SECTION 2

STRUCTURES AND COMPONENTS SUBJECT TO AN AGING MANAGEMENT REVIEW

Section 2 - Table of Contents

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

This section documents the 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 (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 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 letters dated January 9 and April 5, 2002, the applicant submitted its request and application for renewal of the operating license for Fort Calhoun Station, Unit 1 (FCS). 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).

On October 11, 2002, the staff issued requests for additional information (RAIs) regarding the applicant's methodology for identifying SSCs at FCS that are within the scope of license renewal and subject to an AMR and the results of the applicant's scoping and screening process. By letters dated November 22, December 12, and December 19, 2002, the applicant provided responses to the RAIs.

The staff conducted a scoping and screening inspection from November 4-8, 2002, to examine activities that supported the LRA, including the inspection of procedures and representative records and interviews with personnel regarding the process of scoping and screening of components in select 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 reviewed and concluded that the SSCs were outside the scope of license renewal. The inspection team concluded that these SSCs should be within scope and informed the applicant. The applicant agreed to include the additional SSCs. 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. On this basis, 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

The Rule requires that each application for license renewal contain an integrated plant assessment (IPA). Furthermore, the IPA must list and identify those SCs that are subject to an AMR from the SSCs that are within the scope of license renewal.

In Section 2.1, "Scoping and Screening Methodology," of the LRA, the applicant described the scoping and screening methodology used to identify SSCs at FCS 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 FCS LRA, the applicant considered the requirements of the Rule, the statements of consideration (SOCs) for the Rule, and the guidance presented in Nuclear Energy Institute (NEI) 95-10, "Industry Guideline for Implementing the Requirements of 10 CFR Part 54 - The License Renewal Rule," Revision 3, March 2001. 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 provides the technical information required by 10 CFR 54.21(a). In LRA Section 2.1, "Scoping and Screening Methodology," the applicant describes 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 ("System Scoping and Screening Results: Mechanical Systems"), Section 2.4 ("Scoping and Screening Results: Structures"), and Section 2.5 ("Scoping and Screening Results: Electrical) of the LRA amplify the process that the applicant uses to identify the SCs that are subject to an AMR. Chapter 3 of the LRA, "Aging Management Review," contains the following information: Section 3.1, "Aging Management of Reactor Coolant Systems"; Section 3.2, "Aging Management of Engineered Safety Features Systems"; 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 Containment, Structures, and Component Supports"; and 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 (TLAAs).

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

In LRA Section 2.1.3, "Current Licensing Basis Information," the applicant described the use of the Critical Quality Elements (CQE) list, which is the FCS safety classification system, as the source of current licensing basis (CLB) information for determining the correlation between the safety classifications and quality assurance classifications in the CLB.

In LRA Sections 2.1.3.3, "Comparison," 2.1.4, "Plant Level Scoping of Systems and Structures," and 2.1.5, "Scoping of System/Structure Components," the applicant discussed the scoping methodology as it related to safety-related criteria, in accordance with 54.4(a)(1). With respect to the safety-related criteria, the applicant stated that the SSCs within the scope of license renewal include safety-related SSCs that were determined by carefully reviewing the definitions provided in the Rule relative to FCS classifications embodied in the CQE list and FCS safety classification system. The applicant stated that the SSCs designated as CQE satisfy the 10 CFR 54.4(a)(1) requirements, and SSCs designated as Limited CQE (LCQE) satisfy the 10 CFR 54.4(a)(2) requirements. The CQE list also identifies as CQE vital auxiliaries such as electric power distribution, cooling water, and heating, ventilation, and air conditioning (HVAC) systems that are required for mitigation of design basis events (DBEs). By relying on the CQE list, all CQE SSCs will be identified, as well as all SSCs that could fail and prevent the functioning of CQE SSCs.

