



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

9.2.6 CONDENSATE STORAGE FACILITIES

REVIEW RESPONSIBILITIES

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

Secondary - ~~None~~ Civil Engineering and Geosciences Branch (ECGB)²

I. AREAS OF REVIEW

The condensate storage facility (CSF) is provided to serve as a receiver for excess water generated by other systems such as the main condenser hotwell, the liquid radwaste low activity reprocessed condensate, and the makeup water treatment system, and also to serve as the water supply or makeup source for various auxiliary systems. Depending upon its specific function in the plant under review, the CSF may or may not be safety related. The ~~ASB~~SPLB³ review covers the CSF from the condensate storage tank up to the connections or interfaces with other systems to assure conformance with the requirements of General Design Criteria 2, 5, 44, 45, and 46, 60,⁴ and 10 CFR 50.63⁵.

1. The ~~ASB~~SPLB⁶ reviews the capability of the CSF to supply water to various auxiliary systems and to receive return water from other systems.
2. The ~~ASB~~SPLB⁷ reviews the CSF to verify that:
 - a. Failures of CSF components connected to the emergency core cooling system (ECCS) or other safety-related systems do not adversely affect the safety function of the ECCS or other safety-related systems.

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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.

- b. The essential safety-related⁸ portions of the CSF are protected from the effects of natural phenomena, including cold weather protection, so that the event will not adversely affect the safety function of the system.
 - c. Component redundancy necessary to assure CSF safety functions is provided.
 - d. System components meet design code requirements consistent with the component quality group and seismic design classifications.
 - e. Provisions for mitigating the environmental effects of system leakage or storage tank failure are provided.
 - f. Provisions for safe handling of storage tank overflow, the associated instrumentation necessary to detect high or low water level, and isolation means are provided.
 - g. Provisions for automatically transferring from a normal water supply that is nonsafety related to an assured seismic Category I source if required.
3. For plants where the design relies upon the CSF in response to a station blackout, the SPLB reviews the CSF to verify that the CSF capability and capacity meet the requirements of the plant for the Station Blackout (SBO) event covered in SRP Section 8.4 (proposed).⁹

Review Interfaces:¹⁰

The¹¹ ASB SPLB¹² also performs the following reviews under the SRP sections indicated:

- 1. Reviews of flood protection is performed¹³ under SRP Section 3.4.1.
- 2. Reviews of the protection against internally generated missiles is performed¹⁴ under SRP Section 3.5.1.1.
- 3. Reviews of the structures, systems, and components to be protected against externally generated missiles is performed¹⁵ under SRP Section 3.5.2.
- 4. Reviews of high- and moderate-energy pipe breaks is performed¹⁶ under SRP Section 3.6.1.
- 5. Calculates the radioactivity concentrations in the CSF as part of its primary review responsibility in SRP Section 11.1.¹⁷
- 6. Reviews fire protection under SRP Section 9.5.1.¹⁸

In addition, the ASBSPLB¹⁹ will coordinate other branch evaluations that interface with the overall review of the system as follows:

1. The Reactor Systems Branch (RSB)(SRXB)²⁰ will identify essential safety-related²¹ portions of the facilities that are required to function during normal operations and accident conditions, and assist in establishing the basis for the minimum condensate storage capacity as part of its primary review responsibility of SRP Section 6.3.

~~The Effluent Treatment Systems Branch (ETSB) will calculate the radioactivity concentrations in the CSF as part of its primary review responsibility in SRP Section 11.1.²²~~
2. The Mechanical Engineering Branch (EMEB)²³ determines that components, piping, and structures are designed in accordance with applicable codes and standards as part of its primary review responsibility of SRP Sections 3.9.1 through 3.9.3 and MEB also²⁴ determines the acceptability of the seismic and quality group classifications for system components as part of its primary review responsibility of SRP Sections 3.2.1 and 3.2.2. The EMEB²⁵ also reviews the adequacy of the inservice testing program of pumps and valves as part of its primary review responsibility of SRP Section 3.9.6.
3. The Structural Engineering Branch (SEB)ECGB²⁶ will determine 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), the probable maximum flood (PMF), and the tornado missiles as part of its primary review responsibility of 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 the inservice inspection requirements are met for system components as part of its primary review responsibility of SRP Section 6.6.²⁷
4. The Materials and Chemical Engineering Branch (MTEB)(EMCB)²⁸ verifies the inservice inspection requirements are met for system components and²⁹ the compatibility of the materials of construction with the service conditions as part of its primary review responsibility of SRP Section 6.1.1.

