U.S. NUCLEAR REGULATORY COMMISSION

STANDARD REVIEW PLAN

19.3 REGULATORY TREATMENT OF NON-SAFETY SYSTEMS FOR PASSIVE ADVANCED LIGHT WATER REACTORS

REVIEW RESPONSIBILITIES

Primary- Organization responsible for evaluating regulatory treatment of non-safety systems in passive advanced light water reactors

Secondary- Organization(s) responsible for the specific design capabilities of structures, systems, and components (SSCs) as described in the Review Interface Section of this Standard Review Plan (SRP)

Organization responsible for the review of the applicants probabilistic risk assessment (PRA)

Organization responsible for the review of severe accident design features

Organization responsible for review of the Technical Specifications (TSs) and Short Term Availability Controls

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I. AREAS OF REVIEW

This SRP pertains to the staff review of an applicant's Regulatory Treatment of Non-safety Systems (RTNSS) for a design certification (DC) or a combined license (COL) application. Application content guidance for DC and COL applications is provided in Section C.IV.9 of Regulatory Guide (RG) 1.206, "Combined License Applications for Nuclear Reactors," issued June 2007. The scope of a DC review is limited to the design-specific non-safety SSCs within the scope of the certification. For a COL application that references a DC, the staff review of RTNSS for the COL should focus on the plant-specific and site-specific non-safety SSCs that deviate from the referenced DC.

The Advanced Light Water Reactor (ALWR) Utility Requirements Document (URD) for passive plants (Volume III, Chapter 1) issued March 1999 by the Electric Power Research Institute, specifies standards concerning the design and performance of active systems and equipment that perform non-safety-related, defense-in-depth functions. These standards include radiation shielding to permit access after an accident, redundancy for the more probable single active failures, availability of non-safety-related electric power, and protection against more probable hazards. The standards also address realistic safety margin analysis and testing to demonstrate the systems' capabilities to satisfy their non-safety-related, defense-in-depth functions. However, the ALWR URD does not include specific quantitative standards for the reliability of these systems. Appropriate levels of reliability and availability for these systems are established with the reliability assurance program (RAP) and RTNSS process.
The scope, criteria, and process used to determine RTNSS for the passive plant designs are established in:

1. SECY-94-084, "Policy and Technical Issues Associated with the Regulatory Treatment of Non-safety Systems in Passive Plant Designs," dated March 28, 1994 (ML003708068) and associated Staff Requirements Memorandum (SRM), June 30, 1994 (ML003708098).

2. SECY-95-132, "Policy and Technical Issues Associated with the Regulatory Treatment of Non-safety Systems (RTNSS) in Passive Plant Designs," dated May 22, 1995 (ML003708005), and associated SRM, June 28, 1995 (ML003708019).

3. SECY-96-128, "Policy and Key Technical Issues Pertaining to the Westinghouse AP600 Standardized Passive Reactor Design," June 12, 1996 (ML003708224), and associated SRM, January 15, 1997 (ML003755486).

SECY-94-084 and SECY-95-132 describe the scope, criteria, and process used to determine RTNSS in the passive plant designs.

The following five key elements make up the process:

1. The ALWR URD describes the process the designer should use to specify the reliability/availability (R/A) missions of risk-significant SSCs needed to meet regulatory requirements and to allow comparisons of these missions to U.S. Nuclear Regulatory

Commission (NRC) safety goals. An R/A mission is the set of requirements related to the performance, reliability, and availability of an SSC function that adequately ensures the accomplishment of its task, as defined by the focused PRA or deterministic analysis.

2. The designer applies the process to the design to establish R/A missions for the risk-significant SSCs.

3. If active systems are determined to be risk-significant, the NRC reviews the R/A missions to determine if they are adequate and whether the RAP (SRP 17.4) and administrative controls on availability, or simple TSs and limiting conditions for operation (LCOs) can provide reasonable assurance that the missions can be met during operation.

4. If active systems are relied on to meet the R/A missions, the designer imposes design requirements commensurate with the risk-significance of those elements involved.

5. The design certification rule does not explicitly state the R/A missions for risk-significant SSCs. Instead, the rule includes deterministic requirements for both safety-related and non-safety-related design features.