In LRA Sections 2.1.3.3, "Comparison," 2.1.4, "Plant Level Scoping of Systems and Structures," and 2.1.5, "Scoping of System/Structure Components," the applicant discussed the scoping methodology as it related to the non-safety-related criteria 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 the 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 review considered two categories of potential SSCs: (1) non-safety-related SSCs that functionally support the operation of safety-related SSCs, and (2) non-safety-related SSCs whose failure could cause an interaction with safety-related SSCs and potentially result in the failure of the safety-related SSCs to perform their intended safety function(s). For the first category, the applicant has conservatively assumed that non-safety-related piping and supports beyond the safety-related/non-safety-related boundary meet the 10 CFR 54.4(a)(2) criterion and are included in scope. For the second category, the applicant performed a systematic review of potential non-safety-related/safety-related interactions and relied on the LCQE designation for components in the FCS Resource Acquisition Management System (RAMS). The applicant stated that all high-energy piping and certain design features such as piping supports, pipe whip restraints, and internal barriers, as well as certain non-safety-related piping segments and structures, should be brought into scope to meet the requirements.

In LRA Sections 2.1.4, "Plant Level Scoping of Systems and Structures," and 2.1.5, "Scoping of System/Structure Components," the applicant discussed the scoping methodology as it related to the regulated event criteria in accordance with 10 CFR 54.4(a)(3). With respect to the scoping criteria related to 10 CFR 54.4(a)(3), the applicant reviewed all non-CQE SSCs relied on in safety analyses or plant evaluations to perform an intended 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 ensure they were adequately accounted for in the scoping methodology. To support this review, the applicant

assembled and evaluated source documentation developed as part of the applicant's initial response to these specific requirements including USAR sections, design-basis documents (DBDs), design drawings, component databases, and docketed correspondence, including regulatory commitments to the NRC to address each requirement. Additionally, the applicant evaluated specific topical source information pertaining to each regulated event including: fire hazards analysis (FHA), safe shutdown equipment list (SSEL), Environmental Qualification (EQ) Manual, station blackout (SBO) coping assessment, and anticipated transient without scram (ATWS) assessment. These source documents presented detailed design information for each regulated event and provided an additional source of information to identify SCs credited for mitigation of the events of interest. In summary, the SSCs relied on in safety analyses or plant evaluations to perform an intended function that demonstrates compliance with NRC regulations for fire protection (FP), EQ, pressurized thermal shock (PTS), ATWS, and SBO, have been included in the scope of license renewal in accordance with the criteria of 10 CFR 54.4(a)(3).

2.1.2.2 Documentation Sources Used for Scoping and Screening

In LRA Sections 2.1.4, "Plant Level Scoping of Systems and Structures," and 2.1.5, "Scoping of System/Structure Components," the applicant stated information derived from the Updated Safety Analysis Report (USAR), DBDs, CQE list, RAMS, Fort Calhoun Automatic Cable Tracking System (FACTS), SSEL, FHA, FCS EQ Manual, FCS final design package for the diverse scram system (DSS), and the SBO coping assessment contained in an FCS engineering analysis (EA) 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 54.4(a)(1), (2), and (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 SSCs subject to an AMR.

2.1.2.3 Scoping Methodology

The IPA scoping process used by the applicant was performed in two steps, plant level scoping and system level scoping. The first step was the identification of all plant systems and structures and is described in Section 2.1.4 of the LRA. For those systems and structures determined to be in scope, a system level scoping was performed to identify the components within the systems or structures which support the system/structure intended functions. The system level scoping step as described in Section 2.1.5 of the LRA was performed to compile a list of SCs that contribute to the ability to perform the intended functions identified during the process for scoping of plant systems and structures.

2.1.2.3.1 Mechanical Systems Scoping Methodology

The process used by the applicant to identify components within mechanical systems that are within the scope of license renewal primarily relied on unique component identifiers associated with the mechanical components. These components are listed in the RAMS database. Similar to the process for the scoping of plant systems and structures, the FCS safety classification system was the method relied on for identifying components that are in scope in accordance with Criteria 1 and 2 (i.e., components that satisfy Criteria 1 and 2 are all those defined by the CQE list as being CQE or LCQE).

Scoping of system/structure components that are in scope in accordance with Criterion 3 was determined by a review of the system level scoping input documents. A detailed review of the appropriate supporting documents for FP, EQ, ATWS, and SBO was conducted for verification of SSCs credited for these events. No additional equipment was included in the scope of license renewal for the PTS rule.

