SECTION 2

STRUCTURES AND COMPONENTS SUBJECT TO AN AGING MANAGEMENT REVIEW

2 Scoping and Screening Methodology for Identifying Structures and Components Subject to an Aging Management Review, and Implementation Results

This section documents the U.S. Nuclear Regulatory Commission (NRC) staff's review of the methodology used by the applicant to identify structures, systems, and components (SSCs) that are within the scope of the Rule, and to identify structures and components (SCs) that are within the scope of the Rule and are subject to an aging management review (AMR). SCs subject to an AMR are those that perform an intended function, as described in Title 10 of the *Code of Federal Regulations* (CFR) Part 54 (the Rule), and meet the following two criteria.

(1) They perform such functions without moving parts or without a change in configuration or properties, as set forth in 10 CFR 54.21(a)(1)(i) (denoted as "passive" SCs).

(2) They are not subject to replacement based on a qualified life or specified time period, as set forth in 10 CFR 54.21(a)(1)(ii) (denoted as "long-lived" SCs).

The identification of the SSCs within the scope of license renewal is called "scoping." For those SSCs within the scope of license renewal, the identification of passive, long-lived SCs that are subject to an AMR is called "screening."

The staff's review of the scoping and screening methodology is presented in Section 2.1 of this Safety Evaluation Report (SER). The staff's review of the results of the implementation of the scoping and screening methodology is presented in Sections 2.2 through 2.5 of this SER.

By letter dated June 14, 2002, the applicant submitted its request and application for renewal of the operating license for the H.B. Robinson Steam Electric Plant, Unit No. 2 (RNP). As an aid to the staff during the review, the applicant provided evaluation boundary drawings that identify the functional boundaries for systems and components within the scope of license renewal. These evaluation boundary drawings are not part of the license renewal application (LRA). By letter dated October 23, 2002, the applicant provided supplemental LRA information concerning interim staff guidance for fire protection (FP) system aging management, station blackout (SBO), aging management of concrete components, and 10 CFR 54.4(a)(2).

On February 11, 2003, the staff issued requests for additional information (RAIs) regarding the applicant's methodology for identifying SSCs at RNP that are within the scope of license renewal and subject to an AMR, and the results of the applicant's scoping and screening process. This was supplemented by another RAI dated February 21, 2003. By letter dated April 28, 2003, the applicant provided responses to the RAIs. By letter dated October 23, 2002, the applicant provided supplemental LRA information concerning interim staff guidance for FP system aging management, SBO, aging management of concrete components, and 10 CFR 54.4(a)(2). This was supplemented by a letter dated February 21, 2003 requesting additional information.

The staff conducted a scoping and screening inspection from March 31 to April 4, 2003, to examine activities that supported the LRA, including the inspection of procedures and representative records, and personnel interviews regarding the process of scoping and screening plant equipment to select SSCs within the scope of the Rule and subject to an AMR.

The inspection team found several SSCs which the applicant omitted from the scope of license renewal. When such SSCs were found, the inspection team expanded its inspection to determine whether additional SSCs had been omitted. In each case, no additional SSCs were found to be omitted from scope. With the inclusion within scope of the omitted SSCs, the NRC staff concluded that the applicant's scoping and screening process was successful in identifying those SSCs required to be considered for aging management. In addition, for a sample of plant systems, the inspection team performed visual examinations of accessible portions of the systems to observe any effects of equipment aging. Finally, the inspection concluded that the scoping and screening portion of the applicant's license renewal activities were conducted as described in the LRA and that documentation supporting the application is in an auditable and retrievable form. Inspection open items that were identified during the inspection are discussed in this SER.

2.1 Scoping and Screening Methodology

2.1.1 Introduction

Pursuant to 10 CFR Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants," Section 54.21, "Contents of Application—Technical Information," each application for license renewal must contain an integrated plant assessment (IPA). Furthermore, the IPA must identify and list those SCs that are subject to an AMR from the SSCs that are within the scope of license renewal, in accordance with 10 CFR 54.4(a).

In Section 2.1, "Scoping and Screening Methodology," of the LRA, the applicant described the scoping and screening methodology used to identify SSCs at the RNP that are within the scope of license renewal, and SCs that are subject to an AMR. The staff reviewed the applicant's scoping and screening methodology to determine if it meets the scoping requirements stated in 10 CFR 54.4(a) and the screening requirements stated in 10 CFR 54.21.

In developing the scoping and screening methodology for the RNP LRA, the applicant considered the requirements of the Rule, the Statements of Consideration for the Rule, and the guidance presented in the Nuclear Energy Institute's (NEI), "Industry Guideline for Implementing the Requirements of 10 CFR Part 54—The License Renewal Rule," Revision 3, March 2001, (NEI 95-10). In addition, the applicant also considered the NRC staff's correspondence with other applicants and with the NEI in the development of this methodology.

2.1.2 Summary of Technical Information in the Application

In Sections 2.0 and 3.0 of the LRA, the applicant provided the technical information required by 10 CFR 54.21(a). In Section 2.1, "Scoping and Screening Methodology," of the LRA, the applicant described the process used to identify the SSCs that meet the license renewal scoping criteria under 10 CFR 54.4(a), as well as the process used to identify the SCs that are subject to an AMR as required by 10 CFR 54.21(a)(1).

Additionally, Section 2.2, "Plant Level Scoping Results"; Section 2.3, "Scoping and Screening Results—Mechanical Systems"; Section 2.4, "Scoping and Screening Results—Structures"; and Section 2.5, "Scoping and Screening Results—Electrical and Instrumentation and Control (I&C) Systems," of the LRA amplify the process that the applicant used to identify the SCs that are

subject to an AMR. Chapter 3 of the LRA, "Aging Management Review Results," contains the following information:

- Section 3.1, "Aging Management of Reactor Vessel, Internals, and Reactor Coolant System"
- Section 3.2, "Aging Management of Engineered Safety Features"
- Section 3.3, "Aging Management of Auxiliary Systems"
- Section 3.4, "Aging Management of Steam and Power Conversion Systems"
- Section 3.5, "Aging Management of Containments, Structures, and Component Supports"
- Section 3.6, "Aging Management of Electrical and Instrumentation and Controls"
- Chapter 4 of the LRA, "Time-Limited Aging Analyses," contains the applicant's identification and evaluation of time-limited aging analyses

2.1.2.1 Scoping Methodology

2.1.2.1.1 Application of the Scoping Criteria in 10 CFR 54.4(a)

10 CFR 54.4(a)(1)

In Sections 2.1, "Scoping and Screening Methodology"; 2.1.1, "Scoping"; and 2.1.1.1, "Safety-Related Criteria Pursuant to 10 CFR 54.4(a)(1)," of the LRA, the applicant discussed the scoping methodology as it related to the safety-related criteria found in 10 CFR 54.4(a)(1).

The LRA states that 10 CFR 54.4(a)(1) pertains to safety-related SSCs and that SSCs within the scope of license renewal include safety-related SSCs which are relied upon to remain functional during and following design-basis events (as defined in 10 CFR 50.49 (b)(1)) to ensure the following functions:

- the integrity of the reactor coolant pressure boundary
- the capability to shut down the reactor and maintain it in a safe shutdown condition
- the capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposure comparable to the guidelines in 10 CFR 50.34(a)(1), 10 CFR 50.67(b)(2), or 10 CFR 100.11, as applicable

In addition, the LRA states that these criteria are consistent with those used to develop the original Q-List at RNP, as documented in the RNP Continuing Quality Assurance Program Manual and the RNP procedures that control the Q-List. Consistent with commitments in the RNP current licensing basis (CLB), the RNP Q-List criteria define the SSCs relied upon to remain functional during and following design-basis events described in Chapter 15 of the Updated Final Safety Analysis Report (UFSAR), as well as in other sections of the UFSAR where the design bases for SSCs are defined by postulated events such as earthquakes and other external hazards.

The process of identifying safety-related SSCs included the use of the RNP PassPort Equipment Database (EDB) as the primary source used to define a comprehensive list of the systems and structures that make up the RNP, and to identify those systems and structures

that are classified as safety related. The EDB was developed using the RNP Q-List and extends the classification of systems to the component level. For the purposes of license renewal, any system/structure, including support systems, that contains one or more safety-related components was considered to be a safety-related system/structure.

The RNP design and CLB documentation were also reviewed to compile a comprehensive list of functions that each system and structure at RNP is credited with performing. Primary sources of this information include design-basis documents (DBDs), the EDB, and the UFSAR. System functions that meet the criteria of 10 CFR 54.4(a)(1) were identified. These are the system/structure intended functions that are the basis for inclusion in license renewal scope.

10 CFR 54.4(a)(2)

In Sections 2.1, "Scoping and Screening Methodology"; 2.1.1, "Scoping"; and Section 2.1.1.2, "Non-Safety-Related Criteria Pursuant to 10 CFR 54.4(a)(2)," of the LRA, the applicant discussed the scoping methodology as it related to the non-safety-related criteria found in accordance with 10 CFR 54.4(a)(2). With respect to the non-safety-related criteria, the applicant stated, in part, that a review has been performed to identify those non-safety-related SSCs whose failure could prevent satisfactory accomplishment of the safety-related intended functions identified in 10 CFR 54.4(a)(1).

The LRA states that 10 CFR 54.4(a)(2) indicates that SSCs within the scope of license renewal include those non-safety-related SSCs whose failure could prevent satisfactory accomplishment of any of the functions identified for safety-related SSCs. The relationship by which this criterion of 10 CFR 54.4(a)(2) might be satisfied takes on one of two forms (1) functional dependencies, wherein non-safety-related equipment is required to perform a function in order to support the function of safety-related equipment, or (2) physical interactions, wherein the failure of non-safety-related equipment might inhibit the performance of nearby safety-related equipment (e.g., seismic interaction, flooding effects, high-energy line break effects, etc.). At RNP, the procedural requirements for component classification state that components that do not perform a safety-related function, but whose failure could prevent the satisfactory accomplishment of a safety-related function during or following design-basis accidents and transients, are to be classified as safety-related. However, there are instances in which the CLB permits use of non-safety-related systems to support the function of safety-related systems. In these cases, the systems are classified in accordance with CLB commitments. Therefore, an evaluation was performed to assure that all SSCs meeting the criteria of 10 CFR 54.4(a)(2) were identified.

In addition, the LRA states that the RNP design and licensing basis information was reviewed to identify non-safety-related SSCs that directly support a safety-related system or structure and whose failure could prevent the performance of a required intended function. Sources of this information included design basis documents, the UFSAR, the EDB, the Maintenance Rule Database, and docketed correspondence. Each instance was identified in which non-safety-related SSCs were credited in the performance of an intended function or whose failure could prevent the performance of an intended function of a safety-related SSC. In each case, the specific function that is required of the non-safety-related system/structure was identified. The SSCs meeting these criteria were designated as within the scope of license renewal in

accordance with the 10 CFR 54.4(a)(2) criteria, and the associated function or interaction was considered to be a system/structure intended function.

The RNP design and licensing basis information was reviewed to identify non-safety-related SSC interactions with safety-related SSCs that could prevent the performance of a required intended function. Sources of this information included design-basis documents, the UFSAR, plant drawings, and other CLB documentation, as well as the EDB and the Maintenance Rule Database. For each such instance, the specific interaction that might affect the function of safety-related SSCs was identified. The SSCs meeting these criteria were designated as within the scope of license renewal in accordance with the 10 CFR 54.4(a)(2) criteria, and the associated interaction was considered to be a system/structure intended function.

The LRA also states that interactions of nonseismically qualified SSCs with seismically qualified SSCs (commonly referred to as Seismic II over I) are not part of the CLB for RNP. The RNP CLB, however, considers the effects of physical interactions on the SSCs necessary to achieve and maintain safe shutdown, consistent with the plant's responses pertaining to resolution of Unresolved Safety Issue (USI) A-46. The USI A-46 review imposed criteria for evaluating interactions between seismically qualified SSCs and nonseismically qualified SSCs associated with proximity, structural failure and falling, and flexibility of attached cables and piping. This type of interaction was considered in the license renewal process, and a spaces- or area-based approach was used to identify components in this category. As part of the screening process, a plant area-based approach was implemented to identify spatial interactions between non-safety-related SSCs and safety-related SSCs that could adversely affect the accomplishment of an intended function. Plant walkdowns were performed to identify potential seismic interactions and non-safety-related structural components (e.g., pipe supports, raceway supports, equipment supports, and miscellaneous structures) associated with seismic interactions were identified based on their location relative to safety-related SSCs.

10 CFR 54.4(a)(3)

In Sections 2.1, "Scoping and Screening Methodology"; 2.1.1, "Scoping"; and Section 2.1.1.3, "Other Scoping Pursuant to 10 CFR 54.4(a)(3)," of the LRA, the applicant discussed the scoping methodology as it related to the regulated event criteria found in 10 CFR 54.4(a)(3).

The LRA states that 10 CFR 54.4(a)(3) indicates that SSCs relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the Commission's regulations for FP (10 CFR 50.48), environmental qualification (EQ) (10 CFR 50.49), pressurized thermal shock (PTS) (10 CFR 50.61), anticipated transients without scram (ATWS) (10 CFR 50.62), and station blackout (SBO) (10 CFR 50.63) are within the scope of license renewal. CLB evaluations have been performed and documented which facilitate the identification of those SSCs credited in compliance with each of these regulations. For these SSCs, the system/structure level intended function is that function which is relied upon in safety analyses or evaluations to demonstrate compliance with NRC requirements for the regulated event. A system/structure function-based approach is not needed to identify intended functions, but can be used as necessary to identify the boundaries of credited equipment. Systems or structures that have one or more components credited for demonstrating compliance with one of the regulated events are within the scope of license renewal in accordance with the 10 CFR 54.4(a)(3) criteria.

2.1.2.1.2 Documentation Sources Used for Scoping and Screening

In Sections 2.1.1.1, 2.1.1.2, 2.1.1.3, 2.1.2.1, 2.1.2.2, and 2.1.2.3 of the LRA, the applicant stated that information derived from the CLB, licensing-basis documents, DBDs, the UFSAR, plant drawings, the Q-List, the Maintenance Rule Database, and the EDB was reviewed during the license renewal scoping and screening process. The applicant used this information to identify the functions performed by plant systems and structures. These functions were then compared to the scoping criteria in 10 CFR 54(a)(1-3) to determine if the associated plant system or structure performed a license renewal intended function. These sources were also used to develop the list of SCs subject to an AMR.

2.1.2.2 Screening Methodology

2.1.2.2.1 Mechanical Screening

The LRA states that following the scoping for mechanical systems, the applicant performed screening to identify those mechanical components that were subject to an AMR. The applicant stated in Section 2.1.2.1, "Mechanical Systems," of the LRA that the following methodology was used.

For mechanical systems, the screening process was performed on each system identified to be within the scope of license renewal. This process evaluated the individual components included within in-scope mechanical systems to identify specific components or component groups that require an AMR.

For the systems in scope for license renewal, mechanical system evaluation boundaries were established. Generally, these boundaries were determined by mapping the pressure boundary associated with license renewal system intended functions onto the system flow diagrams. License renewal system intended functions are the functions a system must perform relative to the scoping criteria of 10 CFR 54.4(a)(1), 10 CFR 54.4(a)(2), and 10 CFR 54.4(a)(3).

The evaluation boundaries associated with license renewal system intended functions were mapped onto the system's flow diagram. The entire flow path was considered to include all components credited for the successful completion of each intended function.

Based on a review of flow diagrams, design drawings, plant documentation, and the system component list from the EDB, components that were included within the system intended function boundaries were identified. Although mechanical system intended function boundaries ordinarily occur at a valve location, the seismic boundary may extend to a support past the valve and may include a section of non-safety-related piping. This piping segment and the associated support also were included in the scope of license renewal.

The components within the system intended function boundary that perform an intended function without moving parts or without a change in configuration or properties (i.e., the screening criteria of 10 CFR 54.21(a)(1)(i)), were identified. Active and passive screening determinations were based on the guidance in Appendix B to NEI 95-10. Part 54.21(a)(1)(i) of Title 10 of the *Code of Federal Regulations* provides a summary of specific component types

that are excluded from the scope of license renewal. These specific component types are screened based on the provisions of the Rule. Some components were determined to be part of a complex assembly as discussed in NEI 95-10 and were screened accordingly.

The passive, in-scope components that were not subject to replacement based on a qualified life or specified time period (the screening criteria of 10 CFR 54.21(a)(1)(ii)) were identified as requiring an AMR. The determination of whether passive, in-scope components have a qualified life or specified replacement time period was based on a review of plant-specific information including the EDB, maintenance programs, and procedures.

The components that were within the scope of license renewal (i.e., required to perform a license renewal system intended function) were identified and the component intended functions for in-scope components were identified. The component intended functions identified were based on the guidance of NEI 95-10.

2.1.2.2.2 Structural Screening

The LRA states that following structural scoping, the applicant performed screening to identify those civil/structural components that were subject to an AMR. In Section 2.1.2.2, "Civil Structures," of the LRA, the applicant described the methodology used to screen civil/structural components. The applicant stated that the following civil/structural screening methodology was used.

The applicant performed the screening process on each structure identified to be within the scope of license renewal. This method evaluated the individual SCs included within in-scope structures to identify specific SCs or SC groups that require an AMR.

The evaluation boundaries associated with each civil/structural intended function were identified and documented using appropriate drawings and other documentation. Evaluation boundaries between mechanical components, electrical components, and structures and structural components were coordinated between the discipline reviewers. The civil/structural components included items such as walls, supports, and non-current carrying electrical and I&C components (i.e., conduits, cables trays, electrical enclosures, panels, and related supports). Civil/structural intended functions were identified during performance of the scoping process.

Based on a review of the civil/structural evaluation boundaries, the SCs and commodity types within the intended function boundaries for the given structure were identified and documented. A generic list of commodity types was developed using guidance from Table 4.1-1 of NEI 95-10, and potential intended functions for the commodity types were identified. Structural components were identified using the EDB as a starting point. In the screening process, no differentiation was made between individual component and commodity types; they were grouped together under common types. Implementation of this methodology conservatively includes many components and commodities within the scope of license renewal that otherwise would be screened out as not supporting any system intended function.

The in-scope SCs that performed an intended function without moving parts or without a change in configuration or properties (the screening criterion of 10 CFR 54.21(a)(1)(i)), or that are not subject to replacement based on a qualified life or specified time period (the screening

criteria of 10 CFR 54.21(a)(1)(ii)), were identified. Active/passive screening determinations were based on the guidance in Appendix B to NEI 95-10.

Component intended functions for in-scope SCs were determined and documented. The component intended functions were based on the guidance of NEI 95-10. Those SCs that have a component or commodity group intended function that supports a structure intended function were determined to be subject to an AMR.

2.1.2.2.3 Electrical and Instrumentation and Controls (I&C) Screening

The LRA states that screening of electrical and I&C system components was performed differently than for mechanical and structural components. In Section 2.1.2.3, "Electrical and I&C Systems," of the LRA, the applicant described the methodology used to screen electrical and I&C components.

The LRA stated that the method used to determine which electrical and I&C components were subject to an AMR was based on the component commodity group approach consistent with the guidance of NEI 95-10. The primary difference between this method and the method used for mechanical systems and structures was the order in which the component screening steps were performed. This method was selected for use with the electrical and I&C components because most electrical and I&C components are active.

Using the EDB, appropriate plant design drawings, and other documentation, the different types of electrical components within the electrical and I&C systems determined to be in scope for license renewal were identified. The component types associated with the electrical and I&C systems within the scope of license renewal were organized into commodity groupings (i.e., circuit breakers, cables, sensors). In general, grouping of component types followed the guidance in NEI 95-10 regarding grouping of components based on similar functions.

The electrical and I&C component commodity groups that perform an intended function without moving parts, or without a change in configuration or properties (the screening criteria of 10 CFR 54.21(a)(1)(i)), were identified. Active or passive screening determinations were based on the guidance in Appendix B to NEI 95-10. Commodity groups that have passive functions and may be subject to an AMR were identified.

For the passive electrical and I&C component commodity groups, component commodity groups that are not subject to replacement based on a qualified life or specified time period (the screening criteria of 10 CFR 54.21(a)(1)(ii)) were identified as requiring an AMR. Commodity group components that are replaced based on qualified life, determined in accordance with the Environmental Qualification Program, were determined not to be subject to AMR.

2.1.3 Staff Evaluation

As part of the review of the applicant's LRA, the NRC staff evaluated the scoping and screening activities described in the following sections of the application to assure that the applicant outlined a process for determining structural, mechanical, and electrical components at RNP that are subject to an AMR for renewal, in accordance with the requirements of 10 CFR 54.21(a)(1) and 10 CFR 54.21(a)(2):

- Section 2.1, “Scoping,” to ensure that the applicant described a process for identifying SSCs that are within the scope of license renewal in accordance with the requirements of 10 CFR 54.4(a)(1), 10 CFR 54.4(a)(2), and 10 CFR 54.4(a)(3)

- Section 2.2, “Plant Level Scoping Results”; Section 2.3, “Scoping and Screening Results—Mechanical Systems”; Section 2.4, “Scoping and Screening Results—Structures”; and Section 2.5, “Screening Results—Electrical and Instrumentation and Control (I&C) Systems”

In addition, the staff conducted a scoping and screening methodology audit at RNP from September 17 through 20, 2002. The focus of the audit was to ensure that the applicant had developed and implemented adequate guidance to conduct the scoping and screening of SSCs in accordance with the methodologies described in the application and the requirements of the Rule. The audit team reviewed implementation procedures and calculations which describe the scoping and screening methodology implemented by the applicant. The applicant documented the results of licensee renewal evaluations by means of calculations. In addition, the audit team conducted detailed discussions with the cognizant engineers on the implementation and control of the program, and reviewed administrative control documentation and selected design documentation used by the applicant during the scoping and screening process. The audit team further reviewed a sample of system scoping and screening results reports for safety injection, auxiliary feedwater, component cooling water, and main feedwater to ensure that the methodology outlined in the administrative controls was appropriately implemented. The results were found to be consistent with the CLB, as described in the supporting design documentation.

2.1.3.1 Scoping Methodology

The audit team reviewed implementation procedures and calculations which described the scoping and screening methodology implemented by the applicant. These procedures included EGR-NGGC-0501, “Nuclear Plant License Renewal Plan,” Revision 3; EGR-NGGC-0502, “System Structure Scoping for License Renewal,” Revision 3; and RNP-L/LR-0007, “System Structure Scoping for License Renewal,” Revision 3. The team found that the scoping and screening methodology instructions were consistent with Section 2.1 of the LRA and were of sufficient detail to provide the applicant’s staff with concise guidance on the scoping and screening implementation process to be followed during the LRA activities. In addition to the implementing procedures, the audit team reviewed portions of the UFSAR, DBDs, the EDB, system drawings, and selected licensing documentation which were relied upon by the applicant during the scoping and screening phases of the review.

2.1.3.1.1 Application of the Scoping Criteria in 10 CFR 54.4(a)

10 CFR 54.4(a)(1)

Pursuant to 10 CFR 54(a)(1), the applicant must consider all safety-related SSCs which are relied upon to remain functional during and following design-basis events to ensure the following functions, (i) the integrity of the reactor coolant pressure boundary, (ii) the capability to shut down the reactor and maintain it in a safe shutdown condition, or (iii) the capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposures comparable to those referred to in 10 CFR 50.34(a)(1), 10 CFR 50.67(b)(2), or

10 CFR 100.11, are included within the scope of license renewal. The audit team determined that the applicant had included the criteria for safety-related SSCs, as defined in 10 CFR 54(a)(1), in both the LRA and the license renewal implementing procedures.

The applicant used the EDB, which contained the list of safety-related components, as the primary source to determine the systems which would be in scope in accordance with the requirements of 10 CFR 54.4(a)(1). Additional sources included the UFSAR, DBDs, and the CLB. The EDB was developed using the RNP Q-List and extends the classification of systems to the component level. The applicant had determined that any system which contained a safety-related component, as indicated by the EDB would be considered in scope in accordance with 10 CFR 54.4(a)(1). The applicant had documented system scoping on scoping worksheets developed for each system listed in the EDB.

The audit team determined that the system and component intended functions had been identified in the system DBDs. However, during the scoping process, certain intended functions had been grouped and reworded (relative to the intended functions contained in the DBDs) when listed on the scoping worksheets. This issue was identified as RAI 2.1.1-3 in the NRC letter to the applicant dated February 11, 2003.

By letter to the NRC dated April 28, 2003, in response to RAI 2.1.1-3, the applicant indicated that the process of identifying system intended functions included (1) determining design-basis information, (2) cataloging potential, system level, intended functions and maintaining the associated source references, (3) determining relevant DBD functional statements, and (4) comparing the functional statements with information cataloged from other CLB sources.

The applicant identified duplicate or overlapping functional statements and used the one that best described the broadest aspects of the function. If necessary, the statements were expanded to capture the complete functional requirements within the basis for modifications or statements provided. This was in the form of a reference or comment that described the relevant information. The applicant made a determination on whether the functional statement was an intended function and recorded the basis in the form of a reference or a comment. The final set of functions was listed on the appropriate system worksheet.

The applicant stated that the scoping process and results had subsequently been the subject of a self-assessment, as well as a Nuclear Assessment Section assessment. The applicant further stated that there were no cases identified of incomplete, missing, or incorrect intended functions. Based on the information reviewed during the audit and the supplemental information provided by the licensee, the audit team concluded that the applicant had applied an acceptable method for determining and documenting intended functions. Therefore, RAI 2.1.1-3 is considered resolved.

As part of the review of the applicant's scoping methodology, the audit team reviewed a sample of the license renewal database, 10 CFR 54(a)(1) scoping results, and the analyses and documentation to support these reviews, and discussed the methodology and results with the applicant's personnel responsible for these evaluations. The team verified that the applicant had identified and used pertinent engineering and licensing information in order to determine the SSCs required to be in scope, in accordance with the 10 CFR 54.4(a)(1) criteria. On the basis of this sample review and discussions with the applicant, the audit team determined that

the applicant's methodology for identifying systems and structures meeting the scoping criteria of 10 CFR 54(a)(1) was adequate.

10 CFR 54.4(a)(2)

10 CFR 54(a)(2) requires, in part, that the applicant consider all non-safety-related SSCs whose failure could prevent satisfactory accomplishment of any of the functions identified in paragraphs 10 CFR 54(a)(1)(i), 10 CFR 54(a)(1)(ii), or 10 CFR 54(a)(1)(iii) to be within the scope of license renewal.

As part of the evaluation of the applicant's scoping methodology associated with the 10 CFR 54.4(a)(2) criteria, the applicant presented the audit team with a detailed discussion on the development and current implementation of the pertinent design calculations. The audit team also provided the applicant with additional information on the treatment of non-safety-related SSCs affecting safety-related SSCs described in the staff's Interim Staff Guidance (ISG) documents, and reviewed the design calculations developed by the applicant to address the evaluation of the plant SSCs for this topic. Specifically, the staff noted that, by letters dated December 3, 2001, and March 15, 2002, respectively, the NRC issued a staff position to the NEI which described areas to be considered and options it expects licensees to use to determine the SSCs that meet the 10 CFR 54.4(a)2 criteria (i.e., all non-safety-related SSCs whose failure could prevent satisfactory accomplishment of any safety-related functions identified in paragraphs (a)(1)(i), (ii), and (iii) of 10 CFR 54.4).

The letter of December 3, 2001, provided specific examples of operating experience which identified pipe failure events (summarized in Information Notice (IN) 2001-09, "Main Feedwater System Degradation in Safety-Related ASME Code Class 2 Piping Inside the Containment of a Pressurized Water Reactor") and the approaches the NRC considers acceptable to determine which piping systems should be included in scope based on the 10 CFR 54.4(a)2 criteria.

The March 15, 2002, letter further described the staff's expectations for the evaluation of nonpiping SSCs to determine which additional non-safety-related SSCs are within scope. The letter states that applicants should not consider hypothetical failures, but rather should base their evaluation on the plant's CLB, engineering judgment and analyses, and relevant operating experience. The letter further describes operating experience as all documented plant-specific and industry-wide experience that can be used to determine the plausibility of a failure. Documentation could include NRC generic communications and event reports, plant-specific condition reports, industry reports such as safety evaluation reports, and engineering evaluations.

Consistent with the staff position described in the aforementioned letters, the staff reviewed the draft calculations prepared by the applicant to resolve the 10 CFR 54.4(a)(2) ISG issues. These calculations were developed by the applicant's engineering staff to help ensure that all SSCs in the CLB that address the requirements of 10 CFR 54.4(a)(2) have been identified and considered for inclusion in the scope of the LRA. The calculation RNP-L/LR-0006, "Non-Safety-Related Equipment Affecting Safety-Related Equipment—License Renewal System/Structure Scoping," specifically provides detailed guidance for evaluating potential non-safety-related SSCs affecting safety-related SSCs, including interpretation of guidelines to be considered during the application of the 10 CFR 54.4(a)(2) requirements, description of interactions and events including functional dependencies between non-safety-related and safety-related SSCs,

and physical dependencies between these systems. The calculation also includes a description of mitigative and support functions and a summary of potential interactions of interest as a result of certain operational occurrences, such as flooding, high winds, heavy loads, and high-energy line breaks. The applicant developed two additional calculations, RNP-L/LR-0396, "Screening and Aging Management Review Criterion 2 Piping," and RNP-L/LR-0393, "Aging Management Review Seismic Piping (II over I and Seismic Continuity Piping)," to further describe the scoping and screening criteria established for the review, identify affected systems considered within scope, and identify information associated with the AMR (i.e., material environment combinations for each). The RNP-L/LR-0396 calculation also contained a walkdown worksheet for each system evaluated which described the structure housing the system of interest and the reviewers' comments during the walkdown. The audit team reviewed these calculations and verified that the applicant had adequate plans to incorporate the results of these efforts into the scoping methodology process. However, the audit team identified certain discrepancies between the scoping and screening process described in the current calculations and the actual process that was described by the applicant's staff during the audit activities. Specifically, the calculation RNP-L/LR-0006 did not provide a clear description and account of all essential activities in the scoping and screening process related to the determination of Criterion 2 SSCs. The report described a process by which only certain non-safety-related SSCs would be brought into scope if failure of these non-safety-related SSCs is postulated in the CLB and their failure would result in the loss of a safety-related intended function. In fact, during the methodology audit, the audit team clearly established that the Rule required that all non-safety-related SSCs whose failure could result in the loss of ability of a safety-related SSC to perform its intended function would be included in scope. As a result of reviewing prior LRA application correspondence, the applicant had revised its design documentation to strike the criterion which specified that only certain safety-related equipment must be included. The applicant showed the audit team a draft of the revised calculation which did contain the revision. The team found that the revision adequately addressed the staff's concerns.

As a result of the discussions on the 10 CFR 54.4(a)(2) evaluation and a review of the draft calculations prepared by the applicant, the audit team indicated that an RAI would be forthcoming on the issue to allow the applicant an opportunity to complete implementation of the revisions to the draft calculations, perform the evaluations as described in those calculations, and provide the staff with the results from that effort. This issue was identified as RAI 2.1.1-1 in the NRC letter to the applicant dated February 11, 2003.

By letter to the NRC dated October 23, 2003, the applicant provided the information contained in the draft calculations, discussed above, which had been previously reviewed during the audit and determined to be acceptable. The information contained a list of piping systems included within the modified license renewal scope which had been determined to be in scope in accordance with 10 CFR 54.4(a)(2), identification of the piping systems having non-safety-related components requiring an AMR, and the aging management programs (AMPs) credited for managing the identified aging effects. The staff's review of the applicant's scoping results and aging management evaluation of SCs in these systems is presented in Section 2 and 3 of this SER, respectively. The applicant indicated that site-specific and industry operating experience was reviewed in support of AMRs. Operating experience sources considered included Institute of Nuclear Power Operations operating experience items, NRC documents (information notices, generic letters, violations, and staff reports), 10 CFR Part 21 reports, and vendor bulletins, as well as corporate internal operating experience information from Progress

Energy nuclear sites. In addition, this information was included in the letter to the NRC, dated April 28, 2002, which was provided in response to RAI 2.1.1-1.

The staff reviewed the additional information supplied by the applicant, including (1) expansion of the systems within the scope of license renewal and addition of new portions of systems within scope as a result of the revised methodology, (2) determination of the credible failures which could impact the ability of safety-related SSCs to perform their intended functions, (3) evaluation of relevant operating experience, and (4) incorporation of identified non-safety-related SSCs into the applicant's AMPs and the results of NRC inspection and audit activities. On the basis of the review of the above information and documents, the staff concludes that the applicant has supplied sufficient information to demonstrate that all SSCs that meet the 10 CFR 54.4(a)(2) scoping requirements have been identified as within the scope of license renewal. Therefore, RAI 2.1.1-1 is considered resolved.

10 CFR 54.4(a)(3)

10 CFR 54.4(a)(3) requires, in part, that the applicant consider all SSC's relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the Commission's regulations for fire protection (10 CFR 50.48), environmental qualification (10 CFR 50.49), pressurized thermal shock (10 CFR 50.61), anticipated transients without scram (10 CFR 50.62), and station blackout (10 CFR 50.63) to be within the scope of the license renewal.

The applicant used CLB evaluations which had been performed and documented to facilitate the identification of those SSCs credited in compliance of 10 CFR 54.4(a)(3). For these SSCs, the system/structure level intended function is that which is relied upon in safety analyses or evaluations to demonstrate compliance with NRC requirements for the event in question. Systems or structures that have one or more components credited for demonstrating compliance with one of the regulated events are within the scope of license renewal in accordance with the 10 CFR 54.4(a)(3) criteria. The applicant had identified the SSCs credited in the CLB by reviewing the CLB and applicable documentation. Also, by letter to the NRC dated October 23, 2003, the applicant responded to the ISG-02 regarding scoping of equipment relied on to meet the requirements of the Station Blackout Rule (10 CFR 50.63) for License Renewal (10 CFR 54.4(a)(3)).

As part of the review of the applicant's scoping methodology, the audit team reviewed a sample of the license renewal database 10 CFR 54(a)(3) scoping results, and a sample of the analyses and documentation to support these reviews, and discussed the methodology and results with the applicant's personnel responsible for these evaluations. The team verified that the applicant had identified and used pertinent engineering and licensing information to determine the SSCs required to be in scope in accordance with the 10 CFR 54.4(a)(3) criteria. Based on this sampling review and discussions with the applicant, the audit team determined that the applicant's methodology for identifying systems and structures meeting the scoping criteria of 10 CFR 54(a)(3) was adequate.

2.1.3.1.2 Mechanical Scoping

The applicant performed a review of all systems and structures in accordance with calculation RNP-L/LR-0007, “System/Structure Scoping for License Renewal,” and standard procedure EGR-NGGC-0502, “System/Structure Scoping for License Renewal.” The calculation and procedure provided guidance for the identification of systems and structures included within the scope of license renewal. The documents described sources of information required to determine if any SSCs satisfied the 10 CFR 54.4(a)(1-3) criteria and additional rules for identifying mechanical intended functions. The calculation also provided a worksheet for each mechanical system/structure identified during the scoping activities and indicated whether that mechanical system/structure was considered in scope, which of the 10 CFR 54.4 criteria it satisfied, and the specific intended functions for that structure.

The applicant initially identified all systems listed in the EDB which contain safety-related mechanical components for inclusion within scope of renewal. For each system which satisfied the criteria established in RNP-L/LR-0007, the applicant developed a detailed worksheet. The system intended functions were determined from a review of detailed design documentation such as the UFSAR, DBDs, generic issues documents, evaluation reports for the regulated events, and vendor specifications where necessary.

The audit team reviewed a sample of system scoping and screening results reports for safety injection, auxiliary feedwater, component cooling water, and main feedwater to ensure that the methodology outlined in the administrative controls was appropriately implemented. The results reports were found to be consistent with the CLB as described in the supporting design documentation. The audit team discussed the process and results with the cognizant engineers who performed the review. The audit team did not identify any discrepancies between the methodology documented and the implementation results.

2.1.3.1.3 Structural Scoping

The applicant performed a review of all systems and structures in accordance with calculation RNP-L/LR-0007 and standard procedure EGR-NGGC-0502. The calculation and procedure provided guidance for the identification of systems and structures included within the scope of license renewal. With respect to structure scoping, the documents described sources of information required to determine if any structures satisfied the 10 CFR 54.4(a)(1-3) criteria and additional rules for identifying structure intended functions. The calculation also provided a worksheet for each structure identified during the scoping activities and indicated whether that structure was considered in scope, which of the 10 CFR 54.4 criteria it satisfied, and the specific intended functions for that structure. The audit team reviewed a sample of the structure worksheets developed in accordance with the calculation and did not identify any discrepancies between the sample reviewed and the guidance requirements.

The applicant first identified all structures with unique mark numbers from the EDB for inclusion within scope of renewal. Those structures within the database were typically safety-related structures. The applicant reviewed a series of detailed drawings of plant structures to identify initially all structures at the facility. These structures were then further evaluated through walkdowns of the physical structure to determine which structures housed safety-related equipment or could pose an interaction with, and potentially affect, safety-related equipment, and to determine which structural components needed to be addressed. Those structures that

could potentially prevent satisfactory failure of a safety-related function were classified as safety-related by the applicant and addressed as such in the EDB. For each structure which satisfied the criteria established in RNP-L/LR-0007, the applicant developed a detailed worksheet. The structure intended functions were derived from component level data in the EDB, if available, and from review of detailed design documentation, such as the UFSAR, DBDs, generic issues documents, evaluation reports for the regulated events, and vendor specifications where necessary.

As a secondary evaluation method, the applicant then performed a review of all mechanical and electrical system components that were determined to be within the scope of license renewal and identified which structures contained any of these components. The results were compared to the initial list of structures identified in the EDB and additional structures were added to scope if they satisfied one of the scoping criteria.

The audit team reviewed a sample of the structural drawing packages assembled by the applicant for the reactor containment building and intake structure and discussed the process and results with the cognizant engineers who performed the review. The audit team did not identify any discrepancies between the methodology documented and the implementation results.

2.1.3.1.4 Electrical and Instrumentation and Controls Scoping

The applicant performed electrical and I&C component scoping and screening using the commodity group method. Electrical and I&C scoping and screening is discussed in Section 2.1.3.2.3.

2.1.3.2 Screening Methodology

2.1.3.2.1 Mechanical Screening

The audit team reviewed the screening implementation procedures and a selected sample of the system screening reports to ensure consistent application of the applicant's screening methodology. The applicant developed standard procedure EGR-NGGC-0503, "Mechanical Component Screening for License Renewal," to define the process for performing screening of mechanical components.

The applicant established mechanical system evaluation boundaries for SSCs which had been determined to be within scope. Generally, these boundaries were determined by mapping the pressure boundary associated with the license renewal system intended functions onto the system flow diagrams. The entire flow path was considered to include all components credited for the successful completion of each intended function. The applicant identified the components that were included in the system through a review of flow diagrams, design drawings, plant documentation, and the system component list from the EDB.