The RTNSS process applies broadly to those non-safety-related SSCs that perform risk-significant functions and, therefore, are candidates for regulatory oversight. The RTNSS process uses the following five criteria to determine those SSC functions:

A. SSC functions relied on to meet beyond design basis deterministic NRC performance requirements such as those set forth in Title 10 of the *Code of Federal Regulations* (10 CFR) 50.62 for mitigating Anticipated Transients Without Scram (ATWS) and in 10 CFR 50.63 for Station Blackout (SBO).

B. SSC functions relied on to ensure long-term safety (beyond 72 hours) and to address seismic events.

C. SSC functions relied on under power-operating and shutdown conditions to meet the Commission's safety goal guidelines of a core damage frequency (CDF) of less than $1x10^{-4}$ each reactor year and a large release frequency (LRF) of less than $1x10^{-6}$ each reactor year.

D. SSC functions needed to meet the containment performance goal, including containment bypass, during severe accidents.

E. SSC functions relied on to prevent significant adverse systems interactions between passive safety systems and active non-safety SSCs.

The principal areas of the staff's review are listed below. Attachment A describes the staff technical disciplines normally involved in the review of each area and the applicable guidance documents.

1. Identification of SSC functions based on the five RTNSS criteria listed above.

2. Functional design of RTNSS SSCs

    a. Adequacy of functional design requirements

    b. Compliance with functional design requirements

    c. Design improvements to minimize adverse interaction between passive and non-safety-related active systems.

3. Focused PRA sensitivity studies used to identify risk-significant SSCs in the scope of RTNSS program per RTNSS "C".

4. The augmented design standards that must be met by SSCs in the scope of the RTNSS program including seismic design standards, standards for protection against natural phemomena, standards for protection against hazards associated with design basis accidents (e.g., internal floods, turbine missiles) and standards for assuring that SSC functions can be achieved expeditiously.

5. The regulatory treatment proposed for SSCs in the scope of RTNSS program.

6. The reliability of the non-safety-related active system relied upon to achieve a cold shutdown condition.

COL Action Items and Design Certification Requirements and Restrictions

For a DC application, the review will also address COL action items and requirements and restrictions (e.g., interface requirements and site parameters).

For a COL application referencing a DC, a COL applicant must address COL action items (referred to as COL license information in certain DCs) included in the referenced DC. Additionally, a COL applicant must address requirements and restrictions (e.g., interface requirements and site parameters) included in the referenced DC.

Review Interfaces

The comprehensive baseline PRA and focused PRA sensitivity studies that are needed to determine SSCs relied on under power-operating and shutdown conditions to meet the Commission's safety goal guidelines are described in Chapter 19 of the application. Likewise, the severe accident evaluation used to identify SSC functions needed to meet the containment performance goal, including containment bypass, during severe accidents is also described in Chapter 19 of the application. The PRA and Severe Accident staff reviews these topics using SRP 19.0 and documents its review in Chapter 19 of the Final Safety Evaluation Report (FSER) and summarizes the results in Chapter 22 of the FSER.

As described in Appendix A, the technical organizations in the Office of New Reactors responsible for the review of the functional capabilities of SSCs use the general guidance in this SRP to (1) verify or identify SSCs that require regulatory treatment, (2) develop specific review guidance for SSC functions in their review domain and (3) verify that the level of regulatory treatment specified for SSC functions in their review domain is commensurate with the R/A missions for those SSCs. Reviewers in these organizations will interact with PRA and Severe Accident staff to gain an understanding of the R/A mission of SSCs, as characterized in the PRA, within their review scope.

Reviewers responsible for review of systems and components relied upon to ensure long-term safety (beyond 72 hours), i.e., "RTNSS B" SSCs, and to address seismic events will interact with reviewers responsible for review of structures that house those systems and components to reach a finding regarding the ability of "RTNSS B" SSCs to withstand seismic events as severe as the design basis safe shutdown earthquake.