~~The Instrumentation & Control Systems Branch (ICSB) and Power Systems Branch (PSB) will verify the adequacy of the design, installation, inspection, and testing of all electrical systems (sensing, control, and power) required for proper operation as part of its primary review responsibilities of SRP Section 7.1 and Appendix 7-A for ICSB and SRP Section 8.3.1 for PSB.³⁰~~
5. The Electrical Engineering Branch (EELB) will verify the adequacy of the design, installation, inspection, and testing of all electrical systems (sensing, control, and power) required for proper operation as part of its primary review responsibilities of SRP Sections 8.3.1 and 8.3.2.³¹ The EELB, as part of its primary review responsibility for SRP Section 8.4 (proposed), also reviews the plant with respect to SBO requirements and coordinates with the review of SRP Section 9.2.6 with respect to the capacity and capability of the CSF during a station blackout.³²

6. The Instrumentation & Control Branch (HICB) will verify the adequacy of the design, installation, inspection, and testing of all instrumentation and control systems (sensing, control, and power) required for proper operation as part of its primary review responsibilities of SRP Chapter 7.³³
7. The Radiological Assessment Branch (RAB) Emergency Preparedness and Radiation Protection Branch (PERB)³⁴ reviews the facility design to assure that radiation levels³⁵ exposure to personnel will be maintained as low as is reasonably achievable as part of its primary review responsibility for SRP Section 12.1.

The review for fire protection, technical specifications, and quality assurance is coordinated and performed by the Chemical Engineering Branch, Licensing Guidance Branch Technical Specifications Branch, and Quality Assurance and Maintenance Branch as part of their primary review responsibility for SRP Sections 9.5.1, 16.0, and 17.0; respectively.³⁶
8. The review for technical specifications is coordinated and performed by the Technical Specifications Branch (TSB) as part of its primary review responsibility for SRP Section 16.0.³⁷
9. The review for quality assurance is coordinated and performed by the Quality Assurance and Maintenance Branch (HQMB) as part of its primary review responsibility for SRP Chapter 17.³⁸
10. For new plant applicants, the Condensate Storage Facilities may be included in the systematic assessment of shutdown risks as an alternate feature that can supply core cooling water in the event of a loss of normal decay heat removal during shutdown conditions. The Probabilistic Safety Assessment Branch (SPSB) coordinates and performs the shutdown risk assessment reviews as part of its primary review responsibility for SRP Section 19.1 (Proposed).³⁹

For those areas of review identified above as being reviewed as part of the primary review responsibility under other SRP sections of other branches, the acceptance criteria and their methods of application are contained in the referenced SRP sections of the corresponding primary branch.⁴⁰

II. ACCEPTANCE CRITERIA

Acceptability of the design of the condensate storage facility, as described in the applicant's Safety Analysis Report (SAR), is based on specific general design criteria and regulatory guides.

1. For reactor systems where the condensate storage facility is an ultimate means of water supply for safe shutdown or accident mitigation,⁴¹ the CSF is acceptable if the integrated facility design is in accordance with the following criteria:
 - a. General Design Criterion 2, as related to the system being capable of withstanding the effects of earthquakes. Acceptance is based on meeting the

guidance of Regulatory Guide 1.29, Position C-1, if any portion of the system is deemed to be safety related, and Position C-2 for nonsafety-related functions.

- b. General Design Criterion 5, as related to the capability of shared systems and components to perform required safety functions.
 - c. General Design Criterion 44, to assure:
 - (1) Redundancy of components so that under normal and accident conditions the safety function can be performed assuming a single active component failure coincident with the loss of offsite power.
 - (2) The capability to isolate components, subsystems, or piping if required so that the system safety function will not be compromised.
 - (3) The capability to provide sufficient makeup water to safety-related cooling systems.
 - d. General Design Criterion 45, as related to design provisions made to permit inservice inspection of safety-related components and equipment.
 - e. General Design Criterion 46, as related to design provisions made to permit operational functional testing of safety-related systems and components to assure structural integrity, system leak tightness, operability and performance of active components, and capability of the integrated system to function as intended during normal, shutdown, and accident conditions.
 - f. 10 CFR 50.63, Station Blackout (SBO), as related to design provisions to support the plant's ability to withstand and recover from a SBO. Acceptance is based on meeting the guidance of Regulatory Guide 1.155.⁴²
2. The CSF must meet General Design Criteria 60 as it relates to tanks and systems handling radioactive material in liquids. Acceptance is based on meeting the guidance of Regulatory Guide 1.143.⁴³

Technical Rationale:⁴⁴

The technical rationale for application of the above acceptance criteria to the Condensate Storage Facilities is discussed in the following paragraphs:

- 1. GDC 2 requires that nuclear power plant structures, systems and components important to safety be designed to withstand the effects of seismic events and other natural phenomena without loss of capability to perform their safety functions. The subject structures, systems and components are those necessary to ensure: (1) the integrity of the reactor coolant pressure boundary; (2) the capability to shutdown the reactor and maintain it in a safe shutdown condition; or (3) the capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposures comparable to

the guideline exposures of 10 CFR Part 100. When the plant design includes the CSF as a source of cooling water to prevent or mitigate the consequences of accidents, those portions of the CSF which provide or interface with a system that provides a means of shutting down the reactor and maintaining it in a safe shutdown condition must be capable of withstanding the effects of natural phenomena. Meeting the requirements of GDC 2 provides assurance that adequate reactor cooling will be available in the event of an accident, thus preventing offsite exposures in excess of 10 CFR Part 100.

2. GDC 5 prohibits the sharing of structures, systems and components among nuclear power plant units unless it can be shown that such sharing will not significantly impair their ability to perform their safety functions, including, in the event of an accident in one unit, an orderly shutdown and cooldown of the remaining units. The condensate storage facility provides a source of water for decay heat removal from the reactor core in those plants where the design includes this system for support to the plant in its response to an accident. Meeting the requirements of GDC 5 provides assurance that unacceptable effects of equipment failures or other events occurring in one unit of a multi-unit site will not propagate to the unaffected unit(s).
3. GDC 44 requires that a system be provided to transfer heat from structures, systems, and components important to safety to an ultimate heat sink, and specifies performance and design requirements that the system must meet. In those plants whose design includes the CSF as a support function for heat transfer from structures, systems, and components important to safety, compliance with GDC 44 will ensure the system will function to provide decay heat removal during normal, anticipated operational occurrences, and accident conditions.
4. Compliance with GDC 45 requires that the systems which provide essential cooling for safety-related equipment be designed to permit appropriate periodic inspection of important components, such as heat exchangers and piping, to assure the integrity and capability of the system. The CSF can be included in the plant design to provide a source of cooling of the reactor core. In these plants, the CSF needs to be designed such that the ability to perform these safety-related functions can be periodically verified. By allowing for periodic monitoring to detect signs of system degradation or incipient failure, compliance with GDC 45 provides assurance that the CSF will reliably function to provide decay heat removal and/or cooling to safety-related equipment.
5. GDC 46 requires that systems that provide essential cooling for safety-related equipment be designed to permit appropriate periodic pressure and functional testing to assure the structural and leak-tight integrity of its components. The CSF can be included in the plant design to provide a source of cooling of the reactor core. This testing is to include the operability and the performance of the active components of the system, and the operability of the system as a whole. By designing the CSF to allow for testing to detect degradation in performance or the system pressure boundary and compliance with GDC 45 assures that the CSF will reliably function to provide cooling to safety-related equipment and decay heat removal.

6. GDC 60 requires that nuclear power unit design include means to control the release of radioactive materials in liquid effluents produced during normal reactor operation, including anticipated operational occurrences. The criteria in General Design Criteria 60 apply to all tanks located outside the reactor containment and containing radioactive materials in liquids. These tanks have the potential for uncontrolled releases of radioactive materials due to spillage. Through its connections with the reactor coolant system (BWRs) or secondary coolant system (PWRs), the CSF potentially contains radioactive material. Meeting GDC 60 assures that radiation exposure to operating personnel and the general public are as low as reasonably achievable. Regulatory Guide 1.143 provides specific guidance for the implementing GDC 60. Compliance with this Regulatory Guide provides assurance that the design of the CSF will include features to prevent uncontrolled releases of radioactive material.
7. 10 CFR 50.63 invokes explicit requirements on the plant regarding the capability to ensure that the core is cooled in the event of a station blackout. The criteria in 10 CFR 50.63 apply to the CSF in those plants where the plant design includes this system for support to the plant in its response to a station blackout. In those plants, the CSF provides a source of water for removal of decay heat. The CSF capability (e.g., to serve as a water supply from which flow may be delivered as needed) and capacity must meet the decay heat removal requirements of the plant for the SBO event. Regulatory Guide 1.155 provides specific guidance for meeting the requirements of 10 CFR 50.63. Application of the criteria of 10 CFR 50.63 to the CSF ensures that the capacity of the CSF is adequate and that the CSF (including features facilitating flow delivery therefrom) is capable of providing needed functions to support decay heat removal in order to assure adequate core cooling during a station blackout.

III. REVIEW PROCEDURES

The procedures below are used during the construction permit (CP) review to determine 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 used 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 review of OL and DC⁴⁵ applications includes 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 as a result of the staff's review.

Upon request from the primary reviewer, the coordinated review branches will provide input for the areas of review stated in subsection I. The primary reviewer obtains and uses such input as required to assure that this review procedure⁴⁶ is complete.