The applicant then determined the components within the system intended function boundary that performed an intended function without moving parts or without a change in configuration or properties. Active/passive screening determinations were based on the guidance in Appendix B to NEI 95-10. The passive, in-scope components that were not subject to replacement based on a qualified life or specified time period were identified as requiring an

AMR. The determination of whether a passive, in-scope component has a qualified life or specified replacement time period was based on a review of plant-specific information including the EDB, maintenance programs, and procedures. The passive, in-scope components that are not subject to replacement based on a qualified life or specified time period (i.e., screening criteria of 10 CFR 54.21(a)(1)(ii)) were identified as requiring an AMR. The in-scope components identified as requiring an AMR were then compared to the NUREG-1801, "Generic Aging Lessons Learned (GALL) Report," dated July 2001, to ensure that differences are valid and justified. The components that were determined to be within the scope of license renewal were identified and the component intended functions for in-scope components were identified. The component intended functions identified were based on the guidance of NEI 95-10.

The results of the mechanical component screening process were documented in system screening reports which contained the system intended function boundaries, identified the components subject to screening, and documented the screening results for each system component. The component documentation included the component ID, commodity type, screening results (active or passive), the supporting reference calculation, a description, and the intended function. The audit team reviewed a sample of the mechanical screening packages assembled by the applicant and discussed the process and results with the cognizant engineers who performed the review. The audit team did not identify any discrepancies between the screening methodology documented and the implementation results.

2.1.3.2.2 Structural Screening

The audit team reviewed the screening implementation procedures and a selected sample of the structure screening reports to ensure consistent application of the applicant's screening methodology. The applicant developed calculation RNP-L/LR-0124, "License Renewal—Identification of Civil Commodity Types and Bulk Screening Criteria," and standard procedure EGR-NGGC-0506, "Civil/Structural Screening and Aging Management Review for License Renewal," to define the process for performing screening and AMRs of the civil/structural components and to identify typical civil commodity types pertinent to the RNP design. The procedure also provided a description of the criteria to establish evaluation boundaries for each structure. In order to determine which commodity types were applicable to RNP, the applicant compared the commodity listings developed in the NEI 95-10 guidance, as well as all those identified by previous license renewal applicants. The resultant list of commodities captured those items relevant to the RNP design. In addition, the calculation provided a list of 13 component intended functions which were used during the screening process to establish which specific components or commodity types supported a structure intended function.

Because most structural members (e.g., walls, beams, grating, foundations, duct banks, sumps, etc.) do not have individual mark numbers, the structural screening was initiated by first identifying structural members which support the intended function(s) that the structure performs. The structural members were identified by reviewing detailed structural drawings for the in-scope structures. After the structural members were identified, they were assigned to commodity groups where applicable and identified as such in the structural screening calculations. When structures and structural members did not have unique identifier numbers, the applicant's methodology called for creating a pseudo system number for the purposes of cataloging the structure or structural component within the framework of the screening process.

The applicant developed calculations RNP-L/LR-0103, "License Renewal Screening—Structures and Structural Components," and RNP-L/LR-0104, "License Renewal Screening—Containment Structure, Internal and External Structural Components," to capture the results of the screening effort. The calculations provided a concise list of structures and structural components subject to an AMR and described and justified the methodology used to develop that list. The in-scope components identified as requiring an AMR were then compared to the Generic Aging Lessons Learned (GALL) Report to ensure that differences are valid and justified. Additionally, the calculations provided a description of each structure, identified the structure intended functions and the structure evaluation boundary, and described all components which were transferred into the system from other disciplines (e.g., mechanical, electrical) or other structural systems. The audit team reviewed a sample of the structural screening packages assembled by the applicant and discussed the process and results with the cognizant engineers who performed the review. The audit team did not identify any discrepancies between the screening methodology documented and the implementation results.

2.1.3.2.3 Electrical and Instrumentation and Controls Screening

The audit team reviewed the screening implementation procedures and a selected sample of the system screening calculation results to ensure consistent application of the applicant's screening methodology. The applicant developed standard procedure EGR-NGGC-0505, "Electrical Component Screening and Aging Management Review for License Renewal," to define the process for performing screening of electrical components.

The applicant developed a generic list of electrical component types following the guidance in Appendix B to NEI 95-10, reviewed the EDB to identify electrical equipment that had electrical tag numbers for in-scope systems, and reviewed plant documentation, such as modifications, drawings, specifications, vendor manuals, DBDs, the UFSAR, and maintenance records, to identify electrical component types that were not identified by EDB tag numbers.

The electrical and I&C components were then grouped by type into commodity groups (e.g., circuit breakers, cables, sensors, elements). Component types with similar basic functions were grouped for the purpose of evaluation. Component types with unique design characteristics required unique groups and were evaluated separately. The applicant then documented the electrical commodity groups in an electrical screening calculation.

The screening calculation identified the commodity groups within which each electrical screening component type would be evaluated; the basic component groupings, such as similar function, design, materials of construction, aging effects, aging management practices, internal and external operation, environments, and operating experience; and the applicable design and licensing basis references for determining the commodity group.

The applicant reviewed the electrical commodity groups and identified those which met the scoping requirements of 10 CFR 54.4(a)(1-3). The components, within the commodity groups that met the scoping criteria, were reviewed to determine whether the components met the criteria of 10 CFR 54.21(a)(1). Commodity groups which contained long-lived, passive components, and were not replaced based on qualified life or specified time period, were determined to be subject to an AMR. The in-scope components identified as requiring an AMR were then compared to the GALL Report to ensure that differences are valid and justified.

The NRC audit team reviewed certain calculations used to implement standard procedure EGR-NGCC-0505. These calculations identified the electrical component commodity group for systems determined to be in scope in accordance with 10 CFR 54.4(a). The licensee calculations also documented which electrical components were active, passive, or long-lived. The audit team reviewed a sample of electrical screening results assembled by the applicant, and discussed the process and results with the cognizant engineers who performed the review. The audit team did not identify any discrepancies between the screening methodology documented and the implementation results.

2.1.4 Evaluation Findings

The staff review of the information presented in Section 2.1 of the LRA, the supporting information in the RNP calculations and procedures, the information presented during the scoping and screening audit, and the applicant's responses to the staff's RAIs formed the basis of the staff's safety determination. The staff verified that the applicant's scoping and screening methodology, including its supplemental 10 CFR 54.4(a)(2) review which brought additional non-safety-related piping segments and associated components into the scope of license renewal, was consistent with the requirements of the Rule and the staff's position on the treatment of non-safety-related SSCs. On the basis of this review, the staff concludes that the applicant's methodology for identifying the SSCs within the scope of license renewal and the SCs requiring an AMR is consistent with the requirements of 10 CFR 54.4 and 10 CFR 54.21(a)(1).

2.2 Plant-Level Scoping Results

2.2.1 Summary of Technical Information in the Application

This section addresses the plant-level scoping results for license renewal. Pursuant to 10 CFR 54.21(a)(1), the applicant is required to identify and list SCs subject to an AMR. These are passive and long-lived SCs that are within the scope of license renewal.

In LRA Tables 2.2-1, 2.2-2, and 2.2-3, the applicant provided a list of the plant systems and structures and identified those that are within the scope of license renewal. The Rule does not require the identification of all plant systems and structures. However, providing such a list allows for a more efficient staff review. On the basis of the design-basis events considered in the plant's current licensing basis (CLB), other CLB information relating to non-safety-related systems and structures, and certain regulated events, the applicant identified those plant-level systems and structures within the scope of license renewal, as defined in 10 CFR 54.4(a). To verify that the applicant has properly implemented its methodology, the staff has focused its review on the implementation results to confirm that no plant-level systems and structures within the scope of license renewal have been omitted.

2.2.2 Staff Evaluation

In LRA Section 2.1, the applicant describes its methodology for identifying the SCs that are within the scope of license renewal and subject to an AMR. This methodology typically consists of a review of all plant SSCs to identify those that are within the scope of license renewal in accordance with the requirements of 10 CFR 54.4. From those SSCs that are within the scope of license renewal, an applicant will identify and list those SCs that are passive (i.e., that

perform their intended functions without moving parts, or without a change in configuration or properties), and are long-lived (i.e., that are not replaced based on a qualified life or specified time period). The staff reviewed the scoping and screening methodology and provided its evaluation in Section 2.1 of this SER. The applicant documented the implementation of the methodology in LRA Sections 2.3 through 2.5. The staff's review of the applicant's implementation can be found in Sections 2.3 through 2.5 of this SER.

To ensure that the scoping and screening methodology described in LRA Section 2.1 was properly implemented, and that the SCs that are subject to an AMR were properly identified, the staff performed an additional review. The staff sampled the contents of the UFSAR based on the listing of systems and structures in LRA Tables 2.2-1, 2.2-2, and 2.2-3 to determine whether there were systems or structures that may have intended functions as defined by 10 CFR 54.4, but were not included within the scope of license renewal.

Scoping is performed to identify SSCs that perform intended functions within the scope of license renewal as required by 10 CFR 54.4. The RNP scoping process employed a multifaceted approach to ensure that the systems and structures meeting the requirements are identified. The LRA states that the process was designed to make optimum use of existing plant documents and databases to populate the list of systems and structures within the scope of the Rule.

In accordance with 10 CFR 54.4(a)(3), all SSCs relied on in safety analyses or plant evaluations to perform a function that demonstrates compliance with the Commission's regulations for fire protection (10 CFR 50.48), environmental qualification (10 CFR 50.49), pressurized thermal shock (10 CFR 50.61), anticipated transients without scram (10 CFR 50.62), and SBO (10 CFR 50.63) are within the scope of license renewal. The LRA states that current licensing basis evaluations have been performed and documented which facilitate the identification of those SSCs credited in compliance with each of these regulations. It also states that, for these SSCs the system/structure level intended function is that it is relied upon in safety analyses or evaluations to demonstrated compliance with NRC requirements for the event in question.

In the LRA the applicant stated, and the staff agrees based on its review of the LRA and the UFSAR, that the scoping process to identify systems and structures relied upon and/or specifically committed to for fire protection, environmental qualification, pressurized thermal shock, anticipated transients without scram, and SBO is consistent with the criteria in 10 CFR 54.4(a)(3).

During this review, the staff decided that additional information and some clarification would be helpful in determining the completeness and acceptability of the application for a renewed license for the Robinson facility. Therefore, as part of the staff's review of the Robinson LRA a plant inspection was conducted and completed on April 4, 2003. An inspection report (50-261/03-08) documents the inspection findings, which were discussed in a public meeting on April 4, 2003, at the Hartsville Memorial Library, in Hartsville, South Carolina. The purpose of the inspection was to examine activities that support the application for a renewed license. The inspection examined procedures and records and conducted interviews with personnel regarding the process of scoping and screening plant equipment. The inspectors also performed visual inspections of accessible portions of systems to observe any effects of equipment aging. While following the NRC Manual Chapter 2516 and NRC Inspection Procedure 71002, the inspection did not identify any "findings" as defined in NRC inspection

manual 0612. A followup inspection was conducted and completed by the same inspection team on June 27, 2003. An inspection report (50-261/03-09) documents the inspection findings, which was discussed in a public exit meeting on June 27, 2003. The purpose of this inspection was to review the implementation of the applicant's aging management programs (AMPs) and to revisit the inconsistencies observed and documented in the previous report (50-261/03-08).

The following is a summary of the inspection results outlined in the inspection reports.

The inspectors found three examples of inconsistencies between the LRA boundary drawings and calculations in the first inspection report (50-261/03-08) that supports the applicant's conclusions. To resolve this, the applicant wrote a plant action request (AR) to initiate corrective action to correct the inconsistencies. With respect to the auxiliary feed water system, the inspectors questioned why the deep well pumps and piping were not included in the scope of license renewal. The applicant's position is that this equipment does not provide a safety-related water source and therefore does not meet the LRA scoping criteria. This question was also asked in NRC staff's RAI number 2.3.3.8-1. The applicant responded to the RAI on April 28, 2003. The staff discusses the response in Section 2.3.3.8 of this SER and finds that the applicant's response requires further justification. This is still Open Item 2.3.3.8-1.

The inspectors also inspected the diesel fuel oil systems. The applicant's calculation (RNP-L/RA-0006) states that the Unit 1 fuel oil tanks and piping used to transfer oil to Unit 2 for long-term operation of the emergency diesel generators are in scope. However, the boundary drawings did not show the transfer piping as being in scope. The inspectors concluded that the piping should be in scope and included this discrepancy in the inspection report (50-261/03-08). The applicant acknowledged the inspector's comments and added the transfer piping in the boundary drawing and corrected the discrepancy which was confirmed in the inspection report (50-261/03-09).

The inspectors found during the first inspection that the applicant's calculation RNP-L/LR-0396 was intended to explain the process used for scoping and screening of Criterion 2 piping. Criterion 2 covers cases where non-safety-related piping (NSR) located in the vicinity of safety-related (SR) components might cause damage to SR components if they failed due to aging. However, calculation 0396 did not clearly describe the process or conclusions and inspectors identified several minor errors in the calculation. The inspectors stated in the inspection report (50-261/03-08) that the applicant should revise calculation 0396 to more clearly explain its process and conclusions. In the followup inspection in June, the inspectors concluded in the inspection report (50-261/03-09) that the applicant implemented appropriate corrective actions to revise the calculation 0396 and resolve previously identified problems.

2.2.3 Evaluation Findings

On the basis of this review, the staff concludes that the applicant has identified the systems and structures within the scope of license renewal in accordance with the requirements of 10 CFR 54.4.

2.3 Scoping and Screening Results: Mechanical Systems

This section addresses the mechanical systems' scoping and screening results for license renewal. The mechanical systems consist of the following (the SER sections are also provided):

- Reactor Systems

  Reactor Coolant System Piping (2.3.1.1)
  Reactor Coolant Pumps (2.3.1.2)
  Pressurizer (2.3.1.3)
  Reactor Pressure Vessel (2.3.1.4)
  Reactor Vessel Internals (2.3.1.5)
  Steam Generators (2.3.1.6)
  Reactor Vessel Level Instrumentation (2.3.1.7)

- Engineered Safety Feature Systems

  Residual Heat Removal System (2.3.2.1)
  Safety Injection System (2.3.2.2)
  Containment Spray System (2.3.2.3)
  Containment Air Recirculation Cooling System (2.3.2.4)
  Containment Isolation System (2.3.2.5)

- Auxiliary Systems

  Sampling Systems (2.3.3.1)
  Service Water System (2.3.3.2)
  Component Cooling Water System (2.3.3.3)
  Chemical and Volume Control System (2.3.3.4)
  Instrument Air System (2.3.3.5)
  Nitrogen Supply/Blanketing System (2.3.3.6)
  Radioactive Equipment Drain (2.3.3.7)
  Primary and Demineralized Water System (2.3.3.8)
  Spent Fuel Pool Cooling System (2.3.3.9)
  Containment Purge System (2.3.3.10)
  Rod Drive Cooling System (2.3.3.11)
  Heating Ventilation and Air Conditioning (HVAC) Auxiliary Building (2.3.3.12)
  HVAC Control Room Area (2.3.3.13)
  HVAC Fuel Handling Building (2.3.3.14)
  Fire Protection System (2.3.3.15)
  Diesel Generator System (2.3.3.16)
  Dedicated Shutdown Diesel Generator (2.3.3.17)
  Emergency Operations Facility/Technical Support Center (EOF/TSC) Security Diesel Generator (2.3.3.18)
  Fuel Oil System (2.3.3.19)

- Steam and Power Conversion Systems

  Turbine System (2.3.4.1)
  Electro-Hydraulic Control System (2.3.4.2)
  Turbine Generator Lube Oil System (2.3.4.3)
  Extraction Steam System (2.3.4.4)
  Main Steam System (2.3.4.5)
  Steam Generator Blowdown System (2.3.4.6)
  Steam Cycle Sampling (2.3.4.7)
  Feedwater System (2.3.4.8)
  Auxiliary Feedwater System (2.3.4.9)
  Condensate System (2.3.4.10)
  Steam Generator Chemical Addition (2.3.4.11)
  Circulating Water System (2.3.4.12)

10 CFR 54.21(a)(1) requires an applicant to identify and list SCs subject to an AMR. These are passive, long-lived SCs that are within the scope of license renewal. To verify that the applicant has properly implemented its methodology, the staff has focused its review on the implementation results. Such a focus allows the staff to confirm that there is no omission of mechanical system components that are subject to an AMR. If the review identifies no omission, the staff has the basis to find that the applicant has identified the mechanical system components that are subject to an AMR.

2.3.1 Reactor Systems

2.3.1.1 Reactor Coolant System Piping

2.3.1.1.1 Summary of Technical Information in the Application

The applicant describes the reactor coolant system (RCS) piping in LRA Section 2.3.1.1 and provides a list of components subject to an AMR in LRA Table 2.3-1.

The applicant's LRA and UFSAR contain the following description of the RCS.

The RCS consists of three similar heat transfer loops connected in parallel to the reactor vessel (RV). Each loop contains a steam generator (SG), a pump, loop piping, and instrumentation. The pressurizer surge line is connected to one of the loops. Auxiliary system piping connections into the reactor coolant piping are provided as necessary. The principal heat removal systems interconnected with the RCS are the steam and power conversion, safety injection (SI), and residual heat removal (RHR) systems. The RCS is dependent upon the SGs, and the steam, feedwater, and condensate systems for stored and residual heat removal from normal operating conditions to a reactor coolant temperature of approximately 350 °F.

The RCS transfers the heat generated in the core to the SGs where steam is generated to drive the turbine generator. Borated demineralized light water is circulated at the flow rate and temperature consistent with reactor core thermal hydraulic performance requirements. The water also acts as a neutron moderator and reflector and as a solvent for the neutron absorber used in chemical shim control. The RCS provides a boundary which contains the coolant under operating temperature and pressure conditions. During transient operation, the system's heat

capacity attenuates thermal transients generated by the core or extracted by the SGs. The RCS accommodates coolant volume changes within the protection system criteria.

By appropriate selection of the inertia of the reactor coolant pump (RCP) (which affects pump coastdown), the thermal hydraulic effects which result from a loss of flow situation are reduced to a safe level. The layout of the system ensures natural circulation capability following a loss of flow to permit plant cooldown without overheating the core. Part of the system's piping is used by the emergency core cooling system to deliver cooling water to the core during a loss-of-coolant accident (LOCA).

Reactor coolant system piping consists of piping (including fittings, branch connections, thermal sleeves, tubing, and thermowells), pressure-retaining parts of valves, and bolted closures and connections. RCS piping is presented in two parts—(1) Class 1 piping and (2) non-Class 1 piping. The design code for the RCS piping is ASA B31.1-1955. The majority of RCS piping was designed to ASA B31.1; however, some small-bore piping was designed to American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section III.

Class 1 piping includes the RCS main loop piping; pressurizer surge, spray, and safety and relief valve inlet lines; and vents, drains, and instrument lines. Portions of ancillary systems attached to the RCS are also Class 1. Ancillary systems attached to the RCS include the SI system, RHR system, chemical and volume control system (CVCS), and primary sampling system.

Several non-Class 1 piping components in the RCS are within the scope of license renewal for RNP. These include (1) the pressurizer relief tank (PRT), (2) the pressurizer relief and safety valve discharge lines to the PRT, (3) auxiliary lines supporting RCS and PRT functions including containment isolation valves in those lines, and (4) reactor vessel level instrumentation lines downstream of Class 1 boundary bellows.

The PRT, located inside containment, normally contains water at or near ambient containment conditions in a predominantly nitrogen atmosphere. Steam is discharged from relief and safety valves of the RCS into the PRT where it is condensed and cooled by mixing with the water. The PRT also collects leakage and liquid from various system pressure relief valves located inside the containment. The PRT was designed to the ASME Boiler and Pressure Vessel Code, Section III, Class C. To reduce the likelihood of PRT overpressurization following a discharge, the PRT is equipped with a spray to add cooling water and a drain to the waste disposal system (WDS) to remove excess heated water. The PRT is also equipped with two rupture discs that relieve pressure to the containment vessel (CV) at approximately 100 psig. The rupture discs are designed to pass 900,000 lb/hr of saturated steam.

The PRT size is 1300 ft^3 with a design temperature and pressure of 340 °F and 100 psig respectively. The PRT is piped to the pressurizer safety and power-operated relief valves (PORVs) by a 12-inch line. The PRT is normally filled to about 70 percent with primary water and also has approximately 3 psig nitrogen atmosphere in it. A nitrogen regulator outside containment maintains this pressure in the tank along with the ability to vent the PRT to the vent header. Primary water may be added to the tank by use of the primary water pumps and valves. Water may be pumped from the tank by utilizing the "B" reactor coolant drain tank (RCDT) pump and valves or gravity drained to the containment sump.

2.3.1.1.2 Staff Evaluation

The staff reviewed LRA Section 2.3.1.1, UFSAR Sections 5.1 and 5.4.3, and Drawing No. 5739-1971-LR (two sheets)—Reactor Coolant System Flow Diagram to determine whether there is reasonable assurance that the RCS piping components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were required by 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as subject to an AMR to determine if any components were omitted.

Since the reactor coolant system piping is largely composed of components that form the pressure boundary, and that carry the reactor coolant to the reactor vessel and the steam generators, the staff's review was centered upon identification of the components that would be required to be within scope, as safety related equipment that perform the functions described in 10 CFR 54.4(a)(1). The staff's review of long-lived, passive components in the reactor coolant system excluded components that are periodically replaced, such as seals and gaskets, and active components, such as the moving parts in pumps and valves.

Non-safety-related components and piping were also considered (1) if they could fail in such a manner as to prevent other systems and components from completing any of the functions described in 10 CFR 54.4(a)(1), or (2) if they are required for compliance with the regulations for fire protection, environmental qualification, pressurized thermal shock protection, anticipated transients without scram protection, or SBO protection listed in 10 CFR 54.4(a)(3).

The applicant has included the PRT in the pressure-retaining boundary even though this pressure-retaining boundary will be maintained only until the tank's rupture disks give way, as designed, at about 100 psi. This is acceptable to the staff, since the PRT could play a limited role in supporting some of the functions described in 10 CFR 54.4(a)(1), particularly in situations where the rupture disks remain intact.

2.3.1.1.3 Conclusions

The staff reviewed the LRA and the accompanying scoping boundary drawings to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the RCS piping that is within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified RCS piping that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.1.2 Reactor Coolant Pumps

2.3.1.2.1 Summary of Technical Information in the Application

The applicant describes the reactor coolant pumps (RCPs) in LRA Section 2.3.1.2.

The applicant's LRA and UFSAR contain the following description of the RCPs. The RCPs provide the motive force for circulating the reactor coolant through the reactor core, piping, and SGs. Each reactor coolant loop contains a vertical single-stage centrifugal pump which employs a controlled leakage seal assembly. Reactor coolant is pumped by the impeller attached to the bottom of the rotor shaft. The coolant is drawn up through the impeller, discharged through passages in the diffuser and out through a discharge nozzle in the side of the casing. The motor-impeller can be removed from the casing for maintenance or inspection without removing the casing from the piping.

All parts of the pumps in contact with the reactor coolant are austenitic stainless steel or equivalent corrosion-resistant materials. The RNP RCP casings were designed in accordance with ASME Boiler and Pressure Vessel Code, Section III, Class A.

Component cooling water (CCW) is supplied to the motor bearing cooler and the thermal barrier cooling coil. The squirrel cage induction motor driving the pump is air cooled and has oil lubricated thrust and radial bearings. A water-lubricated bearing provides radial support for the pump shaft. A flywheel and an antireverse rotation device are located at the top of the RCP motor. The flywheel provides additional inertia to increase the RCP coastdown time, thereby reducing the consequences of a LOCA. The antireverse rotation device prevents backflow, which may occur during LOCA, from turning the RCP in the reverse direction.

The portion of the RCP rotating element above the pump coupling, including the electric motor and the flywheel, is not subject to an AMR in accordance with 10 CFR 54.21(a)(1)(i). RCP seals are not subject to an AMR because (1) seal leakoff is closely monitored in the control room, and high leakoff flow rate is alarmed as an abnormal condition requiring corrective action, and (2) the RCP seal package and its constituent parts are periodically overhauled on a schedule established by the Preventive Maintenance Program; the seals are inspected and parts are replaced, as required.

Plant operating experience (OE) with pump seal performance has demonstrated the effectiveness of these activities.

Each RCP is supported on a three-legged structural system consisting of three connected columns fabricated of carbon steel members, structural sections, and pipe. Provisions for limited movement of the structure in any horizontal direction to accommodate piping expansion are accomplished with a sliding "Lubrite" base plate arrangement and a system of tie rods and anchor bolts which restrain the structure from movement beyond the calculated limits. A sliding slot at the top of the support structures permits radial thermal growth of the pumps during heatup.

2.3.1.2.2 Staff Evaluation

The staff reviewed LRA Section 2.3.1.2 and UFSAR Section 5.4.1 to determine whether there is reasonable assurance that the RCP components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as subject to an AMR to determine if any components were omitted.

The reactor coolant pumps contain several important components that would not be required to be included in the license renewal scope, since they are not passive, long-lived components. For example, the pump seals are not long-lived, since they are periodically overhauled or replaced, according to Robinson's Preventive Maintenance Program. Other components, however, such as the pump casings and supports, are included in the scope. The pump casings, for example, are passive, long-lived components that comprise part of the reactor coolant system pressure boundary. As such, they are required by 10 CFR 54.4(a)(1) and 10 CFR 54.21(a)(1) to be included in the license renewal scope.

In the review of the reactor coolant pumps, the applicable controlling regulation is proved to be 10 CFR 54.4(a)(1), since its provisions apply directly to the great majority of the reactor coolant pump system components. The pump casings, for example, are in the reactor coolant system pressure boundary. Generally, the reactor coolant pumps may be considered to be under constant test or surveillance, since they are normally in operation. Failure of a pump would be immediately detected, and would likely initiate automatic reactor protection system action, such as a reactor trip. In fact, reactor coolant pump failures are addressed in Chapter 15 of the UFSAR. For the purposes of license renewal, the reactor coolant pump failures of concern would be failures in the passive, long-lived components, such as the pump casings, which would be seen as reactor coolant leaks or breaks. These are also addressed in Chapter 15 of the UFSAR.

2.3.1.2.3 Conclusions

The staff reviewed the LRA and the accompanying scoping boundary drawings to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the RCP components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the RCP components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.1.3 Pressurizer

2.3.1.3.1 Summary of Technical Information in the Application

The applicant describes the pressurizer in LRA Section 2.3.1.3 and provides a list of components subject to an AMR in LRA Table 2.3-1.

The applicant's LRA contains the following description of the pressurizer.

The pressurizer is a vertical cylindrical vessel containing electric heaters in its lower head and a water spray nozzle in its upper head. Sources of heat to the RCS are interconnected by piping to the pressurizer with no intervening isolation valves; the pressurizer lower head is connected to the RCS by the surge line. Pressure relief protection for the RCS is provided on the pressurizer. Overpressure protection consists of three code safety valves and two PORVs. Piping attached to the pressurizer is Class 1 up to and including the safety and relief valves.

The pressurizer was designed and fabricated in accordance with the requirements of the ASME Boiler and Pressure Vessel Code, Section III, Class A. The pressurizer is constructed of carbon steel with internal surfaces clad with austenitic stainless steel. The heaters are sheathed in austenitic stainless steel. The pressurizer vessel surge nozzle is protected from thermal shock by a thermal sleeve. A thermal sleeve also protects the pressurizer spray nozzle.

The pressurizer maintains the required reactor coolant pressure during steady-state operation, limits the pressure changes caused by coolant thermal expansion and contraction during normal load transients, and prevents the pressure in the RCS from exceeding the design pressure.

The pressurizer contains replaceable direct immersion heaters, multiple safety and relief valves, a spray nozzle and interconnecting piping, valves and instrumentation. The electric heaters located in the lower section of the vessel maintain the pressure of the RCS by keeping the water and steam in the pressurizer at saturation temperature corresponding to the system pressure. Three pressurizer heater banks (one control and two backup) with a total design capacity of 1300 kilowatts (kW) are installed. A minimum total capacity of 800 kW is required for normal operating conditions. A minimum of 125 kW of heater capacity is capable of being powered from emergency power supplies. This capacity is sufficient to maintain the RCS near normal operating pressure and to aid natural circulation. This is automatically tripped off from the emergency bus in the event of an SI signal to prevent overloading of the diesel generators (DGs).

The pressurizer is designed to accommodate positive and negative surges caused by load transients. The surge line which is attached to the bottom of the pressurizer connects it to the hot leg of a reactor coolant loop. During a positive surge, caused by a decrease in plant load, the spray system, which is fed from the cold leg of a coolant loop, condenses steam in the pressurizer to prevent the pressurizer pressure from reaching the set point of the PORVs. Power-operated spray valves on the pressurizer limit the pressure during load transients. In addition, the spray valves can be operated manually by a switch in the control room. A small continuous spray flow is provided to assure that the pressurizer liquid is homogeneous with the coolant and to prevent excess cooling of the spray and surge line piping.

2.3.1.3.2 Staff Evaluation

The staff reviewed LRA Section 2.3.1.3 and UFSAR Section 15.6.3.2.1 to determine whether there is reasonable assurance that the pressurizer SSCs within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as subject to an AMR to determine if any components were omitted.

The pressurizer, a safety-related, in-scope component, contains a spray head, a non-safety-related component, which the applicant proposes to exclude from the license renewal scope.

The spray head distributes normal and auxiliary pressurizer spray water into the pressurizer steam bubble, which tends to depressurize the pressurizer, and hence the RCS. Since the normal and auxiliary pressurizer sprays are not safety systems, they cannot be relied upon to function during any of the Chapter 15 accident analyses, unless, in some postulated analysis cases, pressurizer spray could have an aggravating effect upon the transient results (e.g., by delaying a high pressurizer pressure reactor trip).

However, Section 15.6.3.2.1 of the UFSAR mentions the means by which the RCS might be depressurized during a steam generator tube rupture (SGTR) event. The UFSAR lists, "in order of preference: (1) normal pressurizer spray; (2) pressurizer power operated relief valves (PORVs); (3) auxiliary pressurizer spray, and; (4) balancing charging/letdown or using unaffected steam generators for cooldown/depressurization." Normal and auxiliary pressurizer sprays are two of the four listed means of reducing the primary side coolant pressure and ending the primary to secondary side tube break flow. Although the spray flow rates are not determined according to any performance requirements set by the SGTR event, the normal and auxiliary sprays constitute two of the four listed depressurization methods. If, for some reason, the spray head fails in such a way as to block all spray flow, then normal and auxiliary sprays would become unavailable for cooldown and depressurization following an SGTR event.

The spray head is a passive component that presents many parallel flow paths for spray delivery. To end the spray flow, all the flow paths must be blocked, more or less simultaneously. This is characteristic of a common mode fault. Furthermore, this fault must occur just when the spray system is required to perform its function. If the failure occurs before that time, then it would be detected when the normal spray flow is terminated and the pressurizer heaters reduce their compensating heat output.

If the spray head were to fail by falling off the end of its supply line, then the spray water would be still be available, but as a stream, not a fine spray. There would still be some, although diminished, depressurizing effect. This would also be soon detected and corrected.

There do not appear to be any other types of failures in the spray head that could impair or disable the spray function.

Therefore, it seems that inclusion of the pressurizer spray head in the license renewal scope would not be required by either 10 CFR 54.4(a)(1) or by 10 CFR 54.4(a)(3).

However, the staff believes that inclusion of the pressurizer spray head in the license renewal scope under the terms of 10 CFR 54.4(a)(2) merits serious consideration, since the pressurizer spray head is a non-safety-related component that is completely enclosed by a Class 1 component. According to 10 CFR 54.4(a)(2), plant systems, structures, and components that are within the scope of the license renewal application are, ... "All non-safety-related systems,

structures, and components whose failure could prevent satisfactory accomplishment of any of the functions identified in paragraphs (a)(1) (i), (ii), or (iii) of this section." Paragraphs (a)(1) (i), (ii), and (iii) address the integrity of the reactor coolant pressure boundary, the capability to shut down the reactor and maintain it in a safe shutdown condition, and the capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures, respectively. This issue was designated as Confirmatory Item No. 2.3.1.3-1.

If the pressurizer spray head were to degrade or crack, and shed one or more pieces of the head, then these pieces could become loose parts inside the pressurizer. During a pressurization transient, such as a loss or normal feedwater event, or a load rejection, the power-operated relief valves or even the code safety valves might open. A loose part inside the pressurizer might be drawn into the throat of a power-operated relief valve or a code safety valve, and prevent the pressurizer pressure relieving valves from protecting the integrity of the reactor coolant pressure boundary. Depending upon the size and position of the loose part inside the valve throat, the loose part might prevent the valve from reseating properly, and thereby transform a pressurization event into a depressurization event.

The possibility that such loose parts might be generated and that they might prevent certain safety functions of the pressurizer components is not, by itself, sufficient to require that the pressurizer spray head be included in the license renewal scope. There must be some basis, in operating experience, that such a scenario could be reasonably expected to occur sometime during the 20-year license extension, following a 40-year aging period. To date, there have been no recorded instances of this type of failure. Therefore, without an experiential basis, the requirements of 10 CFR 54.4(a)(2) would not be construed to mandate the inclusion of the pressurizer spray head in the license renewal scope.

The pressurizer spray head was temporarily excluded from the license renewal scope, as Confirmatory Item No. 2.3.1.3-1, pending a review of industry-wide and plant-specific operational experience by CP&L to confirm that failure of the pressurizer spray head could not prevent accomplishment of any of the functions identified in 10 CFR 54.4(a)(1). CP&L responded that their review indicated that the hypothetical failure had not been previously experienced. Therefore, the staff concludes that 10 CFR 54.4(a)(2) does not require the inclusion of the pressurizer spray head in the license renewal scope for the H.B. Robinson plant, and the confirmatory item is closed.

2.3.1.3.3 Conclusions

The staff reviewed the LRA and the accompanying scoping boundary drawings to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. The staff concluded that it was not necessary to include the pressurizer spray head in the license renewal scope, to meet the requirements of either 10 CFR 54.4(a)(1) or 10 CFR 54.4(a)(3).

Furthermore, the possibility of a failure in the pressurizer spray head, affecting the functioning of the PORVs or pressurizer safety valves was postulated, and considered under the terms of 10 CFR 54.4(a)(2). In accordance with the NEI guidelines, the staff requested CP&L to provide information to show that the hypothetical failure has not been experienced at H.B. Robinson or at other plants. The applicant surveyed plant-specific and industry-wide operating experience,

and found that there were no known occurrences of the postulated failure scenario. Therefore, the staff concludes that inclusion of the pressurizer spray head in the license renewal scope is not required by 10 CFR 54.4(a)(2), and that confirmatory item no. 2.3.1.3-1 is closed.

2.3.1.4 Reactor Pressure Vessel

2.3.1.4.1 Summary of Technical Information in the Application

The applicant describes the reactor pressure vessel in LRA Section 2.3.1.4 and provides a list of components subject to an AMR in LRA Table 2.3-1.

The applicant's LRA and UFSAR contain the following description of the reactor pressure vessel.

The RV consists of the cylindrical vessel shell, lower vessel head, closure head, nozzles, interior attachments, and associated pressure-retaining bolting. The vessel is fabricated of a low-carbon alloy steel with austenitic stainless steel cladding on all surfaces exposed to the reactor coolant fluid. Coolant flow enters the RV through three inlet nozzles in a plane just below the vessel flange and above the core. The coolant flows downward through the annular space between the vessel wall and the core barrel into a plenum at the bottom of the vessel where it reverses direction, passes up through the core into the upper plenum, and then flows out of the vessel though three exit nozzles located on the same plane as the inlet nozzles. The RPV was designed according to the 1965 Edition of the ASME Boiler and Pressure Vessel Code, Section III, Class A.

2.3.1.4.2 Staff Evaluation

The staff reviewed LRA Section 2.3.1.4 and UFSAR Section 5.3 to determine whether there is reasonable assurance that the reactor pressure vessel SSCs within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

The reactor pressure vessel components that would be subject to an aging management review are listed in Table 2.3-1 of the LRA. Many of these components, such as vessel heads and flanges, and pressure vessel penetrations for control rod drives and for instrument lines, are considered to be in the pressure-retaining boundary. As such, they would be subject to the requirements of 10 CFR 54.4(a)(1). The applicant has also included the cladding in various regions of the pressure vessel as separate components.

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as subject to an AMR to determine if any components were omitted.

The staff agrees with the applicant's identification of the pressure vessel and its associated pressure boundary components as items that should be part of the license renewal scope.

2.3.1.4.3 Conclusions

The staff reviewed the LRA and the accompanying scoping boundary drawings to determine whether any SSCs or components that should be within the scope of license renewal were not identified by the applicant. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the reactor pressure vessel SSCs that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the reactor pressure vessel SSCs that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.1.5 Reactor Vessel Internals

2.3.1.5.1 Summary of Technical Information in the Application

The applicant describes the RV internals in LRA Section 2.3.1.5 and provides a list of components subject to an AMR in LRA Table 2.3-1.

The applicant's LRA and UFSAR contain the following description of the reactor vessel internals.

The RV internals are designed to support, align, and guide the core components and to support and guide in-core instrumentation. The RV internals consist of two basic assemblies—an upper internals assembly that is removed during each refueling operation to obtain access to the reactor core, and a lower internals assembly that can be removed, if desired, following a complete core unload.

The lower internals assembly is supported in the vessel by resting on a ledge in the vessel head-mating surface and is closely guided at the bottom by radial support/clevis assemblies. The upper internals assembly is clamped at this same ledge by the reactor vessel head. The bottom of the upper internals assembly is closely guided by the core barrel alignment pins of the lower internals assembly.

The lower internals comprise the core barrel, thermal shield, core baffle assembly, lower core plate, intermediate diffuser plate, bottom support plate, and supporting structures. The upper internals package (upper core support structure) is a rigid member composed of the top support plate and deep beam sections, support columns, control rod guide tube assemblies, and the upper core plate. Upon upper internals assembly installation, the last three parts are physically located inside the core barrel.

The in-core instrumentation includes in-core flux guide thimbles to permit the insertion of movable detectors for measurement of the neutron flux distribution within the reactor core. Movable miniature neutron flux detectors are available to scan the active length of selected fuel assemblies to provide remote reading of the relative three-dimensional flux distribution. The thimbles are inserted into the reactor core through guide tubes, or conduits, extending from the bottom of the RV through the concrete shield area and then up to a thimble seal table. Since the movable detector thimbles are closed at the leading (reactor) end, they are dry inside. The thimbles thus serve as a pressure barrier between the reactor coolant pressure and the

atmosphere. Mechanical seals between the retractable thimbles and the conduits are provided at the seal table.

2.3.1.5.2 Staff Evaluation

The staff reviewed LRA Section 2.3.1.5 and UFSAR Sections 3.9.5 and 7.7.1.5 to determine whether there is reasonable assurance that the RV internals SSCs within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as subject to an AMR to determine if any components were omitted.

The reactor vessel internals that would be subject to an aging management review are listed in Table 2.3-1 of the LRA. Most of these components are identified as components that provide structural support to safety-related components. They can provide, for example, some of the structural support needed to maintain a coolable core geometry during a design-basis loss-of-coolant-accident.

Unlike many other long-lived, passive components, certain reactor internals are normally moved (i.e., removed and set aside) to permit the movement of fuel assemblies during refueling. This provides periodic opportunities to detect and remedy aging-related problems that might affect these reactor vessel internals. The staff, however, does not judge this to be sufficient to exempt such components from aging management requirements.

2.3.1.5.3 Conclusions

The staff reviewed the LRA and the accompanying scoping boundary drawings to determine whether any SSCs, or components that should be within the scope of license renewal were not identified by the applicant. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the RV internals SSCs that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the RV internals SSCs that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.1.6 Steam Generators

2.3.1.6.1 Summary of Technical Information in the Application

The applicant describes the SGs in LRA Section 2.3.1.6 and provides a list of components subject to an AMR in LRA Table 2.3-1.