Availability controls are a form of regulatory oversight for the availability of non-safety-related SSCs in the scope of RTNSS. Availability controls are established in a manner similar to TS and include AC LCO, applicability specifications, action statements with completion times, surveillance requirements (ACSR) and frequencies. Availability controls are submitted to the NRC for review in the form of the Availability Controls Manual (ACM). The review of ACM is led by the organization responsible for the review of technical specifications in Chapter 16 of the Final Safety Analysis Report (FSAR). PRA and Severe Accident staff and staff responsible for review of specific SSC functions support the review of the ACM in the following ways:

1. Assuring that treatment of RTNSS SSCs in the ACM is commensurate with the assumptions in the PRA.

2. Confirming that, at a minimum, ACs have been included in the ACM for RTNSS "B" SSCs.

3. Verifying the adequacy of the ACSR.

II. ACCEPTANCE CRITERIA

Background

Requirements

Acceptance criteria are based on meeting Commission policy and the relevant requirements of the following Commission regulations:

1. 10 CFR 50.36(c)(2)(ii)(D) – Technical Specification limiting condition for operation of a nuclear reactor must be established for a system, structure or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety.

2. 10 CFR Part 50, Appendix A – General Design Criterion (GDC) 2, “Design bases for protection against natural phenomena.”

SRP Acceptance Criteria

Specific SRP acceptance criteria acceptable to satisfy the Commission’s policy on RTNSS and to meet the relevant requirements of the NRC’s regulations identified above are as follows for the review described in this SRP. The SRP is not a substitute for the NRC regulations, and compliance with it is not required. However, an applicant is required to identify and describe differences between the design features, analytical techniques, and procedural measures proposed for its facility and the SRP acceptance criteria and evaluate how the proposed alternatives to the SRP acceptance criteria provide acceptable methods of compliance with the NRC regulations. The SRP acceptance criteria are derived from Commission direction and staff guidance published in multiple documents, including the following:

1. SEC-93-087, “Policy, Technical, and Licensing Issues Pertaining to Evolutionary and Advanced Light-Water Reactor ALWR Designs,” dated April 2, 1993 (ML003760768), and associated SRM, July 21, 1993 (ML003708056).

2. SECY-94-084, “Policy and Technical Issues Associated with the Regulatory Treatment of Non-safety Systems in Passive Plant Designs,” dated March 28, 1994, and associated SRM, June 30, 1994 (ML003708068).

3. SECY-95-132, “Policy and Technical Issues Associated with the Regulatory Treatment of Non-safety Systems (RTNSS) in Passive Plant Designs,” dated May 22, 1995, and associated SRM, June 28, 1995 (ML003708005).

4. SECY-96-128, “Policy and Key Technical Issues Pertaining to the Westinghouse AP600 Standardized Passive Reactor Design,” June 12, 1996, and associated SRM, January 15, 1997 (ML003708224).

5. Memorandum from L. Joseph Callan, USNRC Executive Director for Operations to Chairman Jackson, US NRC, “Implementation of Staff Position in SECY-96-128, ‘Policy and Key Technical Issues Pertaining to the Westinghouse AP600 Standard Pressurized Reactor Design’, Related to Post-72 Hour Actions”, June 23, 1997 (ML003708229).

Acceptance Criteria

Specific acceptance criteria are listed below for each principal area of the staff’s review.

Area of Review – Identification of SSCs in the Scope of the RTNSS Program

1. The staff will verify that the applicant has met the following acceptance criterion: The applicant has identified those non-safety-related SSCs that require regulatory treatment using the five scoping criteria listed above.

2. The staff will verify that the applicant has met the following acceptance criterion: The applicant has identified the safety functions relied upon in the 72-hour period following an accident and described the non-safety-related equipment that is relied upon to ensure that these safety functions are successful in the post 72-hour period up to seven days following an accident (hereafter referred to as “RTNSS “B” SSCs”).

3. The PRA and Severe Accident staff will verify that the applicant has met the following acceptance criterion: The applicant has determined those non-safety SSCs, if any, used to prevent the occurrence of initiating events and included them in the scope of RTNSS.

Area of Review – Functional Design of RTNSS SSCs

1. The staff will verify that the applicant has met the following acceptance criterion: The applicant has established functional requirements for the design of SSCs in the RTNSS program, including support systems.

2. The staff will verify that the applicant has met the following acceptance criterion: The applicant has designed SSCs in the RTNSS program, and their support systems, to satisfy their functional requirements.