The condensate storage facility (CSF) may be designed either as a safety-related facility or as a nonsafety-related facility, depending on the plant. The safety function performed by the facility is to ensure an adequate supply of water to the auxiliary feedwater system⁴⁷ in the event that it is required for the safe shutdown of the reactor. Normal plant system functions performed by the

CSF, such as makeup to the condenser hotwells and other auxiliary systems of the plant are reviewed to verify that failure will not have an adverse effect on the safety-related functions of the facility.

The review procedures given below are for a typical CSF system of the safety-related type. For cases where there are variations from this typical arrangement, the reviewer will adjust the review procedures given below. However, the system design will be required to meet the acceptance criteria given in subsection II.

1. The Safety Analysis Report is reviewed to determine that the facility description, and piping and instrumentation diagrams (P&IDs) delineate the CSF equipment that is used for normal operation, abnormal operation, and accident conditions as follows:
 - a. The facility functional requirements and the minimum flow requirements for supplying water to the auxiliary feedwater system and other safety-related systems are described.
 - b. Component allowable operational degradation (e.g., pump leakage) and the procedures that will be followed to detect and correct degraded conditions when they become excessive are described. The reviewer, using failure modes and effects analyses, or independent calculations, determines that the facility is capable of sustaining the loss of any active component and of meeting minimum flow requirements to the safety-related systems.
2. The facility P&IDs, layout drawings, and component descriptions and characteristics are reviewed to determine the following:
 - a. Essential safety-related⁴⁸ portions of the CSF are correctly identified and are isolable from the nonessential non safety-related⁴⁹ portions of the system. The P&IDs are reviewed to verify that they clearly indicate the physical division between each portion. System drawings are also reviewed to see that they show the means for accomplishing isolation, and the facility description is reviewed to identify minimum performance requirements for the isolation valves.
 - b. Essential safety-related⁵⁰ portions of the CSF, including the isolation valves separating seismic Category I portions from the nonseismic portions, are classified Quality Group C and seismic Category I.
 - c. Design provisions have been incorporated that permit appropriate inservice inspection and functional testing of system components important to safety. It will be acceptable if the SAR delineates a testing and inspection program and if the system drawings show the necessary test recirculation loops around pumps or isolation valves that would be required by this program.
3. The reviewer verifies that the system has been designed so that facility functions are maintained, as required, in the event of adverse natural phenomena such as tornadoes, hurricanes, and floods, and/or in the event of a loss of offsite power or station blackout.⁵¹

The reviewer evaluates the facility, using engineering judgment and the results of failure modes and effects analyses, to determine the following:

- a. The failure of portions of the facility or of other systems not designed to seismic Category I standards and located close to essentialsafety-related⁵² portions of the facility, or nonseismic Category I structures that house, support, or are close to essentialsafety-related⁵³ portions of the CSF, does not preclude essentialsafety-related⁵⁴ functions. Reference to SAR Chapter 2, describing site features and the general arrangement and layout drawings, as well as to the SAR tabulation of seismic design classifications for structures and facilities, will be necessary. Statements in the SAR to the effect that the above conditions are met are acceptable. (CP)
- b. The essentialsafety-related⁵⁵ portions of the CSF are protected from the effects of floods, cold weather conditions, hurricanes, tornadoes, and internally or externally generated missiles. Flood protection and missile protection criteria are discussed and evaluated in detail under the SRP sections for Chapter 3 of the SAR. The location and design of the facility and structures are reviewed to determine that the degree of protection provided is adequate. A statement to the effect that the facility is located in a seismic Category I structure that is tornado, missile, and flood protected, or that components of the facility will be located in individual structures that will withstand the effects of freezing, flooding, and missiles is acceptable.
- c. The CSF provides sufficient net positive suction head (NPSH) at safety-related pump suction locations considering low condensate storage tank water levels. The SAR should indicate the minimum water level of the condensate storage tank and the elevation of the pump impellers. An independent calculation verifying the applicant's conclusion regarding pump NPSH may be necessary.
- d. The condensate storage tank is equipped with instrumentation to monitor the water level in the tank and alarm when the water level reaches the low-level setpoint which indicates the minimum reserve condensate storage for safety-related system supply.
- e. The condensate storage tank overflow piping is connected to the radwaste system. The outdoor storage tank is designed in compliance with General Design Criteria 60 and the guidance of Regulatory Guide 1.143 and has a dike or retention basin capable of preventing runoff in the event of a tank overflow or tank failure; for a nonsafety-related storage facility, the need for a seismic Category I dike or retention basin is reviewed. As required by Regulatory Guide 1.143, high liquid level conditions actuate alarms both locally and in the control room.⁵⁶
- f. The essentialsafety-related⁵⁷ portions of the facility are protected from the effects of high- and moderate-energy line breaks or cracks. Layout drawings are reviewed to assure that no high- or moderate-energy piping systems are close to essentialsafety-related⁵⁸ portions of the CSF, or that protection from the effects of

failure will be provided. The means of providing such protection will be given in Section 3.6 of the SAR, and the procedures for reviewing this information are given in the corresponding SRP sections.

