U.S. NUCLEAR REGULATORY COMMISSION

STANDARD REVIEW PLAN

OFFICE OF NUCLEAR REACTOR REGULATION

5.4.12 REACTOR COOLANT SYSTEM HIGH POINT VENTS

REVIEW RESPONSIBILITIES

Primary - Reactor Systems Branch (~~RSB~~SRXB)[1]

Secondary - None

I. AREAS OF REVIEW

All light-water nuclear power reactors are required to contain reactor coolant system high point vents in accordance with 10 CFR 50.44(c)(3)(iii).[2] Reactor coolant system high point vents are provided to exhaust noncondensible gases from the primary system that could inhibit natural circulation core cooling. The vent system consists of remotely operated valves at high points in the reactor coolant system to vent gases from the primary system into containment. Since the vents form part of the reactor coolant pressure boundary, design of the vent system shall conform to the requirements of Appendix A to 10 CFR Part 50, "General Design Criteria." In addition, the vent system shall be designed with sufficient redundancy to assure a low probability of inadvertent or irreversible actuation. The vent system's safety function may be required to maintain core coolability following an accident, therefore the system is designed as a safety-related system. ~~RSB~~SRXB[3] review of reactor coolant system high point vents will include the following specific areas:

1. The location, size, discharge capacity, functions, and discharge area(s) of the vent system.

2. Supporting LOCA analyses for breaks in the vent line to demonstrate compliance with 10 CFR ~~Part 50, §~~[4] 50.46.

3. Redundancy and failure modes of the valve train.

4. Procedures for using and not using the vent system, and the bases for these procedures.

5. Information available to the operator for initiating and terminating vent system operation.

6. System environmental qualification to demonstrate compliance with 10 CFR 50.49.[5]

Review Interfaces[6]

In addition, the ~~RSB~~SRXB[7] will coordinate other branch evaluations that interface with the overall review of the system as follows:

1. The ~~Structural Engineering~~Civil Engineering and Geosciences Branch (~~SEB~~ECGB)[8] determines the acceptability of the design analyses, procedures, and criteria used to establish the ability of seismic Category I structures housing the system and supporting systems to withstand the effects of natural phenomena such as the safe shutdown earthquake (SSE), as part of its primary review responsibility for SRP Sections 3.3.1, 3.3.2, 3.5.3, 3.7.1 through 3.7.4, 3.8.4, and 3.8.5.

2. The Mechanical Engineering Branch (~~MEB~~EMEB)[9] determines that the components, piping, and structures are designed in accordance with applicable codes and standards as part of its primary review responsibility for SRP Sections 3.9.1 through 3.9.3. The ~~MEB~~EMEB also determines the acceptability of the seismic and quality group classifications for system components as part of its primary review responsibility for SRP Sections 3.2.1 and 3.2.2. In addition, ~~MEB~~EMEB reviews the adequacy of the inservice testing program of valves as part of its primary review responsibility for SRP Section 3.9.6 and the seismic and dynamic qualification of mechanical and electrical equipment as part of its primary review responsibility for SRP Section 3.10.[10]

3. The ~~Materials~~Civil Engineering and Geosciences Branch (~~MTEB~~ECGB)[11] verifies that inservice inspection requirements are met for system components as part of its primary review responsibility for SRP Section 6.6, and, upon request, verifies the compatibility of the materials of construction with service conditions.

4. The Instrumentation &~~and~~ Control~~s Systems~~ Branch (~~ICSB~~HICB)[12]~~and the Power Systems Branch (PSB)~~[13] determine~~s~~[14] the adequacy of the design, installation, inspection, and testing of all essential~~ electrical components (sensing, control, and power)~~[15] instrumentation and control components[16] required for proper operation as part of its~~their~~ primary review responsibility for SRP Section~~s~~[17] 7.1~~ and 8.1, respectively~~.[18]

5. The Electrical Engineering Branch (EELB) determines the adequacy of the design, installation, inspection, and testing of all essential electrical components required for proper operation as part of its primary review responsibility for SRP Section 8.1.[19]

6. The Containment Systems and Severe Accident Branch (~~CSB~~SCSB)[20] reviews the acceptability of mixing of discharged gases within the containment atmosphere and

assures that containment design limits will not be exceeded by venting during an accident condition as part of its primary review responsibility for SRP Sections 6.2.1 through 6.2.6.

7. The ~~Equipment Qualification~~Plant Systems Branch (~~EQB~~SPLB)[21] reviews the acceptability of the environmental qualification of all vent system components as part of its primary review responsibility for SRP Section~~s 3.10 and~~[22] 3.11.