3. The staff will verify that the applicant has met the following acceptance criterion: The applicant has systematically evaluated adverse interactions between the passive safety systems and any non-safety-related active systems providing defense-in-depth, and incorporated effective design improvements to minimize adverse systems interactions. The staff will also confirm that the applicant has properly updated the PRA model to account for any residual adverse system interactions, after design improvements have been made.

4. The staff will verify that the applicant has met the following acceptance criterion: The design of RTNSS SSCs includes features, as needed, to allow performance of those human actions necessary for successful implementation of the functional design requirement (e.g., controls, connections, access).

Area of Review – Focused PRA Sensitivity Studies

1. The PRA and Severe Accident staff will verify that the applicant has met the following acceptance criterion: The applicant has used the focused PRA to determine (1) the functional R/A missions of active systems needed to meet NRC regulations, Commission safety goal guidelines and the containment performance goal objectives, and (2) the risk-significance associated with failure to accomplish each R/A mission.

Area of Review – Augmented Design Standards

1. The staff will verify that the applicant has met the following acceptance criterion: Safety functions required in the post 72-hour period following an accident can be accomplished with onsite equipment and supplies.

2. The staff will verify that the applicant has met the following acceptance criterion: RTNSS "B" SSCs and supporting equipment will be readily available for connection. Use of mobile equipment is acceptable after seven days.

3. The staff will verify that the applicant has met the following acceptance criterion: RTNSS "B" SSCs and structures housing RTNSS "B" SSCs are designed such that they can withstand the effects of a safe shutdown earthquake (SSE); and, without repair, the SSCs are capable of performing their required functions following the earthquake.

4. The staff will verify that the applicant has met the following acceptance criterion: RTNSS "B" SSCs have been analyzed and designed to withstand the effects of high winds produced in Category 5 hurricanes and tornados, including the effects of sustained winds, maximum gusts, and associated wind-borne missiles.

5. The staff will verify that the applicant has met the following acceptance criterion: RTNSS "B" SSCs have been analyzed and designed to withstand adverse effects associated with design basis accidents (e.g., turbine missiles, pipe whip).

6. The staff will verify that the applicant has met the following acceptance criterion: RTNSS "B" SSCs and supporting equipment will be protected from floods, as required by GDC 2, "Design bases for protection against natural phenomena", and meet the criteria in SRP 2.4 and SRP 3.4.1.

The staff will verify that the applicant has met the following acceptance criterion: RTNSS "B" SSCs and supporting equipment will be 'highly reliable.' A non-safety-related system will be considered highly reliable if it has redundant trains with electrical backup power sources, with the components being addressed in a RAP and has been designed against an assumed single failure as defined in 10 CFR Part 50, Appendix A. A graded approach is utilized related to potential environmental and dynamic effects that may affect the 'highly reliable' non-safety-related SSCs.

Area of Review – Regulatory Treatment of SSCs in the RTNSS Program

1. The staff will verify that the applicant has met the following acceptance criterion: The applicant has determined appropriate regulatory oversight for SSCs in the scope of the RTNSS program in a graded manner commensurate with the risk-significance of each SSC's R/A mission.

2. The staff will verify that the applicant has met the following acceptance criterion: The applicant has provided controls in the ACM or, if appropriate, TSs for the RTNSS SSCs.

3. The staff will verify that the applicant has met the following acceptance criterion: Treatment of RTNSS SSCs in the ACM is commensurate with the assumptions in the PRA.

4. The staff will verify that the applicant has met the following acceptance criterion: ACSR provide adequate methods of establishing availability of SSCs and provide an adequate level of support to ensure that component performance is consistent with the functional reliability in the PRA.

Area of Review – Reliable Means of Achieving Cold Shutdown

1. The staff will verify that the applicant has met the following acceptance criterion: Systems relied upon to bring the plant to a cold shutdown condition will be highly reliable. A non-safety-related system will be considered 'highly reliable' if it has redundant trains with electrical backup power sources with the components being addressed in a RAP. A graded approach is utilized related to potential environmental and dynamic effects that may affect the 'highly reliable' non-safety-related system. Single failure is considered to the extent that a single active failure does not prevent the intended function from occurring.