The piping and instrumentation diagrams (P&IDs) contain safety classification flags for each system indicating the extent of the system that is within the scope of license renewal. A list of CQE and LCQE (and non-CQE for FP) components was extracted from the RAMS equipment database for each system the applicant determined to be in scope. Since certain components, such as piping, did not have unique identifiers in the database, additions were made to the (scoping) list and subsequently to the license renewal database (LRDB) to completely describe all of the components contributing to a particular system's ability to perform its intended functions. Some of these components were scoped as commodity groups in accordance with the guidance established in NEI 95-10 and the Standard Review Plant for License Renewal (SRP-LR).

2.1.2.3.2 Structures and Structural Component Scoping Methodology

The applicant used an evaluation boundary methodology to determine a list of structural components within each (plant level) structure that was determined to be in scope. This method was used because the majority of structural components were not identified in RAMS. The primary FCS inputs used to develop these lists were the USAR, the CQE list, DBDs, and civil and architectural drawings. The Calvert Cliffs and Oconee methodologies were also consulted to identify generic lists of structural components that have been accepted by the NRC. The lists were supplemented by plant drawings and/or written descriptions, as deemed necessary by the applicant to clearly indicate all structural components contributing to the structure's functions. As each list of structural components was produced, a determination was made whether they support the structure's ability to perform an intended function. If a structural component supported the structure's ability to perform any one of the intended functions, the structural component was automatically included within scope. Only if it could be shown that the structural component did not support the structure's ability to perform any of the intended functions was the component listed as out of scope. In those cases, an explanation of the basis for the out-of-scope determination was provided.

2.1.2.3.3 Electrical and Instrumentation and Control (I&C) Systems Scoping Methodology

The applicant used the same method to identify electrical and I&C systems in scope as for mechanical systems described above. A list of CQE and LCQE components was extracted from RAMS for each system determined to be in scope. Since certain components did not have unique identifiers in the database, additions were made to the list, as necessary, to clearly indicate the extent of the system which was identified as within scope. These types of electrical components included: alarms, analyzers, breakers, solenoid operators, switches, resistance temperature detectors (RTDs), transducers, motors, heat tracing, recorders, relays, and panels. Some of these components (e.g., cables and electrical penetration assemblies) were scoped as commodity groups. Commodity group scoping involved the use of the Fort Calhoun Automatic Cable Tracking System (FACTS). FACTS is a CQE-controlled database that is maintained separately from RAMS.

2.1.2.3.4 Commodity Groups Scoping Methodology

The applicant used commodity groups as a method to evaluate certain components which share similar materials, perform the same intended functions, and operate under similar environmental conditions for many systems. The applicant reviewed all component types to determine what could be evaluated as commodities. Commodity groups were then assembled from information on components available in the RAMS and FACTS databases. The resultant commodity groups were then entered into the LRDB for further evaluation.

The applicant developed the following commodities list:

- building piles
- bus bars
- cables and connectors
- components supports
- containment penetration and system interface components for non-CQE systems
- fuel handling equipment and heavy load cranes
- duct banks

2.1.2.4 Screening Methodology

Following the determination of SSCs within the scope of license renewal, the applicant implemented a process for determining which SCs would be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1). In Section 2.1.6, "Mechanical, Electrical, Structural and Commodity Component Screening," of the LRA, the applicant discussed these screening activities as they related to the SCs that are within the scope of license renewal. These screening activities consisted of the identification of passive components, long-lived components, component intended functions, consumables, and component replacement based on performance or condition. The applicant relied on the guidance in Appendix B to NEI 95-10 and Chapter 2 of the SRP to develop the plant-specific listing of passive components of interest during the review.

2.1.3 Staff Evaluation

As part of the review of the applicant's LRA, the staff evaluated the scoping and screening methodologies described in the following sections of the application:

- Section 2.1, "Scoping and Screening Methodology," to ensure that the applicant describes 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), (a)(2), and (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"), to ensure that the applicant described a process for determining structural, mechanical, and electrical components at FCS that are subject to an AMR for renewal in accordance with the requirements of 10 CFR 54.21(a)(1) and (a)(2)