- g. Functions of the essential safety-related⁵⁹ components and subsystems of the CSF (i.e., those necessary for plant safe shutdown) will not be precluded by a loss of offsite power. The CSF design will be acceptable in this regard if minimum system requirements are met with onsite power.
 - h. The condensate storage tank has design provisions that automatically transfer, as required, from a normal nonsafety-related source to a seismic Category I source.
 - i. If a changeover from a nonsafety-related condensate storage source to a safety-related water source is required for safe shutdown or accident mitigation, then the changeover feature (automatic) should meet all the requirements for a safety-related system or component.
 - j. The CSF capacity and features supporting flow delivery from the CSF are sufficient to support withstanding or coping with, and recovering from a SBO as reviewed in SRP Section 8.4. Regulatory Guide 1.155 contains staff positions related to systems and components required for decay heat removal during an SBO. Positions C.3.2, C.3.3.2, and C.3.5 apply to those portions of the CSF necessary for decay heat removal.⁶⁰
4. The descriptive information, P&IDs, system drawings, and failure modes and effects analyses in the SAR are reviewed to assure that essential safety-related⁶¹ portions of the CSF will function as needed following design basis accidents, assuming a concurrent single active component failure. The reviewer evaluates the information presented in the SAR to determine the ability of required components to function, traces the availability of these components on system drawings, and checks that the SAR contains verification that system flow requirements are met for each accident situation for the required time spans. For each case, the design will be acceptable if minimum system flow requirements are met.

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.⁶²

IV. EVALUATION FINDINGS

The reviewer verifies that sufficient information has been provided and his⁶³ review supports conclusions of the following type, to be included in the staff's safety evaluation report:

The condensate storage facility (CSF) includes all components and piping associated with the facility to the points of connection or interfaces with other systems. The review has determined the adequacy of the applicant's proposed design criteria and bases for the condensate storage facility and the requirements for sufficient water supply to safety-related systems during normal, abnormal, and accident conditions.

Portions of the CSF that are necessary for safe shutdown or necessary to mitigate the consequences of an accident are classified seismic Category I and Quality Group C.

The staff concludes that the design of the condensate storage facility is acceptable and meets the requirements of 10 CFR 50.63 and⁶⁴ General Design Criteria 2, 5, 44, 45, and 46, and 60⁶⁵. This conclusion is based on the following:

1. The applicant has met the requirement of General Design Criterion 2 with respect to safety-related portions of the system being capable of withstanding the effects of earthquakes. Acceptance is based on meeting the guidance of Regulatory Guide 1.29, Position C-1, if any portion is deemed safety-related, and Position C-2, for nonsafety-related portions. Portions of the system are deemed safety-related⁶⁶ if a failure or malfunction could result in adverse effects on essential safety-related⁶⁷ systems or components (i.e., necessary for safe shutdown, accident prevention, or accident mitigation.)
2. The applicant has met the requirements of General Design Criterion 5 with respect to sharing of structures, systems, and components by demonstrating that such sharing does not affect the safe shutdown of either unit in the event of an active or passive failure.
3. The applicant has met the requirements of General Design Criterion 44 with respect to the cooling water system by demonstrating sufficient redundancy and capability exists such that a single failure with the loss of offsite power will not result in adverse effect on the ability to shut down safely or mitigate the consequences of an accident in addition to having sufficient capability to provide makeup water to safety-related cooling systems and the capability to isolate components, subsystems or piping without system degradation.
4. The applicant has met the requirements of General Design Criterion 45 with respect to inservice inspection of the safety-related components and equipment by demonstrating the accessibility of the CSF systems for periodic inspections.
5. The applicant has met the requirements of General Design Criterion 46 with respect to periodic pressure and functional testing to assure structural and leak tight integrity, operability, and performance of its active components, and operability of the system as a whole by demonstrating the capability to operate the system at full capacity during normal startup or shutdown procedures or during normal operation without degrading the system to provide for a safe shutdown or to mitigate the consequences of an accident.

