U.S. NUCLEAR REGULATORY COMMISSION

STANDARD REVIEW PLAN

OFFICE OF NUCLEAR REACTOR REGULATION

6.7 MAIN STEAM ISOLATION VALVE LEAKAGE CONTROL SYSTEM (BWR)

REVIEW RESPONSIBILITIES

Primary - ~~Auxiliary Systems Branch~~Plant Systems Branch (~~ASB~~SPLB)[1]

Secondary - None

I. AREAS OF REVIEW

Direct cycle boiling water reactor (BWR) plants have redundant quick-acting isolation valves on each main steam line from the reactor to the turbine. In the event of a loss-of-coolant accident (LOCA), any leakage of contaminated steam through these valves is controlled by a leakage control system. The leakage control system must satisfy the requirements of General Design Criteria 2, 4, and 54. As an alternative, the applicant may use a passive method of controlling offsite consequences resulting from leakage past steam line isolation valves in the event of a LOCA by taking credit for fission product plateout and holdup in the large volume and surface area of the main steam piping, main steam drain lines, turbine bypass line, turbine, and main condenser subject to complying with additional requirements for these items.[2]

The review of the main steam isolation valve leakage control system (MSIVLCS) covers the entire leakage control system, including the source of the sealing medium, if any, and pumps, valves, and piping to the points of connection or interface with the main steam supply system. Emphasis is placed on the components of the leakage control system that are required to remain functional following a ~~design basis~~[3] LOCA.

1. ~~ASB~~ SPLB[4] reviews the design of the MSIVLCS and essential subsystems to ~~assure~~ensure[5] their ability to function following a ~~postulated~~ LOCA, including the loss of offsite power. The system is reviewed to determine that:

   a. A malfunction or failure of an active component of the system, or loss of the source of sealing fluid, if any, will not impair the functional performance of the system.

   b. The failure of nonseismic Category I equipment or components will not have an adverse effect on the ability of the system or components to function.

   c. The capability of the system to perform its intended safety function is maintained assuming a single active failure of a main steam line isolation valve.

2. The ~~ASB~~ SPLB[6] also reviews the design of the leakage control system with respect to the following:

   a. The capability of the system to withstand the effects of the ~~safe shutdown earthquake~~ SSE,[7] including the source of sealing medium, if any.

   b. The capability of the system to control main steam isolation valve leakage and preserve containment integrity under ~~design basis~~ LOCA conditions, including loss of offsite power.

   c. The compatibility of initiation means and controls of the system with loading requirements on the emergency electrical buses, operator reaction times, and with actuation times available in view of the specific team isolation valve leakage limits.

   d. The requirements for interlocks to prevent inadvertent system operation.

   e. The capability of the system design to permit functional testing of components, controls, and actuation devices during power operations to the extent practicable and complete functional testing during plant shutdown.

   f. The capability of the system and main steam supply system components to withstand effects resulting from the use of a sealing medium, if any, such as thermal stresses, pressures associated with flashing, and thermal deformations, so that the structural integrity of the main steam lines and main steam isolation valves will not be affected and that any deformation of valve internals will not result in excessive leakage from or through the valves.

   g. The design provisions incorporated to prevent or treat main steam isolation valve stem packing leakage or other direct leakage.

h. The instrumentation and control features necessary to accomplish the system function, including isolation of components of the system in the event of malfunctions.

i. The need for a third main steam shutoff valve in each main steam line upstream of the turbine stop valve to ~~assure~~ensure the safety function of the MSIVLCS.