8. The ~~Procedure and Test Review~~Quality Assurance and Maintenance Branch (~~PTRB~~HQMB)[23] reviews the vent systems initial test program and test procedures~~testability, operability, and the procedures for operator use during accident conditions~~[24] as part of its primary review responsibility for SRP Section 14.2.

9. The review of technical specifications is coordinated and performed by the ~~Licensing Guidance~~Technical Specifications Branch (~~LGB~~TSB)[25] as part of its primary review responsibility for SRP Section 16.0.

10. The Human Factors Assessment Branch (HHFB) reviews the human factors engineering for the control room portion of the vent system to ensure that personnel can operate the system in an error free manner as part of its primary review responsibility for SRP Section 18.0[26]

For those areas of review identified above as being the responsibility of other branches, the acceptance criteria and their methods of application are contained in the SRP sections identified as the primary review responsibility of those branches.

II. ACCEPTANCE CRITERIA

The objective of the review is to determine that the vent system is capable of removing noncondensible gases from the primary coolant system with a minimal probability of inadvertent or spurious actuation.

~~RSB~~SRXB[27] acceptance criteria are based on meeting the relevant requirements of the following regulations:[28]

A. 10 CFR Part 50, §50.44(c)(3)(iii) as it relates to the provision of, and requirements related to, high point vents for the reactor coolant system, the reactor vessel, and other systems required to maintain adequate core cooling if the accumulation of noncondensible gases would cause the loss of function of these systems. This requirement is equivalent to 10 CFR 50, §50.34(f)(2)(vi) related to TMI action plan item II.B.1 for those applicants subject to 10 CFR 50, §50.34(f) or 10 CFR 52, §52.47(a)(1)(ii).[29]

B~~C~~. 10 CFR Part 50, §50.46(b) as it relates to the long-term cooling of the core following any calculated successful initial operation of the ECCS to remove decay heat for an extended period of time.

C. 10 CFR Part 50, §50.49 as it relates to environmental qualification of electrical equipment necessary to operate the reactor coolant vent system.[30]

D~~A~~. 10 CFR Part 50, §50.55a and General Design Criteria 1 and 30 as they relate to the vent system components which are part of the reactor coolant pressure boundary being designed, fabricated, erected, and tested and maintained to high quality standards.

E~~B~~. General Design Criterion 14, as it relates to the reactor coolant pressure boundary being designed, fabricated, erected and tested to have an extremely low probability of abnormal leakage, of rapidly propagating failure, and of gross rupture.

F. General Design Criteria 17 and 34 as they relate to the provision of normal and emergency power for the vent system components.[31]

G. General Design Criterion 19 as it relates to the vent system controls being operable from the control room.[32]

H. General Design Criterion 36 as it relates to the vent system being designed to permit periodic inspection.[33]

Specific criteria necessary to meet the regulations identified above and necessary to implement task action plan Item II.B.1 of NUREG-0718 and -0737 (References 16 and 17)[34] are as follows:

1. The reactor coolant vent design must ensure that use of these vents during and following an accident does not aggravate the challenge to containment or the course of the accident.[35]

2~~1~~.[36] Vent paths shall be provided on high points of the reactor coolant system (including the pressurizer on PWRs) to vent gases which may inhibit core cooling. For reactors with U-tube steam generators, procedures shall be developed to remove gases from the U-tubes since it is impractical to individually vent the thousands of U-tubes.

3~~2~~. A single failure of a vent valve, power supply, or control system shall not prevent isolation of the vent path. On BWRs, block valves are not required in lines with safety valves used for venting.

4~~3~~. Sufficient redundancy in the design shall be incorporated to minimize the probability of inadvertent actuation. Other methods to reduce the chances of inadvertent actuation, such as removing power or administrative controls, may be considered.

5~~4~~. Since the reactor coolant system vent will be part of the reactor coolant system pressure boundary, all requirements for the reactor pressure boundary must be met.

6~~5~~. The size of the vent line should be kept smaller than the size corresponding to the definition of a LOCA (10 CFR Part 50, Appendix A) to avoid unnecessary challenges to the ECCS.

7~~6~~. Vent paths to the containment should discharge into areas that provide good mixing with containment air and are able to withstand steam, water, noncondensibles, and mixtures of the above.

8~~7~~. The vent system shall be operable from the control room and provide positive valve position indication. Power shall be supplied from emergency buses.