In addition, the staff conducted a scoping and screening methodology audit at the FCS site from July 8-12, 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 engineering reports which describe the scoping and screening methodology implemented by the applicant. 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 the safety injection (SI), auxiliary feedwater (AFW), component cooling water (CCW), main steam (MS), and main feedwater (MFW) systems to ensure the methodology outlined in the administrative controls was appropriately implemented, and the results reports 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 engineering reports which describe the scoping and screening methodology implemented by the applicant. These procedures included (1) PED-GEI-66, "License Renewal Project Procedure," Revision 2; (2) PED-GEI-67, "Mechanical Scoping for License Renewal," Revision 1; (3) PED-GEI-68, "Mechanical Aging Management Review for License Renewal," Revision 1; (4) PED-GEI-69, "Structural Scoping for License Renewal," Revision 1; (5) PED-GEI-70, "Civil/Structural Aging Management Review for License Renewal," Revision 1; (6) PED-GEI-71, "Electrical Scoping for License Renewal," Revision 1; (7) PED-GEI-72, "Electrical Aging Management Review for License Renewal," Revision 2; (8) PED-GEI-73, "Time Limited Aging Analysis Review," Revision 0; and (9) PED-GEI-74, "Writers Guide for License Renewal Application and Associated Documents," Revision 2. 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 supplemental design information including DBDs, system drawings, and selected licensing documentation, which the applicant relied upon during the scoping and screening phases of the review. The team found these design documentation sources to be useful for ensuring that the initial scope of SSCs identified by the applicant was consistent with the FCS CLB.

2.1.3.1.1 Plant-Level Scoping of Systems and Structures

As part of the audit, the applicant further described the process used to incorporate plant design information into the LRA development process. The applicant referenced the PED-GEI 66-74 instruction series to describe the detailed process for developing the LRA application. To accomplish license renewal scoping, the applicant's engineering instructions incorporated the principle of identifying a traceable record of the scoping process by using existing plant documentation to identify systems and structures within the scope of the Rule. Specifically, documentation that the applicant used for the scoping reviews included the USAR, technical specifications, and documents comprising the FCS CLB as described in Section 2.1.2.2 of this SER. The applicant's engineering staff was cognizant of the requirements for, and use of, these information sources during the scoping development phase of the LRA project.

The applicant provided the audit team with a detailed description of the system DBDs and described how they were incorporated into the scoping and screening process. The DBDs were developed by the applicant to assure plant engineering had a verified source of detailed design information for plant systems and selected internal and external events and anticipated operational occurrences, such as internal and external missiles, high-energy line breaks, fire protection, and seismic criteria. The audit team reviewed a sample of the DBDs for both safety-related and non-safety-related systems to better understand the approach the applicant implemented to determine which SSCs would be initially placed in scope for license renewal. The team found the DBD documents to provide a concise, well-documented discussion of the system, including safety-related, non-safety-related, and NRC-required functions (i.e., functions which had been identified as a result of commitments to the NRC, including those for the Commission regulations identified under 10 CFR 54.4 (a)(3)). The DBDs also included brief descriptions of system operation during normal and off-normal conditions, a system modification history, and system and component design requirements. Included in each DBD was a detailed list of the sources of information which included plant-specific sources such as the USAR, technical specifications, calculations and analyses, as well as non-plant-specific sources such as industry codes and standards, NUREGs, regulatory guides, inspection and enforcement bulletins, notices, generic letters, and Commission orders. The DBD documentation is controlled and maintained in accordance with the applicant's site quality assurance program governed by the applicant's quality assurance plan. The audit team reviewed the governing procedures and administrative controls and determined that they presented adequate guidance for the preparation, control, and maintenance of the DBDs.

The applicant also provided the audit team with a detailed discussion on the development of the FCS system scoping report (EA-FC-00-136, "Plant Level Scoping for License Renewal," Revision 0). This report was 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)(1), 10 CFR 54.4(a)(2), and 10 CFR 54.4(a)(3) have been identified and considered for inclusion within the scope of license renewal. The scoping report encompasses all SSCs at FCS. The list of SSCs was developed from the output of the RAMS database and any additional pseudo-systems that were created to reflect system configurations for specific intended functions such as containment penetration isolation. The results of this evaluation were imported into the LRDB. Following the completion of the identification of the systems or structures included within the scope of license renewal, the applicant listed each system evaluated and provided a detailed description of the system, the system and structure intended functions which were the basis for including the system or structure into the scope, along with an indication of which specific Rule criteria the intended function of the system or structure satisfied. The audit team reviewed a sample of the final worksheets in Attachment 9.2, "10 CFR 54.4 System Scoping Results," of EA-FC-00-136 and compared the results to a sample of the design basis information used by the applicant as source documentation for the review. The team found that the applicant had adequately captured the system intended functions from those source documents and appropriately identified which 10 CFR 54.4 criteria each intended function satisfied.