6. The applicant has met the requirements of General Design Criteria 60 with respect to tanks located outside the reactor containment that contain radioactive materials in liquids. Acceptance is based on meeting the guidance of Regulatory Guide 1.143, Positions in C.1.2.⁶⁸
7. The applicant has met the requirements of 10 CFR 50.63 with respect to CSF capacity and capability for station blackout by demonstrating capability for adequate flow delivery from the CSF and capacity consistent with required flow rates and the event duration as needed to support the plant in a station blackout event. Acceptance is based on meeting the guidance of Regulatory Guide 1.155, Positions C.3.2, C.3.3.2, and C.3.5.⁶⁹

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, analysis, and acceptance criteria (ITAAC), including design acceptance criteria (DAC), site interface requirements, and combined license action items that are relevant to this SRP section.⁷⁰

V. IMPLEMENTATION

The following is intended to provide guidance to the 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 52.⁷¹ 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's 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.⁷²

Implementation schedules for conformance to parts of the method discussed herein are contained in the referenced regulatory guides and 10 CFR 50.63.⁷³

VI. REFERENCES

1. 10 CFR 50, §50.63, "Loss of all alternating current power."⁷⁴
12. 10 CFR Part 50, Appendix A, General Design Criterion 2, "Design Bases for Protection Against Natural Phenomena."
23. 10 CFR Part 50, Appendix A, General Design Criterion 5, "Sharing of Structures, Systems, and Components."
34. 10 CFR Part 50, Appendix A, General Design Criterion 44, "Cooling Water."

- 45. 10 CFR Part 50, Appendix A, General Design Criterion 45, "Inspection of Cooling Water System."
- 56.⁷⁵ 10 CFR Part 50, Appendix A, General Design Criterion 46, "Testing of Cooling Water System."
- 7. 10 CFR Part 50, Appendix A, General Design Criterion 60, "Control of Releases of Radioactive Materials to the Environment."⁷⁶
- 68. Regulatory Guide 1.29, "Seismic Design Classification."
- 9. Regulatory Guide 1.143, "Design Guidance For Radioactive Waste Management Systems, Structures, and Components Installed In Light-Water-Cooled Nuclear Power Plants"⁷⁷
- 10 Regulatory Guide 1.155, "Station Blackout"⁷⁸

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SRP Draft Section 9.2.6
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 name and responsibility for SRP Section 9.2.6.
2.	Current PRB review responsibilities	Changes made to add ECGB as the responsible Branch for the secondary review to reflect the current PRB secondary review responsibility for SRP section 9.2.6
3.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB names and responsibility for SRP Section 9.2.6.
4.	Integrated Impact 847	Revised Areas of Review to include reference to General Design Criteria 60.
5.	Integrated Impact 566	Revised Areas of Review to include reference to 10 CFR 50.63. The Station Blackout should receive a level of emphasis similar to that of GDC 2, 5, 44, 45, and 46.
6.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for SRP Section 9.2.6.
7.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for SRP Section 9.2.6.
8.	Editorial	Replaced the term "essential" with "safety-related" as a designation consistent with the current terminology.
9.	Integrated Impact 566	Revised Areas of Review to include an area of review for the review of Station Blackout. The Station Blackout is an additional criteria which is designated for review in SRP Section 8.3.1.
10.	SRP-UDP format item.	Revised Review Interface section of Areas of Review to be consistent with SRP-UDP required format which uses a number/paragraph format to distinguish individual reviews performed by other PRB.
11.	Editorial	Add "The" to the introductory clause to provide a proper prepositional phrase.
12.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for SRP Section 9.2.6.
13.	Editorial	Add "s" to review and delete "of" to provide agreement with the introductory clause and clarify meaning. Delete "is performed" specifying the duties of the SPLB because stating it here is redundant with the statement in the introductory clause.

SRP Draft Section 9.2.6
Attachment A - Proposed Changes in Order of Occurrence

Item	Source	Description
14.	Editorial	Add "s" to review and delete "of" to provide agreement with the introductory clause and clarify meaning. Delete "is performed" specifying the duties of the SPLB because stating it here is redundant with the statement in the introductory clause.
15.	Editorial	Add "s" to review and delete "of" to provide agreement with the introductory clause and clarify meaning. Delete "is performed" specifying the duties of the SPLB because stating it here is redundant with the statement in the introductory clause.
16.	Editorial	Add "s" to review and delete "of" to provide agreement with the introductory clause and clarify meaning. Delete "is performed" specifying the duties of the SPLB because stating it here is redundant with the statement in the introductory clause.
17.	Current PRB review responsibilities	Editorial changes made to reflect current primary responsible for the review for SRP section 9.2.6 and 11.1. This review is moved from the "coordinating" subsection because the responsibility of the SPLB for calculating the radioactive concentrations has replaced that of the now nonexistent Effluent Treatment Systems Branch (ETSB).
18.	Current PRB responsibility.	Editorial change made to reflect current PRB name and responsibility for SRP Section 9.2.6 and 9.5.1. This review is moved from the "coordinating" subsection because the responsibility of the SPLB for fire protection has replaced that of the now nonexistent Chemical Engineering Branch (CMEB).
19.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for SRP Section 9.2.6.
20.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and responsibility for SRP Section 6.3.
21.	Editorial	Replaced the term "essential" with "safety-related" as a designation consistent with the current terminology.
22.	Current PRB review responsibilities	Changes made to reflect current primary responsible for the review for SRP section 11.1 is SPLB and is now listed under Review Interfaces, item I.5 above.
23.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name designation for the Mechanical Engineering Branch.
24.	Editorial	Deleted "also" as redundant to "and."
25.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name designation for the Mechanical Engineering Branch.