Review Interfaces[8]

1. ~~ASB~~SPLB[9] also performs the following reviews under the SRP sections indicated:

a. Review for flood protection is performed under SRP Section 3.4.1.

b. Review of the protection against internally generated missiles is performed under SRP Section 3.5.1.1.

c. Review of the structures, systems, and components to be protected against externally generated missiles is performed under SRP Section 3.5.2.

d. Review of protection against pipe breaks is performed under SRP Section 3.6.1.

e. Review of the environmental qualification of mechanical and electrical equipment is performed under SRP Section 3.11.[10]

f. Review of fire protection is performed under SRP Section 9.5.1.[11]

g. Review of the design of the main steam piping and main steam drain lines is performed under SRP Section 10.3.[12]

h. Review of the design of the main condensers is performed under SRP Sections 10.4.1 and 10.4.2.[13]

i. Review of the turbine system is performed under SRP Sections 10.4.3 and 10.4.4.[14]

2. Related review evaluations will be performed by other branches and the results will be coordinated by ~~ASB~~SPLB[15] to complete the overall evaluation of the system. The evaluations provided by other branches are as follows:

a. The ~~Structural Engineering Branch (SEB)~~Civil Engineering and Geosciences Branch (ECGB)[16] 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 earthquakes (~~SSE~~)~~,[17] the probable maximum flood (PMF), and tornado missiles 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. The ECGB also

verifies that inservice inspection requirements are met for system components as part of its primary review responsibility for SRP Sections 5.2.4 and 6.6.[18]

b. The Mechanical Engineering Branch ~~(MEB)~~(EMEB)[19] 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.

c. The ~~MEB, also,~~EMEB[20] 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.

d. The ~~MEB also~~EMEB[21] reviews the adequacy of the inservice testing program of pumps and valves as part of its primary review responsibility for SRP Section 3.9.6.

e. The ~~Equipment Qualification Branch (EQB)~~EMEB[22] reviews the seismic qualification of Category I instrumentation and electrical equipment ~~and the environmental qualification of mechanical and electrical equipment~~ as part of its primary review responsibility for SRP Section~~s~~ 3.10 ~~and 3.11, respectively~~.[23]

f. The ~~Materials Engineering Branch (MTEB)~~Materials and Chemical Engineering Branch (EMCB)[24] 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~~[25] the compatibility of the materials of construction with service conditions.

g. The ~~Instrumentation and Control Systems Branch (ICSB) and the Power Systems Branch (PSB)~~Instrumentation and Controls Branch (HICB)[26] determines the adequacy of the design, installation, inspection, and testing of all electrical components ~~(sensing, control, and power)~~for sensing and control required for proper operation as part of ~~their~~its primary review responsibility for SRP Section~~s~~ 7.1 ~~and 8.0, respectively~~.[27]

h. The Electrical Engineering Branch (EELB) determines the adequacy of the design, installation, inspection, and testing of all electric power components required for proper operation as part of its primary review responsibility for SRP Sections 8.3.1 and 8.3.2.[28]

i. The ~~Containment Systems Branch (CSB)~~Containment Systems and Severe Accident Branch (SCSB)[29] reviews the MSIVLCS to ~~assure~~ensure that no malfunction can adversely affect containment integrity as part of its primary review responsibility for SRP Sections 6.2.1 and 6.2.4.

~~The review for fire protection, technical specifications, and quality assurance are coordinated and performed by the Chemical Engineering Branch, Licensing Guidance Branch, and Quality~~

~~Assurance Branch as part of their primary review responsibility for SRP Sections 9.5.1, 16.0, and 17.0, respectively.~~[30]

j. The Emergency Preparedness and Radiation Protection Branch (PERB) reviews the postulated radiological consequences from main steam isolation valve leakage following a loss-of-coolant accident (LOCA) as part of its primary review responsibility for SRP Section 15.6.5.[31]

k. The Technical Specifications Branch (TSB) coordinates and performs reviews of the proposed technical specifications as part of its primary review responsibility for SRP Section 16.0.[32]

l. The Quality Assurance and Maintenance Branch (HQMB) coordinates and performs reviews of quality assurance programs as part of its primary review responsibility for SRP Chapter 17.[33]

For those areas of review identified above as being ~~the responsibility of other branches~~part of the review under other SRP sections, the acceptance criteria and ~~their~~ methods of application are contained in the referenced SRP sections ~~corresponding to those branches~~.[34]

II. ACCEPTANCE CRITERIA

Acceptability of the MSIVLCS, as described in the applicant's safety analysis report (SAR), is based on specific general design criteria and regulatory guides. An additional basis for determining the acceptability of the MSIVLCS is the degree of similarity of the design with that of previously reviewed plants.