2.1.3.1.2 Methodology for the Application of the Scoping Criteria in 10 CFR 54.4(a)

Scoping Criteria in 10 CFR 54.4(a)(1)

With respect to the information used to scope 10 CFR 54.4(a)(1) safety-related SSCs , the applicant's process described in instructions GEI-PED-66, 67, 69, and 71 requires that the

plants CLB documentation (e.g., DBDs, USAR, and the RAMS database system) be searched to identify systems and structures that meet the safety-related criteria. The audit team reviewed a sample of the applicant's CQE-list components designated as safety-related (i.e., CQE components) and reviewed a sample of the LRDB search results tables to ensure that the applicant had adequately captured those components designated as CQE. The applicant designed a series of filters which enabled the LRA review engineers to sort through the equipment data system records and provide concise tables of component records on the basis of safety classification or specific intended functions of interest, such as environmental qualification and fire protection. The audit team determined that the filter process was a useful tool for the applicant in developing the initial scope of SSCs for the program.

As part of its review of the implementation and results of the applicant's scoping activities, the staff performed a license renewal scoping and screening inspection at the FCS site during the week of November 8, 2002, and an inspection of the applicant's aging management programs (AMPs) during the weeks of January 6 and January 20, 2003. The inspectors reviewed the applicant's engineering evaluations, documentation of the portions of the systems added to scope, and selected layout markup drawings, and discussed the process with the cognizant individuals responsible for the evaluations. Additionally, the NRC inspectors performed walkdowns of selected areas of the plant containing SSCs of interest. The inspection team identified one item which should be considered by the applicant for inclusion within scope based on the 10 CFR 54.4(a)(1) criterion. Inspection Open Item 50-285/02-07-02 identified unqualified safety injection tank level and pressure indicators that should be considered in the scope of license renewal. These indicators are used to ensure that assumptions are met for the mitigation of a loss-of-coolant-accident analysis. The applicant reviewed this issue and committed to include these components within scope. This was identified as Confirmatory Item 2.1.3.1.2-1.

By letter dated July 7, 2003, the applicant included the safety injection tank level and pressure indicators in scope. The applicant noted that these components were subsequently screened out as active components, resulting in no changes to the LRA. The staff finds the applicant's inclusion of the components within the scope of license renewal and the screening out of the components as active to be acceptable. Confirmatory Item 2.1.3.1.2-1 is closed.

On the basis of the staff's review of the applicant's methodology to identify safety-related SSCs within scope of the Rule, including:

1. review of the governing procedures and administrative controls related to scoping of safety-related SSCs in accordance with 10 CFR 54.4(a)(1) activities,

2. review of a sample of scoping result reports to ensure SSCs designated as safety-related were appropriately captured,

3. review of a sample of the design basis information used by the applicant to assure that the applicant had adequately captured the system intended functions, and

4. discussions with the applicant's cognizant personnel responsible for implementation of the scoping methodology,

the staff concludes that the applicant's scoping methodology to address the 10 CFR 54(a)(1) scoping requirements is adequate.

Scoping Criteria in 10 CFR 54.4(a)(2)

With respect to the scoping of the 10 CFR 54.4(a)(2) SSCs, the applicant initially relied on the RAMS database output of LCQE items. By definition, the LCQE items encompass those SSCs whose satisfactory performance is required to prevent or mitigate the consequences of failures of those SSCs or items identified as CQE. The audit team reviewed the LCQE items and verified that the applicant had adequately incorporated the results of these efforts into the scoping methodology reports. However as part of this review, the audit team determined that additional activities were required by the applicant to address the 10 CFR 54.4(a)(2) requirements.