The applicant's LRA contains the following description of the steam generators.

The SGs remove heat from the RCS by converting feedwater into steam. The SGs provide sufficient capacity to remove heat during normal operations and following postulated accidents and transients. An integral flow restrictor limits the flow rate of steam from an SG following a postulated steam line break accident. SG level instrumentation is provided to assure the heat removal capability is maintained following an accident.

Three SGs are installed, one in each of the three RNP reactor coolant loops. Each SG is a vertical shell-and-tube heat exchanger that transfers heat from a single-phase fluid at high temperature and pressure (the reactor coolant) in the tube side, to a two-phase (steam-water) mixture at lower temperature and pressure in the shell side.

Reactor coolant enters and exits the tube side of each SG through nozzles located in the lower hemispherical head. The RCS fluid flows through inverted U-tubes connected to the tubesheet. The lower head is divided into inlet and outlet chambers by a vertical partition plate extending from the lower head to the tubesheet. The steam-water mixture is generated on the secondary, or shell side, and flows upward through moisture separators and dryers to the outlet nozzle at the top of the vessel providing essentially dry, saturated steam. Manways and inspection ports are provided to permit access to both sides of the lower head and to the U-tubes and moisture-separating equipment on the shell side of the SGs.

The SG support system includes hydraulic snubbers. The snubbers are considered to be structural components; however, portions of the hydraulic equipment for each SG (manifold, hydraulic control unit, flex hoses, piping, reservoir) are subject to an AMR to assure that their pressure boundary integrity is maintained.

Lower assemblies of the SGs, including the lower shell, tubes, and tubesheet, were replaced in 1984.

2.3.1.6.2 Staff Evaluation

The staff reviewed LRA Section 2.3.1.6 and UFSAR Sections 5.4.2 and 10.3 to determine whether the SG SSCs are within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

The SG, a safety-related, in-scope component, contains a feedring, a non-safety-related component, which the applicant proposes to exclude from the license renewal scope.

The feedring distributes main feedwater into the SG shell side, through a number of J-tubes mounted along the upper surface of the feedring. The feedring is normally filled with feedwater, up to a level that is higher than the feedring itself (i.e., to a level inside the J-tubes). This arrangement prevents the formation of steam inside the feedring, which minimizes the possibility of water hammer in the feedwater system. The same feedring distributes auxiliary

feedwater (AFW) during startup and shutdown operations and during certain accidents and transients.

The feedring is not classified as a safety-related component. However, the feedring delivers and distributes AFW, which is required for the removal of decay heat during shutown and following certain accidents. The feedring can fail to perform its distribution function (e.g., by clogging of some J-tubes) without materially affecting the overall primary to secondary heat transfer rate in the SG, provided that all the main or AFW flow continues to be delivered. Full flow, if not uniformly distributed, would still be adequate in the context of accident analyses, to demonstrate compliance with the applicable acceptance criteria. Therefore, clogging, or other problems that prevent the uniform distribution of main or AFW flowing through the feedring, would not be expected to affect normal functioning of by the SG or associated components. If the feedring is not required to remain functional during and following design-basis events to ensure the accomplishment of the safety-related functions listed in 10 CFR 54.4(a)(1), then 10 CFR 54.4(a)(1) would not require the feedring to be part of the license renewal scope.

The feedring is also subject to the requirements of 10 CFR 54.4(a)(2) and 10 CFR 54.4(a)(3). 10 CFR 54.4(a)(2) can be summed up by stating that, if a non-safety-related SSC cannot fail in such a way as to prevent the satisfactory accomplishment of the functions listed in 10 CFR 54.4(a)(1), then it need not be included in the license renewal scope. The requirements of 10 CFR 54.4(a)(3) apply to all SSCs that are relied upon to perform functions necessary to comply with regulations pertaining to fire protection (FP), environmental qualification (EQ), pressurized thermal shock (PTS), anticipated transients without scram (ATWS), and station blackout (SBO).

10 CFR 54.4(a)(2) requires the feedring to be included in the license renewal scope if it can fail in a way that prevents the accomplishment of any of the functions listed in 10 CFR 54.4(a)(1). Example: if there is leak or jet from the feedring that pours cold auxiliary feedwater onto the steam generator tubes, during a transient in which reduced secondary side inventory exposes the tubes, then there is a risk of thermal shock to the tubes and tube rupture. Example: if the feedring begins to degrade and crack, and a piece of the feedring or J-tube falls onto the tubesheet, it might damage the tubesheet area around the tube penetrations. Example: a small piece might break off the feedring during an SG depressurization event, such as the spurious opening of a safety or dump valve. If the piece is small enough to pass through the perforated deck plate, through the steam separators, and through the flow element, then it could possibly lodge in the valve throat and damage or prevent the proper functioning of the valve. Such possibilities, though not likely, indicate that certain failures in the feedring, which could prevent the safety-related functions of the surrounding SG, would mandate the inclusion of the feedring in the scope of license renewal, under the terms of 10 CFR 54.4(a)(2).

The possibility that such loose parts might be generated and that they might prevent the accomplishment of certain safety functions of the steam generator is not, by itself, sufficient to require that the feedring be included in the license renewal scope. There must be some basis, in operating experience. The NEI guidelines indicate that the hypothetical failure (the loose part scenario) need not be considered if it has not been previously experienced.

In response to a staff request for further information in RAI 2.3.1.6-1, RNP surveyed operating history experience compiled by the World Association of Nuclear Operators (WANO) and the Institute of Nuclear Power Operations (INPO), and found that there were no recorded instances of this type of failure. They did find, however, instances wherein J-tubes were replaced, due to

corrosion problems, and an instance wherein there was direct leakage from the feedring. These can be considered to be preconditions to the loose part scenario. Therefore, the staff believes that the feedring should be within the license renewal scope. In a letter dated September 16, 2003 (ADAMS accession no. ML032650884), the applicant agreed to include the steam generator feedrings in the scope of the license renewal application. The steam generator feedrings and their associated aging management program are discussed in Section 3.1.2.2.14 of this report.

2.3.1.6.3 Conclusions

The staff reviewed the LRA and the accompanying scoping boundary drawings to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. On the basis of this review, the staff indicated to the applicant that the SG feedrings should be included in the scope of license renewal, under the requirements of 10 CFR 54.4(a)(2), since there is a possibility that certain failures in the feedrings could lead to prevention of one or more of the safety-related functions of 10 CFR 54.4(a)(1). The applicant included the steam generator feedrings in the scope of the license renewal application. Therefore, the staff concludes that the applicant has adequately identified the SG SSCs that are within the scope of license renewal, and subject to an AMR, as required by 10 CFR 54.4(a).

2.3.1.7 Reactor Vessel Level Instrumentation

2.3.1.7.1 Summary of Technical Information in the Application

The applicant describes the RV level instrumentation in LRA Section 2.3.1.7.

The applicant's LRA contains the following description of the RV instrumentation.

A core cooling instrumentation system is provided to detect the approach to inadequate reactor core cooling and assess the adequacy of responses taken to restore core cooling. The system consists of three subsystems—reactor vessel level instrumentation system (RVLIS), core exit thermocouple system (CETS), and the core cooling monitor system (CCMS). Portions of the RVLIS consist of mechanical components that are part of the RCS pressure boundary or part of the containment pressure boundary.

2.3.1.7.2 Staff Evaluation

The staff reviewed LRA Section 2.3.1.7 to determine whether there is reasonable assurance that the RV-level instrumentation SSCs within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

The reactor vessel instrumentation components that would be subject to an aging management review are listed in Table 2.3-1 of the LRA. Many of these components, such as pressure vessel penetrations for instrument lines, are considered to be in the pressure-retaining boundary. As such, they would be subject to the requirements of 10 CFR 54.4(a)(1). The table does not specifically identify the instrumentation lines that are part of the reactor vessel

instrumentation systems (e.g., RVLIS, CETS, and CCMS). Instead, instrumentation lines are treated as vessel penetrations and elements of the pressure-retaining boundary. For purposes of license renewal and aging management, the staff judges this to be a reasonable approach.

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

2.3.1.7.3 Conclusions

The staff reviewed the LRA and the accompanying scoping boundary drawings to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the RV level instrumentation SSCs that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the RV level instrumentation SSCs that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.1.8 Evaluation Findings

On the basis of this review, the staff concludes that the applicant has adequately identified the RCSs and components that are within the scope of license renewal, in accordance with the requirements of 10 CFR 54.4(a), and that the applicant has adequately identified the RCS components that are subject to an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.2 Engineered Safety Features Systems

2.3.2.1 Residual Heat Removal System

2.3.2.1.1 Summary of Technical Information in the Application

The applicant describes the RHR system in LRA Section 2.3.2.1 and provides a list of components subject to an AMR in LRA Table 2.3-2.

The applicant's LRA and UFSAR contain the following description of the RHR system.

The RHR system delivers borated water to the RCS during the injection phase of a design-basis accident (DBA). Following a LOCA, the RHR system cools and recirculates water that is collected in the containment recirculation sump and returns it to the reactor coolant, containment spray, and SI systems to maintain reactor core and containment cooling functions. In addition, during normal plant operations, the RHR system removes residual and sensible heat from the core during plant shutdown, cooldown, and refueling operations. The RHR system is used to achieve cold shutdown conditions following a postulated fire in accordance with 10 CFR 50, Appendix R, requirements.

The RHR system is in the scope of license renewal, because it contains SCs that are safety related and are relied upon to remain functional during and following design-basis events, SCs that are part of the Environmental Qualification Program, and SCs that are relied upon during postulated fires and SBO events.

2.3.2.1.2 Staff Evaluation

The staff reviewed LRA Section 2.3.2.1 and UFSAR Sections 5.4.4 and 6.3 to determine whether there is reasonable assurance that the RHR system components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

Table 2.3-2 of the LRA lists RHR system components that are to be included in the license renewal scope. These components are included because they are safety-related equipment that are required to operate during and after design-basis accidents, or they are relied upon for FP or in SBO events. All the listed components are in the pressure-retaining boundary. RHR system components are generally required to be included in the license renewal scope because they perform the functions addressed by 10 CFR 54.4(a)(1) and 10 CFR 54.4(a)(3).

2.3.2.1.3 Conclusions

The staff reviewed the LRA and the accompanying scoping boundary drawings to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the RHR system that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the RHR system that are subject to an AMR, as required by 10 CFR54.21(a)(1).

2.3.2.2 Safety Injection System

2.3.2.2.1 Summary of Technical Information in the Application

The applicant describes the SI system in LRA Section 2.3.2.2 and provides a list of components subject to an AMR in LRA Table 2.3-3.

The applicant's LRA and UFSAR contain the following description of the SI system.

Following a postulated DBA, adequate emergency core cooling is provided by the SI system, whose components operate in three modes—passive accumulator injection, active SI, and residual heat removal recirculation. The primary purpose of the system is to deliver cooling water to the reactor core in the event of a LOCA. This limits the fuel cladding temperature and

thereby ensures that the core will remain intact and in place, with its heat transfer geometry preserved. The system also provides a source of borated water for reactivity control.

The SI system is in the scope of license renewal, because it contains SCs that are safety related and are relied upon to remain functional during and following design-basis events, SCs that are part of the Environmental Qualification Program, and SCs that are relied upon during postulated fires and SBO events.

2.3.2.2.2 Staff Evaluation

The staff reviewed LRA Section 2.3.2.2 and UFSAR Section 6.3 to determine whether there is reasonable assurance that the SI system SSCs within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

The Safety Injection System components that are to be included in the license renewal scope are listed in Table 2.3-3 of the LRA. Like the RHR system, these components are safety-related equipment, and many are also in the pressure-retaining boundary. The sump screens and supports are also among the in-scope components. The SI system is required to function during and after design-basis events and SBOs. Its components are generally required to be included in the license renewal scope because they perform the functions addressed by 10 CFR 54.4(a)(1) and 10 CFR 54.4(a)(3).

2.3.2.2.3 Conclusions

The staff reviewed the LRA and the accompanying scoping boundary drawings to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the SI system SSCs that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the SI system SSCs that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.2.3 Containment Spray System

2.3.2.3.1 Summary of Technical Information in the Application

The applicant describes the containment spray system (CSS) in LRA Section 2.3.2.3 and provides a list of components subject to an AMR in LRA Table 2.3-4.

In conjunction with the containment air recirculation cooling system, the first intended function of the CSS is to limit the temperature and pressure within the containment during DBAs to less than the design values for the containment. These two separate, full-capacity systems use diverse engineered features to achieve their intended containment heat removal functions,

thereby providing an additional degree of redundancy. A second intended function performed by the CSS is to remove elemental iodine from the containment atmosphere, should it be released during an accident, in order to satisfy the limits of 10 CFR Part 100.

The CSS consists of two trains. Each train includes a pump, pump cooler, associated piping and valves, spray headers, and spray nozzles. To support the intended function of removing elemental iodine from the containment atmosphere, the flow from each train of the CSS is mixed with sodium hydroxide from the containment spray additive tank via eductors. Immediately following a design-basis LOCA the CSS would normally be operated in the injection mode, taking suction from the borated inventory provided by the refueling water storage tank (RWST). If necessary, following the switchover to the recirculation mode of operation, the containment spray system would take suction from the containment recirculation sump, utilizing the residual heat removal system heat exchangers to transfer heat from the containment atmosphere to secondary plant cooling systems.

In LRA Table 2.3-4, the applicant identifies eight component types of the CSS as being within the scope of license renewal and subject to an AMR.

(1) closure bolting
(2) containment vessel spray pump seal cooler heat exchanger tubing
(3) containment vessel spray pump seal heat exchanger shell and cover
(4) containment vessel spray pump(s)
(5) eductors
(6) flow orifices/elements
(7) spray additive tank
(8) valves, piping, tubing, and fittings

The LRA further identifies that each of these eight component types provides a pressure-boundary intended function. Additionally, the containment vessel (CV) spray pump seal cooler heat exchanger tubing is identified as providing a heat-transfer intended function; eductors and flow orifices/elements are identified as providing a throttling function; and valves, piping, tubing, and fittings are identified as providing the intended function of structural support.

2.3.2.3.2 Staff Evaluation

The staff reviewed LRA Section 2.3.2.3 and UFSAR Section 6.2.2 to determine whether there is reasonable assurance that the applicant has identified the components of the containment spray system within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1). In its review of this section, the staff also reviewed Sections 2.3.2.1 and 2.3.2.2 of the LRA to determine whether there is reasonable assurance that the applicant has applied the license renewal scoping and screening criteria to components primarily associated with the RHR and SI systems (e.g., residual heat removal heat exchangers, the RWST, and containment sump screens) that are also relied upon to support the intended functions of the CSS in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1).

In the performance of its review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

The staff's review of the applicant's scoping results did not identify the omission of any components needed to support the performance of the two intended functions of the CSS, including necessary components that the LRA treats as belonging to the RHR and SI systems. Generally, the applicant adequately identified in LRA Table 2.3-4 those passive, long-lived components of the CSS considered to be within the scope of license renewal. However, the NRC staff identified three instances where passive, long-lived components identified as being within scope did not appear to be listed in LRA Table 2.3-4 as being subject to an AMR. On February 11, 2003, the NRC staff issued RAIs to the applicant concerning these three instances to determine whether the applicant had properly applied the screening criteria of 10 CFR 54.21(a)(1). The staff's RAIs and the applicant's responses, dated April 28, 2003, are described below.

In RAI 2.3.2.3-1, the NRC staff requested that the applicant identify whether the two vacuum breakers protecting the containment spray additive tank from excessive external pressure (i.e., SI-899D and SI-899E) are subject to an AMR in accordance with 10 CFR 54.21(a)(1). Although the applicant indicated that the vacuum breakers are within the scope of license renewal, the vacuum breakers are not included in LRA Table 2.3-4 explicitly, nor is it clear that they are subsumed into one of the component groups listed in LRA Table 2.3-4. The applicant's response to this RAI states that vacuum breakers SI-899D and SI-899E are included in the component group entitled "Valves, Piping, Tubing, and Fittings," which is an existing entry in LRA Table 2.3-4. The staff finds the applicant's response to RAI 2.3.2.3-1 to be acceptable because the applicant identified that the in-scope vacuum breakers are subject to an AMR in accordance with the criteria set forth in 10 CFR 54.21(a)(1). Therefore, staff considers this RAI to be closed.

In RAI 2.3.2.3-2, the NRC staff requested that the applicant identify whether the containment spray header nozzles are subject to an AMR in accordance with 10 CFR 54.21(a)(1). Although the applicant indicated that the spray nozzles are within the scope of license renewal, the nozzles are not included in LRA Table 2.3-4 explicitly, nor is their intended function of inducing spray flow attributed to any component group listed in LRA Table 2.3-4. The applicant's response to this RAI states that the containment spray nozzles are included in the component group entitled "Valves, Piping, Tubing, and Fittings," which is an existing entry in LRA Table 2.3-4. The applicant further explained its position that both the functions of providing a pressure boundary and inducing spray flow are encompassed in the pressure-boundary intended function attributed to this component group in LRA Table 2.3-4. The staff finds the applicant's response to RAI 2.3.2.3-2 to be acceptable because the applicant identified that the containment spray nozzles are subject to an AMR in accordance with the criteria set forth in 10 CFR 54.21(a)(1), and that inducing spray flow is included in the intended function of this component group. Therefore, staff considers this RAI to be closed.

In RAI 2.3.2.3-3, the NRC staff requested that the applicant explain the LRA's treatment of heat exchanger tubesheets, so that the staff could verify that the applicant had appropriately applied the screening criteria of 10 CFR 54.21(a)(1). Although the applicant's treatment of the CV spray pump seal heat exchanger prompted RAI 2.3.2.3-3, the NRC staff's review discerned an apparent discrepancy with respect to the treatment of heat exchanger tubesheets throughout the LRA (i.e., in certain sections, heat exchanger tubesheets were listed as a separate entry in the AMR results tables, while in the tables of other sections, they were not explicitly listed). Therefore, the staff framed RAI 2.3.2.3-3 to be applicable to tubesheets throughout the entire LRA. The applicant's response to this RAI states that the CV spray pump seal heat exchanger

does not contain a tubesheet but is essentially a cooler with cooling coils inside a closed container.

However, the applicant agreed that heat exchanger tubesheets can provide a pressure boundary that is necessary for heat exchangers to perform their intended function(s) for license renewal, and that inconsistencies exist in the identification of heat exchanger subcomponents in the LRA. Therefore, in response to the staff's RAI, the applicant resubmitted entries for heat exchanger subcomponents associated with LRA Tables 2.3-2, 2.3-3, 2.3-4, 2.3-9, 2.3-10, 3.2-1, 3.2-2, 3.3-1, 3.3-2, 3.4-1, and 3.4-2 to correct the identified inconsistencies. The staff finds the applicant's response to RAI 2.3.2.3-3 to be acceptable because the applicant clarified that the CV spray pump seal heat exchanger does not contain a tubesheet, thereby confirming that LRA Table 2.3-4 did not omit this component from the AMR screening required by 10 CFR 54.21(a)(1). The applicant's revisions to the other LRA tables resubmitted in response to this RAI are evaluated in the corresponding sections of this SER.

2.3.2.3.3 Conclusions

The staff reviewed the LRA, the accompanying scoping boundary drawings, and the applicant's RAI responses to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of its review, the staff concludes that the applicant has adequately identified the components of the CSS that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the CSS that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.2.4 Containment Air Recirculation Cooling System

2.3.2.4.1 Summary of Technical Information in the Application

The applicant describes the containment air recirculation cooling system in LRA Section 2.3.2.4 and provides a list of components subject to an AMR in LRA Table 2.3-5.

The intended function performed by the containment air recirculation cooling system, in conjunction with the CSS, is to limit the temperature and pressure within the containment during DBAs to less than the design values for the containment. These two separate, full-capacity systems use diverse engineered features to achieve their intended containment heat removal functions, thereby providing an additional degree of redundancy.

The containment air recirculation cooling system consists of four air handling units, each including a fan, a cooling coil, dampers, and a duct distribution system. The air handling units are spaced around the operating floor adjacent to the containment wall. The service water system provides the cooling water that flows through the finned coils of the containment air recirculation system coolers. The containment air recirculation cooling system cools the containment atmosphere during and following an accident by recirculating air through the coolers to reduce the pressure inside containment to atmospheric pressure.

In LRA Table 2.3-5, the applicant identified seven component types of the containment air recirculation cooling system as being within the scope of license renewal and subject to an AMR:

(1) closure bolting
(2) equipment frames and housings
(3) flexible collars
(4) heating/cooling coils
(5) valves
(6) ductwork and fittings
(7) damper mountings

The LRA further identifies that each of these component types, except for damper mountings, provides a pressure-boundary intended function. The intended function of the damper mountings component type is identified as structural support. In addition to the intended function of pressure boundary, the heating/cooling coils component type is also identified as providing an intended function of heat transfer.

2.3.2.4.2 Staff Evaluation

The staff reviewed LRA Section 2.3.2.4 and UFSAR Section 6.2.2 to determine whether there is reasonable assurance that the components of the containment air recirculation cooling system within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1).

In the performance of its review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

Generally, the staff's review of the LRA found the applicant's scoping and screening results to be in accordance with 10 CFR 54.4 and 10 CFR 54.21. However, the staff's scoping review identified several components that appear to support the performance of the containment air recirculation cooling system's intended function that were not identified as being within the scope of license renewal. Also, the staff's screening review identified several passive, long-lived components of the containment air recirculation cooling system that meet the scoping criteria of 10 CFR 54.4 which did not appear to be included in LRA Table 2.3-5. On February 11, 2003, the NRC staff issued RAIs to the applicant to determine whether the applicant had properly applied to these components the scoping criteria of 10 CFR 54.4 and the screening criteria of 10 CFR 54.21(a)(1). The staff's RAIs, and the applicant's responses, dated April 28, 2003, are described below.

In RAI 2.3.2.4-1, the NRC staff requested that the applicant explain its finding that two specific containment air recirculation cooling system fans (i.e., HVH-9A and HVH-9B), their suction flowpath (up to the first isolation damper), and their discharge flowpath are not within the scope of license renewal in accordance with 10 CFR 54.4(a). These fans and their associated components appear to provide cooling to the RV, vessel supports, and/or vessel shielding. The applicant's response to this RAI explains that, although fans HVH-9A and HVH-9B and their associated components cool SCs in support of normal plant operation, the system's intended

function of containment cooling is performed exclusively by containment air recirculation cooling system fans HVH-1, -2, -3, and -4. The staff finds the applicant's response to RAI 2.3.2.4-1 to be acceptable because the applicant confirmed that fans HVH-9A and HVH-9B and their associated components do not satisfy the license renewal scoping criteria set forth in 10 CFR 54.4(a). Therefore, staff considers this RAI to be closed.

In RAI 2.3.2.4-2, the NRC staff requested that the applicant identify whether a rectangular component labeled "V.D." (which was unidentifiable to the staff), highlighted as being within the scope of license renewal on a scoping boundary drawing of the containment air recirculation cooling system, is subject to an AMR in accordance with 10 CFR 54.21(a)(1). The applicant's response to this RAI states that the unidentifiable component is a volume damper. The applicant states that volume dampers are constructed of the same material as the duct in which they reside and are considered to be a subcomponent of the duct. The applicant further states that volume dampers are included in the component group entitled "Ductwork and Fittings," which is identified in LRA Table 2.3-5 as being subject to an AMR. The applicant's response to RAI 2.3.2.4-2 provided the information requested by the staff and is consistent with 10 CFR 54.21(a)(1). Therefore, the staff finds the applicant's response to be acceptable and considers this RAI to be closed.

In RAI 2.3.2.4-3, the NRC staff requested that the applicant identify whether the ventilation dampers and downstream ductwork composing the normal suction flowpath for four containment air recirculation cooling system fans (i.e., HVH-1, -2, -3, and -4) are within the scope of license renewal, in accordance with 10 CFR 54.4(a), and subject to an AMR, in accordance with 10 CFR 54.21(a)(1). The scoping boundary drawing associated with this system indicates that the normal suction flowpath for these four fans is not within the scope of license renewal. However, upon reviewing Section 6.2.2.2.2 of the UFSAR, the staff determined that the ventilation dampers and downstream ductwork in these fans' suction flowpaths provide a pressure-boundary intended function that is relied upon to support the containment air recirculation cooling system's intended function. The applicant's response to this RAI agrees that the ductwork and ventilation dampers described above are within the scope of license renewal in accordance with 10 CFR 54.4(a)(1). The response further states that (1) the incorrect scoping boundary drawing will be revised to properly identify the license renewal scoping boundary, (2) the passive, long-lived components brought within scope will be identified as requiring an AMR in accordance with 10 CFR 54.21(a)(1), and (3) applicable aging management program requirements will be in effect. The staff notes that no changes to LRA Table 2.3-5 are required in response to this RAI because entries for component groups encompassing dampers and ductwork previously existed. The staff finds the applicant's response to this RAI to be acceptable because the applicant identified the ventilation dampers and ductwork described above as being within the scope of license renewal, in accordance with 10 CFR 54.4(a)(1), and confirmed that the passive, long-lived components brought within scope will be subject to an AMR in accordance with 10 CFR 54.21(a)(1). Therefore, the staff considers this RAI to be closed.

In RAI 2.3.2.4-4, the NRC staff requested that the applicant identify whether eight semicircular or horseshoe-shaped symbols (which were unidentifiable to the staff) on a scoping boundary drawing of the containment air recirculation cooling system represent components that are within the scope of license renewal in accordance with 10 CFR 54.4(a). Each of the semicircular symbols on the diagram is located just inside the shield wall, at the termination of a discharge line from a containment air recirculation cooling system fan. The staff was unable to

discern from the diagram whether the unidentified components had been highlighted by the applicant as being within the scope of license renewal, and, if so, whether they had been included in the AMR results in LRA Table 2.3-5. The applicant's response to this RAI states that the semicircular symbols cited by the staff depict the physical relationship of the duct as it branches off the containment ring header. The response further states that no additional entries are required for LRA Table 2.3-5 because the symbols do not represent a specific component that is within the scope of license renewal in accordance with 10 CFR 54.4(a). As the applicant's response provides the additional information requested by the staff, the staff considers this RAI to be closed.

2.3.2.4.3 Conclusions

The staff reviewed the LRA, the accompanying scoping boundary drawings, and the applicant's RAI responses to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of its review, the staff concludes that the applicant has adequately identified the components of the containment air recirculation cooling system that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the containment air recirculation cooling system that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.2.5 Containment Isolation System

2.3.2.5.1 Summary of Technical Information in the Application

The applicant describes the containment isolation system in LRA Section 2.3.2.5 and provides a list of components subject to an AMR in LRA Table 2.3-6.

The intended function performed by the containment isolation system is to provide for the closure and integrity of containment penetrations to prevent the uncontrolled or unmonitored leakage of radioactive materials to the environment.

The LRA defines the containment isolation system as consisting of eight mechanical process systems listed below whose only intended function is containment isolation.

(1) postaccident hydrogen system
(2) service air system
(3) process/area radiation monitoring
(4) containment pressure relief system
(5) containment vacuum breaker system
(6) liquid waste processing system
(7) penetration pressurization local leak rate test
(8) isolation valve seal water system

Mechanical process systems that have intended functions for license renewal in addition to containment isolation are included in other sections of the LRA. The pressure boundary portions of electrical penetrations and miscellaneous or spare mechanical penetrations that are

not associated with a process system are included in Section 2.4 of the LRA, and the electrical portions of containment electrical penetrations are included in LRA Section 2.5.

In LRA Table 2.3-6, the applicant identified two component types of the containment isolation system as being within the scope of license renewal and subject to an AMR—(1) closure bolting and (2) valves, piping, and fittings.

The LRA further identifies that the intended function of the closure bolting component type is to provide a pressure boundary, and that the intended function of the valves, piping, and fittings component type is to provide a pressure boundary and to provide structural support to safety-related components.

2.3.2.5.2 Staff Evaluation

The staff reviewed LRA Section 2.3.2.5 and various sections of the UFSAR, including 6.2.4, 6.2.5, 9.3.1, 9.3.2, 12.3.3, 9.4.3.2.7, and 11.2, to determine whether there is reasonable assurance that the components of the containment isolation system within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1).

In the performance of its review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

With the exceptions described below, the staff's scoping review found that the LRA generally identifies the components of the containment isolation system which are necessary to effect containment isolation as being within the scope of license renewal. The staff finds this approach to be acceptable for all of the systems included in the containment isolation system except for the postaccident hydrogen system (which is discussed below), because these systems are nonessential except for their containment-isolation intended function. The staff's review of the AMR results in LRA Table 2.3-6 did not identify the omission of any passive, long-lived components that had been considered by the applicant to be within the scope of license renewal. On February 11, 2003, the NRC staff issued RAIs to the applicant to address the scoping concerns identified by the staff regarding the postaccident hydrogen system and other portions of the containment isolation system. The staff's RAIs and the applicant's responses, dated April 28, 2003, are described below.

In RAIs 2.3.2.5-1, 2.3.2.5-2, and 2.3.2.5-3, the NRC staff requested additional information concerning the postaccident hydrogen system. RAI 2.3.2.5-1 requested that the applicant justify not identifying hydrogen control as an intended function for the postaccident hydrogen system. On the basis of descriptions from the UFSAR, including statements from Section 6.2.5.1, the NRC staff determined that the hydrogen recombiners are relied upon in the current safety analysis to prevent the accumulation of a combustible concentration of hydrogen within the containment building. RAI 2.3.2.5-2 requested that the applicant justify excluding from the scope of license renewal the components comprising the pressure boundary of the postaccident hydrogen system (except for those components already in scope for containment isolation), and to justify excluding any passive, long-lived, pressure-boundary components from an AMR. RAI 2.3.2.5-3 requested that the applicant justify excluding from the scope of license

renewal the components needed to operate containment isolation valves and other pneumatic valves to support the hydrogen control function described in the UFSAR and to justify excluding any passive, long-lived components from an AMR.

The applicant's response to RAI 2.3.2.5-1 states that hydrogen control is considered to be a mitigative function following a LOCA, but the hydrogen control systems do not perform an intended function for license renewal. The response explains that, although operation of the hydrogen recombiners is the preferred method for hydrogen control, recombiner operation is considered a recovery action because of the long time period (approximately 54 days) before it is required. As a result, the response states that there is sufficient time to assure the operability of all components in the recombiner system before its operation is required. The response further indicates that the hydrogen recombiner and its supporting components are not safety-related. The applicant's responses to RAIs 2.3.2.5-2 and 2.3.2.5-3 reference these arguments from the response to RAI 2.3.2.5-1 to justify the exclusion from the scope of license renewal of the pressure boundary components of the hydrogen recombiner system (other than those necessary for containment isolation) and the components necessary to operate pneumatic valves in support of hydrogen recombiner operation.

The staff considers the applicant's responses to RAIs 2.3.2.5-1, 2.3.2.5-2, and 2.3.2.5-3 to be unacceptable because they are incomplete. Although the responses provide sufficient information to demonstrate that 10 CFR 54.4(a)(1) and (a)(3) do not apply to the hydrogen recombiners and supporting components, they do not adequately demonstrate that these components are not within the scope of license renewal in accordance with 10 CFR 54.4(a)(2). Specifically, although ample time is available to effect hydrogen control, 10 CFR 54.4 does not explicitly permit components required for accident mitigation to be excluded from the scope of license renewal on that basis. In addition, although the response states that sufficient time exists to ensure that all components of the recombiner system are operable before its operation is required, UFSAR Section 6.2.5.2.2 indicates that the majority of the lines associated with this system cannot be repaired due to the high radiation rates present during postaccident conditions.

The staff explained the basis for its determination of unacceptability to the applicant during a public meeting on May 20, 2003. Following this meeting, the applicant reassessed its responses to RAIs 2.3.2.5-1, 2.3.2.5-2, and 2.3.2.5-3, and, by letter from J.F. Lucas dated September 16, 2003, transmitted a revised response to these items that would bring within scope the components of the hydrogen recombiner system that are necessary to fulfill the hydrogen control intended function. Specifically, in addition to the components necessary for containment isolation, the response brings within scope the hydrogen recombiner, permanently installed piping, and temporary flexible piping associated with the postaccident hydrogen system pressure boundary, as well as the passive pressure boundary components of the associated nitrogen system that actuates the containment isolation valves which would permit the flow of containment atmosphere to and from the hydrogen recombiner. Based on the applicant's decision to bring those components within scope of license renewal, the staff finds the applicant's responses to RAIs 2.3.2.5-1, 2.3.2.5-2, and 2.3.2.5-3 acceptable, and Confirmatory Item 2.3.2.5-3 is closed.

In RAIs 2.3.2.5-4 and 2.3.2.5-5, the NRC staff requested additional information concerning the hydrogen analyzers. RAI 2.3.2.5-4 requested that the applicant justify not identifying hydrogen monitoring as an intended function for license renewal. On the basis of descriptions contained

in Section 6.2.5 of the UFSAR, the staff determined that the hydrogen analyzers are necessary to support proper operation of the hydrogen recombiners. In RAI 2.3.2.5-5, the staff asked the applicant to explain why the LRA did not identify any passive, long-lived, pressure boundary components associated with the hydrogen analyzers' intended function of hydrogen monitoring. In response to these RAIs, the applicant indicated that the hydrogen analyzers do perform an intended function (hydrogen monitoring) and are therefore considered to be within the scope of license renewal. The applicant further stated that the LRA classifies the hydrogen analyzers within the postaccident monitoring system, which consists solely of components considered to be electrical/instrumentation and controls (I&C). The applicant stated that the hydrogen analyzers are located within the containment building and that, therefore, there are no pressure boundary components that are required to support their intended function. The applicant's response provides sufficient basis for the staff to have reasonable assurance that no mechanical components associated with the hydrogen analyzers have been omitted from the scope of license renewal. Therefore, the staff finds the applicant's responses to RAIs 2.3.2.5-4 and 2.3.2.5-5 to be acceptable and considers these RAIs to be closed.

In RAI 2.3.2.5-6, the NRC staff requested that, considering 10 CFR 54.4(a), the applicant justify excluding from the scope of license renewal the debris screens and intervening piping between the containment atmosphere and the containment isolation valves for the containment pressure relief and containment vacuum breaker systems. The staff's review identified that Section 9.4.3.2.7 of the UFSAR states that the debris screens ensure that airborne debris will not interfere with the tight closure of the butterfly valves used for containment isolation. As the debris screens and piping appear to be passive and long-lived components, the staff further requested that the applicant consider whether these components should be subject to an AMR, in accordance with 10 CFR 54.21(a)(1). The applicant's response to this RAI affirms that the debris screens for the butterfly valves and the intervening piping perform an intended function for license renewal and will be subject to an AMR. The staff finds the applicant's response to this RAI to be acceptable because the applicant affirmed that the debris screens and intervening piping are within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1). Therefore, the staff considers RAI 2.3.2.5-6 to be closed.

2.3.2.5.3 Conclusions

The staff reviewed the LRA, the accompanying scoping boundary drawings, and the applicant's RAI responses to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. On the basis of its review, the staff concludes that the applicant has adequately identified the components of the containment isolation system that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the containment isolation system that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3 Auxiliary Systems

2.3.3.1 Sampling Systems

2.3.3.1.1 Summary of Technical Information in the Application

The applicant describes the sampling systems in LRA Section 2.3.3.1 and provides a list of components subject to an AMR in LRA Table 2.3-7.

Sampling systems include the primary sampling system, the steam cycle sampling system, the containment vapor and pressure sampling system, and the postaccident sampling system. The applicant indicated that the Class I portions of the primary sampling system are addressed in Subsection 2.3.1.1, and steam cycle sampling is addressed in Subsection 2.3.4.7.

The primary sampling system provides representative samples for laboratory analysis to evaluate the chemistry of the reactor coolant, RHR system, SI system, steam system, and CVCS during normal operation. The system is operated manually on an intermittent basis. The primary sampling system is described in RNP UFSAR Section 9.3.2.1.

The containment vapor and pressure sampling system provides the means to monitor containment pressure. The postaccident sampling system provides a means to remotely collect reactor coolant, containment atmosphere, and other samples following a postulated accident. The postaccident sampling system is divided into two basic system parts—reactor coolant sampling and containment air sampling. Reactor coolant samples are provided from the primary sampling system. Containment air samples are provided via the penetration pressurization system local leak rate test system from the process/area radiation monitoring system. The postaccident sampling system is described in RNP UFSAR Section 9.3.2.2.

2.3.3.1.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.1 and UFSAR Sections 9.3.2.1 and 9.3.2.2 to determine whether there is reasonable assurance that the sampling system within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

As a result of this review, the staff questioned the applicant (RAI 2.3.3.1-1) as to why the traps T-56A, B, and C shown on the flow diagram HBR2-6490LR are within the scope of components that require an AMR but not included in sampling systems Table 2.3-7 for component/commodity groups requiring AMR. By letter dated April 28, 2003, the applicant responded to this RAI by stating that the traps are included under “Valves, Piping, Tubing and Fittings” in the components/commodity groups requiring an AMR on Table 2.3-7 of the containment vapor and pressure sampling system. The staff finds the applicant’s response acceptable because the applicant identified that traps are in scope and subject to AMR.

The staff also questioned the applicant (RAI 2.3.3.1-2) as to why the piping on the primary sampling system flow diagram 5379-353 LR (a) between valves PS-951 and P-29, (b) between

valves PS-953 and P-30, (c) between valves PS-955A/B and P-31, (d) between valves PS-975 and PS-977/PS 976, (e) between valves PS-974B and PS-988, and (f) between valves PS-969B and PS-985 is not shown within the scope of components requiring AMR.

By letter dated April 28, 2003, the applicant responded to RAI 2.3.3.1-2 by stating that the primary sampling system is not required for safe shutdown or to mitigate the consequences of an accident and is therefore classified as a non-safety-related system. However, the sample lines that interface with safety-related systems are provided with isolation valves, and those that penetrate the containment are provided with two isolation valves in series outside the containment which close upon actuation of the containment isolation signal. The valves that are closed by the containment isolation signal are PS-956A through PS-956H. The valves that provide isolation to the safety-related systems are PS-951, PS-953, PS-955A through PS-955E, and PS-959. Manual valves PS-976, PS-977, PS-988, and PS989D are the safety-related boundary valves for the CVCS. Components of the primary sampling system downstream of valves PS-956B, PS-956D, PS-956F, PS-956H, PS-959, PS-976, PS-977, PS-988 and PS-898 are not safetyrelated.

The primary sampling system is in scope because it has the following intended functions.

- maintain reactor coolant system pressure boundary
- provide containment isolation
- provide a pressure-retaining boundary to prevent spatial interactions with safety-related equipment

The portion of the system relied on to support the maintenance of the RCS pressure boundary is defined by the Class 1 components within the system. This boundary ends at valves PS-951, PS-953, PS-955A, and PS-955B, as shown on the drawing 5379-353LR. The penetration and the downstream piping, including the double isolation valves outside containment, support the containment isolation function as illustrated by the highlighted portion (included in AMR).

The portion of piping inside the containment from the Class 1 boundary to the containment penetration and the piping within the reactor auxiliary building (RAB) do not require an AMR since they do not have a spatial interaction with safety-related equipment as presented in attachment V of RNP-RA/02-0159, letter from J. Moyer (Carolina Power & Light Company (CPLC) to the NRC, “Supplement to Application for Renewal of Operating License,” dated October 23, 2002.