The design of the MSIVLCS is acceptable if the integrated system design is in accordance with the following criteria:

1. General Design Criterion 2 (GDC 2),[35] as related to structures housing the system and the system itself being capable of withstanding the effects of earthquakes. Acceptance is based on meeting position C.1 of Regulatory Guide 1.29 and position C.1 of Regulatory Guide 1.96.

2. General Design Criterion 4 (GDC 4),[36] as related to structures housing the system and the system itself being capable of withstanding the effects of pipe breaks and externally and internally generated missiles. Acceptance is based on meeting positions C.2 and C.4 of Regulatory Guide 1.96.

3. General Design Criterion 54 (GDC 54),[37] as related to the capability for leak detection, isolation, and performance testing for system piping penetrating containment. Acceptance is based on meeting positions C.3 and C.5 through C.12 of Regulatory Guide 1.96.

Technical Rationale[38]

The technical rationale for application of these acceptance criteria to reviewing the MSIVLCS is discussed in the following paragraphs:[39]

1. Compliance with GDC 2 requires that nuclear power plant structures, systems, and components important to safety be designed to withstand the effects of natural phenomena such as earthquake, tornado, hurricane, flood, tsunami, and seiche without loss of capability to perform their safety functions.

   In the event of a LOCA, the function of the MSIVLCS is to reduce the amount of direct, untreated leakage from the main steam isolation valves (MSIVs) when isolation of the primary system and containment is required. Typically, a sealing fluid for the isolation valves has been used. As an alternative, the applicant may use a passive method of controlling offsite doses from leakage past the steam line isolation valves in the event of a LOCA by taking credit for fission product plateout and holdup in the large volume and surface area of the main steam piping, main steam drain lines, turbine bypass line, turbine, and main condenser. Regulatory Guide 1.29, position C.1, and Regulatory Guide 1.96, position C.1, provide guidance on meeting this requirement. The requirements of GDC 2 are imposed on the MSIVLCS to ensure that engineered safety features, including those associated with control of MSIV leakage, function under the appropriate combination of normal and accident conditions, including the effects of natural phenomena.

   Meeting the requirements of GDC 2 provides assurance that equipment associated with managing MSIV leakage will limit the releases of fission products to the environment to levels that will not exceed the offsite doses specified in 10 CFR Part 100.[40]

2. Compliance with GDC 4 requires that structures, systems, and components important to safety be designed to accommodate the effects of, and be compatible with, the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents, including LOCAs and the resulting dynamic effects.

   The requirements of GDC 4 are imposed on the MSIVLCS because this equipment must continue functioning during the post-LOCA recovery period in order to limit offsite radiation doses. Environmental conditions that may occur in association with either loss-of-coolant events or dynamic effects could compromise the function of the MSIVLCS. Regulatory Guide 1.96, positions C.2 and C.4, provides guidance on meeting this requirement with respect to the MSIVLCS.

   Meeting the requirements of GDC 4 provides assurance that the MSIVLCS will function, thereby ensuring that releases of fission products to the environment will not result in offsite doses in excess of those specified in 10 CFR Part 100.[41]

3. Compliance with GDC 54 requires that piping systems penetrating primary reactor containment be provided with leak detection, isolation, and performance testing capabilities.

The requirements of GDC 54 are imposed to provide assurance that unanticipated leakage from parts of the MSIVLCS that penetrate the reactor containment will not occur during the recovery period after a LOCA. Such leakage would compromise the ability of the system to limit the release of fission products to the environment. Regulatory Guide 1.96, positions C.3 and C.5 through C.12, provides guidance on meeting this requirement with respect to the MSIVLCS.

