29.
42.	Editorial.	This specific discussion on General Electric BWR/6 seismic classification was moved to the eighth paragraph. The eighth paragraph was added to address the specific discussions on the seismic classification of certain BWR SSCs, including the new positions on seismic classification of main steam lines for plants/designs crediting the main steam system for retention and holdup of MSIV leakage (instead of an MSIV leakage control system) following an accident.
43.	Editorial.	Deleted the phrase "structures, systems and components" and substituted the acronym SSCs.

**SRP Draft Section 3.2.1**  
Attachment A - Proposed Changes in Order of Occurrence

Item	Source	Description
44.	Editorial.	This change corrected a grammar error by deleting the word "is" and replacing it with "are"; the plural subject "boundary limits" requires a plural verb.
45.	<b>Integrated Impact #94</b>	Added a statement to the Review Procedures to clarify the application of seismic analysis at the interface between seismic Category I and non-seismic system boundaries. The position that the seismic Category I dynamic analysis will be extended to either the first anchor point in the non-seismic system or to sufficient distance in the non-seismic system so as not to degrade the validity of the seismic Category I analysis is consistent with the reviews documented in the ABWR FSER.
46.	<b>Integrated Impact #553.</b>	Added a new Review Procedure to verify the seismic classification of safety-related instrumentation sensing lines are in accordance with the guidance contained in positions C.2 and C.3 of Regulatory Guide 1.151.
47.	Editorial.	Deleted the phrase "structures, systems and components" and substituted the acronym SSCs.
48.	<b>Integrated Impact #83.</b>	Replaced existing sentence regarding the use of Regulatory Guide 1.29 and SSCs that should be within the scope of the Appendix B Quality Assurance Program with a sentence that is specifically consistent with the content of Regulatory Guide 1.29. Regulatory Guide 1.29 addresses seismic Category I SSCs, not all those plant features that are important to safety, which is a much broader category of SSCs than discussed in Regulatory Guide 1.29.
49.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB names and responsibilities for SRP sections in Chapter 17.
50.	Editorial.	Deleted the phrase "structures, systems and components" and substituted the acronym SSCs.
51.	Editorial.	This listing of SSCs not required to be designed to seismic Category I was moved to the Review Procedures from the Evaluation Findings subsection. This level of detail listing specific systems is appropriate for a Review Procedure. Moving this information out of the Evaluation Findings does not alter the findings on this subject and is consistent with the positions on SSCs that need not be designed to seismic Category I requirements contained in Regulatory Guide 1.29, Regulatory Guide 1.143 and the ABWR FSER. (See item 57).

**SRP Draft Section 3.2.1**  
Attachment A - Proposed Changes in Order of Occurrence

Item	Source	Description
52.	<b>Integrated Impact #93</b>	Moved an existing review procedure paragraph (formerly part of paragraph 3) to address the classification guidelines for existing BWR plants by referencing the reviewer to the guidelines contained in Appendix B of SRP Section 3.2.2. In addition, a new review procedure sentence was added to address taking credit for fission product retention in the main steam piping and the condenser as an alternative to an MSIVLCS for fission product control following a postulated accident. In order to take credit for main steam system and condenser fission product retention the associated components must be appropriately classified and must maintain their integrity during and following an SSE. The specific positions for the seismic classification of these systems, including the SRP-UDP implementation of ROC 1323 in SRP Section 3.2.2 draft revision, are contained in Appendix A to SRP Section 3.2.2. The specific positions in regard to seismic classification are consistent with the positions documented in SECY 93-087, the SRM for SECY 93-087 and the ABWR FSER.
53.	<b>Integrated Impact #84</b>	Added a review procedure paragraph addressing the identification of non-seismic Category I SSCs. The new review procedure is consistent with Regulatory Guide 1.29 and the reviews documented in section 3.2.1 of the ABWR FSER.
54.	<b>Integrated Impact #84</b>	Added a Review Procedure addressing the classification of radioactive waste management SSCs in regard to seismic issues and Regulatory Guide 1.143. Regulatory Guide 1.143 provides guidance for seismic classification of radioactive waste management SSCs.
55.	<b>Integrated Impact #84 and #553.</b>	Added a reference in the Review Procedures to Regulatory Guides 1.143 and 1.151 as key guidance documents in regard to applicants taking exceptions to the guidance of the regulatory guides utilized in SRP section 3.2.1.
56.	Editorial	Revised to eliminate use of a gender specific pronoun and to provide related changes to achieve clarity and correct grammar.
57.	Editorial.	Editorial change made to eliminate use of the gender distinction "his" from the Review Procedures discussion.