The staff has reviewed the applicant’s response to RAI 2.3.3.1-2 and finds it acceptable. The response to RAI items (a), (b), and (c) is acceptable because the applicant identified that the subject piping does not require an AMR since it does not have a spatial interaction with safety-related equipment. The response to RAI items (d) and (e) is acceptable because the applicant identified the subject piping as in scope in the CVCS and subject to AMR. The response to RAI item (f) is acceptable because the applicant identified the subject piping as not safetyrelated and not subject to AMR.

2.3.3.1.3 Conclusions

The staff reviewed the LRA and the accompanying scoping boundary drawings and the applicant's response (dated April 28, 2003) to the RAIs to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the sampling systems that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the sampling systems that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.2 Service Water System

2.3.3.2.1 Summary of Technical Information in the Application

The applicant describes the service water system (SWS) in LRA Section 2.3.3.2 and provides a list of components subject to an AMR in LRA Table 2.3-8.

The SWS is an open loop system and provides makeup water to and removes heat from several plant systems. Redundant supply paths with isolation valves are provided to those systems required for safety either during normal operation or under postulated accident conditions. The system removes heat from the CCW system; heating, ventilation, and air conditioning (HVAC) systems in the containment building, auxiliary building, control room area, fuel handling building, and safety-related pump rooms; emergency diesel generators (EDGs); certain safety-related pumps; and various heat loads in the turbine building. The system provides a backup, long-term water supply to the AFW system. The system contains four vertical wet pit service water pumps and two full-capacity service water booster pumps that supply water to the containment fan coolers. The SWS is described in RNP UFSAR Section 9.2.1.

2.3.3.2.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.2 and UFSAR Section 9.2.1 to determine whether there is reasonable assurance that the SWS components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

As a result of this review, the staff questioned the applicant as to why the plant coolers and heat exchangers shown on the SWS flow diagram G-190199LR, sheets 4, 5, 6, 9, and 10, as within the scope of service water components that require an AMR because they provide a pressure-retaining function are not included in SWS Table 2.3-8 for component/commodity groups requiring AMR. The applicant was requested (RAI 2.3.3.2-1) to identify where the LRA addresses the AMR of these components, because this information was not indicated in

Section 2.3.3.2. By letter dated April 28, 2003, the applicant responded to this RAI by stating that plant coolers and heat exchangers within the scope of license renewal are subject to environments from two separate systems. Accordingly, these heat exchangers and coolers interfacing with the SWS are depicted on the service water flow diagrams as well as the corresponding system flow diagrams. These components are included in the evaluation for their respective system LRA tables for AMR as indicated below:

- containment air recirculating units (HVH-1, 2, 3 and 4)—in LRA Table 2.3-5 (Drawing G-190304LR, sheet 1)

- safety injection pumps A, B, and C—in LRA Table 2.3-3 (drawing 5379-1082LR, sheet 2)

- air recirculating cooling units (HVH-6A and 6B)—in LRA Table 2.3-18 (drawing G-190304LR, sheet 2)

- diesel generator air coolers or after coolant heat exchangers (A and B)—in LRA Table 2.3-22 (drawing G-190204A LR, sheet 3)—Although these are identified as “air coolers” on the service water boundary drawing, the components interfacing with the service water system are the “after coolant heat exchangers (A and B)” as identified on the diesel generator boundary drawing.

- lube oil coolers (A and B) and jacket water heat exchanger (A and B)—in LRA Table 2.3-22 (drawing G-190204ALR, sheet 3)

- auxiliary feed water pumps and oil coolers (A and B)—in LRA Table 2.3-29 (drawing G-190197LR, sheet 4)

- component cooling water heat exchangers (A and B)—in LRA Table 2.3-9 (drawing 5379-376LR, sheet 1)

- air recirculating units (HVH-7A and 7B)—in LRA Table 2.3-18 (drawing G-190304LR, sheet 2)
-
- control room refrigeration units (WCCU-1A and 1B)—in LRA Table 2.3-19 (drawing G-190304LR, sheet 4)

- residual heat removal air recirculating units (HVH-8A and 8B)—in LRA Table 2.3-18 (drawing G-109304LR, sheet 2)

- steam-driven auxiliary feedwater pump oil coolers—in LRA Table 2.3-29 (drawing G-190197LR, sheet 4)

The staff also questioned the applicant (RAI 2.3.3.2-2) as to why the penetration coolers, flow indicators, and connecting piping on service water flow diagram G-190199LR, sheet 3, are not shown within the scope of components requiring an AMR. By letter dated April 28, 2003, the applicant responded to this RAI by stating that the penetration coolers and connecting piping (including the flow instrumentation) are not required to support a system intended function as indicated in UFSAR (Revision 15) Section 9.2.1.2, item i, which states that the service water

flow to the containment piping penetration coolers is isolated. Therefore, these components are not within the scope.

The staff has reviewed the above information and finds it acceptable because all the safety-related plant coolers and heat exchangers within the scope of license renewal that interface with SWS for pressure-retaining function are included in the list of components requiring AMR.

2.3.3.2.3 Conclusions

The staff reviewed the LRA, the accompanying scoping boundary drawings, and the applicant's responses (dated April 28, 2003) to RAIs to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the service water system that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the SWS that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.3 Component Cooling Water System

2.3.3.3.1 Summary of Technical Information in the Application

The applicant describes the component cooling water (CCW) system in LRA Section 2.3.3.3 and provides a list of components subject to an AMR in LRA Table 2.3-9.

The CCW system provides a heat sink for the removal of process and operating heat from safety-related components during postulated accidents or transients. During normal operation, the CCW system also provides this function for various nonessential components, as well as the spent fuel storage pool. The CCW system serves as a barrier to the release of radioactive byproducts between potentially radioactive systems and the SWS, and thus to the environment. The CCW system consists of three pumps, two heat exchangers, a supply and return header, a surge tank, and associated piping, valves, and instrumentation. The CCW system is described in RNP UFSAR Section 9.2.2.

2.3.3.3.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.3 and UFSAR Section 9.2.2 to determine whether there is reasonable assurance that the CCW system components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

Table 2.3-9 of the CCW system lists the heat exchangers whose tubes and shell are within the scope of components requiring an AMR because they provide a pressure-retaining function. The staff questioned the applicant (RAI 2.3.3.3-1) as to why the tubesheets of these heat exchangers (except the CCW heat exchangers) are not listed in Table 2.3-9 for component/commodity groups requiring AMR. By letter dated April 28, 2003, the applicant responded to this RAI by stating that the spent fuel pool (SFP) cooling heat exchanger, the nonregenerative heat exchanger, and waste gas compressor coolers have tubesheets that were not identified in the initial submittal. Since the initial submittal, the RNP LR evaluation has been updated to include these corrections. Other sample heat exchangers and control rod drive mechanism (CRDM) cooling coolers listed in Table 2.3-9 do not have tubesheets. These heat exchangers are shell and flanged cooler-type heat exchangers, and the cooling coils (tubing) pass directly through the flanged cover into the shell.

The staff also questioned the applicant (RAI 2.3.3.3-2) as to why the heat exchangers and pump coolers of charging pumps, reactor coolant, RHR, seal water, excess letdown, containment spray pump, and high-head SI pumps are shown on the CCW system flow diagram 5379-376LR (sheets 1, 2, 3, and 4) as within the scope of components that require an AMR but not included in CCW system Table 2.3-9 for component/commodity groups requiring AMR. The applicant was requested to identify where the LRA addresses the AMR of these components because this information was not indicated in Section 2.3.3.3. By letter dated April 28, 2003, the applicant responded to this RAI by stating that the above heat exchangers and pump coolers within the scope of license renewal are subject to environments from two separate systems. Accordingly, the heat exchangers and coolers interfacing with the CCW system are depicted on the CCW system flow diagrams, as well as on the corresponding system flow diagrams. These components are included in the evaluation for their respective system LRA tables for AMR as indicated below:

- The charging pump heat exchangers, seal water heat exchanger, and excess letdown heat exchanger are included in the chemical and volume control system LRA Table 2.3-10.

- The reactor coolant heat exchanger refers specifically to the hot-leg sample heat exchanger which supports only the component cooling water intended function and is listed in the component cooling water system LRA Table 2.3-9.

- Residual heat removal heat exchangers and pump coolers are included in the residual heat removal system LRA Table 2.3-2.

- Reactor coolant pumps are included in the reactor coolant system LRA Table 2.3-1.
- Containment spray pump coolers are included in the containment spray system LRA Table 2.3-4.

- High-head safety injection pump coolers are included in safety injection system LRA Table 2.3-3.

The staff has reviewed the above information and finds it acceptable because all the safety-related pumps, coolers, and heat exchangers within the scope of license renewal that interface with the CCW system for a pressure-retaining function are included in the list of components requiring AMR.

2.3.3.3.3 Conclusions

The staff reviewed the LRA, the accompanying scoping boundary drawings, and the applicant's response (dated April 28, 2003) to RAIs to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the CCW system that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the CCW system that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.4 Chemical and Volume Control System

2.3.3.4.1 Summary of Technical Information in the Application

The applicant describes the CVCS in LRA Section 2.3.3.4 and provides a list of components subject to an AMR in LRA Table 2.3-10.

The applicant's LRA contains the following description of the CVCS.

The CVCS provides a continuous feed and bleed of reactor cooling water for the RCS to maintain proper water level and to adjust boron concentration. The CVCS provides a means for injection of control poison in the form of boric acid solution, chemical additions for corrosion control, and reactor coolant cleanup and degasification. The system also adds makeup water to the RCS, reprocesses water letdown from the RCS and charging pump leakage, and provides seal water injection to the RCP seals.

The CVCS is in the scope of license renewal, because it contains SCs that are safety-related and are relied upon to remain functional during and following design-basis events, SCs that are not safety-related but whose failure could prevent satisfactory accomplishment of the safety-related functions, SCs that are part of the Environmental Qualification Program, and SCs that are relied on during postulated fires and SBO events.

2.3.3.4.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.4 and UFSAR Section 9.3.4 to determine whether there is reasonable assurance that the CVCS components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

2.3.3.4.3 Conclusions

The staff reviewed the LRA and the accompanying scoping boundary drawings to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the CVCS that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the CVCS that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.5 Instrument Air System

2.3.3.5.1 Summary of Technical Information in the Application

The applicant describes the instrument air (IA) system in LRA Section 2.3.3.5 and provides a list of components subject to an AMR in LRA Table 2.3-11.

The IA system provides a reliable source of dry, oil-free air for controls and motive power to safety-related and non-safety-related I&C and pneumatic valves. Safety-related, air-operated valves that are required to operate following design-basis events and are normally supplied by IA are provided with backup sources of either air (accumulators) or nitrogen. The system contains air compressors, air dryers, air receivers, and interconnecting piping and valves. The IA system is described in RNP UFSAR Section 9.3.1.

2.3.3.5.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.5 and UFSAR Section 9.3.1 to determine whether there is reasonable assurance that the IA system components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

The staff also questioned the applicant (RAI 2.3.3.5-1 and RAI 2.3.3.6-2) as to why the accumulators shown on the instrument and station air system Flow Diagram G-190200LR (sheet 9 as within the scope of components requiring an AMR are not listed in the IA system Table 2.3-11 for component/commodity groups requiring an AMR. By letter dated April 28, 2003, the applicant responded to this RAI by stating that the accumulators shown on the diagram G-1902000LR (sheet 9) are the pressurizer nitrogen supply accumulators A and B and are listed on the nitrogen supply/blanketing system Table 2.3-12 for component/commodity groups requiring an AMR. The staff finds the applicant's response acceptable because the applicant identified these as nitrogen supply accumulators subject to AMR as listed on the nitrogen/blanketing system Table 2.3-12.

2.3.3.5.3 Conclusions

The staff reviewed the LRA, the accompanying scoping boundary drawings, and the applicant's response (dated April 28, 2003) to RAIs to determine whether any SSCs that should be within

the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the IA system that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the IA system that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.6 Nitrogen Supply/Blanketing System

2.3.3.6.1 Summary of Technical Information in the Application

The applicant describes the nitrogen supply/blanketing system in LRA Section 2.3.3.6 and provides a list of components subject to an AMR in LRA Table 2.3-12.

The nitrogen supply/blanketing system provides gas for various plant functions as the motive force for some gas-operated valves, to pressurize the SI system accumulators, and to provide inert cover gas for certain tanks. Portions of the system provide motive force for the pressurizer PORVs. The nitrogen supply/blanketing system is described in UFSAR Sections 6.2.5.2.2, 6.8.2.1, 6.9.2.1, and 7.6.1.

2.3.3.6.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.6 and UFSAR Sections 6.2.5.2.2, 6.8.2.1, 6.9.2.1, and 7.6.1 to determine whether there is reasonable assurance that the nitrogen supply/blanketing system components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

Steam dump nitrogen accumulator and connecting piping is shown on the nitrogen supply system Flow Diagram HBR2-8606LR (sheet 2) as within the scope of components requiring an AMR. The staff questioned the applicant (RAI 2.3.3.6-1) as to why connecting branch piping is not considered within the scope of license renewal for components requiring an AMR. By letter dated April 28, 2003, the applicant responded to this RAI by stating that the steam dump nitrogen accumulator is credited with pneumatic supply for the SG PORVs in the event of an Appendix R fire. While the accumulator itself and the piping along the flow path from the accumulator to the PORVs are in scope for license renewal, branch piping connections are not postulated to fail during an Appendix R fire and are outside intended function boundaries. The staff finds the applicant's response acceptable because the applicant explained that the subject branch piping is not postulated to fail during an Appendix R fire and is not in scope for AMR.

2.3.3.6.3 Conclusions

The staff reviewed the LRA, the accompanying scoping boundary drawings, and the applicant's response (dated April 28, 2003) to RAIs to determine whether any SSCs that should be within

the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the nitrogen supply/blanketing system that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the nitrogen supply/blanketing system that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.7 Radioactive Equipment Drain

2.3.3.7.1 Summary of Technical Information in the Application

The applicant describes the radioactive equipment drain system (REDS) in LRA Section 2.3.3.7 and provides a list of components subject to an AMR in LRA Table 2.3-13.

The radioactive equipment drains route potentially radioactive floor drainage to the liquid waste processing system. Portions of the system are relied on during postulated internal fire protection system actuations or failures to drain fire protection water from rooms containing safety-related equipment. The evaluation boundaries for the portions of the radioactive equipment drains that are within the scope of license renewal were determined on the basis of their function following actuation of fire suppression systems in the RAB, as described in UFSAR Appendix 9.5.1B. No flow diagrams were used to determine the evaluation boundaries.

2.3.3.7.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.7 and UFSAR Section 11.2 and Appendix 9.5.1B to determine whether there is reasonable assurance that the radioactive equipment drain components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

Appendix 9.5.1B to the RNP UFSAR states that, based on evaluation of two pipe break locations that typify the areas with water-filled pipe in the auxiliary building, the floor drain system will prevent flooding of electrical safety-related equipment on the second floor. However, 10 CFR 54.21 requires that components subject to an AMR be listed in the application or included by reference. The LRA did not specifically identify the components within the radioactive equipment drains system subject to an AMR other than by listing “piping and fittings” in Table 2.3-13 of the LRA. Therefore, by letter dated February 11, 2003, the staff requested that the applicant clarify which specific piping sections and fittings are within the scope of license renewal and subject to an AMR and how these sections were found to provide protection against flooding from pipe breaks within the auxiliary building.

By letter dated April 28, 2003, the applicant responded to this RAI. The applicant stated that the REDS comprises piping and fittings embedded in the auxiliary building, as well as any

connected exposed piping, and these piping sections and fittings are considered to be within the scope of license renewal and subject to an AMR. The applicant further stated that a description of flooding effects from pipe breaks within the auxiliary building is provided by a letter from E. Utley (CP&L) to NRC, Serial NO-80-896 "Fire Protection Program," dated June 12, 1980, and accepted by the NRC in the SER Supplement dated December 8, 1980. The attachment to this letter discussing Item 3.2.7, "Fire Water Pipe Rupture," identified the piping and fittings as (1) seven 3-inch floor drains in the second-level hallway floor at elevation 246 connected to five 3-inch downcomers, (2) one floor drain served by one downcomer in the 230 kV protective relay area, (3) 16 floor drains in the first-level floor at elevation 226, (4) the first-level drain distribution piping, (5) the 375-gallon drain collection sump tank, and (6) independent DG room floor drains that discharge into the storm drain system. The staff found that this reference adequately identified the piping and fittings within the scope of license renewal and subject to an AMR.

During review of LRA Table 2.4-2, which lists component commodity groups subject to an AMR, the staff noted that the table did not specifically describe embedded piping with a pressure boundary intended function to maintain free flow of water through the equipment drain system. By letter dated February 11, 2003, the staff requested that the applicant clarify which portions of the embedded piping are included within the scope of license renewal and are subject to an AMR, the intended function of this embedded piping, and which AMPs apply to the embedded piping.

By letter dated April 28, 2003, the applicant responded to this RAI. The applicant stated that the intended function of the REDS is to drain rooms in the auxiliary building following a postulated fire header rupture to equalize flooding elevations and protect electrical equipment from flooding. Maintaining clear drains and piping accomplishes this function. Therefore, the intended function of the embedded piping is to provide a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered. The applicant stated that the embedded piping external surface was subject to an AMR via the AMR of civil/structural components and commodities since the piping was in a stainless steel material/embedded concrete environment. This review identified no aging effects for the subject stainless steel piping and fittings, and therefore no AMPs were applied. The embedded piping internal surface was subject to the same AMR as exposed piping, which is identified in LRA Table 2.3-13. The staff found that this response adequately addressed the issue of piping embedded in concrete as a commodity subject to an AMR in LRA Table 3.3-2.

2.3.3.7.3 Conclusions

The staff reviewed the LRA and the accompanying scoping boundary drawings to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the REDS that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the REDS that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.8 Primary and Demineralized Water System

2.3.3.8.1 Summary of Technical Information in the Application

The applicant describes the primary and demineralized water system in LRA Section 2.3.3.8 and provides a list of components subject to an AMR in LRA Table 2.3-14.

The primary and demineralized water system supplies demineralized and deaerated water for process support functions and makeup supplies to various systems throughout the plant. UFSAR Section 9.2.3 provides a description of the primary and demineralized water system. The license renewal evaluation boundaries for the primary and demineralized water system are shown on flow diagram G-190202LR, sheet 3, which was referenced by the LRA.

2.3.3.8.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.8 and UFSAR Sections 2.4, 9.2.2, 9.2.3, and 10.4.8 to determine whether there is reasonable assurance that the primary and demineralized water system components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

The staff identified an issue regarding the need for makeup water to the CCW surge tank to prevent failure of the system as a result of leakage. Section 9.2.2.3.1 of the UFSAR states that a leaking heat exchanger could be left in service with leakage up to the capacity of the makeup line to the system, and that water stored in the CCW surge tank together with makeup flow provides adequate time to isolate a leaking cooling line serving an individual RCP cooler before cooling is lost to essential components in the component cooling loop. Section 9.2.3 of the UFSAR describes that the non-safety-related primary makeup water tank provides normal makeup to the CCW system. However, the primary and demineralized water system LR Flow diagram G-190202LR, sheet 3, and CCW system LR flow diagram, 5379-376, sheet 1, indicate that only the safety-related section of piping from valves CC-832 and CC-711 to the component cooling surge tank header is within LR scope. By letter dated February 11, 2003, the staff requested that the applicant clarify whether the non-safety-related piping and components necessary to provide primary makeup water system flow to the component cooling surge tank are included within the scope of license renewal and subject to an AMR or justify their exclusion.

By letter dated April 28, 2003, the applicant responded to this RAI. The applicant stated that the information provided in the UFSAR is intended to show how the system would be operated to mitigate a leak and that the CCW surge tank maintains a volume of water that provides time for the plant operating staff to find and isolate a leak. The applicant also stated that leakage from the CCW system is an anticipated condition, and procedures are in place to mitigate a range of CCW system degradation up to the complete loss of the system. Lastly, the applicant stated that severance of a CCW line as a result of a pipe break in containment is not a postulated event, and evaluations of the CCW lines inside containment had been performed

that demonstrated the CCW lines inside containment were protected from the effects of postulated ruptures of high-energy piping. Based on the above information, the applicant concluded that the ability to provide makeup water to the CCW surge tank from the primary and demineralized water system is not required for design-basis events and, therefore, is not an intended function for license renewal as defined in 10 CFR 54.4(b).

The staff reviewed the applicant's response and searched the UFSAR for information supporting the applicant's response. The staff found two relevant statements in Section 9.2.2 of the UFSAR. First, the surge tank ensures a continuous CCW supply until a leaking cooling line can be isolated. Second, based on leak-before-break (LBB) criteria for the primary system, all the component cooling equipment is protected against credible missiles. These statements combined with the applicant's response provide adequate assurance that makeup water from the primary and demineralized water system is not required to maintain the operability of the CCW system following a high-energy line break (HELB) inside containment, based on the CLB of the facility. Therefore, the staff found that the makeup piping to the CCW surge tank does not have an intended function as defined in 10 CFR 54.4, and its exclusion from the scope of license renewal is acceptable.

The staff identified that Section 10.4.8 of the RNP UFSAR includes the following statement:

> In the event of a failure of Lake Robinson Dam, shutdown would be accomplished in an orderly manner using the condensate storage tank. When the condensate storage tank reaches a low level limit, auxiliary feedwater pump suction would be changed to the deepwell pump discharge. This source would provide the required feedwater indefinitely or until such time that some other source of feedwater can be established. It is assumed that emergency power is not required for this accident.

Section 9.2.3 of the UFSAR describes three parallel deepwell pumps as part of the primary and demineralized water system. However, the associated Flow Diagram, G-190202LR, sheet 3, indicates that only the safety-related section of piping from the AFW pump suction to and including valve DW-21 is within LR scope. The remaining piping and components from and including the deepwell pumps to valve DW-21 were not identified as within LR scope. By letter dated February 11, 2003, the staff requested that the applicant clarify whether the non-safety-related piping, valve bodies, and pump casings necessary to provide a pressure-retaining boundary from the deepwell pumps to valve DW-21 are included within the scope of license renewal and subject to an AMR or justify their exclusion.

By letter dated April 28, 2003, the applicant responded to RAI 2.3.3.8-1. The applicant stated that the failure of the dam is not a design-basis event. The Lake Robinson Dam is a non-safety-related structure that has been evaluated to assure its capability to function during and following a design-basis earthquake (DBE). The safety-related SWS provides cooling water for safe plant shutdown, including the long-term backup supply of water to the AFW system from Lake Robinson. The function of supplying safety-related SWS flow is supported by the Lake Robinson Dam, which is in scope for license renewal and monitored by an AMP as discussed in LRA Subsections 2.4.2.10 and B.3.16. The applicant stated that, by including the Lake Robinson Dam in scope for license renewal, the safety functions of the SWS and Lake Robinson are assured during the period of extended operation.

The staff reviewed the applicant's response to RAI 2.3.3.8-1. The context of Section 10.4.8 of the UFSAR does not link dam failure to any particular set of initiating events, and seismic

events and age-related degradation do not encompass all credible causes of dam failure. Dam failure results in loss of the ultimate heat sink and loss of the normal backup supply of feedwater from the SWS through the AFW system. Following dam failure and depletion of the condensate storage tank (CST) inventory, failure of the deepwell pumps would cause failure of the safety-related AFW system and prevent the residual heat removal necessary to maintain a safe shutdown condition. Therefore, the deepwell pumps and associated piping are within the scope of LR in accordance with 10 CFR 54.4 (a)(2). The staff found that the applicant has not adequately justified excluding the deepwell pumps and associated piping and valves from an AMR. This was Open Item 2.3.3.8-1.

By letter dated September 16, 2003, the applicant agreed to include, within the scope of license renewal, the three deepwell pumps and associated piping required to provide a backup source of water for the auxiliary feedwater system. The deepwell pumps are vertical turbine-type pumps with integral carbon steel suction piping connected to the pump suction case. This suction piping is integral to the pump and therefore is not shown on the flow diagram. The suction piping is in the well and extends below the pump case. The revised boundary includes the suction piping, deepwell pumps, and piping up to and including the first isolation valve in each branch line. The flow path will connect with valve DW-21 which was included in the original scope of license renewal (refer to boundary drawing G-190202LR, sheet 3, H-3). The staff found that the applicant adequately identified components of the deepwell pumps and associated piping within the scope of license renewal, as required by 10 CFR 54.4(a)(2).

The applicant completed an AMR of the deepwell pumps and associated piping, which resulted in the identification of material/environment combinations not previously identified in the LRA for the primary and demineralized water makeup system. The deepwell pumps are carbon steel/cast iron and are exposed to a raw water environment. The deepwell pump stations are fabricated with carbon steel, stainless steel, and copper alloy valves, piping, and fittings exposed internally to raw water and externally to outdoor air. The piping connected to the pump stations is plastic-coated carbon steel which is run underground. This underground carbon steel piping makes up the majority of the piping in the deepwell system. The suction piping and remaining aboveground piping is carbon steel. The applicant presented the results of the revised aging management evaluations in an update to LRA Table 2.3-14. The staff reviewed the components that were subject to an AMR and found that the applicant has adequately included components of the deepwell pumps and associated piping, as required by 10 CFR 54.21(a)(1). Therefore, Open Item 2.3.3.8-1 is closed. The staff evaluation of the revised AMR results is included in Section 3.3 of this safety evaluation.

2.3.3.8.3 Conclusions

The staff reviewed the LRA and the accompanying scoping boundary drawings to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the primary and demineralized water system that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the primary and demineralized water system that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.9 Spent Fuel Pool Cooling System

2.3.3.9.1 Summary of Technical Information in the Application

The applicant describes the spent fuel pool cooling system in LRA Section 2.3.3.9 and provides a list of components subject to an AMR in LRA Table 2.3-15.

The spent fuel pool cooling system (SFPCS) removes decay heat generated by stored spent fuel elements from the spent fuel pool and provides filtering and demineralization of the water in the spent fuel pool. The SFPCS consists of three separate loops—cooling, purification, and skimmer loops. The cooling loop removes heat from the spent fuel pool by circulating water through the spent fuel pool heat exchanger. Heat is removed from this heat exchanger by the component cooling water system. The purification loop provides filtering and demineralization by circulating a portion of the cooling loop flow through a filter and demineralizer. The skimmer loop removes floating debris and surface contaminants that could affect water clarity by taking a suction on the skimmer and circulating the water through a strainer and filter. The applicant stated that functions involving heat removal, purification, and contaminant removal for the spent fuel pool are not intended functions for license renewal. Functions of the SFPCS within scope of license renewal involve maintaining a barrier to support the pressure boundaries of the spent fuel pool (SFP) and the refueling water storage tank (RWST).

2.3.3.9.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.9 and UFSAR Sections 9.1.2, 9.1.3, and 15.7.6 to determine whether there is reasonable assurance that the spent fuel pool cooling system components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

Section 9.1.3.3.2 of the RNP 2 UFSAR states that the makeup water requirement due to boiling following a complete loss of cooling after a full core offload would be less than 42 gpm. The SFPCS has redundant pumps and procedurally established alternate means of providing heat sink water to the heat exchangers, which ensure that SFP cooling capability can be restored quickly. The SFP large level makeup water source is the RWST via the refueling water purification pump. This path has a capacity of 100 gpm which is more than adequate to replace the water lost. The license renewal boundary diagram for the spent fuel pool cooling system, drawing 5379-1485LR, sheet 1, indicates that the piping and components necessary to deliver makeup water from the RWST to the spent fuel pool are outside of the scope of license renewal, and Section 2.3.3.9 of the LRA states that the heat removal function is not an intended function for license renewal. However, the LRA does not include justification for this determination. By letter dated February 11, 2003, the staff requested in RAI 2.3.3.9-1 that the applicant clarify whether the piping and components necessary for forced cooling of the spent fuel pool and to provide makeup water system flow from the RWST to the spent fuel pool are within the identified scope of license renewal and are subject to an AMR, or justify their exclusion.

By letter dated April 28, 2003, the applicant responded to this request for additional information. The applicant stated that the information provided in the UFSAR discusses evaporation makeup requirements without identifying any potential offsite exposures. Section 15.7.6 of the UFSAR states that the evaporative losses are replenished by primary demineralized water from the 150,000 gallon primary water storage tank. A redundant supply of makeup water is provided by the fire hoses in the vicinity of the spent fuel pit. Although the SFPCS has the capability to be fed by the RWST, the applicant stated that the RWST provides no safety-related function relative to the SFP, and the connected SPFCS piping past the valve isolating the RWST from the SFPCS is nonsafety related. Neither the fire protection equipment, nor the primary water sources in the vicinity of the SFP, are classified as safety related. A loss of an external source of decay heat removal for the spent fuel pool would not cause a significant public dose unless the SFP water level decreased below the level of the stored fuel and subsequent fuel cladding failure occurred. The applicant stated that this would take a minimum of 3 days, over which time, a number of sources of makeup water could be used to compensate for the inventory loss. Among these sources of water are the RWST, the primary water storage tank (PWST), and the fire water system. Based on the above, the applicant concluded that system functions to provide a source of an external cooling for SFPCS and to provide makeup to the SPF for water inventory control are not safety-related functions per the License Renewal Rule (i.e., 10 CFR 54.4(a)(1)(iii)).

The staff reviewed the response and relevant licensing basis information. The last licensing action involving a change in the SFPCS design basis was issued as Amendment 69 to Facility Operating License No. DPR-23 on June 8, 1982. The associated license amendment request was forwarded by letter dated December 1, 1980, and stated that the normal spent fuel pool makeup water source, the RWST, has a capacity of 100 gpm, which is more than adequate to replace the water lost following a loss of forced cooling. The associated NRC safety evaluation noted the makeup capability from the RWST and stated that, in the event of SFPCS pump failure, sufficient pump redundancy or makeup would be available to prevent excessive loss of water from the SFP. Maintenance of an adequate SFP cooling water inventory is necessary to prevent an offsite release comparable to that described in 10 CFR Part 100. Therefore, since failure of the non-safety-related makeup supply from the RWST could cause failure of the safety-related spent fuel cooling provided by an adequate coolant inventory, the piping and components necessary to supply makeup water from the RWST are within the scope of LR in accordance with 10 CFR 54.4 (a)(2).

In further discussions, the applicant agreed to include the SFP makeup path from the RWST to the SFP within the scope of license renewal and add it to the highlighted evaluation boundary drawing. The path from the RWST to the refueling water purification pump suction isolation valve (SFPC-805A, coordinates B-5, 5379-1485LR) was previously included in the evaluation boundary of the safety injection system LR boundary drawing 5379-1082LR, sheet 2. From the refueling water purification pump suction isolation valve, the makeup water flow path returns to the SFP via the purification system demineralizer and filter, the purification loop flow element, the purification loop outlet valve (SFPC-798B), and the SFP cooling system heat exchanger discharge piping. The bypass piping around both the SPF cooling demineralizer and filter are included in the evaluation boundary.

As a result of the expansion of the evaluation boundary, the applicant indicated that LRA Table 2.3-15 would be expanded to include the purification system demineralizer, filter, and pump casing. Each of these components has an intended function of providing a pressure-

retaining boundary so that sufficient flow at adequate pressure is delivered. The applicant indicated that the AMR results for these three additional items should refer to Table 3.3-2, Item 1. The remainder of the piping components in the expanded evaluation boundary is represented by the existing items listed in Table 2.3-15.

The staff reviewed the described SFP makeup water flowpath and the additional components identified as subject to an AMR. The staff found that the described list of components identified as subject to an AMR was complete and included the components with an intended function of providing makeup water from the RWST to the SFP. Therefore, written confirmation of these components in the makeup water flow path that are within the scope of license renewal and subject to an AMR is acceptable to satisfy the requirements of 10 CFR 54.4(a) and 10 CFR 54.21(a). This action is Confirmatory Item 2.3.3.9-1.

By letter dated August 14, 2003, the applicant formally agreed to include the SFP makeup path from the RWST to the SFP within the scope of license renewal, and described the specific boundaries of the components within the scope of license renewal. As a result of the expansion of the evaluation boundary, the applicant revised LRA Table 2.3-15 to include the SFP cooling demineralizer, SFP filter, and RWP pump. The remainder of the piping components fell within existing commodity groups in LRA Table 2.3-15. The staff found that the formal description of the components subject to an AMR was consistent with the previous communication. Therefore, Confirmatory Item 2.3.3.9-1 has been resolved.

2.3.3.9.3 Conclusions

The staff reviewed the LRA and the accompanying scoping boundary drawings to determine whether any structures, systems, or components that should be within the scope of license renewal were not identified by the applicant. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the spent fuel pool cooling system that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the spent fuel pool cooling system that are subject to an aging management review, as required by 10 CFR 54.21(a)(1).

2.3.3.10 Containment Purge System

2.3.3.10.1 Summary of Technical Information in the Application

The applicant describes the containment purge system in LRA Section 2.3.3.10 and provides a list of components subject to an AMR in LRA Table 2.3-16.

In response to RAI 2.3.3.10-1, the applicant stated that the containment purge system performs the intended functions listed below.

- provides containment isolation
- performs a function to demonstrate compliance with regulations for environmental qualification

- mitigates a fuel handling accident inside containment

- provides instrumentation to monitor variables defined as Category 1 in Regulatory Guide 1.97

The containment purge system consists of an outdoor air intake, supply and exhaust ducts that penetrate the containment, redundant isolation valves, and an exhaust filter bank. The containment purge system is designed to replenish the containment air at a rate to ensure that an effective purge can be accomplished within 2 hours.

In LRA Table 2.3-16, the applicant identified the five component types of the containment purge system listed below as being within the scope of license renewal and subject to an AMR.

(1) closure bolting
(2) ductwork and fittings
(3) equipment frames and housings
(4) flexible collars
(5) valves

The LRA further states that each of these five component types provides a pressure-boundary intended function. In addition, the ductwork and fittings component type is identified as providing structural support.

2.3.3.10.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.10 and UFSAR Section 9.4.3.2.6 to determine whether there is reasonable assurance that the components of the containment purge system within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1).

In the performance of its review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

Generally, the staff's review found the scoping and screening results in the LRA to be in accordance with 10 CFR 54.4 and 10 CFR 54.21. However, the staff's review of the applicant's scoping results identified several components that appear to support the performance of the containment purge system's intended functions that were not identified as being within the scope of license renewal. Also, on the basis of its review of the LRA and the UFSAR, the staff could not conclusively identify the intended functions of the containment purge system. On February 11, 2003, the NRC staff issued RAIs to the applicant to address these issues. The staff's RAIs and the applicant's responses, dated April 28, 2003, are described below.

In RAI 2.3.3.10-1, the NRC staff requested that the applicant identify the intended functions of the containment purge system. As the LRA did not include the containment purge system within the containment isolation system (which Section 2.3.2.5 of the LRA identifies as containing the mechanical process systems whose only intended function is containment isolation), the staff questioned whether the intended functions, as defined by 10 CFR 54.4(b), in

addition to its apparent containment isolation intended function. The applicant's response to RAI 2.3.3.10-1 identified the intended functions listed in Section 2.3.3.10.1 of this SER. As the applicant provided the information requested by the staff to allow verification that the scoping boundaries defined in the LRA are in compliance with the requirements set forth in 10 CFR 54.4, the staff finds the applicant's response to this RAI to be acceptable. Therefore, the staff considers RAI 2.3.3.10-1 to be closed.

In RAI 2.3.3.10-2, the NRC staff requested that, considering 10 CFR 54.4(a), the applicant justify excluding from the scope of license renewal the debris screens and intervening piping between the containment atmosphere and the containment isolation valves for the containment purge system. The staff's review found that Section 9.4.3.2.6 of the UFSAR states that the debris screens ensure that airborne debris will not interfere with the tight closure of the butterfly valves used for containment isolation. As the debris screens and piping appear to be passive and long-lived components, the staff further requested that the applicant consider whether these components should be subject to an AMR, in accordance with 10 CFR 54.21(a)(1). The applicant's response to this RAI affirms that the debris screens for the butterfly valves and the intervening piping perform an intended function for license renewal and will be subject to an AMR. The staff finds the applicant's response to this RAI to be acceptable because the applicant affirmed that the debris screens and intervening piping are within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1). Therefore, the staff considers RAI 2.3.3.10-2 to be closed.

2.3.3.10.3 Conclusions

The staff reviewed the LRA, the accompanying scoping boundary drawings, and the applicant's RAI responses to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of its review, the staff concludes that the applicant has adequately identified the components of the containment purge system that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the containment purge system that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.11 Rod Drive Cooling System

2.3.3.11.1 Summary of Technical Information in the Application

The applicant described the rod drive cooling system in LRA Section 2.3.3.11 and provided a list of components subject to an AMR in LRA Table 2.3-17.

The rod drive cooling system is part of the reactor containment building ventilation system. The primary purpose of the reactor containment ventilation system is to reduce personnel exposure to airborne radioactive contaminants and to prevent excessive equipment operating temperatures. The design basis for the rod drive cooling system is to remove heat generated by the CRDMs. The CRDMs require cooling to keep the coils from gradually degrading.

The rod drive cooling system functions by using air from the containment atmosphere that is drawn downward through a cooling shroud surrounding the CRDMs to absorb the heat that is

generated by the rod mechanisms. The system consists of ductwork, a water-cooled heat exchanger, and two 100-percent capacity exhaust fans. The air is drawn from the lower portion of the cooling shroud, cooled by the heat exchanger, and then discharged by the operating fan to the containment atmosphere.

In Section 2.3.3.11 of the LRA, the applicant identified portions of the rod drive cooling system and its SCs that are within the scope of license renewal and subject to an AMR. The applicant stated in the LRA that the rod drive cooling system is further described in Section 9.4.3 of the UFSAR. The applicant identified the following intended functions of the RNP rod drive cooling system based on 10 CFR 54.4(a)(1) and 10 CFR 54.4(a)(3).

- structures and components that are safety-related and are relied upon to remain functional during and following design-basis events (LRA Section 2.3.3.11)

- structures and components that are relied on during postulated fires (LRA Section 2.3.3.11)

- provide cooling to the control rod drive mechanisms in order to keep coils in the drive mechanisms from gradually degrading (UFSAR Section 9.4.3.4)

On the basis of the intended functions as identified above for the rod drive cooling system, the portions of these systems that were identified by the applicant as within the scope of the LRA include all of the rod drive cooling system safety-related components (electrical, mechanical, and instruments). The applicant described its methodology for identifying the mechanical components subject to an AMR in Section 2.1.2.1 of the LRA. On the basis of this scoping methodology, the applicant identified the portions of the rod drive cooling system that are within scope on the flow diagram listed in Section 2.3.3.11 of the LRA. Using the methodology described in Section 2.1.1 of the LRA, the applicant compiled a list of the mechanical components and component types subject to an AMR that are within the evaluation boundaries highlighted on the flow diagram and identified their intended functions. The applicant provided this list in Table 2.3-17 of the LRA.

Closure bolting, ductwork, fittings, equipment frames, equipment housings, and flexible collars are identified as within the scope of license renewal and subject to an AMR and are listed in Table 2.3-17 of the LRA. The applicant further noted in Table 2.3-17 of the LRA that the rod drive cooling system's intended function is to provide a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered. This pressure boundary function is the only applicable intended function of the rod drive cooling system components that is subject to an AMR.