Meeting the requirements of GDC 54 provides assurance that the MSIVLCS will not be a source of additional leakage of fission products and will not result in offsite doses in excess of those specified in 10 CFR Part 100.[42]

III. REVIEW PROCEDURES

The procedures below are used during the standard design certification, construction permit (CP), and combined license (COL)[43] reviews to determine that the design criteria, design bases, and preliminary design meet the acceptance criteria given in subsection II of this SRP section. For the review of operation~~ion~~ing license (OL) or COL[44] applications, the procedures are utilized to verify that the initial design criteria and bases have been appropriately implemented in the final design.

The OL and COL reviews include~~s~~[45] a determination that the content and intent of the technical specifications prepared by the applicant are in agreement with the requirements for system testing, minimum performance, and surveillance developed by the staff. The reviewer will select and emphasize material from this SRP section, as may be appropriate for a particular case.

Upon request from the primary reviewer, the secondary review branches will provide input for the areas of review stated in subsection I of this SRP section. The primary reviewer obtains and uses such input as required to ~~assure~~ensure that this review procedure is complete.

1. The information provided in the SAR pertaining to the design basis and design criteria, the system piping and instrumentation diagrams (P&IDs), and the system description are reviewed to determine that they clearly delineate the following:

   a. The method used to accomplish the main steam isolation valve leakage control function and the system components essential for operation following ~~design basis~~ LOCA conditions.

   b. Essential components of the leakage control system are correctly identified and are isolable from any nonessential portions of the system. The P&IDs are reviewed to verify that they clearly indicate the physical divisions between such portions and indicate any design classification changes. System drawings are reviewed to see that they show the means for accomplishing isolation and the system description is reviewed to identify minimum performance requirements for the leakage control system isolation valves.

   c. Essential components of the leakage control system, including the isolation valves separating any nonessential portions of the system, and the seal fluid source (if

used) are classified seismic Category I and Quality Group A or B, as specified in Regulatory Guide 1.96. Component and system descriptions in the SAR that identify mechanical and performance characteristics are reviewed to verify that the above classifications have been included, and that the P&IDs indicate points of design classification changes. The review for seismic design is performed by ~~SEB~~ECGB[46] and the review for seismic and quality group classification is performed by ~~MEB~~EMEB,[47] as indicated in subsection I of this SRP section.

d. Design provisions have been made that permit appropriate inservice inspection and functional testing of system components. It is acceptable if the SAR information delineates a testing and inspection program and if the system drawings show the necessary design provisions to accomplish the testing program.

2. The reviewer determines that the safety function of the MSIVLCS will be maintained, as required, in the event-of adverse environmental phenomena such as earthquakes. The reviewer uses engineering judgment, the results of failure modes and effects analyses, and the results of reviews performed under other SRP sections indicated in subsection I of this SRP section to determine that the failure of nonessential portions of the system or of other systems not designed to seismic Category I and located close to essential portions of the system, or of nonseismic Category I structures located close to essential portions of the system, will not preclude operation of the essential portions of the MSIVLCS. Reference to SAR sections describing site features, the general arrangement and layout drawings, and the tabulation of seismic design classifications for systems and structures will be necessary. Statements in the SAR that the above conditions are met are acceptable.

3. If the leakage control system is one using a fluid sealing medium:

a. The system design is reviewed to determine that the quantity of sealing fluid needed for an effective seal of the valves has been provided. Independent analyses, using the pump performance curves in the SAR, are made to ~~assure~~ensure that the design and the location of the pump and components are such as to maintain the appropriate net positive suction head (NPSH) requirements and provide a continuous supply of sealing fluid during the full course of an accident.

b. The system design is reviewed to determine that effects resulting from the sealing fluid, such as thermal stresses, pressures associated with flashing, thermal deformations, and other effects will not effect the structural integrity of the steam lines or the main steam isolation valves, or add to excessive leakage of the valves. This portion of the review is done on a case by-case basis. The ~~ASB~~SPLB[48] also accepts the system design if a statement in the SAR commits to performing calculations or functional testing to demonstrate that the above conditions are met.