III. REVIEW PROCEDURES

The procedures for the review of RTNSS SSCs for all passive light water reactors are given in the following paragraphs. In applying these procedures to the review of RTNSS SSCs in the designs of small modular integral pressurized water reactors (iPWR) that rely on passive safety systems, the staff uses a graded approach described in SECY-11-0024, "Use of Risk Insights to Enhance the Safety Focus of Small Modular Reactor Reviews," dated February 18, 2011 (Reference 11). SECY-11-0024 describes the risk-informed and integrated review framework for the review of iPWR designs, and the approach for Design-Specific Review Plans (DSRPs). The Commission approved the use of this approach for iPWRs on May 11, 2011 in its SRM (Reference 11) related to SECY-11-0024. Some examples of this "graded approach" are:

- RTNSS "B" SSCs may have testing and inspections, tests, analyses, and acceptance criteria (ITAAC) because of the augmented design standards they must meet; whereas, testing and ITAAC for other RTNSS SSCs would be unlikely.

- Functional capabilities of some RTNSS "C" SSCs, such as support for standby diesel generators, may have higher risk-significance than functional capabilities of other RTNSS "C" SSCs, such as cooling for the turbine building heating and ventilation systems. RTNSS "C" SSCs performing the function with higher risk-significance would normally receive a more rigorous review.

Area of Review – Identification of SSCs in the Scope of the RTNSS Program

The staff reviews the process used by the applicant to determine which non-safety-related systems in the facility design should be subject to regulatory treatment and under what conditions that treatment should apply. The staff verifies that the implementation of the RTNSS process follows the scope, criteria, and specific steps described in SECY-94-084 and SECY-95-132, which are discussed in RG 1.206. In particular, the staff verifies that the

applicant has applied the RTNSS scoping criteria described in Section I of this SRP appropriately.

1. The staff reviews the applicant's analysis of accidents related to NRC deterministic performance requirements such as 10 CFR 50.62 and 10 CFR 50.63 to identify any non-safety-related SSCs that have been credited in the analyses and confirms that these SSCs have been included in the scope of the RTNSS program (RTNSS "A").

2. The staff reviews the applicant's determination of safety functions that must be satisfied to maintain the plant in a safe stable shutdown condition[1] in the period between three and seven days following an accident and the methods for achieving those safety functions. The staff verifies that non-safety-related SSCs relied upon to satisfy the safety functions have been included in the scope of the RTNSS program (RTNSS "B").

3. The staff reviews the applicant's description of the Seismic Margins Analysis (SMA) documented in Chapter 19 of the FSAR to identify any non-safety-related SSCs that have been credited in the SMA. The staff confirms that any non-safety-related SSCs that are relied upon to meet the acceptance criteria for the SMA have been included in the scope of the RTNSS program (RTNSS "B").

4. The PRA and Severe Accident staff reviews the results of the focused PRA sensitivity studies and confirms that non-safety-related design features or functional capabilities with mitigation capability sufficient to reduce the CDF or LRF below the NRC safety goals when credited in the focused PRA have been identified as risk-significant and included in the scope of the RTNSS program (RTNSS "C").

5. The PRA and Severe Accident staff use information in Chapters 15 and 19 of the FSAR pertaining to initiators of transients and accidents affecting the nuclear steam supply system, and consult as necessary with reviewers of those sections, to verify that the applicant has correctly identified the SSCs that require evaluation of risk-significance based on their contribution to initiating event frequencies. The staff then verifies that the applicant has completely addressed the following screening criteria for assessing risk-significance of those SSCs with respect to initiating event frequency:

    a. Does the calculation of the initiating event frequency consider the non-safety-related SSCs?

    b. Does the unavailability of the non-safety-related SSCs significantly affect the calculation of the initiating event frequency?

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[1] The NRC considers the following to be "safe stable shutdown conditions" for advanced passive LWRs:
(1) "Cold Shutdown" as defined in the Technical Specifications;
(2) A condition by which all plant conditions are stable and within regulatory limits and the reactor coolant system pressure is stabilized and reactor coolant temperature is at value less than or equal to 420 degrees F.

c. Does the initiating event significantly[2] affect the CDF and the LRF?

The staff verifies that the applicant has included non-safety-related SSCs in the scope of the RTNSS program that satisfy the screening criteria listed above (RTNSS "C").