9~~8~~. It is important that the control room displays and controls for the RCS vents do~~added to the control room as a result of this requirement~~ [37]not increase the potential for operator error. A human-factor analysis should be performed taking into consideration:

(a) the use of this information by an operator during both normal and abnormal plant conditions,

(b) integration into emergency procedures,

(c) integration into operator training, and

(d) other alarms during emergency and need for prioritization of alarms.

10~~9~~. Provisions to test for operability of the reactor coolant vent system should be a part of the design. Testing should be performed in accordance with subsection IWV of Section XI of the ASME Code (Reference 18)[38] for Category B valves.

11~~10~~. The reactor coolant vent system (i.e., vent valves, block valves, position indication devices, cable terminations, and piping) shall be seismically and environmentally qualified in accordance with IEEE 344~~-1975~~ (Reference 19)[39] as supplemented by Regulatory Guide 1.100, and Regulatory Guide[40] 1.92~~and SEP 3.92, 3.43, and 3.10~~.[41] Environmental qualifications are in accordance with ~~the May 23, 1980 Commission Order and Memorandum (CLI-80-21)~~10 CFR 50.49.[42]

12~~11~~. Procedures to effectively operate the vent system must consider when venting is needed and when it is not needed. A variety of initial conditions from which venting may be required shall be considered. Operator actions and the necessary instrumentation shall be identified.

Technical Rationale[43]

The technical rationale for application of the above acceptance criteria to the RCS vent system is discussed in the following paragraphs:

1. 10 CFR 50.44(c)(3)(iii) requires that light-water nuclear power reactors be designed with RCS high point vents to maintain adequate core cooling if the accumulation of noncondensible gases would cause the loss of function of the core cooling systems. This regulation further requires that the use of these vents during and following an accident must not aggravate the challenge to containment or the course of the accident. During the TMI-2 accident a substantial volume of hydrogen was generated in the primary

system. To resolve concerns that such a gas volume could interfere with post-accident natural circulation or pump operation, the foregoing regulation was promulgated. This rule establishes specific design requirement that must be met by all license applicants. Compliance with 10 CFR 50.44(c)(3)(iii) assures that there is a means to exhaust gases from the reactor coolant system that might otherwise inhibit long term cooling following an accident, thereby ensuring that adequate reactor core cooling is established and maintained, and additional challenges to containment integrity are not created.

2. 10 CFR 50.46(b) establishes specific reactor core temperature, cladding oxidation, hydrogen generation, and cooling requirements that are designed to protect the fuel and fuel cladding. The RCS vent system supports long term core cooling following an accident by exhausting gases from the primary system that could otherwise inhibit natural circulation or pump operation. By designing the RCS vent system's core cooling function to meet specific fuel protection limits, the plant's first line of defense against the release of fission products is maintained.

3. 10 CFR 50.49 requires environmental qualification of safety related electrical equipment to ensure that such equipment operates satisfactorily in the most severe environment (i.e., temperature, humidity, radiation, etc.) that it may encounter. Since the RCS vent system contains safety related electrical equipment that must operate in a post-LOCA containment environment, it must meet the environmental qualification rules. Meeting 10 CFR 50.49 will ensure that under the most severe conditions the vents will function as designed to maintain long term cooling and protect the integrity of the reactor core and fuel.

4. 10 CFR 50.55a, General Design Criterion 1, and General Design Criterion 30 require that systems be designed, built, tested and maintained to the highest appropriate quality standards to assure they will satisfactorily perform their safety functions. The reactor coolant system (RCS) vent system fulfills two vital safety functions in that it exhausts gases from the RCS to ensure the continuance of long term core cooling and also acts as a part of the RCS pressure boundary (RCPB). Compliance with 10 CFR 50.55a, GDC 1, and GDC 30 ensures the application of quality standards in the design, construction, and maintenance of the RCS vent system providing assurance that it is able to perform its safety functions and that the integrity of the RCPB is maintained.

5. General Design Criterion 14 requires that all RCPB components be designed and constructed such that there is an extremely low probability that these components will fail and cause a primary leak or loss of coolant accident. The RCS vent system is an integral part of the RCPB that is designed to establish a controlled leakage path to vent gases from the RCS. Appropriate design and construction standards will ensure that in its static condition the RCS vent system will not leak, and in its dynamic condition will operate only when called upon to do so. Following GDC 14 will ensure that the integrity of the RCPB is preserved and that adequate core cooling is maintained.