The applicant evaluated component supports for HVAC ductwork cited in Table 3.5-1 of the LRA. The applicant evaluated electrical components that support the operation of the rod drive cooling system in Section 2.1.2.3 of the LRA. The staff's scoping and screening results for structures are provided in Section 2.4 of this SER. Electrical/I&C scoping and screening results for the rod drive cooling system are provided in Section 2.5 of this SER.

2.3.3.11.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.11 and UFSAR Section 9.4.3 to determine whether there is reasonable assurance that the rod drive cooling system components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that are required by 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

To verify that the applicant identified the components of the rod drive cooling system that are within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1), the staff reviewed the flow diagram listed in Section 2.3.3.11 of the LRA that shows the evaluation boundaries for the highlighted portions of the rod drive cooling system that are within scope and in Table 2.3-17 of the LRA, which lists the mechanical components and the applicable intended functions that are subject to an AMR. The staff also reviewed Section 9.4.3 of the UFSAR to determine if there were any portions of the rod drive cooling system that met the scoping criteria in 10 CFR 54.4(a) but were not identified as within scope. The staff reviewed the UFSAR to determine if there were any safety-related system functions that were not identified as an intended function in the LRA and to determine if there were any structures or components that have an intended function that might have been omitted from the scope of structures or components that require an AMR. The staff compared the functions described in the UFSAR to those identified in the LRA.

Using the scoping and screening methodology described in Section 2.1 of the LRA, the applicant identified the SCs subject to an AMR for the rod drive cooling system and listed them in Table 2.3-17 of the LRA. The staff's evaluation of the scoping and screening methodology is in Section 2.1 of this SER. The staff sampled components subject to an AMR. The staff also sampled SCs that are within the scope of the LRA but are not subject to an AMR. Based on this sample, the staff verified that these SCs perform their intended functions without moving parts or without a change in configuration or properties and are not subject to replacement on the basis of a qualified life or specified time period.

To ensure that those portions of the rod drive cooling system excluded from the scope of license renewal do not perform any intended functions, the staff requested additional information based on a review of the UFSAR and the LRA. The staff noted that Section 2.3.3.11 of the LRA presents a summary description of the system functions and identified a corresponding system flow diagram. The flow diagram highlights the evaluation boundaries, and Table 2.3-17 of the LRA tabulates the components within the scope of license renewal and subject to an AMR for the rod drive cooling system. The corresponding drawings and UFSAR, however, show additional components that were not listed in Table 2.3-17 of the LRA.

The staff noted that the applicant did not identify damper housings, ventilation system passive components, or structural sealants that require an AMR. The scoping and screening determination should consider whether failure of the damper housings, passive components, or structural sealants would result in a failure of the associated active components to perform their intended functions and whether the damper housings, passive components, or structural sealants meet the long-lived and passive criteria as defined in the rule.

In an RAI, the NRC staff noted that ventilation damper housings are not highlighted on ventilation flow diagrams or identified in the LRA as within the scope of license renewal. While ventilation components such as fan housings and cooling coils are highlighted as within the scope of license renewal, ventilation damper housings are not highlighted on the ventilation flow diagrams referenced in the application.

By letter dated April 28, 2003, the applicant provided information stating that ventilation dampers are within the scope of license renewal. The system commodity "Damper Housings" is used to identify damper housings within the scope of license renewal that provide a structural support function. The system commodity "Ductwork" is used to identify damper equipment housings within the scope of license renewal that provide a pressure boundary function. The staff finds this acceptable.

In its April 28, 2003, letter, the applicant stated that system commodity "Ductwork" is also used to identify miscellaneous ductwork components that provide a pressure-retaining function. The licensee stated that ductwork includes ducts, fittings, access doors, equipment housings, flexible collars or connections, and seals.

Access doors, flexible connections, and seals are subject to AMR using the system commodity "Ductwork" grouping for untagged components in HVAC systems. Ductwork test connections are categorized as fittings. Therefore, ductwork test connections are included in the AMR result for the system commodity "Ductwork."

The licensee also stated that turning vanes are within the scope of license renewal and are subject to an AMR. Turning vanes are constructed of the same material as the duct in which they reside and are considered to be a subcomponent of the duct. Therefore, turning vanes are included in the AMR results for ductwork. The staff finds this acceptable.

Some components that are common to many systems, including the rod drive cooling system, have been evaluated separately by the applicant in Section 2.1.2 of the LRA as consumables. The staff notes that the applicant should reference the latest consumable guidance provided in the License Renewal Standard Review Plan, dated April 2001 (NUREG-1800, Table 2.1-3).

In response to RAI 2.1.2-1, by letter dated April 28, 2003, the licensee stated that the evaluation process used to evaluate consumables is consistent with the guidance provided in NUREG-1800, Table 2.1-3. The staff finds this acceptable.

The staff evaluated component supports for piping, cables, and equipment, which are discussed in Section 2.4 of the LRA titled, "Scoping and Screening Results—Structures." In Section 2.5 of this report, the staff evaluated electrical and instrumentation components that support the operation of the rod drive cooling system, which are discussed in Section 2.5 of the LRA titled, "Scoping and Screening Results—Electrical and Instrumentation and Controls (I&C) Systems."

The staff reviewed the LRA, supporting information in the UFSAR, and the applicant's response to RAIs. In addition, the staff sampled several components from the rod drive cooling system flow diagram, as identified in Section 2.3.3.11 of the LRA, to determine whether the applicant properly identified components within the scope of license renewal and subject to an AMR.

2.3.3.11.3 Conclusions

The staff reviewed the LRA and the accompanying scoping boundary drawings to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has appropriately identified the components of the rod drive cooling systems that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has appropriately identified the components of the rod drive cooling systems that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.12 Heating Ventilation and Air Conditioning—Auxiliary Building

2.3.3.12.1 Summary of Technical Information in the Application

The applicant described the HVAC for the auxiliary building in LRA Section 2.3.3.12 and provided a list of components subject to an AMR in LRA Table 2.3-18.

The primary purpose of the auxiliary building HVAC system is to provide heat removal to ensure proper operation of safety-related equipment in the auxiliary building. The system provides clean air to the operating areas of the auxiliary building and filters and exhausts air from the equipment rooms and open areas of the auxiliary building. The auxiliary building HVAC system includes a separate ventilation system for the waste evaporator enclosure on the roof of the building. A separate ventilation supply and exhaust system is provided for each DG room and operates when the DG is operating. Also, the system provides for local cooling of safety-related pump rooms.

An exhaust system consisting of two 100-percent capacity exhaust fans, high-efficiency particulate filters, activated carbon adsorbers, and motor-operated dampers is provided to exhaust air from potentially contaminated areas. During normal plant operation, this system is not operating. On a high-radiation signal, the unit is manually started, thus closing the bypass damper and opening the filter damper. The discharge of this system is connected to the intake of the main exhaust units.

Separate redundant room chillers are located in all rooms containing engineered safeguard features pump motors. These rooms contain the low-head RHR pumps, high-head SI pumps, containment spray pumps, and AFW pumps. When starting any pump in these areas, the room chiller unit in that area will start automatically. These chiller units are automatically sequenced on the EDG power supply in the event of loss of offsite electrical power.

The ventilation for the DG rooms is provided by separate air supply and exhaust systems for each room. During winter operations, a bypass damper is opened to allow recirculated air to be returned from the DG room to the inlet of the supply fan. When starting either or both DGs, the supply and exhaust systems will start automatically. During normal operations with the DGs not operating, ventilation to the rooms is supplied from the auxiliary building supply and exhaust ventilation system.

Two 100-percent capacity exhaust fans are provided to exhaust air from the various areas of the auxiliary building. Prefilters and high-efficiency particulate filters are provided on the outlet of the exhaust fans. The discharge from these units is directed to the plant stack.

Heating steam to coils in the HVAC units is supplied from the auxiliary steam system, and condensate is returned to the same system.

A separate ventilation system is provided for the waste evaporator enclosure on the roof of the auxiliary building. This system consists of a motor-operated outdoor air supply louver, filters, supply and exhaust fans, and an air distribution system. The exhaust fan discharges to the intake of the main exhaust units.

In Section 2.3.3.12 of the LRA, the applicant identified portions of the auxiliary building HVAC system and its SCs that are within the scope of license renewal and subject to an AMR. The applicant noted that the auxiliary building HVAC system is further described in Sections 9.4.4 and 9.4.8 of the UFSAR. The applicant identified the intended functions of the auxiliary building HVAC system based on 10 CFR 54.4(a)(1) and 10 CFR 54.4(a)(3).

Section 2.3.3.12 of the LRA states that the auxiliary building HVAC system contains SCs that are safety related and are relied upon to remain functional during and following design-basis events, SCs that are relied on during postulated fires, and SCs that are part of the EQ Program.

Section 9.4 of the UFSAR states that the auxiliary building HVAC system is designed to remove the normal heat gain from the outdoors, equipment, lighting, and people; replace the normal heat lost to the outdoors; provide adequate ventilation for access requirements; and reduce the concentration of airborne radionuclides, nonradioactive particulate matter, and noxious gases.

On the basis of the intended functions as identified above for the auxiliary building HVAC system, the portions of these systems that were identified by the applicant as within the scope of license renewal include all of the auxiliary building HVAC safety-related components (electrical, mechanical, and instruments). The applicant described its methodology for identifying the mechanical components subject to an AMR in Section 2.1.2.1 of the LRA. On the basis of this scoping methodology, the applicant identified the portions of the auxiliary building HVAC system that are within scope on the flow diagrams listed in Section 2.3.3.12 of the LRA. Using the methodology described in Section 2.1.1 of the LRA, the applicant compiled a list of the mechanical components and component types subject to an AMR that are within the evaluation boundaries highlighted on the flow diagrams and identified their intended functions. The applicant provided this list in Table 2.3-18 of the LRA.

Closure bolting, ductwork, fittings, equipment frames, equipment housings, flexible collars, and heating/cooling coils are the component types identified in Table 2.3-18 of the LRA as within the scope of license renewal and subject to an AMR. The applicant further noted in Table 2.3-18 of the LRA that the auxiliary building HVAC system's intended function is to provide a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered. An additional intended function is for the ductwork and fitting to provide structural support to safety-related components.

The applicant evaluated component supports for HVAC ductwork cited in Table 3.5-1 of the LRA. The applicant evaluated electrical components that support the operation of the auxiliary

building HVAC system in Section 2.1.2.3 of the LRA. The staff's scoping and screening results of structures are provided in Section 2.4 of this SER. Electrical/I&C scoping and screening results of the auxiliary building HVAC system are provided in Section 2.5 of this SER.

2.3.3.12.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.12 and UFSAR Sections 9.4, 9.4.4, and 9.4.8 to determine whether there is reasonable assurance that the auxiliary building HVAC system components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were required by 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

To verify that the applicant identified the components of the auxiliary building HVAC system that are within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1), the staff reviewed both the flow diagrams listed in Section 2.3.3.12 of the LRA that show the evaluation boundaries for the highlighted portions of the auxiliary building HVAC system that are within scope and Table 2.3-18 of the LRA which lists the mechanical components and the applicable intended functions that are subject to an AMR. The staff compared the functions described in the UFSAR to those identified in the LRA.

The applicant identified the SCs subject to an AMR for the auxiliary building HVAC system using the scoping and screening methodology described in Section 2.1 of the LRA and listed them in Table 2.3-18 of the LRA. The staff evaluated the scoping and screening methodology in Section 2.1 of this SER. The staff sampled components subject to an AMR. The staff also sampled the SCs that were within the scope of the LRA but not subject to an AMR. Based on this sample, the staff verified that these SCs performed their intended functions without moving parts or without a change in a configuration or properties and are not subject to replacement on the basis of a qualified life or specified time period.

To ensure that those portions of the auxiliary building HVAC system excluded from the scope of license renewal do not perform any intended functions, the staff requested additional information based on a review of the UFSAR and LRA descriptions. The staff noted that Section 2.3.3.12 of the LRA presents a summary description of the system functions and identified the system flow diagrams. The flow diagrams highlight the evaluation boundaries, and Table 2.3-18 of the LRA tabulates the components that are within scope and subject to an AMR for the auxiliary building HVAC system. The corresponding drawings and the UFSAR, however, show additional components that were not listed in Table 2.3-18 of the LRA.

In response to the staff's RAI, the applicant stated in a letter dated April 28, 2003, that ductwork in the auxiliary building HVAC system is subject to an AMR because it performs an intended function within the license renewal evaluation boundary, as shown on the flow diagram boundary drawings, and it is a passive component not subject to periodic replacement. The applicant also stated that ductwork is presently included in the component/commodity group "Equipment Frames and Housing" in LRA Table 2.3-19. To eliminate any confusion, the component/commodity group "Ductwork and Fittings" has been added to the HVAC control

room area system, and the ductwork will be moved from the “Equipment Frames and Housing” group to the “Ductwork and Fittings” group. The staff finds this acceptable.

The staff noted that the applicant did not identify damper housings, ventilation system passive components, or structural sealants that require an AMR. The scoping and screening determination should consider whether failure of the damper housings, passive components, or structural sealants would result in a failure of the associated active components to perform their intended functions and whether the damper housings, passive components, or structural sealants meet the long-lived and passive criteria as defined in the rule.

The applicant’s response in the April 28, 2003, letter stated that the system commodity “Ductwork” is also used to identify miscellaneous ductwork components that provide a pressure-retaining function. The licensee stated that ductwork includes ducts, fittings, access doors, equipment housings, flexible collars or connections, and seals.

Access doors, flexible connections, and seals were subject to AMR using the system commodity “Ductwork” grouping for untagged components in HVAC systems. Ductwork test connections are categorized as fittings. Therefore, ductwork test connections are included in the AMR result for the system commodity “Ductwork.”

The licensee also stated that turning vanes are within the scope of license renewal and are subject to an AMR. Turning vanes are constructed of the same material as the duct in which they reside and are considered to be a subcomponent of the duct. Therefore, turning vanes are included in the AMR results for ductwork. The staff finds this acceptable.

Some components that are common to many systems, including the auxiliary building HVAC system, have been evaluated separately by the applicant in Section 2.1.2 of the LRA as consumables. The staff noted that the applicant should reference the latest consumable guidance provided in the License Renewal Standard Review Plan, dated April 2001 (NUREG-1800, Table 2.1-3).

In a letter dated April 28, 2003, the licensee stated that the evaluation process used to evaluate consumables is consistent with the guidance provided in NUREG-1800, Table 2.1-3. The staff finds this acceptable.

The staff evaluated component supports for piping, cables, and equipment, which are discussed in Section 2.4 of the LRA titled, “Scoping and Screening Results—Structures.” In Section 2.5 of this report, the staff evaluated electrical and instrumentation components that support the operation of the auxiliary building HVAC system, which are discussed in Section 2.5 of the LRA, titled “Scoping and Screening Results—Electrical and Instrumentation and Controls.”

The staff reviewed the LRA, supporting information in the UFSAR, and the applicant’s response to RAIs. In addition, the staff sampled several components from the auxiliary building HVAC system flow diagram, as identified in Section 2.3.3.12 of the LRA, to determine whether the applicant properly identified the components within scope and subject to an AMR.

2.3.3.12.3 Conclusions

The staff reviewed the LRA and the accompanying scoping boundary drawings to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has appropriately identified the components of the auxiliary building HVAC system that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has appropriately identified the components of the auxiliary building HVAC system that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.13 Heating, Ventilation, and Air Conditioning—Control Room Area

2.3.3.13.1 Summary of Technical Information in the Application

The applicant described the control room area HVAC in LRA Section 2.3.3.13 and provided a list of components subject to an AMR in LRA Table 2.3-19.

The RNP control room area HVAC system consists of an environmental control system and an air cleanup system to serve the control room. The primary purpose of the control room HVAC system is to provide heating, ventilation, cooling, filtration, air intake, and exhaust isolation during normal operation and a DBA.

The control room HVAC comprises two parts, an environmental control system and an air cleanup system. The system is safety related, and redundancy is provided for safety-related active components.

The environmental control system continually operates during normal and emergency conditions. This system consists of redundant 100-percent capacity fans and gravity dampers arranged in parallel and a stainless steel housing containing a medium-efficiency filter and redundant 100-percent capacity direct expansion cooling coils. Redundant 100-percent capacity service water cooled condensing units are provided, one connected by refrigerant piping to each cooling coil. Redundant safety-related equipment and controls are powered from separate safety-related power supplies. The air cleanup system normally operates only during emergency conditions. This system consists of redundant 100-percent capacity fans and gravity dampers arranged in parallel and a stainless steel housing containing a prefilter, a pre-HEPA charcoal adsorber, and post-HEPA filter banks.

The control room air conditioning system consists of a single outside air intake with the connecting duct containing parallel and redundant air-operated control dampers. The control room kitchen and toilet exhaust duct contains redundant air-operated control dampers in series. All air-operated control dampers are designed to fail to safe positions following a loss of IA supply or electric power, and redundancy is provided for single failure protection.

In Section 2.3.3.13 of the LRA, the applicant identified portions of the control room area HVAC system and its SCs that are within the scope of license renewal and subject to an AMR. The applicant noted in Section 2.3.3.13 of the LRA that the control area HVAC system is further

described in Section 9.4.2 of the UFSAR. The applicant identified the following intended functions of the RNP control room area HVAC system based on 10 CFR 54.4(a)(1) and 10 CFR 54.4(a)(3).

Section 2.3.3.13 of the LRA states that the control room area HVAC system contains structures and components that are safety related and are relied upon to remain functional during and following design-basis events and structures and components that are relied on during postulated fires.

Section 9.4.2.1 of the UFSAR states that the control room area HVAC system is designed to perform the following functions:

- maintain the control room at a design temperature within limits, assuring personnel comfort as well as a suitable environment for continuous operation of controls and instrumentation
- detect the introduction of radioactive material into the control room and automatically place the system into the emergency pressurization mode of operation following a safety injection or high-radiation signal
- remove airborne radioactivity from the control room envelope and outside air makeup to the extent that dose to the control room operator following a design-basis accident does not exceed the limit specified in General Design Criterion 19
- be powered by the redundant emergency buses
- remain operable following any single active component failure or following a failure in a single emergency power supply coincident with the loss of offsite power
- meet the seismic Category 1 requirements for all safety-related system components

On the basis of the intended functions identified above for the control room area HVAC system, the portions of these systems that were identified by the applicant as within the scope of the application include all of the control room area HVAC system safety-related components (electrical, mechanical, and instruments). The applicant described its methodology for identifying the mechanical components subject to an AMR in Section 2.1.2.1 of the LRA. On the basis of this scoping methodology, the applicant identified the portions of the control room area HVAC system that are within scope on the flow diagram listed in Section 2.3.3.13 of the LRA. Using the methodology described in Section 2.1.1 of the LRA, the applicant compiled a list of the mechanical components and component types subject to an AMR that are within the evaluation boundaries highlighted on the flow diagram and identified their intended functions. The applicant provided this list in Table 2.3-19 of the LRA.

The component types identified as within the scope of license renewal and subject to an AMR within Table 2.3-19 of the LRA include closure bolting, equipment frames, equipment housings, flexible collars, flow orifices/elements, heating/cooling coils, valves, piping, tubing, and fittings. The applicant noted in Table 2.3-19 of the LRA that the control room area HVAC system intended functions include the pressure-retaining boundary, structural support, heat transfer, and flow restriction functions.

The applicant evaluated component supports for HVAC ductwork cited in Table 3.5-1 of the LRA. The applicant evaluated electrical components that support the operation of the control room area HVAC system in Section 2.1.2.3 of the LRA. The staff's scoping and screening results for structures are provided in Section 2.4 of this SER. Electrical/I&C scoping and screening results for the control room area HVAC system are provided in Section 2.5 of this SER.

2.3.3.13.2 Staff Evaluation

The staff reviewed LRA Section 2.3.13 and UFSAR Section 9.4.2 to determine whether there is reasonable assurance that the control room area HVAC components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were required by 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

To verify that the applicant identified the components of the control room area HVAC system that are within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1), the staff reviewed the flow diagram listed in Section 2.3.3.13 of the LRA that shows the evaluation boundaries for the highlighted portions of the control room area HVAC system that are within scope and Table 2.3-19 of the LRA, which lists the mechanical components and the applicable intended functions that are subject to an AMR. The staff also reviewed Section 9.4.2 of the UFSAR to determine if there were any portions of the control room area HVAC system that met the scoping criteria in 10 CFR 54.4(a) but were not identified as within the scope. The staff reviewed the UFSAR also to determine if there were any safety-related system functions that were not identified as an intended function in the LRA and to determine if there were any structures or components that have an intended function that might have been omitted from the scope of structures or components that require an AMR. The staff compared the functions described in the UFSAR to those identified in the LRA.

The applicant identified the SCs subject to an AMR for the control room area HVAC system using the scoping and screening methodology described in Section 2.1 of the LRA and listed them in Table 2.3-19 of the LRA. The staff evaluated the scoping and screening methodology in Section 2.1 of this SER. The staff sampled components subject to an AMR. The staff also sampled the SCs that were within the scope of the LRA but not subject to an AMR. Based on this sample, the staff verified that these SCs performed their intended functions without moving parts or without a change in configuration or properties and are not subject to replacement on the basis of a qualified life or specified time period.

To ensure that those portions of the control room area HVAC system excluded from the scope of license renewal do not perform any intended functions, the staff requested additional information based on a review of the UFSAR and LRA descriptions. The staff noted that Section 2.3.3.13 of the LRA presents a summary description of the system functions and identified a corresponding system flow diagram. The flow diagram highlights the evaluation

boundaries, and Table 2.3-19 of the LRA tabulates the components within scope and subject to an AMR for the control room area HVAC system. The corresponding drawings and UFSAR, however, show additional components that were not listed in Table 2.3-19 of the LRA.

In an RAI, the NRC staff stated that the ventilation systems used to support use of the safe shutdown controls have not been included as part of the scoping and screening process. In a letter dated April 28, 2003, the applicant stated that RAB HVAC and control room HVAC systems are in scope for license renewal and are relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the Commission's regulations for fire protection. The applicant further stated that plant shutdown from the safe shutdown controls is accomplished as described in UFSAR Section 7.4.1.1 and UFSAR Appendix 9.5.1A. Section III.G of 10 CFR 50 Appendix R, "Safe Shutdown Components/Cable Separation Analysis," documents the evaluation performed for the Appendix R ventilation support function and the acceptability of existing analyses that demonstrate that safe shutdown requirements can be satisfied.

The applicant also stated that no other ventilation systems support the use of the safe shutdown controls. Safe shutdown control panels in the turbine building do not need HVAC because of the open design of the turbine building. Therefore, ventilation systems used to support the safe shutdown controls are in the scope of license renewal and subject to an AMR. The staff finds this acceptable.

The staff noted that the applicant did not identify damper housings, ductwork, ventilation system passive components, or structural sealants that require an AMR. The scoping and screening determination should consider whether failure of the damper housings, ductwork, passive components, or structural sealants would result in a failure of the associated active components to perform their intended functions and whether the damper housings, ductwork, passive components, or structural sealants meet the long-lived and passive criteria as defined in the rule. The applicant's response in the April 28, 2003, letter stated that system commodity "Ductwork" is also used to identify miscellaneous ductwork components that provide a pressure-retaining function. The licensee stated that ductwork includes ducts, fittings, access doors, equipment housings, flexible collars or connections, and seals.

Access doors, flexible connections, and seals were subject to AMR using the system commodity "Ductwork" grouping for untagged components in HVAC systems. Ductwork test connections are categorized as fittings. Therefore, ductwork test connections are included in the aging management review results for the system commodity "Ductwork."

The licensee also stated that turning vanes are within the scope of license renewal and are subject to an AMR. Turning vanes are constructed of the same material as the duct in which they reside and are considered to be a subcomponent of the duct. Therefore, turning vanes are included in the AMR results for ductwork. The staff finds this acceptable.

Some components that are common to many systems, including the control room area HVAC system, have been evaluated separately by the applicant in Section 2.1.2 of the LRA as consumables. The staff noted that the applicant should reference the latest consumable guidance provided in the License Renewal Standard Review Plan, dated April 2001 (NUREG-1800, Table 2.1-3).

In a letter dated April 28, 2003, the licensee stated that the evaluation process used to evaluate consumables is consistent with the guidance provided in NUREG-1800, Table 2.1-3. The staff finds this acceptable.

The staff evaluated component support for piping, cables, and equipment, which are discussed in Section 2.4 of the LRA, titled "Scoping and Screening Results—Structures." In Section 2.5 of this report, the staff evaluated electrical and instrumentation components that support the operation of the control room area HVAC system, which are discussed in Section 2.5 of the LRA, titled "Scoping and Screening Results—Electrical and Instrumentation and Controls."

The staff reviewed the LRA, supporting information in the UFSAR, and the applicant's response to RAIs. In addition, the staff sampled several components from the control room area HVAC system flow diagram as identified in Section 2.3.3.13 of the LRA to determine whether the applicant properly identified the components within scope and subject to an AMR.

2.3.3.13.3 Conclusions

The staff reviewed the LRA and the accompanying scoping boundary drawings to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has appropriately identified the components of the control room area HVAC systems that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has appropriately identified the components of the control room area HVAC systems that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.14 Heating, Ventilation, and Air Conditioning—Fuel Handling Building

2.3.3.14.1 Summary of Technical Information in the Application

The applicant describes the HVAC system for the fuel handling building (FHB) in LRA Section 2.3.3.14 and provides a list of components subject to an AMR in LRA Table 2.3-20.

The FHB HVAC system provides ventilation and heat removal for the fuel handling building. The primary purpose of the FHB HVAC system is to provide clean air to the operating areas of the building and then filter and exhaust air from both the equipment rooms and open areas of the building.

Ventilation and cooling of the various areas in the FHB are accomplished with a continuous supply of treated outdoor air from two supply air units to various areas within the building, inter area air transfer from areas of lower contamination to areas of higher contamination, and three independent air exhaust systems.

The ventilation air supply system consists of two air handling units. Each air handling unit consists of prefilters, steam heating coils, and a centrifugal fan enclosed by a sheet metal casing. The air intake of these units is connected to dampered outdoor air louvers, and the

supply air is discharged into an air distribution system. The direction of air flow is always from areas of lower contamination to areas of higher contamination.

In Section 2.3.3.14 of the LRA the applicant identified portions of the FHB HVAC system and its SCs that are within the scope of license renewal and subject to an AMR. The applicant noted in Section 2.3.3.14 of the LRA that the FHB HVAC system is further described in Section 9.4.5 of the RNP UFSAR. The applicant identified the following intended functions of the FHB HVAC system based on 10 CFR 54.4(a)(1) and 10 CFR 54.4(a)(2):

- structures and components that are safety related and are relied upon to remain functional during and following design-basis events (LRA Section 2.3.3.14)

- structures and components that are relied on during postulated fires, (LRA Section 2.3.3.11)

- provide ventilation and cooling of the various areas in the fuel handling building, (UFSAR Section 9.4.3.4)

On the basis of the intended functions identified above for the FHB HVAC system, the portions of the system that were identified by the applicant as within the scope of the application include all of the system safety-related components (electrical, mechanical, and instruments). The applicant described its methodology for identifying the mechanical components subject to an AMR in Section 2.1.2.1 of the LRA. On the basis of this scoping methodology, the applicant identified the portions of the system that are within scope on the flow diagram listed in Section 2.3.3.14 of the LRA. Using the methodology described in Section 2.1.1 of the LRA, the applicant compiled a list of the mechanical components and component types subject to an AMR that are within the evaluation boundaries highlighted on the flow diagram and identified their intended functions. The applicant provided this list in Table 2.3-20 of the LRA.

The component types identified as within the scope of license renewal and subject to an AMR and listed in Table 2.3-20 of the LRA include closure bolting, ductwork, fittings, equipment frames, equipment housings, and flexible collars. The applicant further noted in Table 2.3-20 of the LRA that the FHB HVAC system intended functions are to provide a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered and to provide structural support to safety-related components.

The applicant evaluated component supports for HVAC ductwork cited in Table 3.5-1 of the LRA. The applicant evaluated electrical components that support the operation of the FHB HVAC system in Section 2.1.2.3 of the LRA. The staff's scoping and screening results for structures are provided in Section 2.4 of this SER. Scoping and screening results for electrical/I&C for the FHB HVAC system are provided in Section 2.5 of this SER.

2.3.3.14.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.14 and UFSAR Sections 9.4.1 and 9.4.5 to determine whether there is reasonable assurance that the FHB HVAC system components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of its review, the staff selected system functions described in the UFSAR that are required by 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

To verify that the applicant identified the components of the FHB HVAC system that are within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1), the staff reviewed the flow diagram listed in Section 2.3.3.14 of the LRA that shows the evaluation boundaries for the highlighted portions of the FHB HVAC system that are within scope and Table 2.3-14 of the LRA, which lists the mechanical components and the applicable intended functions that are subject to an AMR. The staff also reviewed Section 9.4.5 of the UFSAR to determine if there were any portions of the FHB HVAC system that met the scoping criteria in 10 CFR 54.4(a) but were not identified as within the scope. The staff also reviewed the UFSAR to determine if there were any safety-related system functions that were not identified as an intended function in the LRA to determine if there were any structures or components that have an intended function that might have been omitted from the scope of structures or components that require an AMR. The staff compared the functions described in the UFSAR to those identified in the LRA.

The applicant identified the SCs subject to an AMR for the FHB HVAC system using the scoping and screening methodology described in Section 2.1 of the LRA and listed them in Table 2.3-20 of the LRA. The staff evaluated the scoping and screening methodology in Section 2.1 of this SER. The staff sampled components subject to an AMR. The staff also sampled the SCs that were within the scope of the LRA but not subject to an AMR. Based on this sample, the staff verified that these SCs performed their intended functions without moving parts or without a change in configuration or properties and are not subject to replacement on the basis of a qualified life or specified time period.

To ensure that those portions of the FHB HVAC system excluded from the scope of license renewal do not perform any intended functions, the staff requested additional information based on a review of the UFSAR and LRA descriptions. The staff noted that Section 2.3.3.14 of the LRA presents a summary description of the system functions and identified a corresponding system flow diagram. The flow diagram highlights the evaluation boundaries, and Table 2.3-20 of the LRA tabulates the components within scope and subject to an AMR for the FHB HVAC system. The corresponding drawings and UFSAR, however, show additional components that were not listed in Table 2.3-20 of the LRA.

An NRC staff RAI stated that fans HVE-14, HVE-15, and HVE-21 and their associated ductwork, fan housing, filters, and components are excluded from the scope of license renewal and that the applicant should state whether these fans and their associated components are subject to an AMR. In response, by letter dated April 28, 2003, the applicant stated that the identified fans and their associated components are not subject to an AMR because the components do not perform a license renewal intended function. The intended function for the FHB HVAC system is to mitigate the consequences of a fuel handling accident inside the FHB to ensure that radioactive releases do not result in offsite exposures greater than the guidelines provided by 10 CFR Part 100. The listed components are not required to accomplish the intended function. The staff finds this acceptable.

The staff noted that the applicant did not identify damper housings, ventilation system passive components, or structural sealants that require an AMR. The scoping and screening determination should consider whether failure of the damper housings, passive components, or structural sealants would result in a failure of the associated active components to perform their intended functions and whether the damper housings, passive components, or structural sealants meet the long-lived and passive criteria as defined in the Rule.

By letter dated April 28, 2003, the applicant provided information stating that ventilation dampers are within the scope of license renewal. The system commodity "Damper Housings" is used to identify damper housings within the scope of license renewal that provide a structural support function. The system commodity "Ductwork" is used to identify damper equipment housings within the scope of license renewal that provide a pressure boundary function.

The applicant, in its April 28, 2003, letter, stated that system commodity "Ductwork" is also used to identify miscellaneous ductwork components that provide a pressure-retaining function. The licensee stated that ductwork includes ducts, fittings, access doors, equipment housings, flexible collars or connections, and seals.

Access doors, flexible connections, and seals were subject to AMR using the system commodity "Ductwork" grouping for untagged components in HVAC systems. Ductwork test connections are categorized as fittings. Therefore, ductwork test connections are included in the aging management review result for the system commodity "Ductwork."

The licensee also stated that turning vanes are within the scope of license renewal and are subject to an AMR. Turning vanes are constructed of the same material as the duct in which they reside and are considered to be a subcomponent of the duct. Therefore, turning vanes are included in the AMR results for ductwork. The staff finds this acceptable.

Some components that are common to many systems, including the fuel handling building HVAC system, have been evaluated separately by the applicant in Section 2.1.2 of the LRA as consumables. The staff noted that the applicant should reference the latest consumable guidance provided in the License Renewal Standard Review Plan, dated April 2001 (Reference: NUREG-1800, Table 2.1-3).

In a letter dated April 28, 2003, the licensee stated that the evaluation process used to evaluate consumables is consistent with the guidance provided in NUREG-1800, Table 2.1-3. The staff finds this acceptable.

The staff evaluated component supports for piping, cables, and equipment, which are discussed in Section 2.4 of the LRA titled, "Scoping and Screening Results—Structures." In Section 2.5 of this report the staff evaluated electrical and instrumentation components that support the operation of the fuel handling building HVAC system, which are discussed in Section 2.5 of the LRA titled, "Scoping and Screening Results—Electrical and Instrumentation and Controls (I&C) Systems."

The staff reviewed the LRA, supporting information in the UFSAR, and the applicant's response to RAIs. In addition, the staff sampled several components from the fuel handling building HVAC system flow diagram, as identified in Section 2.3.3.14 of the LRA, to determine whether the applicant properly identified the components within scope and subject to an AMR.

2.3.3.14.3 Conclusions

The staff reviewed the LRA and the accompanying scoping boundary drawings to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has appropriately identified the components of the FHB HVAC system that are within the scope of license renewal, as required by 10 CFR 54.4 (a), and that the applicant has appropriately identified the components of the FHB HVAC system that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.15 Fire Protection System

2.3.3.15.1 Summary of Technical Information in the Application

The applicant describes the FP systems in LRA Section 2.3.3.15, "Fire Protection System," and provides a list of components subject to an AMR in LRA Table 2.3-21.

In LRA Section 2.3.3.15, the applicant identifies the SCs at RNP that support either FP design or safe shutdown following a fire that are considered within the scope of license renewal in accordance with 10 CFR 54.4(a)(3) and subject to an AMR. In LRA Section 2.3.3.15, the applicant identifies and describes the systems and components that are within the scope of license renewal. The applicant also describes the criteria for including the FP system in the scope of license renewal and its methodology for including components in the LRA. LRA Table 2.3-21 lists the components and commodities that have been identified by the applicant as requiring AMR. LRA Tables 3.3-1 and 3.3-2 include the aging management evaluations.

During preliminary discussions with the applicant, the staff determined that additional information regarding the fire suppression systems (system drawings and system descriptions) should be included in the application. The applicant responded in a letter dated August 14, 2002, with the additional information requested. By letter dated October 23, 2002, the applicant responded to the draft interim staff guidance (ISG-04) regarding aging management of FP systems for license renewal (ADAMS Accession No. ML023440137).

By letter dated February 11, 2003, the staff issued the final RAI letter regarding FP SCs, which is discussed in Section 2.3.3.15.2. By letter dated April 28, 2003, the applicant responded to that RAI. By letter dated June 13, 2003, the applicant provided supplemental information regarding the LRA.

According to 10 CFR 54.4(a)(3), all SSCs relied upon in safety analyses or plant evaluation to perform a function that demonstrates compliance with the Commission's regulations in 10 CFR 50.48, "Fire Protection," must be included within the scope of license renewal. As required by 10 CFR 50.48, the applicant must implement and maintain an FP program. The applicant used its Passport Equipment Database, UFSAR Section 9.5.1, UFSAR Appendices 9.5.1A, 9.5.1B, and 9.5.1C, design drawings, and component databases to determine the SSCs relied on for FP to meet 10 CFR 54.4(a)(3).

In Section 2.1.1.3.1 of the LRA, the applicant identifies the methodology for including SSCs in the LRA.

The purpose of the FP system is to protect plant equipment in the event of a fire to ensure safe plant shutdown and minimize the risk of a radioactive release to the environment. The FP systems consist of fire suppression systems (water, Halon 1301, carbon dioxide (CO_2) and portable extinguishers), fire detection systems, and fire barrier systems.

The fire water supply system has fire pumps that draw water from Lake Robinson. A pressure maintenance pump (jockey pump) provides normal pressurization to the fire water supply system. The fire water supply system feeds fixed manual suppression systems, such as hydrants and fire hose stations, and wet pipe, deluge, and preaction sprinkler systems throughout the RNP. The manual hose stations serve as backup protection in areas where automatic suppression (water based or gaseous) is installed. Gaseous FP systems (Halon 1301 and CO_2) are installed in areas where non-water-based fire suppressant agents are preferred. Portable extinguishers are provided at strategic locations throughout the plant as described in the fire hazards analysis (FHA) portion of the UFSAR.

The fire detection system continuously monitors for the presence of fire, promptly alarms in the event of a fire, actuates certain automatic fixed FP systems, and, in some areas, provides auxiliary functions such as closing ventilation system dampers. Smoke, heat, and flame fire detection devices are located throughout the plant. Local fire alarm panels will alarm and indicate the affected fire detection zone. Also, the alarms will be received in the control room and be displayed in the control room and/or the control room vestibule.

Fire barriers are used at RNP to divide buildings into fire zones and fire areas to prevent fire propagation. Barriers, such as walls, ceilings, floors, doors, dampers, and penetration seals, are installed to limit fire propagation from area to area. Other features limit fire propagation and control damage. These features are radiant energy shields, curbs, dikes, and flame-retardant coatings.

On the basis of the methodology described above, the applicant identifies the highlighted portions of the flow diagrams, “License Renewal Boundary Drawings,” which were provided with the August 14, 2002, letter, as the boundaries of the portions of the FP water-based system that are included within the scope of license renewal. Non-water-based FP systems were not provided on boundary drawings; rather, they were included in system descriptions that were also provided in the August 14, 2002, letter.

In LRA Section 2.3.3.15, the applicant identifies the following FP system components as within the scope of license renewal and subject to an AMR:

- closure bolting
- diesel-driven and motor-driven fire pumps
- ductwork and fittings
- fire hydrants
- flow orifices and elements
- jockey pump
- sprinklers
- valves, piping, tubing, and fittings

The intended functions of the FP mechanical components identified by the applicant are pressure boundary integrity, structural support, flow restriction (throttle), and filtration. In LRA Table 2.3-21, the applicant lists the mechanical components and their respective intended functions.

2.3.3.15.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.15, UFSAR Section 9.5.1, and UFSAR Section 9.5.1 Appendices A, B, and C, to determine whether there is reasonable assurance that the fire protection system components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted. Commitments to 10 CFR Part 50, Appendix R, are described in the UFSAR. The staff sampled portions of the UFSAR to identify any additional FP system function that meets the scoping requirements of 10 CFR 54.4 but was not identified as an intended function in the LRA.

The staff also reviewed the SER referenced for the FP program, which was listed directly in the RNP license condition. This SER summarizes the FP program and commitments made to meet 10 CFR 50.48 using the guidelines of Appendix A to Branch Technical Position (BTP) Auxiliary Power Conversion Systems Branch (APCSB) 9.5-1. The staff sampled portions of this SER to verify that the functions of the FP components relied upon to satisfy the provisions of Appendix A to BTP APCSB 9.5-1 were included within the scope of license renewal as intended functions in the LRA.