6. The PRA and Severe Accident staff reviews the applicant's evaluation of potential uncertainties associated with assumptions made in the PRA regarding passive systems and verifies that the applicant has included non-safety-related SSCs in the scope of the RTNSS program to compensate for the uncertainties in the PRA and in the modeling of severe accident phenomenology, or provided a reasonable justification for not doing so (RTNSS "C").

7. The staff verifies that the applicant included any non-safety-related SSCs credited in meeting the Commission's containment performance goals in the scope of the RTNSS program (RTNSS "D"). The goals are:

   a. The containment should maintain its role as a reliable, leak-tight barrier by ensuring that containment stresses do not exceed American Society of Mechanical Engineers service level C limits for a minimum period of 24 hours following the onset of core damage, and that following this 24-hour period the containment should continue to provide a barrier against the uncontrolled release of fission products.

   b. The conditional containment failure probability determined from the Level II PRA is less than or equal to 10.

8. The staff reviews the applicant's evaluation of the potential for adverse interaction between passive safety-related and active non-safety-related systems and assures that any non-safety-related design features or functional capabilities relied upon to prevent non-safety-related systems from adversely impacting a safety function have been included in the scope of RTNSS (RTNSS "E")

Area of Review – Functional Design of RTNSS SSCs

1. The staff reviews the design of SSCs using guidance in specific SRPs (See Appendix A) to assure that the acceptance criteria listed in Section II have been satisfied.

Area of Review – Focused PRA Sensitivity Studies

1. The PRA and Severe Accident staff reviews the focused PRA using guidance in SRP 19.0 to assure that acceptance criteria in Section II of this SRP are satisfied.

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[2] An SSC failure that is a dominant contributor to an initiating event is significant if the initiating event contributes 10 percent or more to at-power or shutdown internal events CDF.

2. The PRA and Severe Accident staff reviews the mission statements for RTNSS SSCs and verifies that R/A missions are consistent with the assumptions in the PRA or other pertinent assumptions related to the function of the SSC. The staff issues requests for additional information when necessary to gain a clear understanding of the stated mission or support a determination that the mission is reasonable given the function of the SSC.

Area of Review – Augmented Design Standards

1. The staff reviews the applicant's determination of safety functions that must be satisfied to maintain the plant in a safe stable shutdown condition[3] in the period between three and seven days following an accident and the methods for achieving those safety functions. The staff verifies that non-safety-related SSCs relied upon to satisfy the safety functions have been designed to meet the augmented design standards for protection from seismic events and natural phenomena.

2. The staff reviews the applicant's augmented design standards and verifies that they meet the acceptance criteria stated above in Section II.

Area of Review – Regulatory Treatment of SSCs in the RTNSS Program

1. The staff reviews the results of the focused PRA sensitivity studies and confirms that the applicant has included requirements in the TSs, in accordance with 10 CFR 50.36(c)(2)(ii)(D), for non-safety-related design features or functional capabilities with mitigation capability sufficient to reduce the CDF or LRF below the NRC safety goals when credited in the focused PRA.

2. The staff reviews availability controls selected by the applicant for SSCs in the scope of the RTNSS program. The staff verifies that AC LCOs and completion times are established such that the availability of each function provided by RTNSS equipment is consistent with the functional availability in the PRA. The staff also verifies that surveillance requirements are established which provide an adequate level of support to ensure that component performance is consistent with the functional reliability in the PRA. Reviewers should assure that any support systems needed to establish the availability of a function have been identified and addressed with availability controls. It is acceptable for support systems to simply inherit the controls of the supported system. The reviewer considers the activities, including tests, performed to implement a surveillance requirement and confirms that SSC availability can be adequately determined with the surveillance requirement.

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[3] The NRC considers the following to be "safe stable shutdown conditions" for advanced passive LWRs:
(3) "Cold Shutdown" as defined in the Technical Specifications;
(4) A condition by which all plant conditions are stable and within regulatory limits and the reactor coolant system pressure is stabilized and reactor coolant temperature is at value less than or equal to 420 degrees F.

Area of Review - Reliable Means of Achieving Cold Shutdown

The organization responsible for review of reactor thermal hydraulic systems in pressurized water reactors and boiling water reactors uses guidance in SRP 5.4.7 to assure that design features for removal of residual heat to bring the plant to a cold shutdown condition meet the acceptance criteria listed in Section II of this SRP.