6. General Design Criteria 17 and 34 require that onsite and offsite electric power systems be provided for all safety-related structures, systems, and components (GDC 17) and specifically for residual heat removal systems (GDC 34). The electric power systems

must have adequate independence, redundancy, and testability, and provide sufficient capacity and capability to assure that fuel and reactor coolant pressure boundary design limits are not exceeded, and that core cooling and containment integrity are maintained. The reactor coolant system vents require electric power to function properly. Meeting the requirements of GDC 17 and 34 will ensure that power is maintained to the vent system during accidents. This will enable the vent system to fulfill its safety function of venting gases from the reactor coolant system thereby ensuring that adequate core cooling is established and maintained.

7. General Design Criterion 19 requires that the plant design incorporate a control room from which emergency actions can be taken to maintain the plant in a safe condition under accident conditions. The reactor coolant vents are remotely operable from the control room such that the vent system can properly fulfill its safety function of venting primary system gases during an accident. Compliance with GDC 19 will provide assurance that control room operability is preserved such that the reactor coolant system vents can be operated during an accident thereby ensuring that core cooling is maintained.

8. General Design Criterion 36 requires that emergency core cooling systems (ECCS) be designed to allow periodic inspections to assure the integrity and capability of these systems to carry out their safety functions is maintained. The reactor coolant system vents are part of the ECCS in that they eliminate gases from the primary system which could otherwise inhibit ECCS natural circulation or pump operation. Conforming with GDC 36 will ensure that the operability of the reactor coolant system vents is maintained throughout the life of the plant so that core cooling will not be interrupted by the evolution of gas during an accident.

III. REVIEW PROCEDURES

The procedures below are used during the construction permit (CP) review to assure that the design criteria and bases and the preliminary design as set forth in the Preliminary Safety Analysis Report meet the acceptance criteria given in subsection II.

For operating license (OL) reviews, the procedures are utilized to verify that the initial design criteria and bases have been appropriately implemented in the final design as set forth in the Final Safety Analysis Report. The OL review also includes the proposed technical specifications, to assure that they are adequate in regard to limiting conditions of operation and periodic surveillance testing.

The reviewer will select and emphasize material from this SRP section, as may be appropriate for a particular case.

1. ~~RSB~~SRXB[44] reviews the vent system description to determine that the vent paths are capable of venting reactor coolant system high points. For areas that may be impractical to vent, such as the U-tubes in steam generators, the reviewer determines that adequate procedures have been developed to assure coolability.

2. At ~~RSB~~SRXB[45] request, ~~ICSB~~HICB[46] reviews the instrumentation, vent controls, and power source to establish that a single failure will not prevent isolation of the vent system.

3. ~~RSB~~SRXB[47] examines valve redundancy and other methods to minimize inadvertent actuation. Comparisons of the methods to prevent inadvertent actuation should be made with other safety-related systems.

4. ~~MTEB~~EMCB[48] evaluates the vent system to determine that all requirements for the reactor pressure boundary are met.

5. ~~RSB~~SRXB[49] examines the size of the vent line and orifices to see that they are smaller than the LOCA definition. If vent path capacity is of LOCA size, a LOCA analysis shall be provided.

6. ~~RSB~~SRXB[50] determines that the areas of discharge for the vent system are capable of withstanding all substances which may be vented. In addition ~~CSB~~SCSB[51] examines these areas to see that adequate mixing with the containment atmosphere is provided.

7. ~~RSB~~SRXB[52] examines the description and P&IDs to assure that the vents are operable from the control room and that power is supplied from emergency buses.

8. ~~HFEB~~HHFB[53] determines that the control room displays and controls for the RCS vent system ~~added to the control room as a result of this requirement~~ [54]do not increase the potential for operator error. ~~A human-factor analysis will be evaluated taking into consideration:~~

~~(a) the use of this information by an operator during both normal and abnormal plant conditions,~~

~~(b) integration into emergency procedures,~~

~~(c) integration into operator training, and~~

~~(d) other alarms during emergency and need for prioritization of alarms.~~[55]

9. ~~PRTB~~EMEB[56] examines provisions to test for operability of the reactor coolant vent system. Testing should be performed in accordance with subsection IWV of Section XI of the ASME Code for Category B valves.

10. ~~EQB~~EMEB[57] reviews the reactor coolant vent system (i.e., vent valves, block valves, position indication devices, cable terminations, and piping) to assure that it is seismically ~~and environmentally~~[58] qualified in accordance with IEEE 344~~-1975~~[59] as supplemented by Regulatory Guide 1.100, and Regulatory Guide[60] 1.92 ~~and SEP 3.92, 3.43, and 3.10~~.[61]

11. SPLB reviews the reactor coolant vent system (i.e., vent valves, block valves, position indication devices, and cable terminations) to assure that it is environmentally qualified[62] in accordance with 10 CFR 50.49.[63]

12.[64] ~~RSB~~SRXB[65] evaluates the procedures necessary to operate the vent system. The operating procedures shall consider the following:

a. When venting is needed and when it is not needed.

b. The method for determining the size of a noncondensible bubble.

c. A variety of initial conditions from which venting may take place.

d. Operator actions and necessary instrumentation.