The FP system is within the scope of license renewal, as described in LRA Section 2.3.3.15, because it contains the following types of components:

- SCs that are safety related and are relied upon to remain functional during and following design-basis events
- SCs that are not safety related but whose failure could prevent satisfactory accomplishment of the safety-related functions
- SCs that are part of the Environmental Qualification Program
- SCs that are relied on during postulated fires

In LRA Section 2.3.3.15, the applicant states that flow diagrams were not prepared to show the evaluation boundaries for the portions of the FP system that are within the scope of license renewal. The applicant scoped the FP systems by using plant documents and functional classifications in the equipment databases. The plant documents were not provided in the application. Flow diagrams were provided for the fuel oil system as described in LRA Section 2.3.3.19. The staff questioned the lack of review material during preliminary discussions, and the applicant, in a letter sent August 14, 2002, delivered FP boundary

drawings for the water systems, consisting of the flow diagrams for the FP systems highlighted to show the portions of this system that are within the scope of license renewal. For the nonwater FP systems, lists of relevant portions of the equipment database and system descriptions were provided for staff review.

The safe shutdown equipment required for compliance with 10 CFR Part 50, Appendix R, was screened with its respective systems and therefore is not addressed in this section of the LRA. A sampling review of the equipment listed in UFSAR Section 9.5.1C, “Safe Shutdown Analysis,” did not identify any SSCs missing from scoping.

The staff sampled portions of the applicant’s UFSAR Section 9.5.1, “Fire Protection System,” and Appendices 9.5.1A, “Fire Hazards Analysis,” 9.5.1B, “Fire Protection Program Description and Review Per Appendix A to BTP APCSB 9.5-1," and 9.5.1C, “Safe-Shutdown Analysis,” which contains plant commitments and safety evaluations that form the basis of the FP program at RNP. The staff then compared a sample of the FP systems and components identified within the UFSAR to the FP system flow diagrams and equipment lists to verify that required components were identified within the evaluation boundaries of the flow diagram or included in equipment lists and were not excluded from the scope of license renewal.

The staff also compared SSCs identified in the NRC-approved SER, which documents the applicant’s compliance with provisions of Appendix A to BTP APCSB 9.5-1, “Fire Protection for Nuclear Power Plants,” to the FP system flow diagrams to verify if portions of the FP system were inadvertently excluded from within the scope of license renewal.

In Appendix 9.5.1B of the UFSAR, the applicant provides a discussion of its “compliance with the intent” of Appendix A to BTP APCSB 9.5-1. Since RNP was licensed prior to 1979, Section III.G, III.J, and III.L of 10 CFR Part 50, Appendix R, also apply. The UFSAR contains the analysis to demonstrate compliance with 10 CFR Part 50, Appendix R, and with Appendix A to BTP APCSB 9.5-1.

The applicant has committed to meet the guidelines provided in Attachment 6, “Quality Assurance,” of the August 4, 1977, NRC letter titled “Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls and Quality Assurance.” The quality assurance program at RNP for FP systems is in effect as described in UFSAR Section 17, as outlined in the CP&L Corporate Quality Assurance Manual.

The staff reviewed the applicant’s submittal and the UFSAR to verify that required components of the FP systems were included within the scope of license renewal and subject to an AMR, in accordance with 10 CFR 54.4 and 54.21(a)(1).

In a letter dated February 11, 2003, the staff transmitted the final RAI letter to the applicant regarding the exclusion from the LRA of some FP components that either are part of the plant’s CLB or required to demonstrate compliance with 10 CFR 50.48.

During a meeting on October 24, 2002, the applicant clarified that the jockey fire pump, as listed in LRA Table 2.3-21, is the fire water booster pump as shown on drawing HBR2-8255LR, sheet 1.

In a letter dated April 28, 2003, in response to RAI 2.3.3.15-1, the applicant clarified that fire hose is considered to be a consumable, consistent with other consumables listed after LRA Table 2.3-21. The applicant will replace fire hoses in accordance with National Fire Protection Association (NFPA) guidance.

In response to RAI 2.3.3.15-2, the applicant provides a basis for the exclusion of the Unit 1 fire water loop from the scope of license renewal. The explanation that although the Unit 1 fire water loop is available as a viable backup to the Unit 2 fire water pumps and the 1978 SER described the availability of this backup function, the applicant concludes that the Unit 1 system is not required to comply with NRC FP regulations. The staff has reviewed the applicant's basis and considers the fire water system compliant with the regulation without the Unit 1 fire water loop, and therefore finds acceptable the exclusion of the Unit 1 fire water loop from scope.

In response to RAI 2.3.3.15-3, the applicant provides a basis for the exclusion of selected turbine building local application fire suppression systems from the LRA scope. In its RAI response, the applicant confirms that dedicated shutdown (DS) cables are routed on the outside of the turbine building. The applicant explains that even with the loss of the turbine building or transformer yard, the motor-driven AFW pumps and sufficient power distribution would remain available to safely shut down the plant. The staff has reviewed the applicant's basis for excluding these water suppression systems and, based on the RAI response, concurs that these systems predate the safe shutdown systems (i.e., the excluded systems were installed for insurance purposes only). The applicant's letter of June 13, 2003, provides additional information regarding this item. In the letter the applicant states that the fire hydrants are credited with protecting the dedicated shutdown cables and that the hydrants are within the scope of license renewal. Therefore, the staff finds that excluding these systems from scope is acceptable.

In response to RAI 2.3.3.15-4, the applicant clarified that the concrete barrier separation between RHR pumps in the RHR pit is included as a "Civil Concrete" commodity in LRA Table 3.5-1, Item 16.

Regarding RAI 2.3.3.15-5, during a meeting on May 20, 2003, the staff explained a concern about the applicant's ability to identify and isolate a leak prior to excessive water discharge due to an aging-related failure. By letter dated June 13, 2003, the applicant agreed to include the piping to the closed valve within the scope of license renewal for FP systems at or around the power block, including the spent fuel pit area and transformer area. For the FP for other site buildings, the applicant has expanded the scoping boundaries such that the boundaries are at the site building. The applicant provides four points to support this position. First, relatively large bore piping will be included within scope. Second, significant leakage would be identified since the site buildings are subject to ongoing observation. Third, leakage would be readily detected and resolved. Fourth, system design does not always provide an easily identified valve for isolation. The staff has reviewed this analysis and considers that this approach, flagging the license renewal boundaries at closed valves in the power block and at the entrance to the structure for site buildings, would quickly identify and isolate a leak. Therefore, the staff finds the resolution of this RAI acceptable.

In response to RAI 2.3.3.15-6, the applicant clarifies that Halon 1301 fire extinguishing agent cylinder assemblies are included in LRA Table 2.3-21, as part of the "Valves, Piping and

Fittings" commodity group, and therefore were subject to an AMR as described in LRA Table 3.3-2, Item 19.

In response to RAI 2.3.3.15-7, the applicant clarified that CO_2 cylinders used to store CO_2 for FP systems are included in LRA Table 2.3-21, in the component/commodity group of "Valves, Piping and Fittings." The aging management of these cylinders is consistent with the aging management for similar materials.

In response to RAI 2.3.3.15-8, the applicant identified that the CO_2 system's heat actuated devices (HADs) were not presently identified in the LRA. The applicant applied its screening criteria to the tubing related to the HADs and determined that the tubing will be considered within the scope of license renewal and subject to an AMR. The staff has reviewed the scoping and AMR and finds it acceptable.

In response to RAI 2.3.3.15-9, the applicant confirms that both the electric and diesel power fire pumps have strainers. Although these nonferrous strainers were initially excluded from aging management since the applicant considered them part of the pump, upon further review, these strainers have been accorded the "provides filtration" intended function and will be managed against the effects of aging. The management shall include periodic removal, refurbishment, and replacement as specified by the RNP Preventive Maintenance Aging Management Program (PMAMP). The staff has reviewed the response to RAI 2.3.3.15-9, and since the strainers will be added to the scope of license renewal and shall be inspected under the PMAMP, the staff finds this acceptable.

In response to RAI 2.3.3.15-10, the applicant states that the flame-retardant coatings have been added to the license renewal scope and the AMR has been updated to evaluate flame-retardant coatings. The aging effect, "loss of material due to flaking," will be monitored through the PMAMP. The applicant clarified in the letter dated June 13, 2003, that cables inside containment in the cable penetration area were not coated and instead a suppression system was installed (see the letter dated January 28, 1980, from E.E. Utley to A. Schwencer (Public Legacy Library No. 8001310299). The staff has evaluated the addition of flame-retardant coating to the scope of license renewal and the AMP and finds this acceptable.

In response to RAI 2.3.3-15-11, the applicant referred to the fact that the fire protective wrap for the fuel oil makeup line is no longer credited. The applicant further clarified that the 3-hour barrier for the "B" diesel generator service water line is included within the scope of license renewal as part of LRA Tables 2.4-2 and 2.4-3, and the AMR results are included in LRA Table 3.3-1,
Item 19.

After the staff determined which SCs were within the scope of license renewal, the staff determined whether the applicant properly selected the components subject to an AMR from among those identified as being within the scope of license renewal. The staff reviewed selected components that the applicant had identified as being within the scope of license renewal to verify that the applicant had identified these components as subject to an AMR if they perform intended functions without moving parts or without a change in configuration or properties and are not subject to replacement on the basis of a qualified life or specified time period. The staff did not identify any other omissions of passive and long-lived components that are required for 10 CFR 50.48 compliance.

2.3.3.15.3 Conclusions

The staff reviewed the LRA and the accompanying scoping boundary drawings to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the FP system that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the FP system that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.16 Diesel Generator System

2.3.3.16.1 Summary of Technical Information in the Application

The applicant describes the diesel generator system (DGS) in LRA Section 2.3.3.16 and provides a list of components subject to an AMR in LRA Table 2.3-22.

The DGS provides AC power to the onsite electrical distribution system for plant shutdown. The DGS comprises two diesel generators and seven support systems necessary for proper operation of the diesel generators. These support systems consist of the starting air, the lube oil, the jacket water cooling, the scavenging air, the scavenging air cooling, the diesel engine fuel oil, and the diesel exhaust subsystems.

In LRA Table 2.3-22, the applicant identified the following components from the DGS as being within the scope of license renewal and subject to an AMR (1) after coolant heat exchangers shell, shell and waterbox cover, tube sheet, tubing, waterbox, and waterbox cover, (2) jacket water and after coolant regulators body/bonnet, (3) jacket water heat exchangers shell, shell and waterbox cover, tube sheet, tubing, waterbox, and waterbox cover, (4) jacket water standby heater shell, (5) lube oil heat exchangers tube sheet, tubing, waterbox, water box cover, shell, shell and water box cover, filters, heaters shell, strainers, and recirculation standby pump, (6) standby circulating coolant pump, (7) main bearing oil booster regulators body/bonnet, (8) air supply regulators to jacking gear body/bonnet, (9) pre lube oil pump, (10) air exhaust silencer, (11) air intake silencer filters, (12) air start strainers, (13) air receiver tanks, (14) jacket water expansion tanks, (15) flow orifices elements, (16) starting air compressor unloaders regulator body/bonnet, and (17) valves, piping, tubing, and fittings.

The applicant stated that the intended function common to all components is to provide pressure-retaining boundary so that sufficient flow at adequate pressure is delivered. Other intended functions, as stated, are to provide heat transfer (after coolant, jacket water, and lube oil heat exchanger tubing); filtration (lube oil strainers, air start strainers, valves, piping, tubing, and fittings); structural support to safety-related components (air exhaust silencer, air intake silencer filters, starting air compressor, unloaders, regulator body/bonnet, valves, piping, tubing, and fittings); and flow restriction (flow orifices/elements).

2.3.3.16.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.16 and UFSAR Section 8.3.1.1.5 to determine whether there is reasonable assurance that the DGS components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

The staff's review of the applicant's scoping results did not identify the omission of any components needed to support the performance of the DGS's intended functions. The staff also found that the applicant adequately identified in LRA Table 2.3-22 those long-lived, passive components of the DGS considered to be within the scope of license renewal.

2.3.3.16.3 Conclusions

The staff reviewed the LRA and the accompanying scoping boundary drawings to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the DGS that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the DGS that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.17 Dedicated Shutdown Diesel Generator

2.3.3.17.1 Summary of Technical Information in the Application

The applicant describes the dedicated shutdown diesel generator (DSDG) in LRA Section 2.3.3.17 and provides a list of components subject to an AMR in LRA Table 2.3-23.

The DSDG is relied on during postulated fires and also serves as the alternate alternating current supply during a station blackout.

In Table 2.3-23, the applicant identified the following components from the DSDG as being within the scope of license renewal and subject to an AMR (1) air exhaust silencer, (2) air vacuum box filter, (3) air volume tank, (4) expansion tank, (5) immersion heater, (6) lube oil circulating pump, cooler shell, cooler tubing and channels, cooler channel and shell, cooler tubing and fins, filter, and strainer, (7) radiator tubing and water box, (8) soak back oil filter, (9) turbo charger oil filter and soak back pump, (10) air compressor filter, (11) duct work and fittings, and (12) valves, piping, tubing, and fittings.

The applicant stated that the intended function common to all components is to provide pressure-retaining boundary so that sufficient flow at adequate pressure is delivered. Other intended functions of selected components are, as stated, to provide filtration (lube oil strainer), heat transfer (lube oil cooler tubing and channels, lube oil cooler tubing and fins, and radiator

tubing), flow restriction and structural support to safety-related components (valves, piping, tubing, and fittings).

2.3.3.17.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.17 and UFSAR Section 8.3.1.1.2 to determine whether there is reasonable assurance that the DSDG components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

The staff's review of the applicant's scoping results did not identify the omission of any components needed to support the performance of the DSDGs intended functions. The staff also found that the applicant adequately identified in LRA Table 2.3-23 those long-lived, passive components of the DSDG considered to be within the scope of license renewal.

2.3.3.17.3 Conclusions

The staff reviewed the LRA and the accompanying scoping boundary drawings to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the DSDG that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the DSDG that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.18 Emergency Operations Facility/Technical Support Center (EOF/TSC) Security Diesel Generator

2.3.3.18.1 Summary of Technical Information in the Application

The applicant describes the Emergency Operations Facility/Technical Support Center (EOF/TSC) security diesel generator in LRA Section 2.3.3.18 and provides a list of components subject to an AMR in LRA Table 2.3-24.

The EOF/TSC security diesel generator provides backup electrical power to the EOF/TSC building and security systems upon loss of the normal power supplies.

In LRA table 2.3-24, the applicant identified the following components from the EOF/TFC security diesel generator as being within the scope of license renewal and subject to an AMR (1) ductwork and fittings, (2) intake filters, (3) exhaust silencer, (4) jacket water immersion heater, (5) radiator, and (6) valves, piping, tubing and fittings.

The applicant stated that the intended function common to all components listed above, with the exception of the intake filters, is to provide pressure-retaining boundary so that sufficient flow at adequate pressure is delivered. Other intended functions of components are, as stated, to provide filtration (intake filter) and heat transfer (radiator).

2.3.3.18.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.18 to determine whether there is reasonable assurance that the EOF/TSC security diesel generator components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

The staff's review of the applicant's scoping results did not identify the omission of any components needed to support the performance of the EOF/TSC security diesel generator's intended functions. The staff also found that the applicant adequately identified in LRA Table 2.3-24 those long-lived, passive components of the EOF/TSC security diesel generator system considered to be within the scope of license renewal.

2.3.3.18.3 Conclusions

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the EOF/TSC security diesel generator that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the EOF/TSC security diesel generator that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.19 Fuel Oil System

2.3.3.19.1 Summary of Technical Information in the Application

The applicant describes the fuel oil system (FOS) in LRA Section 2.3.3.19 and provides a list of components subject to an AMR in LRA Table 2.3-25.

The FOS supplies fuel oil to the emergency diesel engines, the dedicated shutdown diesel engine, and the diesel engine-driven fire pump from fuel oil storage tanks on site. The fuel oil system also provides fuel oil to the EOF/TSC security diesel generator.

In LRA Table 2.3-25, the applicant identified the FOS components/commodities requiring aging management review (AMR), their intended functions, and provided a reference to the results of the AMR for each component/commodity type.

In the referred table, the applicant identified the following components from the FOS as being within the scope of license renewal and subject to an AMR (1) diesel generator fire pump fuel oil tank and oil storage tank vent filter, (2) dedicated shutdown diesel generator fuel oil day tank, fuel oil priming pump, fuel oil pumps, and fuel oil tank, (3) emergency diesel generator day tank vent filters, fuel oil day tanks, fuel oil duplex filters, fuel oil priming pumps, fuel oil storage tank, (4) EOF/TSC security diesel generator fuel oil day tank, fuel oil pump, main storage tank, (5) flow orifices/elements, (6) fuel oil transfer pumps, (7) turbine tanks, and (8) valves, piping, tubing, and fittings.

2.3.3.19.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.19 to determine whether there is reasonable assurance that the FOS components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

The staff's review of the applicant's scoping results did not identify the omission of any components needed to support the performance of the FOS's intended functions. The staff also found that the applicant adequately identified in LRA Table 2.3-25 those long-lived, passive components of the DGS considered to be within the scope of license renewal.

2.3.3.19.3 Conclusions

The staff reviewed the LRA and the accompanying scoping boundary drawings to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the FOS that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the FOS that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.4 Steam and Power Conversion Systems

2.3.4.1 Turbine System

2.3.4.1.1 Summary of Technical Information in the Application

The applicant describes the turbine system in LRA Section 2.3.4.1.

The turbine system converts the thermal energy of the steam from the main steam system into mechanical energy used to drive the main generator and produce the plant's electrical output. Turbine system valves provide overspeed trip of the turbine to prevent generation of turbine blade missiles. The turbine system is described in RNP UFSAR Section 10.2.2. The evaluation

boundaries for the applicable portions of the turbine system were defined on the basis of plant documentation that presents a listing of components within the evaluation boundary of the system.

The turbine system was conservatively included in the scope of license renewal because it contains SCs that are not safety related whose failure may prevent satisfactory accomplishment of safety-related functions and SCs that are relied on during postulated ATWS events. These functions are accomplished by providing protection from turbine overspeed or maintaining the integrity of the low-pressure turbine rotor. However, a review of the turbine system design and component functions during the mechanical system screening process concluded that either (1) the system functions are performed by active components, or (2) any failure of component pressure boundary would not prevent the performance of the system intended functions. This conclusion is consistent with the information presented in the NRC Standard Review Plan for License Renewal, Table 2.1-5 for turbine controls that provide overspeed protection. The screening review concluded that the turbine system components do not perform any intended functions for license renewal; therefore, none of the turbine system components are subject to an AMR.

2.3.4.1.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.1 and UFSAR Section 10.2 to determine whether there is reasonable assurance that the turbine system components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted. The staff identified no omissions.

The staff evaluated the information provided in LRA Section 2.3.4.1 and UFSAR Section 10.2. The intended functions of the turbine system are accomplished by isolating the steam supply to the turbine under certain conditions and maintaining the integrity of the turbine rotors. The steam isolation valves and turbine rotors are active components excluded from an AMR pursuant to 10 CFR 54.21(a)(1). Failure of the passive, pressure-retaining boundary of the steam isolation valve bodies, turbine steam piping, and the turbine casing would not prevent the accomplishment of the intended functions of the turbine system. Therefore, components of the turbine system are not required by 10 CFR 54.21(a)(1) to be subject to an AMR.

2.3.4.1.3 Conclusions

The staff reviewed the LRA and UFSAR to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the turbine system that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has an adequate basis for concluding that no components of the turbine system are subject to an AMR, as required by

10 CFR 54.21(a)(1).

2.3.4.2 Electro-Hydraulic Control System

2.3.4.2.1 Summary of Technical Information in the Application

The applicant describes the electro-hydraulic control (EHC) system in LRA Section 2.3.4.2.

The EHC system controls the flow of steam to the turbine system through all phases of turbine operation. The system also provides overspeed trip of the turbine to prevent generation of turbine blade missiles. The EHC system is described in RNP UFSAR Section 10.2.2. The evaluation boundaries for the applicable portions of the EHC system were defined on the basis of plant documentation that presents a listing of components within the evaluation boundary of the system. The EHC system was conservatively included in the scope of license renewal, because it contains SCs which are not safety related whose failure may prevent satisfactory accomplishment of safety-related functions. However, a review of the EHC system design and component functions during the mechanical system screening process concludes that (1) the system function is performed by active components, and (2) any failure of component pressure boundary would not prevent the performance of the system intended function. This conclusion is consistent with the information presented in the NRC SRP-LR, Table 2.1-5 for turbine overspeed trip components. The screening review concluded that the EHC system components do not perform any intended functions for license renewal; therefore, none of the EHC system components are subject to an AMR.

2.3.4.2.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.2 and UFSAR Section 10.2 to determine whether there is reasonable assurance that the EHC system components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted. The staff identified no omissions.

The staff evaluated the information provided in LRA Section 2.3.4.2 and UFSAR Section 10.2. The intended functions of the electro-hydraulic control system are accomplished by isolating the steam supply to the turbine under certain conditions. The electro-hydraulic control system valves are active components that perform this function by releasing electro-hydraulic control system fluid pressure. Therefore, components of the electro-hydraulic control system are not required by 10 CFR 54.21(a)(1) to be subject to an AMR.

2.3.4.2.3 Conclusions

The staff reviewed the LRA and UFSAR to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No

omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the electro-hydraulic control system that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has an adequate basis for concluding that no components of the EHC system are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.4.3 Turbine Generator Lube Oil System

2.3.4.3.1 Summary of Technical Information in the Application

The applicant describes the turbine generator lube oil system in LRA Section 2.3.4.3.

The turbine generator lube oil system provides oil for cooling and lubricating the turbine bearings and turning gear. The system also provides pressurized oil to the turbine system overspeed and protective trip devices. The turbine generator lube oil system is described in RNP UFSAR Section 10.2.2. The evaluation boundaries for the applicable portions of the turbine generator lube oil system were defined on the basis of plant documentation that presents a listing of components within the evaluation boundary of the system. The turbine generator lube oil system was conservatively included in the scope of license renewal, because it contains SCs that are not safety related whose failure may prevent satisfactory accomplishment of safety-related functions. However, a review of the turbine generator lube oil system design and component functions during the mechanical system screening process concludes that (1) the system function is performed by active components, and (2) any failure of component pressure boundary would not prevent the performance of the system intended function. This conclusion is consistent with the information presented in the NRC SRP-LR, Table 2.1-5 for turbine controls. Therefore, none of the turbine generator lube oil system components is subject to an AMR.

2.3.4.3.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.3 and UFSAR Section 10.2 to determine whether there is reasonable assurance that the turbine generator lube oil system components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as subject to an AMR to determine if any components were omitted. The staff identified no omissions.

The staff evaluated the information provided in LRA Section 2.3.4.3 and USAR Section 10.2. The turbine generator lube oil system performs no intended function as defined in 10 CFR 54.4(b). Therefore, components of the turbine generator lube oil system are not required by 10 CFR 54.21(a)(1) to be subject to an AMR.

2.3.4.3.3 Conclusions

The staff reviewed the LRA and UFSAR to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the turbine generator lube oil system that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has an adequate basis for concluding that no components of the turbine generator lube oil system are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.4.4 Extraction Steam System

2.3.4.4.1 Summary of Technical Information in the Application

In LRA Section 2.3.4.4, the applicant describes the extraction steam system (ESS). The ESS provides reheating and moisture removal for the steam flow from the high-pressure turbine before it is supplied to the low-pressure turbines. The ESS also provides turbine overspeed protection by utilizing valves to stop the flow of reheat steam to the low-pressure turbine.

The applicant stated that the ESS was included in the scope of license renewal, because it was identified as having SCs that are not safety related whose failure could prevent satisfactory accomplishment of the safety-related functions. The ESS license renewal evaluation boundaries are shown on the piping and instrumentation (P&I) diagram, “Main & Extraction Steam System Flow Diagram,” G-190196LR, sheet 1. However, the applicant did not provide a table to list the ESS components subject to an AMR. The ESS is also described in UFSAR Section 10.3, “Main Steam Supply System.”

2.3.4.4.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.4, UFSAR Section 10.3, and the P&I diagram to determine whether there is reasonable assurance that the ESS components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

In LRA Section 2.3.4.4, the applicant stated that following screening of the ESS, it concluded that none of the ESS components perform an intended function without moving parts or without a change in configuration. Therefore, none of the components in the ESS license renewal evaluation boundaries is subject to an AMR. During its review of the LRA Section 2.3.4.4, the staff concluded that ESS components, such as piping, valves, etc., were long-lived components with a passive function and should be subject to an AMR. Therefore, the staff determined that additional information was needed to complete its review of the ESS.

By letter dated February 11, 2003, the staff requested (via RAIs 2.3.4.4-1, 2.3.4.4-2, 2.3.4.4-3, and 2.3.4.4-4) the applicant to provide the following information:

- justification for not including in an AMR those extraction steam system valves utilized to provide turbine overspeed protection

- highlighting of the extraction steam system license renewal evaluation boundaries in the P&I diagram to ensure that all the long-lived components with a passive function are identified and included for an AMR

- provision of a component/commodity groups table to identify the system components, such as piping, valves, etc., and their intended functions—If a component is not subject to an AMR, detailed justifications for its exclusion

In its response dated April 28, 2003, the applicant stated that two specific features in the ESS are credited with turbine overspeed protection. These are (1) nonreturn air-operated swing check valves located in the extraction steam lines for all but the No. 1 and No. 2 feedwater heaters, and (2) emergency dump valves on these heaters which are not equipped with non return valves. The operation of the check valves is an active function. Failure of the valve or piping pressure boundary would not result in a liability for turbine overspeed, as the diverted steam would still be prevented from returning to the turbine where it might cause overspeed. Similarly, operation of the emergency dump valves is an active function, and should the pressure boundary associated with the dump valves or piping, the result would be to divert steam away from the turbine. In either case, passive failure of the system components would not prevent successful accomplishment of the system intended function. The staff agrees with the applicant that operation of the above-cited valves in the ESS is an active function, and that failure of the system components would not prevent successful accomplishment of the system intended function. Therefore, the staff finds the applicant's rationale for excluding these valves from an AMR acceptable.

In its April 28, 2003, response, the applicant stated that following screening of the ESS, it concluded that none of the system components perform an intended function without moving parts or without a change in configuration. Therefore, none of the components in the ESS boundaries is subject to an AMR. The staff finds acceptable the applicant's clarification of its rationale for finding none of the components in the ESS boundaries subject to an AMR.

Also, in its April 28, 2003, response, the applicant agreed that the ESS provides a system intended function to prevent backflow from feedwater heaters and associated piping. As discussed above, the operation of the check and emergency dump valves in the ESS is an active function, and a loss of component pressure boundary would not prevent successful accomplishment of the system intended function. Therefore, the ESS components are not subject to an AMR. The staff finds the applicant's justification for not listing ESS components in an AMR table acceptable.

In addition, in LRA Section 2.3.4.4, the applicant stated that the ESS was included in the scope of license renewal. Also, in Item 6 of LRA Table 3.4-1, the applicant, in part, stated that the turbine system and ESS are not in the scope of license renewal. The staff requested the applicant to clarify this discrepancy.

In its April 28, 2003, response, the applicant stated that Item 6 of LRA Table 3.4-1 was intended to state that there are no components in the license renewal evaluation boundaries of the ESS that perform an LR intended function. The staff finds the applicant's clarification of the above-cited discrepancy acceptable.

2.3.4.4.3 Conclusions

The staff reviewed the LRA, UFSAR, and the accompanying scoping boundary P&I diagram to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the ESS that are within the scope of license renewal, as required by 10 CFR 54.4(a). Also, the staff concurs with the applicant that no components in the ESS are subject to an AMR as required by 10 CFR 54.21(a)(1).

2.3.4.5 Main Steam System

2.3.4.5.1 Summary of Technical Information in the Application

In LRA Section 2.3.4.5, "Main Steam System," the applicant describes the main steam system (MSS). The MSS transports saturated steam from the SGs to the main turbine and other secondary steam system components. The system is the principal heat sink for the RCS, and protects the RCS and the SGs from overpressurization. The MSS provides isolation of the SGs following a postulated accident, such as a steam line break, and provides steam supply to the steam-driven AFW pump. The MSS license renewal evaluation boundaries are highlighted on the P&I diagram G-190196LR, sheet 1. MSS components subject to an AMR are listed in LRA Table 2.3-26. The MSS is also described in UFSAR Section 10.3, "Main Steam System."

2.3.4.5.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.5, UFSAR Section 10.3, and the P&I diagram to determine whether there is reasonable assurance that the MSS components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted. The staff found that the components of the MSS that have an intended function meeting the criteria of 10 CFR 54.4(a) have been identified as being within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.21(a)(1). The staff did not identify any omissions.

2.3.4.5.3 Conclusions

The staff reviewed the LRA, UFSAR, and the accompanying scoping boundary P&I diagram to determine whether any SSCs that should be within the scope of license renewal were not

identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the MSS that are within the scope of license renewal, as required by 10 CFR 54.4(a). Also, the staff concludes that the applicant has appropriately identified the MSS components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.4.6 Steam Generator Blowdown System

2.3.4.6.1 Summary of Technical Information in the Application

In LRA Section 2.3.4.6, "Steam Generator Blowdown System," the applicant describes the steam generator blowdown system (SGBS). The SGBS assists in maintaining required SG chemistry by providing a means for removal of foreign matter that concentrates in the SGs. The system is fed by three independent blowdown lines (one per SG) that penetrate containment and tie to a common blowdown drain tank. The SGBS license renewal evaluation boundaries are highlighted on the P&I diagram G-190243LR, sheet 1. SGBS components subject to an AMR are listed in LRA Table 2.3-27. The SGBS is also described in UFSAR Section 10.4.7, "Steam Generator Blowdown System."

2.3.4.6.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.6, UFSAR Section 10.4.7, and the P&I drawing to determine whether there is reasonable assurance that the SGBS components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted. The staff found that the components of the SGBS that have an intended function meeting the criteria of 10 CFR 54.4(a) have been identified as being within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.21(a)(1). The staff did not identify any omissions.

2.3.4.6.3 Conclusions

The staff reviewed the LRA, UFSAR, and the accompanying scoping boundary drawings to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the SGBS that are within the scope of license renewal as required by 10 CFR 54.4(a). Also, the staff concludes that the applicant has adequately identified the SGBS components that are subject to AMR as required by 10 CFR 54.21(a)(1).

2.3.4.7 Steam Cycle Sampling

2.3.4.7.1 Summary of Technical Information in the Application

In RNP LRA Section 2.3.4.7, "Steam Cycle Sampling System," the applicant describes the steam cycle sampling system (SCSS). The SCSS provides for sampling and analysis of SG liquid via sample lines connected to the SGBS. A separate sample line is provided for each SG blowdown line.

The applicant stated that the SCSS is in the scope of license renewal, because it contains SCs that are safety related and are relied upon to remain functional during and following design-basis events. The SCSS license renewal evaluation boundaries are highlighted on the P&I diagram "Secondary Sampling System Flow Diagram," HBR2-09006LR, sheet 2. However, the applicant did not provide a table to list the SCSS components subject to an AMR.

2.3.4.7.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.7, UFSAR Section 10.4.7, and the P&I diagram to determine whether there is reasonable assurance that the SCSS components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

During its review of LRA Section 2.3.4.7, the staff determined that additional information was needed to complete its review of the SCSS. In the February 11, 2003, letter, the staff requested (via RAI 2.3.4.7-1) the applicant to provide a component/commodity groups table to identify the SCSS components and their intended functions. If an SCSS component is not subject to an AMR, the applicant should provide detailed justifications for its exclusion.

In its April 28, 2003, response, the applicant stated that the only components with an intended function in the SCSS are sample heat exchangers. However, the license renewal functional boundary associated with the sample heat exchangers is the CCW system pressure boundary. The CCW system water flows through the shell and around the tubes of the SCSS heat exchangers and provides cooling for the sample flow. The tubing and shells of these heat exchangers are included in LRA Table 2.3-9 for the CCW system. The staff finds acceptable the applicant's rationale for including the tubing and shells of these heat exchangers in LRA Table 2.3-9 for the CCW system.

2.3.4.7.3 Conclusions

The staff reviewed the LRA, UFSAR, and the accompanying scoping boundary drawing to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the SCSS that are within the scope of license renewal, as required by 10 CFR 54.4(a). Also, the

staff concludes that the applicant has adequately identified the SCSS components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.4.8 Feedwater System

2.3.4.8.1 Summary of Technical Information in the Application

The applicant describes the feedwater system in LRA Section 2.3.4.8 and provides a list of components subject to an AMR in LRA Table 2.3-28.

The feedwater system provides preheated, high-pressure feedwater to the SGs under operating conditions. The system provides for feedwater and blowdown isolation following a postulated loss of coolant accident or steam line break event and assists in maintaining SG water chemistry. SG level is controlled to ensure proper water inventory for various operational and accident conditions. The control is achieved by variations in the feedwater flowrate. The feedwater system is described in RNP UFSAR Section 10.4.6.

In LRA Table 2.3-28, the applicant identified eight component/commodity groups of the feedwater system as being within the scope of license renewal and subject to an AMR:

(1) closure bolting
(2) feedwater heat exchanger cover/tubesheet
(3) feedwater heat exchanger cover
(4) feedwater heat exchanger tubesheet
(5) feedwater heat exchanger tubing
(6) flow orifices/elements
(7) temperature elements
(8) valves, piping, tubing, and fittings

The applicant further stated that each of these eight component/commodity groups provides a pressure-boundary intended function. Additionally, the flow orifices/elements were identified as providing the function of flow restriction function, and valves, piping, tubing, and fittings were identified as providing the function of structural support.

2.3.4.8.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.8 and UFSAR Section 10.4.6 to determine whether there is reasonable assurance that the feedwater system components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted. The staff's review of the applicant's scoping results did not identify the omission of any components needed to support the performance of the feedwater system's stated intended functions. The applicant adequately identified in LRA Table 2.3-28 those long-lived, passive components of the feedwater system considered to be within the scope of license renewal.

2.3.4.8.3 Conclusions

The staff reviewed the LRA and the accompanying scoping boundary drawings to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the feedwater system that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the feedwater system that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.4.9 Auxiliary Feedwater System

2.3.4.9.1 Summary of Technical Information in the Application

The applicant describes the AFW system in LRA Section 2.3.4.9 and provides a list of components subject to an AMR in LRA Table 2.3-29.

The AFW system supplies feedwater to the SGs when normal feedwater sources are not available. The system provides for isolation of flow to a faulted SG following postulated accidents, such as an SG tube rupture or main steam line break. The AFW system can provide feedwater to any combination of SGs from any one or combination of three pumps; two are motor driven, and the third is steam driven. Steam can be supplied to the steam-driven pump from any of the SGs. The pumps can take suction from the CST, which is the normal source, or from the SWS or the deepwell pumps if the CST is not available. The steam-driven pump provides an independent and diversely powered means of providing feedwater to the SGs.

The steam-driven system provides the required flow through injection lines that are separate from the motor-driven subsystem. The AFW system is described in RNP UFSAR Section 10.4.8.

In LRA Table 2.3-29, the applicant identified 10 component/commodity groups of the AFW system as being within the scope of license renewal and subject to an AMR.

(1) closure bolting

(2) flow orifices/elements

(3) steam- and motor-driven auxiliary feedwater pump lube oil heat exchanger tubing

(4) steam- and motor-driven auxiliary feedwater pump lube oil heat exchanger waterboxes

(5) steam- and motor-driven auxiliary feedwater pump lube oil heat exchanger tubing and shells

(6) steam- and motor-driven auxiliary feedwater pump lube oil heat exchanger shells

(7) steam-driven auxiliary feedwater pump lube oil pump

(8) steam- and motor-driven auxiliary feedwater pumps

(9) steam-driven auxiliary feedwater turbine

(10) valves, piping, tubing, and fittings

The applicant further stated that each of these 10 component/commodity groups provides a pressure-boundary intended function. Additionally, the flow orifices/elements were identified as providing a flow restriction function, the heat exchanger tubing and shells were identified as providing a heat transfer function, and valves, piping, tubing, and fittings were identified as providing the intended function of structural support.

2.3.4.9.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.9 and UFSAR Section 10.4.8 to determine whether there is reasonable assurance that the AFW system components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

Generally, the staff's review of the applicant's scoping and screening results found that the results were in accordance with 10 CFR 54.4 and 10 CFR 54.21. However, the staff's review of the applicant's scoping results identified a set of components that appeared to support the performance of the AFW system's intended function that were not identified as being within the scope of license renewal. Also, the staff's review of the applicant's screening results questioned aspects of a long-lived, passive component of the AFW system that meet the scoping criteria of 10 CFR 54.4 but which did not appear to be fully addressed in LRA Table 2.3-29. On February 11, 2003, the NRC staff issued RAIs to the applicant to determine whether the applicant had properly applied the scoping criteria of 10 CFR 54.4 and the screening criteria of 10 CFR 54.21(a)(1). The staff's RAIs and the applicant's responses, dated April 28, 2003, are described below.

In RAI 2.3.4.9-1, the staff questioned why the alternate source to the AFW system was not within the scope of license renewal. RNP LRA, drawing G-190202-LR, sheet 3, depicts the supply from the deepwell pumps to the AFW pumps as not within the scope of license renewal. As noted in UFSAR Section 10.4.8, this is the source of water credited in the event of a failure of the Lake Robinson Dam. Additionally, the UFSAR notes that makeup from these pumps is required after 2 hours at hot shutdown, assuming the minimum volume of water in the CST. The applicant responded by referring to the RNP response to RAI 2.3.3.8-1. Because the identical issue was raised by RAI 2.3.3.8-1, this question, which is an Open Item, is addressed in Section 2.3.3.8.

In RAI 2.3.4.9-2, the staff questioned whether a restricting orifice, which appears to be the cavitating venturi in the steam turbine AFW pump discharge pipe described in UFSAR

Section 10.4.8.2, was specifically addressed, and whether there is any unique AMR associated with such a passive device. This venturi limits flow in the event of low steam generator pressure in the event of a failed discharge flow control valve. The AMR tables do not clearly describe this venturi.

The applicant responded that this cavitating venturi is constructed of both carbon steel and stainless steel (for high-wear parts). This component applies to LRA Table 3.4-1, Item 2, and LRA Table 3.4-2, Items 1, 2, 11, and 13. This component was specifically evaluated in the AMR for the AFW system. Intended functions for this component include pressure boundary and flow restriction. Therefore, this component was evaluated for aging effects on the carbon steel pressure-retaining subcomponents and for aging effects on the wear-resistant (flow-restricting) stainless steel components. As stated in UFSAR Section 10.4.8.2, the function of this cavitating venturi is to limit flow to a low-pressure (i.e., failed) SG in the case of a failed discharge flow control valve. Manual operation of the AFW system limits the flow through the discharge piping to 500 gpm. System flow testing is also limited to approximately 500 gpm. The flow at which this venturi cavitates is approximately 625 gpm. Therefore, in order for this venturi to operate in its flow-limiting mode, there would have to be an event resulting in low SG pressure and a failed discharge flow control valve. Any degradation resulting from this type of operation would be considered event driven and would therefore not be subject to aging management. The staff considered that the applicant adequately addressed AMR for the cavitating venturi and justified its position that no unique AMR is required for potential degradation in a cavitating mode.