4. The MSIVLCS is reviewed to verify that instrumentation, controls, and interlocks designed to standards appropriate for an engineered safety feature are provided to actuate the system in the event of a ~~design basis~~ LOCA, and to prevent inadvertent actuation. Interlocks to prevent inadvertent operation of the leakage control system that are actuated by signals from the reactor protection, engineered safety feature, or containment isolation systems are acceptable. A statement in the SAR that such instrumentation, controls, and interlocks will be provided is acceptable for construction permit (CP) review.

5. The system performance requirements, P&IDs, MSIVLCS drawings, and the results of failure modes and effects analyses are reviewed to ~~assure~~ensure that the system can function following a ~~design basis~~ LOCA assuming a concurrent single active failure, including the failure of a single main steam isolation valve to close. The reviewer evaluates the analyses presented in the SAR to ~~assure~~ensure the function of required components, traces the availability of these components on system drawings, and checks that the SAR contains verification that minimum requirements are met for each failure condition over the required time spans. For each case the design is acceptable if minimum system functional requirements are met. The reviewer upon request from ~~AEB~~PERB[49] provides an estimate of the quantity of fluid processed by the MSIVLCS, for use in calculating radiological consequences of a LOCA.

6. The leakage control system design is reviewed to verify that valve stem packing leakage or other direct leakage from the main steam isolation valves or other components outside containment is prevented or controlled. Such leakage could bypass the leakage control system and result in untreated releases to the environment. The means for prevention or control need not be part of the leakage control system itself, but should meet the same design criteria.

7. The leakage control system design is reviewed to determine if a third main steam line valve, located between the main steam isolation valve and the turbine stop valve, is required to ~~assure~~ensure that the MSIVLCS can perform its safety function following a ~~design basis~~ LOCA.

8. An acceptable alternative to providing an MSIVLCS involves taking credit for fission product plateout and holdup in the large volume and surface area of the main steam piping, main steam drain lines, turbine bypass line, and main condenser for controlling offsite consequences from leakage past steam line isolation valves in the event of a LOCA. If this alternative is proposed, the reviewer coordinates with SPLB reviews under other SRP sections and reviews of other branches as described in subsection I to verify that:

   a. offsite consequences of such an event are acceptable,

   b. appropriate components associated with the proposed fission product plateout and holdup path are seismic Category I or analyzed for SSE conditions, as applicable, and

c. the classification of affected components subjects them to quality standards adequate to ensure performance of these functions.[50]

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.[51]

IV. EVALUATION FINDINGS

The reviewer verifies that sufficient information has been provided and ~~his~~ that the[52] review supports conclusions of the following type, to be included in the staff's safety evaluation report (SER):[53]

The main steam isolation valve leakage control system (MSIVLCS) includes the source of the sealing medium, (if used) pumps, valves, and piping to the points of connection or interface with the main steam lines. The system is designed to seismic Category I, Quality Group B requirements since it is necessary for postaccident fission product removal. That portion of the system connected to the piping between the MSIVs is designed to seismic Category I, Quality Group A requirements since it is part of the primary coolant system pressure boundary. Based on the review of the applicant's proposed design criteria, design bases, safety classification of system and components, and the requirements for operation of the system during loss-of-coolant accident conditions, the staff concludes that the design of the main steam isolation valve leakage control system is in conformance with the Commission's regulations as set forth in General Design Criteria 2, 4, and 54. This conclusion is based on the following:

1. The applicant's design meets the requirements of General Design Criterion 2 since the design is in accordance with position C.1 of Regulatory Guide 1.29 and position C.1 of Regulatory Guide 1.96.

2. The applicant's design meets General Design Criterion 4 with regards to pipe breaks and missiles since the design meets positions C.2 and C.4 of Regulatory Guide 1.96.

3. The applicant's design also meets the requirements of General Design Criterion 54 as related to leak detection, isolation, and performance testing for system piping penetrating containment. The bases for acceptance is that the design meets positions C.3 and C.5 through C.12 of Regulatory Guide 1.96.