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Attachment A - Proposed Changes in Order of Occurrence

Item	Source	Description
26.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and designation for the Civil Engineering and Geosciences Branch.
27.	Editorial	Moved the interface discussing the review of inservice inspection from the below paragraph and added a reference to SRP Section 6.6 since it is the section under which inservice inspection is reviewed.
28.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB name and designation for the Materials and Chemical Engineering Branch and responsibility for SRP section 6.1.1.
29.	Editorial	Moved the interface discussing the review of inservice inspection to the previous paragraph since it is performed under SRP Section 6.6 by the ECGB branch.
30.	SRP-UDP format item.	Format change to separate review interface items for each review involving a different PRB and unrelated SRP section. Also, changes are made to reflect current PRB names, designations, and responsibilities.
31.	SRP-UDP format item.	Format change to separate review interface items for each review involving a different PRB and unrelated SRP section. Also, change is made to reflect the current PRB name and designation for the Electrical Engineering Branch.
32.	SRP-UDP Integration of SBO Issues	Revised to reflect new SRP Section 8.4 which provides the primary review of SBO issues.
33.	SRP-UDP format item.	Format change to separate review interface items for each review involving a different PRB and unrelated SRP section. Also, change is made to reflect the current PRB name and designation for the Instrumentation & Control Branch.
34.	Current PRB names and abbreviations.	Editorial change made to reflect current PRB names and responsibility for SRP Section 12.1.
35.	Editorial	Change to improve sentence structure.
36.	SRP-UDP format item.	Format change to separate review interface items for each review involving a different PRB and unrelated SRP section. Also, changes are made to reflect current PRB names, designations, and responsibilities for SRP section 9.2.5, 9.5.1, 16.0, and chapter 17.

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Item	Source	Description
37.	SRP-UDP format item.	Format change to separate review interface items for each review involving a different PRB and unrelated SRP section. Also, change is made to reflect the current PRB responsibility for SRP section 16.0 and name and designation for the Technical Specifications Branch.
38.	SRP-UDP format item and editorial.	Format change to separate review interface items for each review involving a different PRB and unrelated SRP section. Also, changes are made to reflect current PRB names, designations, and responsibilities for QA program review and change designation from Section 17.0 to Chapter 17.
39.	Inter-SRP Technical Issues.	This review interface identifies reviews conducted to satisfy SECY 93-087 and ABWR FSER Staff guidance on Shutdown and Low Power Operations. The staff requested that design certification applicants complete an assessment of shutdown and low-power risk. The shutdown and low-power risk assessment must identify design-specific vulnerabilities and weaknesses and document consideration and incorporation of design features that minimize such vulnerabilities. The Condensate Storage Facilities were included in the ABWR FSER risk assessment as a system that can provide an alternative core cooling water supply in the event of the loss of normal decay heat removal. Consideration of the Condensate Storage Facilities in the shutdown and low-power risk assessment is the responsibility of the SPSB and will be included in the proposed SRP Section 19.1 on risk assessments.
40.	Editorial.	Revised this sentence to reflect the fact the acceptance criteria and their methods of application applies to interfaces by the SPLB as well as other branches.
41.	Editorial	Added punctuation to improve clarity.
42.	Integrated Impact 566	Added 10 CFR 50.63 as Acceptance Criterion, and Regulatory Guide 1.155, which provides specific guidelines for plant ability to withstand a Station Blackout.
43.	Integrated Impact 847	Added General Design Criteria 60 as Acceptance Criterion, and Regulatory Guide 1.143, which provides specific guidelines for tanks containing radioactivity.
44.	SRP-UDP format item, develop Technical Rationale.	Technical Rationale were developed and added for the following Acceptance criteria: GDC 2, 5, 44, 45, 46, and 60 and 10 CFR 50.63. The SRP-UDP program requires that Technical Rationale be developed for the Acceptance Criteria.