With regard to the scoping of SSCs to meet the requirements of 10 CFR 54.4(a)(2), the audit team discussed the draft ISG on the 54.4(a)(2) issue with the applicant. 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 applicants to use to determine what SSCs meet the 10 CFR 54.4(a)(2) criterion (i.e., all non-safety-related SSCs whose failure could prevent satisfactory accomplishment of any safety-related functions identified in paragraphs 10 CFR 54.4(a)(1)(i),(ii),(iii) of this section).

The December 3rd letter 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 54.4(a)(2) criterion.

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

Consistent with the staff position described in the aforementioned letters, that audit team requested that the applicant respond to an RAI on the subject which was sent to the applicant on October 11, 2002. In that RAI, the staff asked the applicant to describe its scoping methodology implementation for the evaluation of the 10 CFR 54.4(a)(2) criterion. As part of its response, the applicant was requested to indicate the option(s) credited, list the SSCs included within scope as a result of its efforts, list those SCs for which AMRs were conducted, and for each SC, describe the AMPs, as applicable, to be credited for managing the identified aging effects (RAI 2.1-1).

By letter dated December 19, 2002 (Omaha Public Power District (OPPD) Letter No. LIC-02-0147), the applicant responded to the staff's RAI. As part of that response, the applicant

provided a discussion of the methodology used to supplement the initial evaluation of plant SSCs with respect to the 10 CFR 54.4(a)(2) criteria. The applicant's supplemental effort consisted of:

- performing a review of all LRA boundary drawings including a review of those drawings extending beyond the scope of the license renewal boundaries
- reviewing completed plant level scoping and screening evaluations
- reviewing systems and their drawings for identified systems that were not within the scope of license renewal
- performing walkdowns of plant areas to identify the potential interactions
- reviewing piping plan and elevation drawings to determine the potential for interference of non-safety-related SCs with safety-related SCs in instances where the drawing was of sufficient detail to preclude the need to perform a physical plant walkdown

The applicant's review initially encompassed all seismic II/I and non-seismic II/I systems containing either steam or liquid as well as non-fluid-filled (i.e., air/gas) systems. With respect to the non-fluid-filled systems, the applicant performed a review of NRC generic communications and industry operating experience associated with non-fluid-filled systems. This review did not reveal any instances of failures due to age-related degradation of these systems which could prevent safety-related equipment from performing their intended functions. Review of FCS plant-specific operating experience associated with non-fluid-filled systems also did not identify any instances of such failures. As a result, no further SSCs were brought into scope for non-fluid-filled systems.

The remaining fluid-filled systems were all included in the supplemental review except for those systems which could not have an effect on safety-related SSCs because of their remoteness (i.e., physical separation) from such safety-related SSCs.

In addition, the applicant developed an EA (EA-FC-00-149,"10 CFR 54.4(a)(2) Scoping for License Renewal," Revision 0), to provide guidance and clarification for its reviewers to carry out the supplemental evaluation. The applicant's EA defined relevant spatial interactions (i.e., physical impact, pipe whip, jet impingement, leakage and spray), described the mitigative and preventive approaches to handling such interactions, provided a methodology for evaluating plant SSCs to identify any SSCs that might have a potential for spatial interaction, and provided an analysis and results for the plant. The results contained a list of systems having components which met the 10 CFR 54.4(a)(2) criteria. Included were systems previously within scope (e.g., AFW, MFW, component cooling water, chemical and volume control (CVCS), fire protection (FP), liquid waste (LWD), main steam, raw water (RW), reactor coolant, spent fuel pool cooling (SFPC), SI, and steam generator blowdown), as well as additional systems added to scope: auxiliary steam, condensate return, chemical feed, demineralized water, primary sampling, potable water, and service water.

For those SSCs within scope, the applicant performed an operating experience review to determine what plausible aging effects required managing and concluded that four programs

(flow-accelerated corrosion (FAC), chemistry, general corrosion of external surfaces, and structural monitoring (SMP)) were applicable for these SSCs.