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.[66]

IV. EVALUATION FINDINGS

The reviewer verifies that sufficient information has been provided and that the review supports conclusions of the following type, to be included in the staff's Safety Evaluation Report:

The staff concludes that the design of the reactor coolant system high point vents is acceptable and meets the relevant requirements of 10 CFR Part 50, §50.44(c),[67] §50.46, §50.49,[68] and §50.55a, and[69] General Design Criteria 1, 14, 17, 19, ~~and~~ 30, 34, and 36.[70] This conclusion is based on the following:

The reactor coolant system high point vents includes components and piping to remotely relieve noncondensible gases from the primary coolant system and vent the gases to the containment atmosphere or to holdup tanks within containment. [The review has included the applicant's proposed design criteria and design bases, and these meet the requirements for the Construction Permit Stage.] [The review has included the applicant's analysis of the vent system design with the design criteria and design bases and has included operating procedures for the vents.] (Operating License Stage)

In addition, the basis for acceptance in the staff review is conformance of the applicant's designs, design criteria, and design bases for the reactor coolant system vents and supporting systems to applicable regulatory guides, branch technical positions, and industry standards [identify each document and describe how the applicant has implemented each].

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.[71]

V. IMPLEMENTATION

The following is intended to provide guidance to applicants and licensees regarding the NRC staff's plans 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.[72] 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.[73]

Implementation schedules for conformance to parts of the method discussed herein are contained in the referenced regulations, regulatory guides and NUREGs.[74]

VI. REFERENCES[75]

1. 10 CFR 50.34, "Contents of Applications."[76]

2. 10 CFR 50.44, "Standards for Combustible Gas Control System in Light-Water-Cooled Power Reactors."[77]

3~~1~~. 10 CFR ~~Part 50,~~ [78]50.46, "Acceptance Criteria for Emergency Core Cooling Systems for[79] Light Water Nuclear Power Reactors."

4. 10 CFR 50.49, "Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants."[80]

5~~2~~. 10 CFR ~~Part 50,~~ [81]50.55a, "Codes and Standards."

6~~3~~. 10 CFR ~~Part~~ [82]50, Appendix A, General Design Criterion 1, "Quality Standards and Records."

7~~4~~. 10 CFR ~~Part~~ [83]50, Appendix A, General Design Criterion 14, "Reactor Coolant Pressure Boundary."

8. 10 CFR 50, Appendix A, General Design Criterion 17, "Electric Power Systems."[84]

9. 10 CFR 50, Appendix A, General Design Criterion 19, "Control Room."[85]

10~~5~~. 10 CFR ~~Part~~ [86]50, Appendix A, General Design Criterion 30, "Quality of Reactor Coolant Pressure Boundary."

11. 10 CFR 50, Appendix A, General Design Criterion 34, "Residual Heat Removal."[87]

12. 10 CFR 50, Appendix A, General Design Criterion 36, "Inspection of Emergency Core Cooling System."[88]

13. 10 CFR 52.47, "Contents of Applications."[89]

14. Regulatory Guide 1.92, "Combining Modal Responses and Special Components in Seismic Response Analysis."[90]

15. NRC Regulatory Guide 1.100, "Seismic Qualification of Electric Equipment for Nuclear Power Plants."[91]

16~~6~~. NUREG-0718, "Licensing Requirements for Pending Applications for Construction Permits and Manufacturing Licenses."

17~~7~~. NUREG-0737, "Clarification of TMI Action Plan Requirements."