**SRP Draft Section 3.2.1**  
Attachment A - Proposed Changes in Order of Occurrence

Item	Source	Description
58.	<b>Integrated Impact #84.</b>	Added a reference in the Review Procedures to Regulatory Guides 1.143 and 1.151 as key guidance documents in regard to the staff taking positions on conformance to the regulatory guides and the positions discussed in SRP section 3.2.1. Including the positions discussed in the review procedures is required because positions in Regulatory Guide 1.143 are modified by positions in the Review Procedures of 3.2.1.
59.	SRP-UDP Guidance, Implementation of 10 CFR 52	Added standard paragraph to address application of Review Procedures in design certification reviews.
60.	Editorial.	As this may be the first usage of the phrase "structures, systems and components" in the review findings, the acronym SSCs was added.
61.	Editorial.	Deleted the phrase "structures, systems and components" and substituted the acronym SSCs.
62.	<b>Integrated Impact #84.</b>	Clarified the Evaluation Findings discussion on SSCs that do not have to be designed to seismic Category I requirements so that the evaluation finding is consistent with Regulatory Guide 1.29 position C.2. Deleted the discussion on excluding electrical features as this point was already made in the first sentence and need not be duplicated here. Also moved the listing of SSCs not required to be designed to seismic Category I to the review procedures, this listing is not appropriate for the evaluation finding discussions. Moving this listing to the review procedures is consistent with the positions on SSCs that need not be designed to seismic Category I requirements contained in Regulatory Guide 1.29, Regulatory Guide 1.143 and the ABWR FSER.
63.	Editorial.	Deleted the phrase "structures, systems and components" and substituted the acronym SSCs.
64.	<b>Integrated Impact #83 and #84.</b>	Revised Evaluation Findings to note that the SSCs within the scope of this review are within the applicants' quality assurance program and are in compliance with GDC 1 and 61.
65.	<b>Integrated Impact #83.</b>	Added an Evaluation Finding indicating confirmation that seismic Category I items are within the scope of a quality assurance program in compliance with the requirements of 10 CFR Part 50, Appendix B.
66.	Editorial.	Deleted the phrase "structures, systems and components" and the parentheses around the acronym SSCs.

**SRP Draft Section 3.2.1**  
Attachment A - Proposed Changes in Order of Occurrence

Item	Source	Description
67.	<b>Integrated Impact #553.</b>	Added Regulatory Guide 1.151, "Instrument Sensing Lines" to the evaluation findings as appropriate guidance for those SSCs (instrument sensing lines can be considered a specific portion of the system) that are seismic Category I.
68.	Editorial.	This is an editorial change to delete the use of "our conclusion" which is redundant for the Evaluation Findings. Also the paragraph has been separated into two sentences to eliminate the one long sentence used previously.
69.	Editorial.	Replaced "the" with "those" to correct grammatical error.
70.	<b>Integrated Impact #84.</b>	A new Evaluation Finding was added on the guidance of Regulatory Guide 1.29 concerning non-seismic Category I SSCs whose failure could reduce the functioning of any seismic Category I feature to an unacceptable safety level.
71.	<b>Integrated Impact #84.</b>	A new Evaluation Finding was added for the guidance of Regulatory Guide 1.143 concerning seismic classification of the radioactive waste SSCs.
72.	<b>Integrated Impact #93.</b>	Added a new Evaluation Finding on the seismic classification of the main steam lines in accordance with the guidance contained in the Appendices of SRP Section 3.2.2, including changes reflecting the SRP-UDP implementation of ROC 1323 in the SRP Section 3.2.2 draft revision. This approach will incorporate by reference the guidance of SECY 93-087 and the reviews documented in the ABWR FSER when it is added to SRP Section 3.2.2.
73.	10 CFR 52 applicability issue.	Added an evaluation finding paragraph to address design certification review findings. This finding paragraph is consistent with the SRP-UDP format for design certification evaluation findings.
74.	SRP-UDP Guidance, Implementation of 10 CFR 52	Added standard sentence to address application of the SRP section to reviews of applications filed under 10 CFR Part 52, as well as Part 50.
75.	SRP-UDP Guidance	Added standard paragraph to indicate applicability of this section to reviews of future applications.
76.	Editorial.	Used the plural "Regulatory Guides" as there is more than one Regulatory Guide referenced in the body of this SRP section.
77.	<b>Integrated Impact #83.</b>	Included a reference to GDC 1, "Quality Standards and Records."