As part of its review of the implementation and results of these activities, the staff performed a license renewal scoping and screening inspection at the FCS site during the week of November 8, 2002, and an inspection of the applicant's aging management programs (AMPs) during the weeks of January 6 and January 20, 2003. The inspectors reviewed the applicant's engineering evaluation, documentation of the portions of the systems added to scope, and selected layout markup drawings, and discussed the process with the cognizant individuals responsible for the evaluations. Additionally, the NRC inspectors performed walkdowns of selected areas of the plant containing SSCs of interest. The inspection team determined that the applicant's implementation of the supplementary evaluation was comprehensive. However, the inspection team identified two items which the applicant had eliminated from the scope of license renewal which the inspection team believed should be reconsidered by the applicant for inclusion within scope based on the 10 CFR 54.4(a)(2) criterion; (1) the safety injection leakage cooler in the CCW system (Inspection Open Item 50-285/02-07-01) and (2) the warm water recirculation path to the intake structure (Inspection Open Item 50-285/02-07-04). With regard to Inspection Open Item 50-285/02-07-01, the applicant reviewed the issue and committed to include these components within the scope of license renewal. The resolution of this inspection open item can be found in NRC Inspection Report 50-285/03-07, dated March 20, 2003, and the staff's evaluation can be found in Section 2.3.3.16 of this SER. With regard to Inspection Open Item 50-285/02-07-04, during the colder winter months, a portion of the heated water in the circulating water discharge tunnel is directed to a release point upstream of the intake screens to warm the river water entering the intake structure. The purpose of this recirculation flow path is to prevent the formation of frazil ice, which can block raw water flow to the heat exchangers that help maintain adequate cooling for safety-related components. Currently, the applicant considers the systems, structures, and components supporting warm water recirculation not to be within the scope of license renewal. However, the staff found documents supporting the inclusion of this function within the scope of license renewal. After discussions with the applicant, the staff determined that the warm water recirculation issue is a 10 CFR Part 50 issue, in that the issue is relevant for the current operating term and not unique to license renewal. Therefore, the issue has been referred to the operating reactors staff for followup. The staff's evaluation can be found in Section 2.3.3.15 of this SER.

The staff has reviewed the applicant's supplemental evaluation and finds it to be acceptable on the basis of the applicant's inclusion of additional non-safety-related SSCs which meet the 10 CFR Part 54.4(a)(2) requirements using the revised methodology. As a result of this supplemental review, the applicant brought portions of additional non-safety-related systems and associated components into the scope of license renewal, supplied the results of the associated AMRs, and presented a summary of the programs and activities that will be used to manage aging of these SCs. The staff's review of the applicant's scoping results and aging management evaluation of SCs in these systems is presented in Sections 2.3.3.16 and 3.3.2.4.16 of this SER, respectively. The additional information supplied by the applicant, includes the following:

– 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

– determination of the credible failures which could impact the ability of safety-related SSCs from performing their intended functions

– evaluation of relevant operating experience

– incorporation of identified non-safety-related SSCs into the applicant's AMPs

As a result of staff inspection and audit activities, the staff concludes that the applicant's scoping methodology to address the 10 CFR 54.4(a)(2) scoping requirements is adequate. Therefore, RAI 2.1-1 is considered resolved.

Scoping Criteria in 10 CFR 54.4(a)(3)

The applicant's 10 CFR 54.4(a)(3) scoping process requires identification of source documents used to provide evaluations for demonstrating compliance with each of the regulated events of interest in accordance with the regulations. The applicant's evaluations focused on identifying and verifying that specific systems or structures were relied upon in response to the particular regulated event. Specific documents that the applicant reviewed for evaluating the regulated events included (1) 10 CFR 50.48-RAMS database, USAR, DBDs, docketed correspondence to regulatory commitments to NRC that address fire protection regulations; (2) 10 CFR 50.49-Environmental Qualification List contained in the Plant EQ Manual; (3) 10 CFR 50.61-the an evaluation performed by the applicant in accordance with RG-1.154 to verify SSCs meeting the PTS Criteria; and (4) 10 CFR 50.62-docketed correspondence to regulatory commitments on ATWS and the USAR (the applicant developed an engineering analysis containing information related to the final design package for plant modifications to address the Rule); (5) 10 CFR 50.63-the applicant developed an engineering analysis containing information related to the plant calculations and analyses to address the rule. During the audit, the team reviewed a sample of the analyses and documentation to support these reviews to determine whether they provided sufficient information to allow the applicant to identify the intended functions to ensure compliance with each regulated event, and whether the applicant had identified the SSCs needed to ensure that the intended functions would be maintained. The team discussed the methodology and results with the applicant's personnel responsible for these evaluations, and verified that the applicant had identified and used pertinent engineering and licensing information in order to determine the SSCs required to be in scope within accordance with the 10 CFR 54.4(a)(3) criteria.