18. ASME Boiler and Pressure Vessel Code, Section XI, Subsection IWV, "Inservice Testing of Valves in Light-Water Reactor Power Plants."[92]

19. IEEE 344-1987, "Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations."[93]

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SRP Draft Section 5.4.12
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 to reflect current PRB name and responsibility for this SRP Section.
2.	Integrated Impact Number 296	Revised Areas of Review to include reference to 10CFR50.44(c)(3)(iii).
3.	Current PRB names and abbreviations.	Editorial change to reflect current PRB name and responsibility for this SRP Section.
4.	SRP-UDP format item	Modified citation of 10 CFR section for consistency with SRP-UDP guidance.
5.	Integrated Impact Number 297	Revised Areas of Review to include reference to 10CFR50.49.
6.	SRP-UDP format item, Reformat Areas of Review	Added "Review Interfaces" heading to Areas of Review. Reformatted existing description of review interfaces in numbered format to describe how SRXB reviews aspects of the Reactor Coolant High Point Vents under other SRP Sections and how other branches support the review.
7.	Current PRB names and abbreviations.	Editorial change to reflect current PRB name and responsibility for this SRP Section.
8.	Current PRB names and abbreviations	Editorial change made to reflect current PRB name and responsibility for SRP Sections 3.3.1, 3.3.2, 3.5.3, 3.7.1 through 3.7.4, 3.8.4, and 3.8.5.
9.	Current PRB names and abbreviations	Editorial change made to reflect current PRB name and responsibility wherever it occurs in this paragraph for SRP Sections 3.2.1 and 3.2.2, 3.9.1 through 3.9.3, 3.9.6, and 3.10.
10.	Current PRB names and abbreviations, Editorial	Moved reference to SRP Section 3.10 from SPLB (old responsibility was EQB) below (interface item 7) to reflect current PRB names and responsibilities for SRP Section 3.10. The text associated with the SRP Section number is taken from the SRP Section title.
11.	Current PRB names and abbreviations	Editorial change made to reflect current PRB name and responsibility for SRP Section 6.6.
12.	Current PRB names and abbreviations	Editorial change made to reflect current PRB name and responsibility for SRP Section 7.1.
13.	SRP-UDP Format Item	Reference to PSB deleted to create a separate interface item for a different PRB and separate SRP Section as directed in SRP-UDP guidance.
14.	Editorial	"Determine" changed to "determines" to support creating separate interface item.

Item	Source	Description
15.	SRP-UDP Format Item	Reference to electrical components deleted to support creating a separate interface item for a different PRB and separate SRP Section as directed in SRP-UDP guidance.
16.	SRP-UDP Format Item	HICB responsibility from SRP Section 7.1 added to support the creation of a separate interface item.
17.	Editorial	"their" changed to "its" and "sections" changed to "section" to support creating a separate interface item.
18.	SRP-UDP Format Item	Reference to SRP section 8.1 deleted for the creation of a separate interface item for a different PRB and separate SRP Section as directed in SRP-UDP guidance.
19.	SRP-UDP Format Item	Separate interface item created for a different PRB and separate SRP Section as directed in SRP-UDP guidance.
20.	Current PRB names and abbreviations	Editorial change made to reflect current PRB name and responsibility for SRP Sections 6.2.1 through 6.2.6.
21.	Current PRB names and abbreviations	Editorial change made to reflect current PRB name and responsibility for SRP Section 3.11.
22.	Current PRB names and abbreviations, Editorial	Moved reference to SRP Section 3.10 to EMEB above (interface item 2) to reflect current PRB names and responsibilities for SRP Section 3.10.
23.	Current PRB names and abbreviations	Editorial change made to reflect current PRB name and responsibility for SRP Section 14.2.
24.	Editorial	The characterization of the SRP 14.2 review was modified to be more accurate with the current content of SRP Section 14.2.
25.	Current PRB names and abbreviations	Editorial change made to reflect current PRB name and responsibility for SRP Section 16.0.
26.	Editorial	Added an interface item for HHFB for SRP Section on human factors review. Human factors review is part of the Acceptance Criteria (II.8) and the Review Procedures (III.8) for this SRP Section.
27.	Current PRB names and abbreviations.	Editorial change to reflect current PRB name and responsibility for this SRP Section.
28.	SRP-UDP format item	The Acceptance Criteria were reordered per SRP-UDP guidance, and relettered accordingly.
29.	Integrated Impact Number 296	Added 10CFR50.44(c)(3)(iii) to Acceptance Criteria.
30.	Integrated Impact 297	Added 10 CFR 50.49 to Acceptance Criteria.