**SRP Draft Section 3.2.1**  
Attachment A - Proposed Changes in Order of Occurrence

Item	Source	Description
78.	Editorial.	Renumbered the references to allow for the added references.
79.	<b>Integrated Impact #84.</b>	Included a reference to GDC 61, "Fuel Storage and Handling and Radioactivity Control."
80.	<b>Integrated Impact #83.</b>	Included a reference to 10 CFR 50 Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants."
81.	Editorial.	Renumbered the references to allow for the added references.
82.	Editorial.	Renumbered the references to allow for the added references.
83.	<b>Integrated Impact #84.</b>	Included a reference to Regulatory Guide 1.143, "Design Guidance for Radioactive Waste Management Systems, Structures, and Components Installed in Light-Water-Cooled Nuclear Power Plants."
84.	<b>Integrated Impact #553.</b>	Included a reference to Regulatory Guide 1.151, "Instrument Sensing Lines."

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**SRP Draft Section 3.2.1**  
Attachment B - Cross Reference of Integrated Impacts

Integrated Impact No.	Issue	SRP Subsections Affected
82	Develop Technical Rationale for use of existing guidance document. Regulatory Guide 1.29 provides guidance for seismic classification of SSCs and is currently cited in the SRP. Technical Rationale should be developed for the use of Regulatory Guide 1.29 to determine compliance with GDC 2.	Subsection II: Although this II will not be processed further, Technical Rationale was developed to address Regulatory Guide 1.29 (item 1 and 2 of the technical rationale).
83	Incorporate GDC 1 and 10 CFR 50 Appendix B into the Acceptance Criteria and provide Evaluation Findings to establish that those SSCs classified as seismic Category I are within the scope of the applicant's QA Program.	<p>Subsection I: Areas of Review (fourth paragraph).</p> <p>Subsection II: Acceptance Criteria (step 1).</p> <p>Subsection III: Review Procedures discussing Regulatory Guide 1.29 were clarified (sixth paragraph).</p> <p>Subsection IV: Evaluation Findings (second paragraph and item 1).</p> <p>Subsection V: References (items 1 and 4).</p>
84	Add Acceptance Criteria for existing and new guidance documents to identify non-seismic Category I SSCs that must be designed to maintain integrity during specified seismic events. This includes radioactive waste management systems and other systems that could adversely impact safety-related system functions.	<p>Subsection I: Areas of Review (second and third paragraphs and review interfaces under the reviews performed by others item 1).</p> <p>Subsection II: Acceptance Criteria (added item 3 and Regulatory Guide 1.143 discussion).</p> <p>Subsection III: Review Procedures (second, third, ninth, tenth, eleventh and twelfth paragraphs).</p> <p>Subsection IV: Evaluation Findings (second and third paragraphs, conclusions steps 3 and 4).</p> <p>Subsection VI: References (items 3 and 7).</p>
86	Augment the guidance in the SRP to address the classification of those systems other than radioactive waste management systems whose failure could potentially result in offsite whole body doses that are greater than 0.005 Sv (0.5 rem). These systems should be classified, in accordance with Regulatory Guide 1.29, as seismic Category I.	Subsection III: Review Procedures (second paragraph).

**SRP Draft Section 3.2.1**  
Attachment B - Cross Reference of Integrated Impacts

Integrated Impact No.	Issue	SRP Subsections Affected
93	Modify the Review Procedures to address the seismic classification of certain BWR SSCs.	Subsection III: Review Procedures (eighth paragraph).  Subsection IV: Evaluation Findings (conclusions item 5).
94	Augment the guidance in the SRP to address the application of seismic analysis at the interface between seismic Category I and non-seismic system boundaries.	Subsection III: Review Procedures (fourth paragraph).
553	Add Regulatory Guide 1.151 as a guidance document and develop an associated Review Procedure to address seismic classification of safety-related instrument sensing lines.	Subsection I: Add an Area of Review discussion in the third paragraph.  Subsection II: Acceptance Criteria (second to last paragraph).  Subsection III: Review Procedures (second, third, fifth and eleventh paragraphs).  Subsection IV: Evaluation Findings (conclusions #2).  Subsection V: Added item 8 to the references.
1136	Placeholder addressing a draft Regulatory Guide.	None.
1218	Placeholder addressing a proposed rulemaking amending 10 CFR Parts 50 and 100.	None.