Guidance Specific to DC and COL applications

For review of a DC application, the reviewer should follow the above procedures to verify that the design set forth in the FSAR meets the acceptance criteria. DCs have referred to the FSAR as the design control document. The reviewer should also consider the appropriateness of identified COL action items. The reviewer may identify additional COL action items; however, to ensure these COL action items are addressed during a COL application, they should be added to the DC FSAR.

For review of a COL application, the scope of the review is dependent on whether the COL applicant references a DC, an ESP or other NRC approvals (e.g., manufacturing license, site suitability report or topical report).

For review of both DC and COL applications, SRP Section 14.3 should be followed for the review of ITAAC. The review of ITAAC cannot be completed until after the completion of this section.

IV. EVALUATION FINDINGS

The reviewer verifies that the applicant has provided sufficient information to address the regulatory criteria stated in the section on RTNSS in the staff's Safety Evaluation Report (SER) and that the review and calculations (if applicable) support conclusions of the following type to be included in the SER. The reviewer also states the bases for those conclusions.

1. The staff concludes that the applicant's process for using the focused PRA results to identify RTNSS-important non-safety-related SSCs follows the process approved by the NRC and is therefore acceptable.

2. Based on its review, the staff concludes that the applicant has correctly identified the non-safety equipment relied upon to meet the SBO and ATWS rules and therefore requiring regulatory treatment.

3. The staff finds that the applicant has included sufficient non-safety-related equipment in the RTNSS program to ensure that safety functions relied upon in the post-72-hour period are successful. Further, the staff finds that the non-safety-related equipment relied upon in the post-72-hour period has been designed in accordance with Commission policy and that the applicant has established appropriate ACs for this equipment.

4. The staff has reviewed the mission statements for SSCs including R/A missions. These statements correctly describe the missions of RTNSS and non-safety-related SSCs and R/A missions are consistent with assumptions in the PRA; therefore, the staff finds them acceptable.

5. The applicant proposed a means for implementing RTNSS controls in the form of administrative ACs for the SSCs as discussed in the SER Section. The ACM, which has been incorporated into FSAR, documents the ACs.

6. The applicant has provided reasonable assurance that the SSCs relied upon to bring the facility to a cold shutdown condition are highly reliable.

7. The staff has reviewed the applicant's implementation of the RTNSS process using the guidance in SRP 19.3 and determined that it satisfies the scope, criteria, and process described in SECY-94-084 and associated SRM, SECY-95-132 and associated SRM, and RG 1.206. Therefore, the staff finds the applicant's implementation to be acceptable.

The staff should support findings of acceptability with logical bases built from an evaluation of the considerations given in Subsection III of this SRP. Reviewers should verify that the applicant provided sufficient information to complete the review in accordance with this SRP and therefore that the review is sufficiently complete to support its general findings as identified above, which should be included in the staff's SER.

For DC reviews, the findings will also summarize the staff's evaluation of the COL action/information items proposed by the DC applicant that are relevant to this SRP section. For COL reviews, the findings will also summarize the staff's evaluation of how the COL applicant addressed those COL action/information items included in the DCD referenced in its application that are relevant to this SRP section.

V. IMPLEMENTATION

The staff will use this SRP section in performing safety evaluations of license applications, design certifications, and design approvals submitted by applicants pursuant to 10 CFR Part 50 or 10 CFR Part 52.

The provisions of this SRP apply to reviews of applications submitted six months or more after the date of issuance of this SRP, unless superseded by a later revision.

VI. REFERENCES

1. EPRI, Advanced Light Water Reactor (ALWR) Utility Requirements Document for passive plants (Volume III, Chapter 1), March 1999.

2. NRC, RG 1.206, "Combined License Applications for Nuclear Power Plants (LWR Edition)," June 2007.

3. NRC, SECY-93-087, “Policy, Technical, and Licensing Issues Pertaining to Evolutionary and Advanced Light-Water Reactor ALWR Designs,” dated April 2, 1993, and associated SRM, July 21, 1993

4. NRC, SECY-94-084, “Policy and Technical Issues Associated with the Regulatory Treatment of Non-safety Systems in Passive Plant Designs,” dated March 28, 1994, and associated Staff Requirements Memorandum (SRM), June 30, 1994.