(If an alternative to an MSIVLCS is proposed to address steam line isolation valve leakage, this section of the SER should instead briefly indicate that an acceptable alternative to the MSIVLCS has been provided to control offsite consequences resulting

from leakage past the steam line isolation valves in the event of a LOCA and that findings related to the acceptable alternative are described in other sections of the SER.)[54]

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.[55]

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.[56] 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 compliance 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.[57]

Implementation schedules for conformance to parts of the method discussed herein are contained in the referenced regulatory guides.

VI. REFERENCES

1. 10 CFR Part 50, Appendix A, General Design Criterion 2, "Design Bases for Protection Against Natural Phenomena."

2. 10 CFR Part 50, Appendix A, General Design Criterion 4, "Environmental and ~~Missile~~ Dynamic Effects[58] Design Bases."

3. 10 CFR Part 50, Appendix A, General Design Criterion 54, "Piping Systems Penetrating Containment."

4. Regulatory Guide 1.29, "Seismic Design Classification."

5. Regulatory Guide 1.96, "Design of Main Steam Isolation Valve Leakage Control Systems for Boiling Water Reactor Nuclear Power Plants."

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SRP Draft Section 6.7
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 name and abbreviation	Changed PRB to Plant Systems Branch (SPLB).
2.	Integrated Impact No. 118	Added description of alternative means of controlling offsite doses.
3.	SRP-UDP format item	Global change to delete modifier of LOCA per Generic Issue B-3.
4.	Current PRB abbreviation	Changed PRB to SPLB.
5.	Editorial	Changed "assure" to "ensure" (global change for this section).
6.	Current PRB abbreviation	Changed PRB to SPLB.
7.	Editorial revision	The abbreviation for safe shutdown earthquake was previously defined.
8.	SRP-UDP format item	Added "Review Interfaces" to AREAS OF REVIEW and organized in numbered paragraph form.
9.	Current PRB abbreviation	Changed PRB to SPLB.
10.	Current SPLB review responsibility	Added SPLB review responsibility for SRP Section 3.11.
11.	Current SPLB review responsibility	Added SPLB review responsibility for SRP Section 9.5.1.
12.	Integrated Impact No. 118	Added SPLB review responsibility for SRP Section 10.3.
13.	Integrated Impact No. 118	Added SPLB review responsibility for SRP Section 10.4.1 and 10.4.2.
14.	Integrated Impact No. 118	Added SPLB review responsibility for SRP Section 10.4.3 and 10.4.4.
15.	Current PRB abbreviation	Changed PRB to SPLB.
16.	Current review branch name and abbreviation	Changed review branch to Civil Engineering and Geosciences Branch (ECGB).
17.	Editorial revision	The abbreviation for safe shutdown earthquake was previously defined.
18.	Update of PRB review responsibilities	Relocated to reflect that ECGB is now the PRB responsible for SRP Section 6.6. Also added interface to SRP Section 5.2.4 since some portions of the MSIVLCS may be required to be designed and inspected per Code Class 1 requirements.
19.	Current review branch abbreviation	Changed review branch abbreviation to EMEB.
20.	Current review branch abbreviation	Changed review branch abbreviation to EMEB.
21.	Current review branch abbreviation	Changed review branch abbreviation to EMEB.