2.3.4.9.3 Conclusions

The staff reviewed the LRA and the accompanying scoping boundary drawings to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the AFW system that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the AFW system that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.4.10 Condensate System

2.3.4.10.1 Summary of Technical Information in the Application

The applicant describes the condensate system in LRA Section 2.3.4.10 and provides a list of components subject to an AMR in LRA Table 2.3-30.

The condensate system provides makeup grade water to the steam generators for removing decay and sensible heat from the RCS. The condensate system provides a passive flow of water, by gravity, to the AFW system to support safe shutdown of the plant. The condensate system consists of a CST with piping to the suctions of all three AFW system pumps. The condensate system is described in UFSAR Section 9.2.5.

In LRA Table 2.3-30, the applicant identified three component/commodity groups of the condensate system as being within the scope of license renewal and subject to an AMR.

(1) condensate storage tank
(2) flow orifices/elements
(3) valves, piping, tubing, and fittings

The applicant further stated that each of these three component/commodity groups provides a pressure-boundary intended function. Additionally, the CST provides structural and/or functional support to non-safety-related equipment where failure of this equipment could impact safety-related functions. Valves, piping, tubing, and fittings were also identified as providing the intended function of structural support.

2.3.4.10.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.10 and UFSAR Section 9.2.5 to determine whether there is reasonable assurance that the condensate system components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted. Generally, the staff's review of the applicant's scoping and screening results found that the results were in accordance with 10 CFR 54.4 and 10 CFR 54.21. However, the staff's review of the applicant's scoping results identified several components that appeared to support the performance of the condensate system's intended function that were not identified as being within the scope of license renewal. Also, the staff's review of the applicant's screening results questioned aspects regarding passive components of the condensate system that meet the scoping criteria of 10 CFR 54.4 which did not appear to be fully addressed in LRA Table 2.3-30.

On February 11, 2003, the NRC staff issued RAIs to the applicant to determine whether the applicant had properly applied the scoping criteria of 10 CFR 54.4 and the screening criteria of 10 CFR 54.21(a)(1). The staff's RAIs and the applicant's responses, dated April 28, 2003, are described below.

In RAI 2.3.4.10-1, the staff questioned why LRA drawing G-190197-LR, sheet 1, did not identify the 6-inch vent pipe on the top of the CST as within the scope of license renewal. This pipe appears to provide vacuum protection for this tank. The RNP response, dated April 28, 2003, stated that the condensate system is in scope, and the tank is part of the condensate system. The 6-inch vent pipe on top of the CST is an integral part of the condensate storage tank, within the evaluation boundary, and should have been highlighted as part of the boundary of the tank. The vent pipe, as part of the condensate storage tank listed in LRA Table 2.3-30, is covered in LRA Table 3.4-2, Item 13. This response is acceptable as the applicant has confirmed that the vent pipe is within the scope of license renewal.

In RAI 2.3.4.10-2, the staff noted that in LRA drawing G-190197-LR, sheet 1, the class breaks for a number of the pipes connected to the CST appear to be directly at the tank itself, and

some pipes have such a break located immediately downstream of the first valve away from the tank. The license renewal boundary highlighting conforms with these class breaks. The staff requested an explanation for the basis for some piping being within scope of license renewal up to the first valve and some terminating at the tank, given the tank's intended pressure boundary function. The applicant's response stated that the pipes highlighted to the first isolation valve are below the minimum water level required to support the system intended functions. The pipes not highlighted are above this minimum water level and are not needed to support the system intended functions. The response further noted that piping within the evaluation boundary for Criterion 2 is not highlighted on any licensing renewal drawing. The Criterion 2 system intended function is to "provide a pressure-retaining boundary to prevent spatial interactions with safety-related equipment." The response clarified a potential misstatement in RAI 2.3.4.10-2 in that the nonhighlighted piping may still be within scope of license renewal if it is required to satisfy Criterion 2 to prevent spatial interactions with safety-related equipment. The staff considers the applicant's response acceptable as it clarified that the piping connecting below the minimum water level is within the scope of license renewal, at least up to the first valve, in order to provide pressure boundary up to that level for the system intended function.

In RAI 2.3.4.10-3, the staff questioned why a diaphragm within the CST, depicted on LRA drawing G-190197-LR, sheet 1, was not listed in Table 2.3-30 as a component requiring an AMR. The applicant's response noted that the Table 2.3-30 entry for the CST contains a reference to AMR Table 3.4-2, Item 5, which addresses the diaphragm within the condensate storage tank. Because the LRA does include the diaphragm within the scope of license renewal and identifies the need for an AMR for this component, this response is acceptable.

2.3.4.10.3 Conclusions

The staff reviewed the LRA and the accompanying scoping boundary drawings to determine whether any structures, systems, or components that should be within the scope of license renewal were not identified by the applicant. No omissions were found beyond those noted and evaluated as acceptable above. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the condensate system that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the condensate system that are subject to an aging management review, as required by 10 CFR 54.21(a)(1).

2.3.4.11 Steam Generator Chemical Addition

2.3.4.11.1 Summary of Technical Information in the Application

The applicant describes the SG chemical addition system in LRA Section 2.3.4.11, and provides a list of components subject to an AMR in LRA Table 2.3-31.

The SG chemical addition system provides for chemical addition to the feedwater system for proper SG chemistry control. Portions of the system provide pressure boundary integrity for the feedwater and AFW systems.

In LRA Table 2.3-31, the applicant identified the valves, piping, tubing, and fittings component/commodity group of the SG chemical addition system as being within the scope of license renewal and subject to an AMR.

The applicant further identified that this component/commodity group provides intended functions of pressure-boundary and structural support.

2.3.4.11.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.11 to determine whether there is reasonable assurance that the SG chemical addition system components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

The staff's review of the applicant's scoping results did not identify the omission of any components needed to support the performance of the SG chemical addition system's stated intended functions. The applicant adequately identified in LRA Table 2.3-31 those long-lived, passive components of the SG chemical addition system considered to be within the scope of license renewal.

2.3.4.11.3 Conclusions

The staff reviewed the LRA and the accompanying scoping boundary drawings to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the SG chemical addition system that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the SG chemical addition system that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.4.12 Circulating Water System

2.3.4.12.1 Summary of Technical Information in the Application

The applicant describes the circulating water system in LRA Section 2.3.4.12 and provides a list of components subject to an AMR in LRA Table 2.3-32.

The circulating water system provides cooling water from Lake Robinson to the main condensers to condense the steam discharged from the turbine system. Portions of the system provide a flow path for the SWS flow. The circulating water system is described in UFSAR Section 10.4.5.

In LRA Table 2.3-32, the applicant identified the piping and fittings component/commodity group of the circulating water system as within the scope of license renewal and subject to an AMR. The applicant further stated that this component/commodity group provides a pressure-boundary intended function.

2.3.4.12.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.12 and UFSAR Section 10.4.5 to determine whether there is reasonable assurance that the circulating water system components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

The staff's review of the applicant's scoping results did not identify the omission of any components needed to support the performance of the circulating water system's stated intended functions. The applicant adequately identified in LRA Table 2.3-32 those long-lived, passive components of the circulating water system considered to be within the scope of license renewal.

2.3.4.12.3 Conclusions

The staff reviewed the LRA and the accompanying scoping boundary drawings to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the circulating water system that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the circulating water system that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4 Scoping and Screening Results: Structures

This section addresses the scoping and screening results for structures for the LRA for the RNP. The structures consist of containment (2.4.1) and other structures (2.4.2).

Pursuant to 10 CFR 54.21(a)(1), an applicant is required to identify and list SCs subject to an AMR. These are passive, long-lived structures and components that are within the scope of license renewal. To verify that the applicant has properly implemented its methodology, the staff focuses its review on the implementation results. Such a focus allows the staff to confirm that there is no omission of structural components that are subject to an AMR. If the review identifies no omission, the staff has the basis to find that the applicant has identified the structural components that are subject to an AMR.

2.4.1 Containment

The RNP containment structure is a steel-lined concrete shell in the form of a vertical right-circular cylinder with a hemispherical dome and a flat base. The containment encloses the reactor and major components of the RCS and other important systems that interface with the RCS. Also, the containment houses and supports components required for reactor refueling. This includes the polar crane, refueling cavity, and portions of the fuel handling system. The containment is described in Section 3.8.1 of the RNP UFSAR.

Containment structural components requiring an AMR are identified and discussed in three subsections (1) containment structure, (2) containment internal structural components, and (3) containment external structural components that surround and provide protection for the equipment and personnel hatches.

2.4.1.1 Containment Structure

The LRA identified the components of the containment structure that require an AMR as the concrete dome and cylinder walls, base slab, floor, liner plate, anchors and embedments, penetrations (fuel transfer tube, mechanical penetration assemblies, and electrical penetration assemblies), equipment hatch, personnel hatch, reinforcing steel in concrete, steel pilings, post tensioning system, and containment liner insulation. Each of the components is described below.

The dome and cylinder walls of the containment are supported by the base slab. The base slab is supported by steel pipe piles. The reactor sump (also called the containment sump) is hung from the base slab. A reinforced concrete floor is provided in the containment, above the floor liner, to protect the liner plate from punctures and corrosion that could breach the essentially leak-proof membrane. The interior of the containment is lined with steel plates that are welded together. The liner plate covers the dome, cylinder walls, reactor sump, and the base slab and forms a leak-proof membrane.

Anchor studs are welded to the steel liner and serve to anchor the liner to the concrete containment shell. In penetration areas, penetration steel frames and reinforcing plates are embedded in the concrete containment shell to provide continuity of the reinforcement.

The fuel transfer tube links the refueling canal inside the containment to the spent fuel pool in the FHB. During normal operation, the inside and outside of the fuel transfer tube are dry; a blind flange is installed which serves as part of the containment's essentially leak-tight barrier.

Mechanical penetrations provide the means for passage of process piping and ducts across the containment boundary. With some exceptions, double-barrier piping penetrations are provided. This design consists of a sleeve welded to the liner and connected to the process line by bellows, end plates, or a combination thereof. Connections are provided to pressurize the interior of double-barrier penetrations to assure leak-tight integrity.

Electrical penetrations provide the means for electrical and instrumentation conductors to cross the containment boundary while maintaining an essentially leak-tight barrier. Most electrical penetrations are the cartridge type consisting of a hollow cylinder sealed on both ends and welded to the penetration sleeve. The cartridge is provided with pressurization connections for leak detection.

The equipment hatch is a large flanged penetration that provides access to the containment interior for large equipment. The hatch consists of a bolted, dished door with a double-gasketed flange. The hatch barrel is embedded in the containment wall and is welded to the liner.

The containment personnel hatch (or airlock) consists of a cylindrical steel tube that passes through the concrete wall of the containment and is welded to the liner. It has a bulkhead, with an airlock door, at each end. The doors are interlocked to prevent simultaneous opening. Each of the doors contains double-gasketed seals and local leakage rate testing capability to ensure pressure integrity of the seals.

Reinforcing steel is used in the containment dome, cylinder, and base slab. The reinforcing steel is embedded in concrete, which provides corrosion protection for the steel components. The containment is supported on steel pipe pile foundations. Pilings restrain the containment base slab both vertically and horizontally and safely transmit the structural loads to the dense soils underlying the site.

The posttensioning system consists of vertical tendons located on the centerline of the wall spaced approximately every 3 feet around the periphery of the containment. Tendons made up of high-strength steel bars (six bars per tendon) are placed within 6-inch diameter, heavy wall galvanized steel pipe sheaths. After the tendons were tensioned, the sheaths were filled with Portland cement grout.

The liner on the containment cylinder wall is insulated to limit stresses caused by the high containment temperature following a postulated LOCA. The containment liner insulation extends from the floor up to elevation 367’10" and consists of cross-linked polyvinyl chloride (PVC) foam or polyamide foam panels with an outer sheathing of stainless steel. Various aspects of the containment liner insulation design are described in UFSAR Sections 3.8.1.1.3, 3.8.1.3.1, 3.8.1.4.5, and 3.8.1.6.1.7.

2.4.1.2 Containment Internal Structural Components

The LRA states that the containment internal structural components requiring an AMR are made of concrete and steel materials. The major components are concrete shield walls (primary and secondary), concrete and steel supports (RV, RCP, SG, pressurizer), steel polar crane, ECCS sump screens, and structural and miscellaneous steel. Each of the components is described below.

The primary shield wall is a thick cylindrical wall that encloses the RV and provides biological shielding to permit access into the reactor containment during full power operation for inspection and maintenance. The lower portion of the wall forms an integral part of the main structural support for the RV. The primary shield wall also acts as part of the missile barrier.

The secondary shield wall surrounds the reactor coolant loops and the primary shield wall. It consists of interior walls in the containment structure, the operating floor, and the reactor containment structure.

The RV has three supports located at alternate nozzles. Each support bears on a support shoe, which is fastened to the support structure. The support shoe is a structural member that

transmits the support loads to the supporting structure. Each support is designed to restrain vertical, lateral, and rotational movement of the RV, but allows for thermal growth by permitting radial sliding on bearing plates.

Each RCP is supported on a three-legged structural system consisting of three connected columns fabricated of carbon steel members, structural sections, and pipe. Provision for limited movement of the structure in any horizontal direction to accommodate piping expansion is accomplished with a sliding "Lubrite" base plate arrangement and a system of tie rods and anchor bolts which restrains the structure from movement beyond the calculated limits. Sliding shoes at the top of the support structures permit radial thermal growth of the pumps during heatup.

The SGs are supported on a structural system consisting of four connected columns all welded together, fabricated of carbon steel members, with provisions for limited movement of the structure in a horizontal direction to accommodate piping expansion with a system of "Lubrite" plates, hydraulic snubbers, guides, and stops. The "Lubrite" plates, hydraulic snubbers, guides, and stops are designed as damped supports to resist the action of seismic and pipe break loads. The pressurizer is supported on a heavy concrete slab spread between the concrete shield walls. The pressurizer is a bottom skirt support vessel, resting on a ring girder.

The reactor building polar crane is a cantilevered end gantry crane that operates on a circular track supported by the crane wall. The crane and associated rails are seismically qualified Class 1 structures. The polar crane has a main and an auxiliary hoist and provides a means of lifting and handling heavy loads inside the containment. The ECCS sump is located outside the crane wall in the northeast quadrant of the containment. The sump screens are used to stop buoyant materials from entering the ECCS sump.

Structural and miscellaneous steel platforms (grating and checkered plate), stairways, and ladders are provided inside the containment to allow access to the various elevations and areas for inspection and maintenance. Structural and miscellaneous steel platforms also provide support for safety-related and non-safety-related systems and components, including piping, ducts, miscellaneous equipment, electrical cable tray and conduit, instruments and tubing, and electrical and instrumentation enclosures and racks.

2.4.1.3 Containment External Structural Components

The LRA indicates that the containment external structural components requiring an AMR are concrete and steel components around the equipment hatch and the personnel lock shield areas.

The containment external structural components consist of the reinforced concrete structures that surround and provide protection for the equipment and personnel hatches. The structure associated with the equipment hatch also provides protection for the containment purge inlet valves that penetrate the containment wall. The equipment hatch area structure consists of a reinforced concrete slab on grade and reinforced concrete walls that enclose the area around the equipment hatch and containment purge inlet valve.

The personnel lock shield structure consists of a reinforced concrete slab on grade, reinforced concrete walls, and roof slab. The personnel lock shield structure is located in the enclosed area between the reactor containment building, the RAB, and the turbine building.

2.4.1.4 Summary of Technical Information in the Application

The applicant describes the containment structure in LRA Section 2.4.1.1, the containment internal structural components in LRA Section 2.4.1.2, and the containment external structural components in LRA Section 2.4.1.3 and provides a list of components subject to an AMR in LRA Table 2.4-1.

The applicant concluded that the containment is in scope of license renewal because it contains the following:

- SCs that are safety related and are relied upon to remain functional during and following design-basis events
- SCs that are not safety related but whose failure could prevent satisfactory accomplishment of the safety-related functions
- SCs that are relied on during postulated fires, ATWS, and SBO events

Table 2.4-1 lists 51 structural component types requiring an AMR, provides a reference to the results of the AMR for each component type, and identifies the intended functions listed below for the containment structure, the containment internal structural components, and the containment external structural components. The intended functions of the containment structure are as follows:

- provide pressure boundary and/or fission product barrier
- provide rated fire barrier to confine or retard a fire from spreading to or from adjacent areas of the plant
- provide structural and/or functional support to safety-related equipment
- provide structural and/or functional support to non-safety-related equipment where
- failure of this structural component could prevent satisfactory accomplishment of any of the required safety-related functions
- provide structural support and/or shelter to components required for fire protection, ATWS, and/or SBO
- provide spray shield or curbs for directing flow (such as safety injection flow to containment sump)
- provide shelter/protection to safety-related equipment (including radiation shielding)
- serve as missile (internal or external) barrier

- provide heat sink during SBO or design-basis accidents
- provide pressure-retaining boundary so that sufficient flow at adequate pressure is delivered
- provide pipe-whip restraint and/or jet impingement protection

2.4.1.5 Staff Evaluation

The staff reviewed LRA Section 2.4.1 and UFSAR Section 3.8.1 to determine whether there is reasonable assurance that the containment structure, the containment internal structural components, and the containment external structural components within the scope of license renewal and subject to an AMR have been identified in accordance with the requirements of 10 CFR 54.4 and 54.21(a)(1).

In performing the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

Table 2.4-1 lists 51 structural component types that require AMR. These structural component types include anchorage/embedments (exposed surface), anchorage/embedments (embedded/encased), bellows, cable tray and conduit, cavity seal ring plate, concrete sump, containment liner insulation and penetration insulation, containment liner plate (including liner attachments and liner anchors), electrical and instrument panels and enclosures, electrical component supports, electric penetrations, equipment hatch, equipment supports, expansion anchors, external reinforced concrete components (missile shield slab, walls, and roof slabs), fire hose station, floor drains, fuel transfer tube, fuel transfer tube blind flange, grouted tendons, HVAC duct supports, instrument line supports, instrument racks and frames, internal reinforced concrete components (beams, walls, floors, columns, radiation shielding, refueling cavity, equipment pads, missile shields, curbs, hatches, and grout), masonry walls, mechanical penetrations, miscellaneous steel structures (stairs, ladders, platforms, connectors, grating, and checker plate), moisture barrier, NIS detector cover, personnel airlock, pilings, pipe supports, pipe-whip restraints, polar crane, pressurizer and pressurizer surge line supports, protective enclosure (structures sheltering or enclosing plant equipments), reactor cavity (refueling canal) liner plate, RCP supports, reactor manway covers, RV missile shield frame, RV support, reinforced concrete (cylinder wall, dome and basement), seals and gaskets, siding, slide bearing plates, SG supports, structural steel (beams, plates, connectors, and columns), sump screens (supports), threaded fasteners, tube track supports, and vibration isolators.

The applicant states that its determination of structures within the scope of license renewal was made by initially identifying RNP structures and then reviewing them to determine which structures satisfy one or more of the criteria contained in 10 CFR 54.4. The scoping results with respect to whether a structure is in-scope or out of scope are listed in Table 2.2-2, “License Renewal Scoping Results for Structures,” which contains 106 structures. In response to RAI 2.5.1-1, the applicant modified the switchyard relay building and switchyard and transformer structures from out of scope to in scope and added isolated phase bus duct yard support

structures and 4 kV nonsegregated bus duct yard support in scope to Table 2.2-2. The SCs within the scope are then screened for conformance to the requirements contained in 10 CFR 54.21(a)(1). The SCs that meet the requirements contained in 10 CFR 54.21(a)(1) are identified as requiring an AMR for license renewal.

The applicant states that its methodology for screening SCs includes screening of components and commodities that have been transferred to the civil discipline from the mechanical and electrical disciplines. Evaluation boundaries between mechanical components, electrical components, and structures and structural components were coordinated between discipline reviewers. The types of components and commodities treated in this manner include pipe/component snubbers; fire damper penetration seals; electrical component supports; and electrical cabinets, consoles, cubicles, junction boxes, and panels.

The LRA describes in detail the methodology that the applicant used for scoping and screening structures. The LRA describes in sufficient detail the components of the containment structure, the internal structures, and the containment external structures that are within the scope and subject to an AMR. The staff finds the applicant's methodology for scoping to be acceptable because it meets the criteria contained in 10 CFR 54.4. The staff reviewed Table 2.2-2, "License Renewal Scoping Results for Structures," and found the listed structures acceptable. The staff selected system functions described in the UFSAR to verify that components having intended functions were not omitted from the scope of the Rule. The staff finds the applicant's methodology for screening to be acceptable because it meets the criteria contained in 10 CFR 54.21(a)(1). The staff reviewed the 51 structural components and their intended functions listed in Table 2.4-1 and found them acceptable.

2.4.1.6 Conclusions

The staff reviewed the LRA to determine whether structures or components that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether components that should be subject to an AMR were not identified by the applicant. No omissions were found. The staff concludes that the applicant has adequately identified the structural components of the containment structure, the containment internal structure, and the containment external structure that are within the scope of license renewal, as required by 10 CFR 54.4(a). The staff also concludes that the applicant has adequately identified the structural components of the containment structure, the containment internal structure, and the containment external structure that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2 Other Structures

Other structures that require license renewal are the passive and long-lived structures other than the containment structure. In LRA Section 2.4.2, "Other Structures," the applicant determined that the following structures are included in the group of other structures for license renewal:

- reactor auxiliary building
- fuel handling building

- turbine building
- dedicated shutdown diesel generator building
- radwaste building
- intake structure
- north service water header enclosure
- Emergency Operations Facility/Technical Support Center security diesel generator building
- discharge structures
- Lake Robinson Dam
- pipe restraint tower
- yard structures and foundations
- refueling system

2.4.2.1 Reactor Auxiliary Building

2.4.2.1.1 Summary of Technical Information in the Application

The applicant describes the RAB in LRA Section 2.4.2.1 and provides a list of components subject to an AMR in LRA Table 2.4-2.

The RAB is a reinforced concrete, seismic Category I structure that houses safety-related systems. It includes the control room, the emergency diesel generator rooms, the RHR pump pit, boron injection tank room, north and south cable vaults, piping penetration area, and the B waste evaporator enclosure installed on the roof of the building. A sump tank room and RHR pit are located below grade.

The RAB reinforced concrete foundation slab of the RAB is supported on pilings (steel pipe, cast-in-place concrete pilings). The auxiliary building is constructed with reinforced concrete bearing walls and floor slabs. Water stops were used in the construction joints of the RAB foundation slab. Also, waterproofing membrane was installed on the building sump and RHR pit exterior surfaces to inhibit the intrusion of ground water. The water stops and waterproofing are considered to be subcomponents of the concrete slabs and walls.

The auxiliary building is described in UFSAR Section 3.8.4.1. In the license renewal evaluation, common walls (and associated penetrations) between the RAB and adjacent buildings were included in the scope of the RAB, with the exception of the containment walls. Also included in the scope of the RAB are stairs and equipment supports located on the exterior walls of the

building, and the area between the containment, FHB, and RAB in the vicinity of the RHR pit. Floor drains in the RAB are credited for minimizing flood levels following fire protection system pipe breaks or actuations. The floor drains are in scope for license renewal. The Motor Control Center (MCC) 5 water spray shield is in scope for license renewal, because it protects MCC 5 from water spray following a postulated pipe break.

The auxiliary building is in the scope of license renewal, because it contains (1) SCs that are safety related and are relied upon to remain functional during and following design-basis events, (2) SCs that are not safety related but whose failure could prevent satisfactory accomplishment of the safety-related functions, and (3) SCs that are relied on during postulated fires, ATWS, and SBO events.

Table 2.4.2, lists 40 structural component types requiring an AMR, provides a reference to the results of the AMR for each component type, and identifies the intended functions listed below for the RAB:

- provide pressure boundary and/or fission product barrier
- provide rated fire barrier to confine or retard a fire from spreading to or from adjacent areas of the plant
- provide structural and/or functional support to safety-related equipment
- provide structural and/or functional support to non-safety-related equipment where failure of this structural component could prevent satisfactory accomplishment of any of the required safety-related functions
- provide structural support and/or shelter to components required for fire protection, ATWS, and/or SBO
- provide spray shield or curbs for directing flow (such as safety injection flow to containment sump)
- provide a protective barrier for internal/external flood event
- provide shelter/protection to safety-related equipment (including radiation shielding)
- serve as missile (internal or external) barrier
- provide pipe-whip restraint and/or jet impingement protection

2.4.2.1.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.1 and UFSAR Section 3.8.4.1 to determine whether there is reasonable assurance that the RAB and structural components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In performing the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

Table 2.4-2 lists 40 structural component types that require AMR. These structural component types include anchorage/embedments (exposed surface), anchorage/embedments (embedded/encased), battery rack, cable tray and conduit, concrete sump, control room ceiling, concrete curb, damper mounting, doors including fire doors, electrical and instrument panels and enclosures, electrical bus duct, electrical component supports, equipment supports, expansion anchors, fire barrier assemblies, fire barrier penetration seals, fire hose station, fire plugs/fire hatches, floor drains, HVAC duct supports, instrument line supports, instrument racks and frames, louvers, masonry walls, miscellaneous steel structures (stairs, ladders, platforms, connectors, grating, and checker plate), pilings, pipe supports, pipe-whip restraints, protective enclosure, raised floor, reinforced concrete (beams, walls, floors, columns, etc.), roof, seismic joint filler, siding, slide bearing plates, spray shields, structural steel (beams, plates, connectors, and columns), threaded fasteners, tube track supports, and vibration isolators.

Since the foundation of the boron injection tank was not listed in Table 2.4-2, on February 11, 2003, the staff requested the applicant in RAI 2.4.2-5 to identify whether the boron injection tank and its foundation were in scope and subject to an AMR. In response to RAI 2.4.2-5, on April 28, 2003, the applicant stated that the boron injection tank and its foundation were in scope and subject to an AMR.

The staff has reviewed the information in LRA Section 2.4.2.1, the UFSAR, and the additional information submitted by the applicant in response to the staff's RAI. The staff finds that the applicant made no omissions in scoping the auxiliary building and structural components for license renewal. The staff's review also found that all the passive SCs identified as being within the scope of license renewal were subject to an AMR.

2.4.2.1.3 Conclusions

The staff reviewed the LRA to determine whether SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the structural components of the auxiliary building that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the structural components of the auxiliary building that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2.2 Fuel Handling Building

2.4.2.2.1 Summary of Technical Information in the Application

The applicant describes the FHB in LRA Section 2.4.2.2 and provides a list of components subject to an AMR in LRA Table 2.4-3.

The FHB comprises several adjacent structures and a superstructure that supports the spent fuel cask handling crane. The FHB is further subdivided into structures, rooms, and functional areas.

The FHB includes the spent fuel pit (including the spent fuel pit structure, liner, spent fuel racks, and spent fuel cask storage area), the gas decay tank room, transfer canal structure, new fuel storage room, spent fuel pit cooling pump and heat exchanger rooms, CVCS holdup tank room, hot machine shop, cask and large equipment decontamination area, tool room, and HVAC fan rooms. The FHB is supported on pilings with a higher density of pilings under the spent fuel pit structure, which consists of the gas decay tank room under the spent fuel pit, and the superstructure above the spent fuel pit. Water stops were used in the construction of the FHB sump pits. Water stops are considered to be subcomponents of the concrete sump pit slabs and walls. The spent fuel pit is designed for the underwater storage of spent fuel assemblies after their removal from the reactor. The entire interior basin face and transfer canal are lined with stainless steel plate. A spent fuel pool bridge crane is mounted on rails adjacent to the spent fuel pit and is used to move components within the pit. The superstructure above the spent fuel pit is constructed of structural steel with aluminum or fiberglass siding. The superstructure supports a 125-ton spent fuel cask handling crane that is used to move the spent fuel cask and miscellaneous equipment between ground level and the spent fuel pit.

In the license renewal evaluation, the hot machine shop, tool room, cask and large equipment decontamination area, spent fuel pit heat exchanger room, and the pipe corridor beneath the spent fuel pit pump room were determined to be in scope for license renewal. The spent fuel pit, spent fuel racks, and fuel transfer canal were determined to be in scope. The entire steel and reinforced concrete structure load path (including pilings) supporting the spent fuel cask handling crane are included in scope. The spent fuel cask handling crane itself as well as the spent fuel bridge crane were included in scope. However, the CVCS holdup tank room structure was screened out, because it does not support any intended function of the FHB structure. Civil components and commodities in the new fuel storage room were evaluated and determined not to support any intended function of the FHB structure. The FHB is shown on UFSAR Figures 1.2.2-7 and 1.2.2-8. The spent fuel pit is discussed in UFSAR Section 3.8.4. The FHB is in the scope of license renewal because it contains (1) SCs that are safety related and are relied upon to remain functional during and following design-basis events, (2) SCs that are not safety related whose failure could prevent satisfactory accomplishment of the safety-related functions, and (3) SCs that are relied on during postulated fires and SBO events.

Table 2.4-3 lists 25 structural component types requiring an AMR, provides a reference to the results of the AMR for each component type, and identifies the intended functions listed below for the FHB:.

- provide pressure boundary and/or fission product barrier
- provide structural and/or functional support to safety-related equipment
- provide structural and/or functional support to non-safety-related equipment where failure of this structural component could prevent satisfactory accomplishment of any of the required safety-related functions

- provide structural support and/or shelter to components required for fire protection, an anticipated transient without scam, and/or a station blackout
- provide shelter/protection to safety-related equipment (including radiation shielding)
- provide rated fire barrier to confine or retard a fire from spreading to or from adjacent areas of the plant
- serve as missile (internal or external) barrier
- provide heat sink during station blackout or design-basis accidents

2.4.2.2.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.2 and UFSAR Section 3.8.4 to determine whether there is reasonable assurance that the FHB and structural components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In performing the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

Table 2.4-3 lists 25 structural component types that require an AMR. These structural component types include anchorage/embedments (exposed surface), anchorage/embedments (embedded/encased in concrete), bellows, cable tray and conduit, doors, electrical and instrument panels and enclosures, electrical component supports, expansion anchors, fire barrier penetration seals, HVAC duct supports, instrument line supports, instrument racks and frames, masonry walls, miscellaneous steel structures (stairs, ladders, platforms, connectors, grating, and checker plate), pilings, pipe supports, reinforced concrete (beams, walls, floors, columns, etc.), seismic joint filler, spent fuel pool liner, siding, spent fuel bridge crane, spent fuel cask crane, spent fuel storage rack, structural steel (beams, plates, connectors, and columns), and tube track supports.

The staff finds that the applicant made no omissions in scoping the FHB and SCs for license renewal. The staff's review also found that all the passive structures and components identified as being within the scope of license renewal were subject to an AMR.

2.4.2.2.3 Conclusions

The staff reviewed the LRA to determine whether SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the structural components of the FHB that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the structural components of the FHB that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2.3 Turbine Building

2.4.2.3.1 Summary of Technical Information in the Application

The applicant describes the turbine building in LRA Section 2.4.2.3 and provides a list of components subject to an AMR in LRA Table 2.4-4.

The turbine building is primarily an open steel frame structure built on reinforced concrete foundations. The foundations are supported on pilings. In general, the turbine building is a Class III structure; Class III structures are not related to reactor operation or safety. However, the turbine building includes a seismic Category I bay in the area that houses and supports the steam-driven AFW pump and associated components. In addition, safety-related piping is routed through a Class III portion of the turbine building in a concrete trench covered with a checkered plate on the bottom floor. The building is located just south of the reactor containment building. The turbine building is described in UFSAR Sections 3.2.1.2 and 3.8.4.

The turbine building is within the scope of license renewal because it contains (1) SCs that are safety related and are relied upon to remain functional during and following design-basis events, (2) SCs that are not safety related but whose failure could prevent satisfactory accomplishment of the safety-related functions, and (3) and SCs that are relied on during postulated fires, ATWS, and SBO events.

Table 2.4-4 lists 26 structural component types requiring an AMR, provides a reference to the results of the AMR for each component type, and identifies the following intended functions for the turbine building:

- provide structural and/or functional support to safety-related equipment.
- provide structural and/or functional support to non-safety-related equipment where failure of this structural component could prevent satisfactory accomplishment of any of the required safety-related functions
- provide structural support and/or shelter to components required for fire protection, ATWS, and/or SBO
- provide spray shield or curbs for directing flow (such as safety injection flow to containment sump)
- serve as missile (internal or external) barrier
- provide shelter/protection to safety-related equipment (including radiation shielding)

2.4.2.3.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.3 and UFSAR Sections 3.2.1.2 and 3.8.4 to determine whether there is reasonable assurance that the structural components of the turbine building within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In performing the review, the staff selected functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

Table 2.4-4 lists 26 structural component types that require an AMR. These structural component types include anchorage/embedments (exposed surface), anchorage/embedments (embedded/encased), battery rack, cable tray and conduit, doors, electrical and instrument panels and enclosures, electrical bus duct, electrical component supports, equipment supports, expansion anchors, instrument line supports, instrument racks and frames, louvers, masonry walls, miscellaneous steel structures (stairs, ladders, platforms, connectors, grating, and checker plate), pilings, pipe supports, pipe-whip restraints, protective enclosure (structures sheltering or enclosing plant equipment), reinforced concrete (beams, walls, floors, columns, etc.), siding, spray shields, structural steel (beams, plates, connectors, and columns), threaded fasteners, tube track supports, and turbine gantry crane.

Since the safety-related piping is routed through the turbine building in a concrete trench, which was not listed in Table 2.4-2, on February 11, 2003, the staff requested the applicant in RAI 2.4.2-3 to clarify whether the concrete trench is in scope and subject to an AMR. In response to RAI 2.4.2-3, on April 28, 2003, the applicant stated that the concrete trench is in scope and subject to an AMR and is included in the reinforced concrete component in Table 2.4-4.

The staff has reviewed the information in LRA Section 2.4.2.3, the UFSAR, and the additional information submitted by the applicant in response to the staff's RAI. The staff finds that the applicant made no omissions in scoping the turbine building and components for license renewal. The staff's review also found that the passive SCs identified as being within the scope of license renewal were subject to an AMR.

2.4.2.3.3 Conclusions

The staff reviewed the LRA to determine whether structures, systems, or components that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the structural components of the turbine building that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the structural components of the turbine building that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2.4 Dedicated Shutdown Diesel Generator Building

2.4.2.4.1 Summary of Technical Information in the Application

The applicant describes the dedicated shutdown diesel generator (DSDG) building in LRA Section 2.4.2.4 and provides a list of components subject to an AMR in LRA Table 2.4-5.

Based on the fire protection safe shutdown analysis, certain postulated fires may cause multiple failures that could prevent safe plant shutdown; therefore, a DS system was installed to bring the plant to a safe shutdown condition. The DSDG is part of the DS system. The DSDG building structure is scoped to include the reinforced concrete slab which supports the DS diesel skid mounted structural steel enclosure, the DS diesel battery charger, and the DS diesel cooling unit. The structure is located west of the turbine building. The DS diesel building is in the scope of license renewal because it contains SCs that are relied on during postulated fires and SBO events.

Table 2.4-5 lists 16 structural component types requiring an AMR, provides a reference to the results of the AMR for each component type, and identifies provisions of structural support and/or shelter to components required for fire protection, ATWS, and/or SBO as the intended function for the DSDG building.

2.4.2.4.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.4 to determine whether there is reasonable assurance that the DSDG building structural components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In performing the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

Table 2.4-5 lists 16 structural component types that require an AMR. These structural component types include the anchor bolt chair for the tank foundation, anchorage/embedments (exposed surface), anchorage/embedments (embedded/encased in concrete), battery rack, cable tray and conduit, electrical and instrument panels and enclosures, electrical component supports, equipment supports, expansion anchors, instrument racks and frames, louvers, pipe supports, protective enclosure (structures sheltering or enclosing plant equipment), reinforced concrete (beams, walls, floors, columns, etc.), structural steel (beams, plates, connectors, and columns), and threaded fasteners.

The staff has reviewed the information in LRA Section 2.4.2.4. The staff finds that the applicant made no omissions in scoping the dedicated shutdown diesel generator building and components for license renewal. The staff's review also found that the passive SCs identified as being within the scope of license renewal were subject to an AMR.

2.4.2.4.3 Conclusions

The staff reviewed the LRA to determine whether SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment during the onsite inspection to determine whether components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the structural components of the DSDG building that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the DSDG building that are subject to an AMR, as required by

10 CFR 54.21(a)(1).

2.4.2.5 Radwaste Building

2.4.2.5.1 Summary of Technical Information in the Application

The applicant describes the radwaste building in LRA Section 2.4.2.5 and provides a list of components subject to an AMR in LRA Table 2.4-6.

The radwaste building is a detached structure located adjacent to the east side of the auxiliary building. The building is used for storage of contaminated materials, such as spent ion exchange resins; filters; anti-C clothing; and contaminated waste materials. An expansion joint assembly is installed at the pipe chase interface between the RAB and the radwaste building to prevent load transfer between buildings. The radwaste building is a reinforced concrete structure supported on a concrete slab. The south and west walls support the grating providing missile and tornado protection for the north service water header enclosure. The radwaste building walls provide protection for the safety-related service water pipe. The radwaste building is in the scope of license renewal because it contains SCs that are not safety related but whose failure could prevent satisfactory accomplishment of the safety-related functions and SCs that are relied on during postulated fires.

Table 2.4-6 lists nine structural component types requiring an AMR, provides a reference to the results of the AMR for each component type, and identifies the following intended functions for the radwaste building:

- provide structural and/or functional support to non-safety-related equipment where failure of this structural component could prevent satisfactory accomplishment of any of the required safety-related functions

- provide structural support and/or shelter to components required for fire protection, ATWS, and/or SBO

- provide shelter/protection to safety-related equipment (including radiation shielding)

- serve as missile (internal or external) barrier

2.4.2.5.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.5 to determine whether there is reasonable assurance that the radwaste building components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In performing the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

Table 2.4-6 lists nine structural component types that require an AMR. These structural component types include anchorage/embedments (exposed surface), anchorage/embedments (embedded/encased), expansion anchors, masonry walls, pipe supports, reinforced concrete (beams, walls, floors, columns, etc.), seismic joint filler (later deleted in response to RAI 2.4.2-7), structural steel (beams, plates, connectors, and columns), and threaded fasteners.

On February 11, 2003, the staff requested the applicant in RAI 2.4.2-7 to clarify whether the components associated with radwaste building cranes and hoists, fire doors, and fire penetrations were in scope and subject to an AMR. In response to RAI 2.4.2-7, on April 28, 2003, the applicant states that the crane and hoists, fire doors, and fire penetrations do not perform a license renewal intended function and were not included in Table 2.4-6. This is because the components' intended functions in the radwaste building are to protect and provide missile shield walls for the safety-related north service water header and to shelter and support a fire water header isolation valve inside a masonry block enclosure at the north end of the radwaste building. Only the components listed in Table 2.4-6 have a license renewal intended function. The response also states that the seismic joint filler should be deleted from Table 2.4-6 because it was inadvertently included. The applicant indicated it will modify the structural steel component's intended function to "provide structural support and/or shelter to components required for fire protection, ATWS and/or SBO," and the reinforced concrete component's intended function to "provide structural and/or functional support to non-safety-related equipment where failure of this structural component could prevent satisfactory accomplishment of any of the required safety-related functions."

The staff has reviewed the information in LRA Section 2.4.2.5 and the applicant's additional submittals. The staff finds that the applicant made no omissions in scoping the radwaste building and structural components for license renewal. The staff's review also found that the passive SCs identified as being within the scope of license renewal were subject to an AMR.