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Item	Source	Description
45.	Editorial	This statement was modified to indicate that Technical Specification reviews are also part of the review of the design certification applications. Technical Specifications are part of the DC application as established in 10 CFR 50.34(b)(vi)(6) and 10 CFR 52.47(a)(1)(i).
46.	Editorial	Removed the word "procedure" to provide clarification for the completeness of the review not just the procedure.
47.	Potential Impact 24348	The phrase specifying the auxiliary feedwater system appears to limit applicability to PWRs, even though the section applies to BWRs as well. Potential Impact 24348 addresses the CSF in a BWR.
48.	Editorial	Replaced the term "essential" with "safety-related" as a designation consistent with the current terminology.
49.	Editorial	Replaced the term "nonessential" with "non safety-related" as a designation consistent with the current terminology.
50.	Editorial	Replaced the term "essential" with "safety-related" as a designation consistent with the current terminology.
51.	Integrated Impact 566	Added station blackout to the events for which the system is designed.
52.	Editorial	Replaced the term "essential" with "safety-related" as a designation consistent with the current terminology.
53.	Editorial	Replaced the term "essential" with "safety-related" as a designation consistent with the current terminology.
54.	Editorial	Replaced the term "essential" with "safety-related" as a designation consistent with the current terminology.
55.	Editorial	Replaced the term "essential" with "safety-related" as a designation consistent with the current terminology.
56.	Integrated Impact 847	Added review to guidance of RG 1.143.
57.	Editorial	Replaced the term "essential" with "safety-related" as a designation consistent with the current terminology.
58.	Editorial	Replaced the term "essential" with "safety-related" as a designation consistent with the current terminology.
59.	Editorial	Replaced the term "essential" with "safety-related" as a designation consistent with the current terminology.
60.	Integrated Impact 566	Added a Review Procedure to assure that the CSF will support a SBO.

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Item	Source	Description
61.	Editorial	Replaced the term "essential" with "safety-related" as a designation consistent with the current terminology.
62.	SRP-UDP Guidance, Implementation of 10 CFR 52	Added standard paragraph to address application of Review Procedures in design certification reviews.
63.	Editorial	Revised to avoid use of a gender-specific pronoun.
64.	Integrated Impact 566	Revised Evaluation Findings introduction to include reference to 10 CFR 50.63 to reflect its importance relative to GDCs 2, 5, 44, 45, and 46.
65.	Integrated Impact 847	Revised Areas of Review to include reference to General Design Criteria 60.
66.	Editorial	Add a hyphen in the term safety-related to use the current representation of the term.
67.	Editorial	Replaced the term "essential" with "safety-related" as a designation consistent with the current terminology.
68.	Integrated Impact 847	Included an evaluation finding for General Design Criteria 60.
69.	Integrated Impact 566	Included an evaluation finding for 10 CFR 50.63.
70.	SRP-UDP format item.	Added a general description of additional items that should be discussed in the Evaluation Findings for the design certification reviews.
71.	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.
72.	SRP-UDP Guidance	Added standard paragraph to indicate applicability of this section to reviews of future applications.
73.	Integrated Impact 566	Revised Implementation subsection to include reference to the 10 CFR 50.63 implementation schedule.
74.	Integrated Impact 566	Added 10 CFR 50.63 to the reference subsection.
75.	Editorial	Reordered reference numbering to accommodate additional references and SRP-UDP format.
76.	Integrated Impact 847	Added General Design Criteria 60 reference to subsection.
77.	Integrated Impact 847	Added Regulatory Guide 1.143 reference to subsection.
78.	Integrated Impact 566	Added Regulatory Guide 1.155 reference to subsection.

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Attachment B - Cross Reference of Integrated Impacts

Integrated Impact No.	Issue	SRP Subsections Affected
566	Incorporate 10 CFR 50.63 and Regulatory Guide 1.155 requirements and guidance in Acceptance Criteria and coordinate condensate storage facility review with the SBO review of SRP Section 8.3.1.	<p>Subsection I, Areas of Review, Review Interfaces, Item 10.</p> <p>Subsection II, Acceptance Criteria, Item 3.f.</p> <p>Subsection III, Review Procedures, Item 3.j.</p> <p>Subsection VI, Evaluation Findings, (Item 7)</p> <p>Subsection V, Implementation (last Paragraph).</p> <p>Subsection VI, References (Items 1 and 10).</p>
847	Incorporate General Design Criteria 60 as acceptance criteria and Regulatory Guide 1.143 as guidance, in the acceptance criteria.	<p>Subsection II, Acceptance Criteria, Item 2.</p> <p>Subsection III, Review Procedures, Item 3.e.</p> <p>Subsection VI, Evaluation Findings, (Item 6)</p> <p>Subsection VI, References (Items 7).</p>