Item	Source	Description
31.	Integrated Impact 965	Added a new Acceptance Criteria for GDC 17 and 34.
32.	Integrated Impact 965	Added a new Acceptance Criteria for GDC 19.
33.	Integrated Impact 965	Added a new Acceptance Criteria for GDC 36.
34.	SRP-UDP format item, Reformat reference citations	Added parenthetical citation of the reference item numbers from the Reference section.
35.	Integrated Impact 296	Added new specific criterion 1 regarding ensuring the vent design does not add challenges to containment or change the course of the accident.
36.	Editorial	This and subsequent specific acceptance criteria were renumbered due to the addition of new criterion 1.
37.	Editorial	Modified specific acceptance criterion 8 to apply generically to all license applicants rather than only to plants that are adding RCS vents to an existing design.
38.	SRP-UDP format item, Reformat reference citations	Added parenthetical citation of a reference which has been added to the reference list.
39.	Integrated Impact 297, SRP-UDP format item	Revised citation for IEEE 344-1975 to cite IEEE 344. Applicable version of this standard is specified in the References section. Also added parenthetical citation for this reference which has been added to the reference list
40.	Editorial	Added "and Regulatory Guide" to clarify the sentence.
41.	SRP-UDP format item, Reformat reference citations	Deleted citations of outdated references. The Systematic Evaluation Program (SEP) was a 1977 review of specific safety issues for 11 of the oldest domestic operating reactors. This program was discontinued in 1980 (See PI 24583).
42.	Integrated Impact 297	Changed citation for source of environmental qualification requirements from Commission Memorandum and Order CLI-80-21 to 10 CFR 50.49.
43.	SRP-UDP format item, Develop Technical Rationales	Added Technical Rationale for GDC 1, 14, 17, 19, 30, 34, and 36, and 10 CFR 50.44(c)(3)(iii), 10 CFR 50.46(b), 10 CFR 50.49, and 10 CFR 50.55a. Technical Rationale is a new SRP-UDP format item.
44.	Current PRB names and abbreviations.	Editorial change to reflect current PRB name and responsibility for this SRP Section.
45.	Current PRB names and abbreviations.	Editorial change to reflect current PRB name and responsibility for this SRP Section.
46.	Current PRB names and abbreviations.	Editorial change to reflect current PRB name and responsibility for SRP Section 7.1.

Item	Source	Description
47.	Current PRB names and abbreviations.	Editorial change to reflect current PRB name and responsibility for this SRP Section.
48.	Current PRB names and abbreviations.	Editorial change to reflect current PRB name and responsibility for SRP Section 6.6.
49.	Current PRB names and abbreviations.	Editorial change to reflect current PRB name and responsibility for this SRP Section.
50.	Current PRB names and abbreviations.	Editorial change to reflect current PRB name and responsibility for this SRP Section.
51.	Current PRB names and abbreviations.	Editorial change to reflect current PRB name and responsibility for SRP Sections 6.2.1 through 6.2.6.
52.	Current PRB names and abbreviations.	Editorial change to reflect current PRB name and responsibility for this SRP Section.
53.	Current PRB names and abbreviations.	Editorial change to reflect current PRB name and responsibility for SRP Section 18.0 (18.1).
54.	Editorial	Modified Review Procedure 8 to apply generically to all license applicants rather than only to plants that are adding RCS vents to an existing design.
55.	Editorial	Deleted portions of this Review Procedure that were very detailed for consistency with the rest of the Review Procedures in this subsection and for consistency with other SRP sections.
56.	Current PRB names and abbreviations.	Editorial change to reflect current PRB name and responsibility for SRP Section 3.9.6.
57.	Current PRB names and abbreviations.	Editorial change to reflect current PRB name and responsibility for SRP Section 3.2.1.
58.	Editorial	Editorial change made to reflect current PRB names and responsibilities for seismic qualification. The environmental qualification review, which is now done by SPLB, has been added as review item 11.
59.	Integrated Impact 297	Revised citation for IEEE 344-1975 to cite IEEE 344. Applicable version of this standard is specified in the References section.
60.	Editorial	Added "and Regulatory Guide" to clarify the sentence.
61.	SRP-UDP format item, Reformat reference citations	Deleted citations of outdated references. The Systematic Evaluation Program (SEP) was a 1977 review of specific safety issues for 11 of the oldest domestic operating reactors. This program was discontinued in 1980 (See PI 24583).
62.	Current PRB names and abbreviations	Review Procedures step 10 was split into steps 10 and 11 to reflect the current PRB assignments for seismic and equipment qualification.