2.4.2.5.3 Conclusions

The staff reviewed the LRA to determine whether SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the radwaste building that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the radwaste building that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2.6 Intake Structures

2.4.2.6.1 Summary of Technical Information in the Application

The applicant describes the intake structures in LRA Section 2.4.2.6 and provides a list of components subject to an AMR in LRA Table 2.4-7.

The intake structure is a Class I reinforced concrete structure consisting of three bays. The intake structure supports the four safety-related service water pumps, the three non-safety-

related circulating water pumps, and the three firewater pumps (booster pump, motor-driven pump, engine-driven pump). These pumps take suction from the bays and supply water to the plant via their respective systems. There are three traveling screens, one for each bay, to remove small debris from the intake water. The intake structure is in the scope of license renewal because it contains SCs that are safety related and are relied upon to remain functional during and following design-basis events, SCs that are not safety related whose failure could prevent satisfactory accomplishment of the safety-related functions, and SCs that are relied on during postulated fires and SBO events.

Table 2.4-7 lists 16 structural component types requiring an AMR, provides a reference to the results of the AMR for each component type, and identifies the following intended functions for the intake structure:

- provide rated fire barrier to confine or retard a fire from spreading to or from adjacent areas of the plant
- provide structural and/or functional support to safety-related equipment
- provide structural and/or functional support to non-safety-related equipment where failure of this structural component could prevent satisfactory accomplishment of the required safety-related functions
- provide structural support and/or shelter to components required for fire protection, ATWS, and/or SBO
- provide shelter/protection to safety-related equipment (including radiation shielding)
- provide source of cooling water for plant shutdown

2.4.2.6.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.6 to determine whether there is reasonable assurance that the intake structures within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In performing the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

Table 2.4-7 lists 16 structural component types that require an AMR. These structural component types include anchorage/embedments (exposed surface), anchorage/embedments (embedded/encased in concrete), battery rack, cable tray and conduit, concrete fill, electrical and instrument panels and enclosures, electrical component supports, expansion anchors, instrument racks and frames, manhole covers, miscellaneous steel structures (stairs, ladders, platforms, connectors, grating, and checker plate), pipe supports, protective enclosure (structures sheltering or enclosing plant equipment), reinforced concrete (beams, walls, floors, columns, etc.), siding, and structural steel (beams, plates, connectors, and columns).

On February 11, 2003, the staff requested the applicant in RAI 2.4.2-8 to provide justifications for the exclusion of the three traveling screens that remove small debris from the intake water. In response to RAI 2.4.2-8, on April 28, 2003, the applicant provided the following justification:

> The traveling screens are designated as non-safety related in the circulating water system. The traveling screens do not provide a license renewal intended function as defined in 10 CFR 54.4(a)(1), (2) or (3). There is a relatively low flow velocity (approximately 0.07 ft/sec) through the traveling screens during a design basis event and the condition of the RNP impoundment is relatively nonaggressive. Additionally, the following factors were considered during review of the traveling screens for scoping:
>
> - The traveling screens are not required to perform a function during and following a design basis event, and therefore do not meet the scoping criteria of 10 CFR 54.4(a)(1)(i), (ii), or (iii).
> - There is no credible failure mode of the traveling screens that could prevent satisfactory accomplishment of any of the functions identified in paragraphs 10 CFR 54.4(a)(1)(i), (ii), or (iii). Therefore the traveling screens do not meet the scoping criteria of 10 CFR 54.4(a)(2).
> - The traveling screens are not required to perform a function in support of the regulated events of 10 CFR 54.4(a)(3).

Based on the above, the traveling screens are not considered to meet the scoping criteria of 10 CFR 54.4(a) and do not perform a licensee renewal intended function per 10 CFR 54.4(b).

The staff has reviewed the information in LRA Section 2.4.2.6 and the responses to the staff's RAI. The staff finds that the applicant made no omissions in scoping the intake structure and structural components for license renewal. The staff's review also found that the passive SCs identified as being within the scope of license renewal were subject to an AMR.

2.4.2.6.3 Conclusions

The staff reviewed the LRA to determine whether SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the intake structures that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the intake structures that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2.7 North Service Water Header Enclosure

2.4.2.7.1 Summary of Technical Information in the Application

The applicant describes the north service water header enclosure in LRA Section 2.4.2.7 and provides a list of components subject to an AMR in LRA Table 2.4-8.

The north service water header enclosure provides support and protection for a portion of the north service water header that is routed above ground. The north service water header has been designed with protective barriers to ensure that this portion of the SWS is capable of

withstanding the passage of a tornado without a loss of function. The protective barriers provided for the aboveground portion of the north service water header are a double layer of grating and a poured concrete wall in the area to the south and west of the radwaste building. The radwaste building's south and west walls also provide missile protection. The concrete structure is designed as Class I. Service water pit 3, south of the radwaste building, is surrounded by and included in the scope of the north service water header enclosure.

The north service water header enclosure is in the scope of license renewal because it contains (1) SCs that are safety related and are relied upon to remain functional during and following design-basis events, (2) SCs that are not safety related but whose failure could prevent satisfactory accomplishment of the safety-related functions, and (3) SCs that are relied on during postulated fires and SBO events.

Table 2.4-8 lists 15 structural component types requiring an AMR, provides a reference to the results of the AMR for each component type, and identifies the following intended functions for the north service water header enclosure:

- provide rated fire barrier to confine or retard a fire from spreading to or from adjacent areas of the plant
- provide structural and/or functional support to safety-related equipment
- provide structural and/or functional support to non-safety-related equipment where failure of this structural component could prevent satisfactory accomplishment of any of the required safety-related functions
- provide structural support and/or shelter to components required for fire protection, ATWS, and/or SBO
- provide spray shield or curbs for directing flow (such as safety injection flow to containment sump)
- provide shelter/protection to safety-related equipment (including radiation shielding)
- serve as missile (internal or external) barrier

2.4.2.7.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.7 to determine whether there is reasonable assurance that the north service water header enclosure components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In performing the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

Table 2.4-8 lists 15 structural component types that require an AMR. These structural component types include anchorage/embedments (exposed surface), anchorage/embedments

(embedded/encased in concrete), cable tray and conduit, concrete fill, concrete curb, electrical and instrument panels and enclosures, electrical component supports, expansion anchors, instrument line supports, masonry walls, miscellaneous steel structures (stairs, ladders, platforms, connectors, grating, and checker plate), pipe supports, reinforced concrete (beams, walls, floors, columns, etc.), structural steel (beams, plates, connectors, and columns), and threaded fasteners.

Section 3.2.1.2 of the UFSAR states that the concrete missile shield wall and the support slab for the aboveground portions of the service water system north header are Class I. These two structural components were not specifically listed in LRA Table 2.4-8. On February 11, 2003, the staff requested the applicant to clarify whether they are subject to an AMR. In response to RAI 2.4.2-2, on April 28, 2003, the applicant stated that they are subject to an AMR.

The staff has reviewed the information in LRA Section 2.4.2.7 and the applicant's response to the staff's RAI. The staff finds that the applicant made no omissions in scoping the north service water header enclosure and structural components for license renewal. The staff's review also found that the passive SCs identified as being within the scope of license renewal were subject to an AMR.

2.4.2.7.3 Conclusions

The staff reviewed the LRA to determine whether SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the structural components of the north service water header enclosure that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the north service water header enclosure that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2.8 Emergency Operations Facility/Technical Support Center Security Diesel Generator Building

2.4.2.8.1 Summary of Technical Information in the Application

The applicant describes the EOF/TSC security DG building in LRA Section 2.4.2.8 and provides a list of components subject to an AMR in LRA Table 2.4-9.

The EOF/TSC security DG building houses equipment that is relied on to provide electrical power following postulated fires. This structure consists of a reinforced concrete slab with walls constructed of concrete block and removable (from inside the structure) steel grating panels. The building is located west of the main power block near the work control building. The EOF/TSC security DG building is in the scope of license renewal because it contains SCs that are relied on during postulated fires.

Table 2.4-9 lists 16 structural component types requiring an AMR, provides a reference to the results of the AMR for each component type, and identifies the intended function of the

EOF/TSC security DG building as the provision of structural support and/or shelter to components required for fire protection, ATWS, and/or SBO.

2.4.2.8.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.8 to determine whether there is reasonable assurance that the EOF/TSC security DG building components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

Table 2.4-9 lists 16 structural component types that require an AMR. These structural component types include anchorage/embedments (exposed surface), anchorage/embedments (embedded/encased in concrete), battery rack, cable tray and conduit, doors, electrical and instrument panels and enclosures, electrical component supports, expansion anchors, masonry walls, miscellaneous steel structures (stairs, ladders, platforms, connectors, grating, and checker plate), pipe supports, protective enclosure, reinforced concrete (beams, walls, floors, columns, etc.), structural steel (beams, plates, connectors, and columns), threaded fasteners, and vibration isolators.

The staff has reviewed the information in LRA Section 2.4.2.8. The staff finds that the applicant made no omissions in scoping the EOF/TSC security DG building and structural components for license renewal. The staff's review also found that the passive SCs identified as being within the scope of license renewal were subject to an AMR.

2.4.2.8.3 Conclusions

The staff reviewed the LRA to determine whether SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the structural components of the EOF/TSC security DG building that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the EOF/TSC security DG building that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2.9 Discharge Structures

2.4.2.9.1 Summary of Technical Information in the Application

The applicant describes the discharge structures in LRA Section 2.4.2.9.

The structures associated with the discharge of circulating water and service water to Lake Robinson are seal well #2, the discharge canal, and the canal outlet structure. Seal well #2 is an underground/underwater reinforced concrete structure which receives water from the

underground circulating water discharge conduit and injects the water into the discharge canal. The discharge canal is an earthen structure that directs condenser cooling and service system water discharged from the plant to Lake Robinson via a channel. The discharge canal originates just east of the plant, parallels the west shore of the lake, and terminates in the lake near its upper end. The canal outlet structure is a reinforced concrete structure located at the intersection of the discharge canal and Lake Robinson. It contains a weir over which water is discharged, thereby promoting mixing with water in the lake. In the scoping process, the discharge structures were conservatively assumed to contain SCs that are not safety related but whose failure could prevent satisfactory accomplishment of safety-related functions. However, during screening, it was concluded that none of the structural components of the discharge structures could prevent the performance of any required safety-related function. Therefore, the discharge structure components perform no intended functions and are not subject to an AMR.

2.4.2.9.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.9 to determine whether there is reasonable assurance that the discharge structures components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In performing the review, the staff selected functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

The staff has reviewed the information in LRA Section 2.4.2.9. The staff finds that the applicant made no omissions in scoping the discharge structures and structural components for license renewal. The staff agrees with the applicant's conclusion that none of the structural components of the discharge structures could prevent the performance of any required safety-related function. Therefore, the discharge structure components perform no intended functions and are not subject to an AMR.

2.4.2.9.3 Conclusions

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the structural components of the discharge structures that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has an adequate basis for concluding that no components of the discharge structures are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2.10 Lake Robinson Dam

2.4.2.10.1 Summary of Technical Information in the Application

The applicant describes the Lake Robinson Dam in LRA Section 2.4.2.10 and provides a list of components subject to an AMR in LRA Table 2.4-10. Lake Robinson was constructed originally as a cooling water source for the Robinson Unit 1 fossil station. The lake was created by construction of the Lake Robinson Dam. The dam has a central vertical clay core and supporting shells of compacted sand. The dam has a maximum height of about 50 feet. Riprap protection is provided on the upstream face from the crest to elevation 205 feet (5 ft below low water elevation) and on the downstream side for that portion of the slope below levation 195 feet. The dam includes a reinforced concrete spillway. Two large steel gates and steel valves are used to control water release from the reservoir. The Lake Robinson Reservoir provides plant cooling water for normal and emergency situations and supplies fire protection water.

Lake Robinson Dam is in the scope of license renewal because it contains SCs that are not safety related but whose failure could prevent satisfactory accomplishment of the safety-related functions and SCs that are relied on during postulated fires.

Table 2.4-10 lists seven structural component types requiring an AMR, provides a reference to the results of the AMR for each component type, and identifies the following intended functions for the Lake Robinson Dam:

- provide structural and/or functional support to safety-related equipment
- provide structural and/or functional support to non-safety-related equipment where failure of this structural component could prevent satisfactory accomplishment of any of the required safety-related functions
- provide structural support and/or shelter to components required for fire protection, ATWS, and/or SBO
- provide source of cooling water for plant shutdown

2.4.2.10.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.10 to determine whether there is reasonable assurance that the Lake Robinson Dam components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In performing the review, the staff selected functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

Table 2.4-10 lists seven structural component types that require an AMR. These structural component types include anchorage/embedments (exposed surface), anchorage/embedments (embedded/encased in concrete), lake dam, spillway for dam structure, structural steel (beams, plates, connectors, and columns), gates/valves, and threaded fasteners.

The staff reviewed LRA Section 2.4.2.10 to determine whether there is reasonable assurance that the Lake Robinson Dam components within the scope of license renewal and subject to an

AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1). The staff finds that the applicant has properly identified the structural components that are subject to an AMR.

2.4.2.10.3 Conclusions

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the structural components of the Lake Robinson Dam that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the Lake Robinson Dam that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2.11 Pipe Restraint Tower

2.4.2.11.1 Summary of Technical Information in the Application

The applicant describes the pipe restraint tower in LRA Section 2.4.2.11 and provides a list of components subject to an AMR in LRA Table 2.4-11. The pipe restraint tower is a seismic Category I structural steel frame structure supported by a reinforced concrete foundation. The foundation is supported on pilings. Grating platforms are located at various elevations. This structure is required for mitigation of pipe whip and jet impingement as a result of postulated HELBs outside the containment. The location is due south of the reactor containment structure approximately between turbine building column lines 11 and 12. The pipe restraint tower supports the main steam safety relief and isolation valves, the feedwater isolation valves, and acts as a pipe-whip restraint for the main steam and feedwater lines. The pipe restraint tower is not physically attached to the containment building and is connected via platforms to the seismic Category I portion of the turbine building.

The pipe restraint tower is in the scope of license renewal because it contains (1) SCs that are safety related and are relied upon to remain functional during and following design-basis events, (2) SCs that are not safety related but whose failure could prevent satisfactory accomplishment of the safety-related functions, and (3) SCs that are relied on during postulated fires, ATWS, and SBO events.

Table 2.4-11 lists 13 structural component types requiring an AMR, provides a reference to the results of the AMR for each component type, and identifies the following intended functions for the pipe restraint tower:

- provide structural and/or functional support to safety-related equipment
- provide structural and/or functional support to non-safety-related equipment where failure of this structural component could prevent satisfactory accomplishment of any of the required safety-related functions
- provide structural support and/or shelter to components required for fire protection, ATWS, and/or SBO

- provide shelter/protection to safety-related equipment (including radiation shielding)
- provide pipe-whip restraint and/or jet impingement protection

2.4.2.11.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.11 to determine whether there is reasonable assurance that the pipe restraint tower components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In performing the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

Table 2.4-11 lists 13 structural component types that require an AMR. These structural component types include anchorage/embedments (exposed surface), anchorage/embedments (embedded/encased in concrete), cable tray and conduit, electrical and instrument panels and enclosures, electrical component supports, instrument line supports, miscellaneous steel structures (stairs, ladders, platforms, connectors, grating, and checker plate), piling, pipe supports, pipe-whip restraints, reinforced concrete (beams, walls, floors, columns, etc.), structural steel (beams, plates, connectors, and columns), and threaded fasteners.

The staff has reviewed the information in LRA Section 2.4.2.11. The staff finds that the applicant made no omissions in scoping the pipe restraint tower and structural components for license renewal. The staff's review also found that all the passive SCs identified as being within the scope of license renewal are subject to an AMR.

2.4.2.11.3 Conclusions

The staff reviewed the LRA to determine whether SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the structural components of the pipe restraint tower that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the pipe restraint tower that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2.12 Yard Structures and Foundations

2.4.2.12.1 Summary of Technical Information in the Application

The applicant describes the yard structures and foundations in LRA Section 2.4.2.12 and provides a list of components subject to an AMR in LRA Table 2.4-12. Yard structures and foundations include concrete foundations and steel supports for miscellaneous in-scope equipment, concrete trenches for in-scope piping and utilities, electrical enclosures and panels located in Personnel Access Portal (PAP) West supporting security lighting, and concrete duct banks and manholes. Portions of the PAP West structure were evaluated to be in scope during

the screening process for security lighting when security lighting circuits were determined to be located in the yard structures. The yard structures and foundations classification includes miscellaneous yard structures consisting of foundations (concrete and structural steel) for piping, cable trays, conduits, and electrical enclosures and panels located outside other structures and buildings.

Yard structures and foundations are within the scope of license renewal because they contain SCs that are safety related and are relied upon to remain functional during and following design-basis events, SCs that are not safety related but whose failure could prevent satisfactory accomplishment of the safety-related functions, and SCs that are relied on during postulated fires and SBO events. (Individual structures may not perform all of these functions.)

Table 2.4-12 lists 20 structural component types requiring an AMR, provides a reference to the results of the AMR for each component type, and identifies the following intended functions for yard structures and foundations

- provide rated fire barrier to confine or retard a fire from spreading to or from adjacent areas of the plant
- provide structural and/or functional support to safety-related equipment
- provide structural and/or functional support to non-safety-related equipment where failure of this structural component could prevent satisfactory accomplishment of any of the required safety-related functions
- provide structural support and/or shelter to components required for fire protection, ATWS and/or SBO
- provide shelter/protection to safety-related equipment (including radiation shielding)

2.4.2.12.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.12 to determine whether there is reasonable assurance that the yard structures and foundations components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In performing the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

Table 2.4-12 lists 20 structural component types that require an AMR. These structural component types include anchor bolt chair for tank foundation, anchorage/embedments (exposed surface), anchorage/embedments (embedded/encased in concrete), cable tray and conduit, concrete tank foundation, doors, electrical and instrument panels and enclosures, electrical component supports, electrical manhole, expansion anchors, manhole covers, masonry walls, miscellaneous steel structures (stairs, ladders, platforms, connectors, grating, and checker plate), pipe supports, protective enclosure, reinforced concrete (beams, walls, floors, columns, etc.), siding, structural steel (beams, plates, connectors, and columns),

threaded fasteners, and underground conduit duct bank. On February 11, 2003, the staff requested the applicant in RAI 2.5.1-1 to explain why the screening results in section 2.5.1 did not include offsite power system structures or components. In response to RAI 2.5.1-1, on April 28, 2003, the applicant provided a list supporting structures and civil/structural component/commodity groups which are required for restoration of offsite power. The switchyard relay building, switchyard and transformer structures, isolated phase bus duct yard support structures, and the 4 kV nonsegregated bus duct yard support structures were added as in scope. Electrical bus duct (enclosure), battery rack, and pilings were added to Table 2.4.12 as structural component types that are in scope and subject to an AMR to meet the requirement of 10 CFR 54.4(a)(3) with respect to the offsite power system SCs.

Since the UFSAR lists the primary water storage tank as a Class I component and Section 2.4.2.12 of the LRA states that the primary water storage tank was determined to be outside of the intended function boundary for license renewal, on February 11, 2003, the staff requested the applicant to provide justifications for that determination. In response to RAI 2.4.2-4, on April 28, 2003, the applicant provided the following justification:

> The original RNP licensing basis considered the CVCS flow path from the boric acid storage tanks to the blender (and including the PWST and its flow path) and to the charging pumps' suction to be safety related, and required operability of this equipment in the technical specifications. Safety-related tanks were designed to Class I criteria. A subsequent license change identified that only the RWST was required as a postaccident makeup source of borated water, and relocated the requirements for the CVCS and PWST to the technical requirements manual. Therefore, the PWST does not support any system intended function, which resulted in the above conclusion stated in LRA Section 2.4.2.12. Section 2.4.2.12 was submitted to the NRC prior to RNP reformulating its position with respect to 10 CFR 54.4(a)(2). Based on recent industry guidance relating to 10 CFR 54.4(a)(2) and piping systems (Criterion 2 piping), the PWST required evaluation for its potential spatial interactions with nearby safety-related equipment. There is no safety-related equipment in its proximity that would be adversely affected by spray or leakage from the tank. Consequently, the PWST was determined to have no potential spatial interaction with safety-related equipment and does not require aging management.

The staff finds the above response reasonable and acceptable.

Table 3.2.1-2 of the UFSAR lists the S/G drain (flash) tank, refueling water storage tank, accumulator tanks, fuel oil storage tank, chemical drain tank, waste holdup tanks, sump tank, gas decay tanks, spent resin storage tank, and RCDT as Class I components. However, none of these tanks is listed in Table 2.2-1, "License Renewal Scoping Results for Mechanical Systems," or Table 2.2-2, "License Renewal Scoping Results for Structures of the LRA." On February 11, 2003, the staff requested the applicant to clarify whether these tanks are within scope and subject to an AMR.

In response to RAI 2.4-1 and RAI 2.4-5, on April 28, 2003, the applicant stated that the S/G drain (flash) tank, refueling water storage tank, accumulator tanks, fuel oil storage tank, and their foundations are in scope and subject to an AMR, but the remaining tanks (namely, the chemical drain tank, waste holdup tanks, sump tank, gas decay tanks, spent resin storage tank, and the RCDT) are mechanical components within the liquid waste processing system and the gaseous waste processing system that do not require an AMR. The liquid waste processing system is within the scope of the LR rule because it is a Criterion 2 piping system, the containment isolation function and the electrical components associated with EQ and Regulatory Guide (RG) 1.97 functions. None of the tanks within the liquid radwaste system

support these system intended functions. The gaseous waste processing system has no system function that meets the LR scoping criteria and is not in scope of the rule as explained below. In fact, an evaluation of a complete rupture of a waste gas decay tank has shown that the dose limits as described above would not be exceeded. The waste gas decay tank rupture is considered the worst-case tank rupture of any radwaste tank (liquid or gas) due to the curie content and rapid expansion of the gaseous contents (UFSAR Section 15.7.1.1 and 15.7.2.1). Paragraph 15.7.1.3 of the UFSAR concludes, "an accidental waste gas release would present no hazard to the health and safety of the public." Based on this conclusion, none of the tanks in the gaseous radwaste system requires an AMR because the system is not in scope. The liquid radwaste system is in scope, but the identified tanks do not support any intended system function and on that basis do not require an AMR.

The staff finds the above response reasonable and acceptable.

The staff has reviewed the information in LRA Section 2.4.2.12, the UFSAR, and the additional information submitted by the applicant in response to the staff's RAIs. The staff finds that the applicant made no omissions in scoping the yard structures and foundations and structural components for license renewal. The staff's review also found that the applicant has properly identified all the passive SCs requiring an AMR.

2.4.2.12.3 Conclusions

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the structural components of the yard structures and foundations that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the yard structures and foundations that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2.13 Refueling System

2.4.2.13.1 Summary of Technical Information in the Application

The applicant describes the refueling system in LRA Section 2.4.2.13. The refueling system contains components in the containment and the FHB and provides a safe, effective means of transporting and handling fuel. There are no safety-related components in the refueling system except for the fuel transfer tube and the fuel transfer tube blind flange. The flange was transferred to the containment building and is screened there along with the fuel transfer tube. No safety-related functions are associated with this equipment, and no intended functions were assigned to the system other than for the fuel transfer tube flange. Therefore, all remaining components were screened as out of the evaluation boundary. The flange on the fuel transfer tube is discussed in the LRA as part of the containment.

2.4.2.13.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.13 to determine whether there is reasonable assurance that the refueling system components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In performing the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

Since the fuel transfer tube and the blind flange have been included with the license renewal scope in the containment structure and are subject to an AMR, the staff agrees with the applicant's conclusion to screen out the remaining components of the refueling system since they are not relied upon to remain functional during and following the postulated fire event, SBO event, or design-basis events.

2.4.2.13.3 Conclusions

The staff reviewed the LRA to determine whether SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the structural components of the refueling system that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the refueling system that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.3 Evaluation Findings

On the basis of this review, the staff concludes that there is reasonable assurance that the applicant has adequately identified the structures and structural components that are within the scope of license renewal, in accordance with the requirements of 10 CFR 54.4(a), and that the applicant has adequately identified the structural components that are subject to an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1).

2.5 Scoping and Screening Results: Electrical/Instrumentation and Control Systems

This section addresses the scoping and screening results of electrical/I&C systems at RNP for license renewal. As required by 10 CFR 54.21(a)(1), an applicant must identify and list SCs subject to an AMR. These are passive, long-lived SCs that are within the scope of license renewal. To verify that the applicant has properly implemented its methodology, the staff focuses its review on the implementation results. Such a focus allows the staff to confirm that there is no omission of electrical system components that are subject to an AMR. If the review identifies no omission, the staff has the basis to find that there is reasonable assurance that the applicant has identified the electrical system components that are subject to an AMR.

The applicant performed the screening for electrical/I&C components on a generic component commodity group basis for the in-scope electrical/I&C systems. The in-scope electrical/I&C component commodity groups identified at RNP are listed in Table 2.5.1. The table includes all

electrical/I&C components commodity groups, provided in NEI 95-10, Appendix B, with the exception of those types that did not meet the requirements of 10 CFR 54.4(a).

Table 2.5-1 RNP In-Scope Electrical/I&C Components

Alarm Units	Electrical/I&C Penetration Assemblies	Loop Controllers	Signal Conditioners
Analyzers	Elements	Meters	Solenoid Operators
Annunciators	Fuses	Motor Control Centers	Solid-State Devices
Batteries	Generators	Motors	Splices
Bus Duct	Heat Tracing	Power Distribution Panels	Surge Arresters
Chargers	Heaters	Power Supplies	Switches
Circuit Breakers	Indicators	Radiation Monitors	Switchgear
Converters	Insulated Cables and Connections	Recorders	Terminal Blocks
Communication Equipment	Inverters	Regulators	Thermocouples
Electrical Controls and Panel Internal Component Assemblies	Isolators	Relays	Transducers
	Light Bulbs	RTDs	Transformers
	Load Centers	Sensors	

The applicant eliminated the following components because they did not meet the license renewal scoping requirements of 10 CFR 54.4(a):

- electrical bus (the isolated-phase bus system and the switchyard and transformer system)
- transmission conductors
- high-voltage insulators
- high-voltage surge arresters
- uninsulated ground conductors

After applying the screening criteria as discussed in 10 CFR 54.21(a)(1)(i), the applicant determined that the following electrical commodities at RNP require an AMR.

- bus duct (2.5.1)

- insulated cables and connections (2.5.2)
- electrical and I&C penetration assemblies (2.5.3)

2.5.1 Bus Duct

Section 2.5.3.1, “Bus Duct,” in the LRA identifies bus ducts as passive long-lived component commodity groups that connect power supplies and load centers in order to deliver voltage and current to support the system’s intended function as defined in 10 CFR 54.21(a)(1)(i).

2.5.1.1 Summary of Technical Information in the Application

The applicant describes the bus ducts in LRA Section 2.5.3.1 and provides a list of components subject to an AMR in LRA Table 3.6-2.

The function of bus ducts is to electrically connect power supplies and load centers to deliver voltage and current. The bus ducts utilize preassembled raceway (enclosure) design with internal conductors installed on electrically insulated supports. Bus duct insulated copper conductors, their associated insulators, and electrical connections are reviewed as a single component commodity group. Bus ducts within scope of license renewal are (1) nonsegregated 480-V bus duct connecting EDG A to emergency bus E1, (2) nonsegregated 480-V bus duct connecting EDG B to emergency bus E2, (3) nonsegregated bus duct from the DS system transformer to the DS bus, (4) nonsegregated bus duct connecting 480-V switchgear bus 3 to the DS bus, and (5) the cross-tie, nonsegregated bus duct connecting emergency bus E1 and E2.

Bus ducts are not in the RNP EQ Program. Equipment in the EQ Program has documented qualified life. Components in the EQ Program that have a qualified life less than 40 years are replaced on the basis of a specified time period at the end of their qualified life. Components in the EQ Program that have a qualified life based on the 40-year current operating license term are the subject of time-limited aging analysis (TLAA). Since no bus ducts are within the scope of the EQ Program, bus ducts in the scope of license renewal are considered to meet the criteria of 10 CFR 54.21(a)(1)(ii) and are subject to an AMR.

2.5.1.2 Staff Evaluation

The staff reviewed LRA Section 2.5.3.1 to determine whether there is reasonable assurance that the bus duct components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1). The bus ducts identified by the applicant as requiring AMR are used between EDGs and emergency buses and between DS system transformer to DS bus to 480-V switchgear bus 3 to conduct electrical power (voltage and current). The staff reviewed these component categories against the requirements of 10 CFR 54.4(a)(1) and 10 CFR 5.4.4(a)(3) and found these categories are included in these requirements.

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

2.5.1.3 Conclusions

The staff reviewed the LRA to determine whether any structures, systems, or components that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the bus duct components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the bus duct components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.5.2 Insulated Cables and Connections

Section 2.5.3.2, "Insulated Cables and Connections," in the LRA identifies cables and connections as long-lived and non-EQ component groups that perform an electrical passive function in support of its system intended function as defined by 10 CFR 54.21(a)(1)(i).

2.5.2.1 Summary of Technical Information in the Application

The applicant describes the insulated cables and connections in LRA Section 2.5.3.2 and provides a list of components subject to an AMR in LRA Section 2.5.4.

The function of insulated cables and connections is to electrically connect specified sections of an electrical circuit to deliver voltage, current, or signals. Electrical cables and their required terminations (i.e., connections) are reviewed as a single component commodity group. The types of connections included in this review are splices, connectors, and terminal blocks. Numerous insulated cables and connections are included in the EQ Program. The insulated cables and connections that are included in this program have a qualified life that is documented in the EQ Program. Components in the EQ Program that have a qualified life less than 40 years are replaced on the basis of a specified time period at the end of their qualified life. Components in the EQ Program that have a qualified life based on the 40-year current operating license term are the subject of TLAA. Accordingly, all insulated cables and connections within the EQ Program are exempt from screening under 10 CFR 54.21(a)(1)(ii) and are not subject to an AMR review. The TLAA associated with electrical/I&C components within the EQ Program is discussed in LRA Section 4.4.1.

Insulated cables and connections that perform an intended function within the scope of license renewal, but are not included in the EQ Program, meet the criteria 54.21(a)(1)(ii) and are subject to an AMR.

2.5.2.2 Staff Evaluation

The staff reviewed LRA Section 2.5.3.2 to determine whether there is reasonable assurance that the insulated cable and connections components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1).

In the performance of the review the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not

omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

Consistent with the requirements specified in 10 CFR 54.4(a), fuse holders (including fuse clips and fuse blocks) are considered to be passive electrical components. Fuse holders would be scoped, screened, and included in the AMR in the same manner as terminal blocks and other types of electrical connections that are currently being treated in the process. This staff position applies only to fuse holders that are not part of a large assembly. Based on this information, the staff requires that applicable fuse holders be included within the scope of license renewal and subject to an AMR, or additional justification for their exclusion needs to be provided (RAI 2.5.2-1). The staff guidance on the identification and treatment of electrical fuse holders for license renewal is contained in a May 16, 2002, letter to the NEI and the Union of Concerned Scientists.

In response to staff's RAI 2.5.2-1, the applicant, by letter dated April 28, 2003, stated that the fuse holders are passive, long-lived electrical components. The applicant considers them to be another type of electrical connection similar to a terminal block. The applicant further stated that fuse holders inside the enclosure of an active component, such as switchgear, power supplies, power inverters, battery chargers, and circuit boards, are considered to be parts of the larger assembly. Since parts and subcomponents in such enclosure are inspected regularly and maintained as part of the plant's normal maintenance and surveillance activities, they are not subject to an AMR. The applicant identified two fuse holders that will require aging management.

The applicant evaluated the cables and connections as a single component commodity group. Insulated cables and connections that perform an intended function within the scope of license renewal, but are not included in the EQ Program, meet the criterion of 10 CFR 54.21(a)(1)(ii) and are subject to AMR. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted. The staff agrees that the applicant has correctly identified the cables and connections as a component commodity group that performs its function without moving parts or a change in configuration or properties (passive and long lived), and the cables and connections are therefore subject to an AMR.

2.5.2.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the insulated cables and connections that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the insulated cables and connections that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.5.3 Electrical/Instrumentation and Control Penetration Assemblies

Electrical/I&C penetration assemblies are used to pass electrical circuits through the containment wall while maintaining containment integrity. They provide electrical continuity for the circuit, as well as a pressure boundary for the containment. The pressure boundary function of electrical penetration assemblies is addressed in LRA Table 2.4-1.

2.5.3.1 Summary of Technical Information in the Application

The applicant describes the electrical/I&C penetration assemblies in LRA Section 2.5.3.3. The components of non-EQ electrical penetration assemblies subject to AMR are the organic insulating materials associated with electrical conductors and connections.

Electrical/I&C penetration assemblies included in the EQ Program have a qualified life that is documented. Therefore, electrical/I&C penetration assemblies in the EQ Program do not meet the criteria of 10 CFR 54.21(a)(1)(ii) and are not subject to an AMR.

A review of the electrical/I&C penetration assemblies determined that in addition to the electrical/I&C penetration assemblies included in the EQ Program, additional electrical penetration assemblies are employed at RNP. Except for spare penetrations and one penetration supporting a single out-of-scope circuit, these additional electrical/I&C penetration assemblies were considered to be subject to an AMR whether or not their associated cables are in the scope of license renewal. The penetration supporting the single out-of-scope circuit is of the same design as those covered by the EQ Program. Therefore, electrical penetrations that are not included in the EQ program are considered to meet the criterion of 10 CFR 54.21(a)(1)(ii) and are subject to an AMR except for spare penetrations and one non-EQ penetration containing a single out-of-scope circuit.

2.5.3.2 Staff Evaluation

The staff reviewed Section 2.5 of the LRA to determine whether there is reasonable assurance that the applicant has identified the electrical components within the scope of license renewal and subject to an AMR, in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1). The containment electrical penetrations identified by the applicant as requiring an AMR are non-safety-related (non-EQ) and are used plant-wide to conduct electrical power (voltage and current), either continuously or intermittently between two sections of the electrical/I&C circuits supplying power to various equipment in the containment. The staff reviewed these component categories against the requirements of 10 CFR 54.4(a)(2) and 10 CFR 54.4(b) and found these categories are included in these requirements.

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

2.5.3.3 Conclusions

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the electrical/I&C penetration assemblies that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the electrical/I&C penetration assemblies that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.5.4 Station Blackout

2.5.4.1 Summary of Technical Information in the Application

In Section 2.5, the applicant identified several components potentially in scope for license renewal—electrical bus, transmission conductors, high-voltage insulators, high-voltage surge arresters, and uninsulated ground conductors. These component types are required to function for recovery from an SBO event. However, the applicant eliminated these components from further consideration based on their not meeting the license renewal scoping requirements of 10 CFR 54.4(a). These component types are required to function for recovery from an SBO.

2.5.4.2 Staff Evaluation

The screening results in Section 2.5 do not include any offsite power system structures or components. The license renewal rule, 10 CFR 54.4(a)(3), requires that all SSCs relied on in safety analyses or plant evaluations to perform a function that demonstrates compliance with the Commission regulation for SBO (10 CFR 50.63) be included within the scope of license renewal. The SBO rule, Section 10 CFR 50.63(a)(1), requires that each light-water-cooled power plant licensed to operate be able to withstand and recover from an SBO of a specified duration (the coping duration) that is based upon factors that include "(iii) The expected frequency of loss of offsite power, and (iv) the probable time needed to recover offsite power." The licensee's plant evaluations followed the guidance in NRC RG 1.155 and NUMARC 87-00 to determine if they required plant-specific coping duration. The criteria specified in RG 1.155 to calculate a plant-specific coping duration were based upon the expected frequency of loss of offsite power and the probable time needed to restore offsite power, as well as the other two factors (onsite emergency ac power source, redundancy and reliability) specified in 10 CFR 50.63(a)(1). In requiring that a plant's coping duration be based on the probable time needed to restore offsite power, 10 CFR 50.63(a)(1) specifies that the offsite power system be an assumed method of recovering from an SBO event. Disregarding the offsite power system as a means of recovering from an SBO event would not meet the requirements of the rule and would result in a longer required coping duration. The function of the offsite power system in the SBO rule is, therefore, to provide a means of recovering from the SBO. This system meets the criteria for license renewal within 10 CFR 54.4(a)(3) as a system that performs a function that demonstrates compliance with the Commission's regulations on SBO. Based on this information, the staff requires that applicable offsite power system SCs be included within the scope of license renewal and subject to an AMR, or additional justification for their exclusion must be provided (RAI 2.5.1-1). The staff guidance on scoping of equipment relied on to meet the SBO rule for license renewal is contained in an April 1, 2002, letter to the NEI and the Union of Concerned Scientists.

In response to the staff's RAI 2.5.1-1, the applicant stated on April 28, 2003, that the components comprised by the restoration power path for offsite power from the switchyard are within the scope of license renewal in accordance with the SBO scoping criterion 10 CFR 54.4(a)(3). The first source of offsite power when recovering from an SBO event is the startup transformer (SUT). The SUT is fed from the Unit 1 115-kV switchyard, which has multiple sources of supply from either the Unit 1 115-kV or Unit 2 230 kV switchyards. The SUT east bus 115-kV oil circuit breaker (OCB) and the west bus 115-kV OCB represent the first isolation devices upstream of the SUT and demarcate the RNP 115-kV switchyard from the CP&L transmission and distribution system. The second source of offsite power when recovering

from an SBO event is obtained by way of the unit auxiliary transformer (UAT) by backfeeding the main transformers. Prior to backfeeding the main transformers, the main generator connecting straps must be disconnected. The main transformers are fed from the Unit 2 230-kV switchyard, which (like the Unit 1 115-kV switchyard) has multiple sources of supply from either the Unit 1 115-kV or Unit 2 230-kV switchyards. The 230-kV south bus OCB (52-8) and the 230-kV north bus OCB (52-9) represent the first isolation devices upstream of the UAT and demarcate the RNP 230-kV switchyard from the CP&L transmission and distribution system. The offsite power system is discussed in UFSAR Section 8.2.

Additionally, the applicant stated that the electrical components comprised by the restoration power path for offsite power were reviewed, and the passive, long-lived components subject to an AMR include the following:

- generator isolated phase (iso-phase) bus duct
- nonsegregated 4.16-kV & 480-V bus duct
- high-voltage insulators
- switchyard bus
- insulated cables and connections (connectors, splices, terminal blocks)
- transmission conductors and connections

The applicant indicated that due to the bounding approach taken for insulated cables and connections (i.e., no insulated cables and connections were scoped out), even though these systems were initially scoped out, the insulated cables and connections within these scoped-out systems were included in the original RNP AMR.

In the performance of the review, the staff selected system functions described in the UFSAR that were set forth in 10 CFR 54.4 to verify that components having intended functions were not omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

2.5.4.3 Conclusions

The staff reviewed the LRA and the applicant's RAI response dated April 28, 2003 for scoping and screening results of SBO components to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that the applicant has adequately identified the components of the SBO system that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the SBO system that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.5.5 Evaluation Findings

On the basis of the staff's review of the information presented in Section 2.5 of the LRA and the additional information provided by the applicant in response to the staff's RAI, the staff

concludes that the applicant has identified those parts of the electrical systems that are within the scope of license renewal, as required by 10 CFR 54.4(a), and subject to an AMR, as required by 10 CFR 54.21(a)(1).