Item	Source	Description
22.	Current review branch abbreviation	Changed review branch abbreviation to EMEB.
23.	Current SPLB review responsibility	Changed because SPLB has review responsibility for SRP Section 3.11.
24.	Current review branch name and abbreviation	Changed review branch to Materials and Chemical Engineering Branch (EMCB).
25.	Update of PRB review responsibilities	Relocated to reflect that ECGB is now the PRB responsible for SRP Section 6.6.
26.	Current review branch name and abbreviation	Changed review branch to Instrumentation and Controls Branch (HICB).
27.	SRP-UDP format item	Section rewritten to reflect current SRP format and HICB responsibility for SRP Section 7.1.
28.	SRP-UDP format item	Section rewritten to reflect current SRP format and EELB responsibility for SRP Section 8.0.
29.	Current review branch name and abbreviation	Changed review branch to Containment Systems and Severe Accident Branch (SCSB).
30.	SRP-UDP format item	Section removed to reflect current SRP format.
31.	SRP UDP Format item, Review Interfaces	Added a Review Interface for SRP Section 15.6.5 since it is the primary interface section for reviewing the consequences of MSIV leakage following a LOCA.
32.	SRP-UDP format item	Section rewritten to reflect current SRP format and TSB responsibility for SRP Section 16.
33.	SRP-UDP format item	Section rewritten to reflect current SRP format and HQMB responsibility for SRP Section 17.
34.	Editorial	Revised wording for consistency with other SRP sections.
35.	Editorial	Provided "GDC 2" as initialism for "General Design Criterion 2."
36.	Editorial	Provided "GDC 4" as initialism for "General Design Criterion 4."
37.	Editorial	Provided "GDC 54" as initialism for "General Design Criterion 54."
38.	SRP-UDP format item, develop technical rationale	"Technical Rationale" added to ACCEPTANCE CRITERIA and organized as numbered paragraphs describing the bases for referencing the General Design Criteria.
39.	SRP-UDP format item, develop technical rationale	Added lead-in sentence for "Technical Rationale."
40.	SRP-UDP format item, develop technical rationale	Added technical rationale for GDC 2.

Item	Source	Description
41.	SRP-UDP format item, develop technical rationale	Added technical rationale for GDC 4.
42.	SRP-UDP format item, develop technical rationale	Added technical rationale for GDC 54.
43.	SRP-UDP format item	Added reference to standard design certification and combined license (COL) per 10 CFR Part 52.
44.	SRP-UDP format item	Added reference to COL per 10 CFR Part 52.
45.	SRP-UDP format item	Added reference to COL per 10 CFR Part 52.
46.	Current review branch abbreviation	Changed review branch abbreviation to ECGB.
47.	Current review branch abbreviation	Changed review branch abbreviation to EMEB.
48.	Current PRB abbreviation	Changed PRB to SPLB.
49.	Current review branch abbreviation	Changed review branch name and abbreviation to Emergency Preparedness and Radiation Protection Branch (PERB).
50.	Integrated Impact No. 118	Included review of alternative method of controlling release of radioactivity via MSIV leakage in REVIEW PROCEDURES.
51.	SRP-UDP Guidance, Implementation of 10 CFR 52	Added standard paragraph to address application of Review Procedures in design certification reviews.
52.	Editorial	Modified to eliminate gender-specific reference.
53.	Editorial	Provided "SER" as initialism for "safety evaluation report."
54.	Integrated Impact No. 118	Included reference to alternative method of controlling release of radioactivity via MSIV leakage in EVALUATION FINDINGS.
55.	SRP-UDP Format Item, Implement 10 CFR 52 Related Changes	To address design certification reviews a new paragraph was added to the end of the Evaluation Findings. This paragraph addresses design certification specific items including ITAAC, DAC, site interface requirements, and combined license action items relevant to the SRP section.
56.	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.
57.	SRP-UDP Guidance	Added standard paragraph to indicate applicability of this section to reviews of future applications.
58.	SRP-UDP format item	Updated title for GDC 2.

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Integrated Impact No.	Issue	SRP Subsections Affected
118	Incorporate consideration of the use of the large volume and surface area of the main steam piping, main steam drain lines, turbine bypass line, main condenser, and turbine as the paths of potential leakage of fission products via the MSIVs to the environment after a LOCA.	Subsection I, AREAS OF REVIEW, first paragraph Subsection I, AREAS OF REVIEW, Review Interfaces, paragraph 1.g Subsection I, AREAS OF REVIEW, Review Interfaces, paragraph 1.h Subsection I, AREAS OF REVIEW, Review Interfaces, paragraph 1.i Subsection III.8, REVIEW PROCEDURES Subsection IV, EVALUATION FINDINGS, third paragraph