5. NRC, SECY-95-132, Policy and Technical Issues Associated with the Regulatory Treatment of Non-safety Systems (RTNSS) in Passive Plant Designs,” dated May 22, 1995, and associated SRM, June 28, 1995.

6. NRC, SECY-96-128, “Policy and Key Technical Issues Pertaining to the Westinghouse AP600 Standardized Passive Reactor Design,” June 12, 1996, and associated SRM, January 15, 1997.

7. NRC, Memorandum from L. Joseph Callan, USNRC Executive Director for Operations to Chairman Jackson, US NRC, “Implementation of Staff Position in SECY-96-128, ‘Policy and Key Technical Issues Pertaining to the Westinghouse AP600 Standard Pressurized Reactor Design’, Related to Post-72- Hour Actions”, June 23, 1997.

8. NRC, “Safety Goals for the Operations of Nuclear Power Plants; Policy Statement,” *Federal Register*, Volume 51, No. 149, pp. 28044-28049, August 4, 1986. Corrected and reprinted at *Federal Register*, Volume 51, No. 162, pp. 30028–30033, August 21, 1986.

9. 10 CFR Part 50, “Domestic Licensing of Production and Utilization Facilities”

10. 10 CFR Part 52, “Licenses, Certifications, and Approvals For Nuclear Power Plants.”

11. NRC, SECY-11-0024 “Use of Risk Insights to Enhance the Safety Focus of Small Modular Reactor Reviews,” dated February 18, 2011 (ML110110691), and associated SRM, May 11, 2011 (ML111320551).

Appendix A
Review Disciplines and Review Guidance Used in the Review of RTNSS

Area of Review	Principal Reviewer Disciplines	Applicable SRP or DSRS[4]
Identification of SSC functions based on the five RTNSS criteria listed above.	I & C Systems (Criteria A, B, E)	19.3
	Electrical Power Systems (Criteria A, B, E)	19.3
	Balance of Plant Systems (Criteria B, C, E)	19.3
	Containment Systems (Criteria B, E)	19.3
	PRA & Severe Accidents (Criteria C, D)	19.3 19.0
Design of RTNSS SSCs • Functional design requirements • Compliance with functional requirements • Features included as necessary to prevent adverse interaction with passive safety systems	Mechanical Systems and Components	3.10
	I & C Systems	7.8 3.10
	Electrical Power Systems	8.3.1 8.4
	Balance of Plant Systems	3.10 9.1.3 9.2.1 9.2.2 9.2.5 9.5.4
Focused PRA sensitivity studies used to identify risk-significant SSCs in the scope of RTNSS program per RTNSS "C".	PRA & Severe Accident	19.0

[4] Design Specific Review Standard

The augmented design standards that must be met by SSCs in the scope of the RTNSS program.	Protection from Seismic events Protection from internal and external hazards, other than seismic	3.7.2 3.7.3 2.4 3.4.1
The regulatory treatment proposed for SSCs in the scope of RTNSS program.	I & C Systems Electrical Power Systems Balance of Plant Systems Containment Systems PRA & Severe Accidents	19.3 19.3 19.3 19.3 19.3
The reliability of the non-safety-related active system relied upon to achieve a cold shutdown condition.	Thermal-hydraulic systems in LWRs	5.7.4

PAPERWORK REDUCTION ACT STATEMENT

The information collections contained in the Standard Review Plan are covered by the requirements of 10 CFR Part 50 and 10 CFR Part 52, and were approved by the Office of Management and Budget, approval number 3150-0011 and 3150-0151.

PUBLIC PROTECTION NOTIFICATION

The NRC may not conduct or sponsor, and a person is not required to respond to, a request for information or an information collection requirement unless the requesting document displays a currently valid OMB control number.

SRP Section 19.3
"Regulatory Treatment of Non-Safety Systems for
Passive Advanced Light Water Reactors"
Description of Changes

Section 19.3 is a new SRP section not previously included in NUREG-0800. It was developed to provide guidance for applicants to address Regulatory Treatment of Non-Safety Systems for Passive Light Water Reactors.