Item	Source	Description
63.	Integrated Impact 297	Added reference to 10 CFR 50.49 to SPLB's environmental review item.
64.	SRP-UDP Format Item	Review Procedures step 10 was split into steps 10 and 11. The former 11 is now renumbered 12.
65.	Current PRB names and abbreviations.	Editorial change to reflect current PRB name and responsibility for this SRP Section.
66.	SRP-UDP Guidance, Implementation of 10 CFR 52	Added standard paragraph to address application of Review Procedures in design certification reviews.
67.	Integrated Impacts 296	Added reference to 10 CFR 50.44(c) to the Evaluation Findings subsection.
68.	Integrated Impacts 297	Added reference to 10 CFR 50.49 to the Evaluation Findings subsection.
69.	Editorial	Added "and" to clarify the sentence.
70.	Integrated Impact 965	Added reference to GDCs 17, 19, 34, and 36 to the Evaluation Findings subsection.
71.	10 CFR 52 applicability related change	Standard design certification (DC) terminology was added to the Evaluation Findings section.
72.	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.
73.	SRP-UDP Guidance	Added standard paragraph to indicate applicability of this section to reviews of future applications.
74.	Editorial	Added "regulations" to the list of documents which implement schedules since such documents have been added to this SRP Section.
75.	SRP-UDP format item	References have been reordered per SRP-UDP guidance. New references are interspersed with old ones, and items have been renumbered accordingly.
76.	Integrated Impact Number 296	Added 10CFR50.34 to the list of References.
77.	Integrated Impact 296	Addition of reference item to support citation of 10 CFR 50.44(c)(3)(iii) in SRP section.
78.	SRP-UDP format item, reformat reference citation	The citation of a 10 CFR reference was reformatted for consistency with SRP-UDP guidance.
79.	Reference verification	Added "Emergency Core Cooling System for" to correct the given title of the CFR reference.
80.	Integrated Impact 297	Addition of reference item to support citation of 10 CFR 50.49 in SRP section.
81.	SRP-UDP format item, reformat reference citation	The citation of a 10 CFR reference was reformatted for consistency with SRP-UDP guidance.

Item	Source	Description
82.	SRP-UDP format item, reformat reference citation	The citation of a 10 CFR reference was reformatted for consistency with SRP-UDP guidance.
83.	SRP-UDP format item, reformat reference citation	The citation of a 10 CFR reference was reformatted for consistency with SRP-UDP guidance.
84.	Integrated Impact 965	Added a new reference citation for GDC 17.
85.	Integrated Impact 965	Added a new reference citation for GDC 19.
86.	SRP-UDP format item, reformat reference citation	The citation of a 10 CFR reference was reformatted for consistency with SRP-UDP guidance.
87.	Integrated Impact 965	Added a new reference citation for GDC 34.
88.	Integrated Impact 965	Added a new reference citation for GDC 36.
89.	Integrated Impact Number 296	Added 10CFR52.47 to the list of References.
90.	SRP-UDP format item, reference verification	This reference, which is cited in specific Acceptance Criterion #11, has been added to the reference list.
91.	SRP-UDP format item, reference verification	This reference, which is cited in specific Acceptance Criterion #11, has been added to the reference list.
92.	SRP-UDP format item, reference verification	This reference, which is cited in specific Acceptance Criterion #9, has been added to the reference list.
93.	SRP-UDP format item, reference verification	This reference, which is cited in specific Acceptance Criterion #11, has been added to the reference list.

SRP Draft Section 5.4.12
Attachment B - Cross Reference of Integrated Impacts

Integrated Impact No.	Issue	SRP Subsections Affected
296	Revise SRP Section where appropriate to add a citation for 10 CFR 50.44(c) as a source of acceptance criteria for Reactor Coolant System High Point Vents.	-Subsection I, Areas of Review, introductory paragraph -Subsection II, Acceptance Criteria, criterion A, specific criterion 1. -Subsection IV, Evaluation Findings, second paragraph -Subsection VI, References, references 1, 2, and 13.
297	Revise SRP Section where appropriate to add a citation for 10 CFR 50.49 and IEEE-344 1987 as sources of acceptance criteria for Reactor Coolant System High Point Vents.	-Subsection I, Areas of Review, step 6 -Subsection II, Acceptance Criteria, criterion C and specific criterion 11. -Subsection III, Review Procedures, steps 10 & 11 -Subsection IV, Evaluation Findings, second paragraph -Subsection VI, References, reference 4.
965	Revise SRP Section where appropriate to add General Design Criteria 17, 19, 34, and 36 as sources of acceptance criteria for Reactor Coolant System High Point Vents.	-Subsection II, Acceptance Criteria, criteria F, G, and H. -Subsection IV, Evaluation Findings, second paragraph. -Subsection VI, References, references 8, 9, 11, and 12.
967	This Integrated Impact identifies a future work issue to add a new section to Regulatory Guide 1.70 covering reactor coolant system high point vents.	-None
1020	Revise SRP Section where appropriate to include a citation for 10 CFR 50.34(f)(2)(vi).	-None, included in ROC 296