On the basis of the staff's review of the applicant's methodology to identify SSCs within the scope of the Rule in accordance with 10 CFR 54.4(a)(3), including:

1. review of the governing procedures and administrative controls related to scoping of safety-related SSCs in accordance with 10 CFR 54.4(a)(3) activities,

2. review of a sample of scoping result reports to ensure SSCs designated as credited for mitigation of the events defined in 10 CFR 54.4(a)(3) were appropriately captured,

3. review of a sample of the design basis information used by the applicant to assure that the applicant had adequately captured the SSC intended functions with respect to these regulated events, and

4. discussions with the applicant's cognizant personnel responsible for implementation of the scoping methodology,

and as a result of NRC inspection and audit activities, the staff concludes that the applicant's scoping methodology to address the 10 CFR 54.4(a)(3) scoping requirements is adequate.

2.1.3.1.3 Methodology for Component-Level Scoping

The applicant considered three types of classifications during component scoping: mechanical, civil and structural, and electrical. The scoping methodology for each of these component classifications is discussed below.

2.1.3.1.3.1 Mechanical Component Scoping

The methodology used by the applicant to identify mechanical system components in scope was based on initially establishing evaluation boundaries for each system. This activity was governed by PED-GEI-67. For mechanical systems, these evaluation boundaries were determined by mapping the pressure boundary associated with license renewal system intended functions onto the P&IDs. These boundary determinations included CQE, LCQE, non-CQE, and interfacing system pressure boundaries such as branch lines and instrument lines for completeness. The system components that are within the scope of license renewal (i.e., required to perform a license renewal system intended function) are then identified. This component list was incorporated into the LRDB and subsequently factored into the development of the engineering analyses which documented the scoping results for each individual system. As part of the engineering analysis process, any components which were evaluated and functionally realigned to other systems based on system intended functions were reviewed and identified in the engineering analyses. The engineering analyses listed each component from the donor system, by component type and description, as well as the system to which the component was moved.

The audit team reviewed a sample of the mechanical system P&IDs and mechanical system scoping EAs developed for the MFW, MS, SI, CCW, and AFW systems to verify that the applicant had adequately defined the scope of these systems in accordance with the methodology prescribed in PED-GEI-67. The team determined that the applicant had adequately identified those components within the selected systems in accordance with the criteria established and had provided adequate documentation to support identification of those individual system components that were functionally realigned to other systems. The team did identify a minor exception related to the auxiliary feedwater evaluation. Specifically, the P&ID for the AFW system included some piping and components downstream from the diesel-driven AFW pump as within the scope of 10 CFR 54.4. In addition, the LRDB conservatively placed the diesel-driven AFW pump fuel oil day tank as within the scope of license renewal. The tank was also checked off as subject to AMR. After further evaluation, the applicant determined that the diesel-driven AFW pump and piping was a non-safety-related portion of the AFW system that was not included in the license renewal engineering evaluation for the system. The applicant installed the diesel-driven AFW pump and associated piping in 1994 because the probabilistic risk assessment (PRA) identified a need to increase the reliability of the AFW system; however, this portion of the system was classified as non-safety-related. Based on the criteria for license renewal scope under 10 CFR 54.4, this portion of the system is not within the scope of license renewal. The audit team concluded that the applicant needed to update its

AFW drawing and the LRDB so that these documents agree with the license renewal scoping results for AFW components that are subject to an AMR. During the audit, the applicant responded to the item by initiating a condition report to correct the documentation. The team was satisfied with the applicant's actions. The audit team did not identify any additional discrepancies between the methodology documented and the implementation results.

As a result of staff's inspection and audit activities, the staff concludes that the applicant's scoping methodology to address scoping of mechanical components meets the requirements of 10 CFR 54.4(a).

2.1.3.1.3.2 Structural Component Scoping

The applicant performed its structural scoping in accordance with the detailed methodology defined in PED-GEI-69. For civil structures, the evaluation boundaries were determined by developing a complete description of each structure. This was accomplished by a review of design drawings, DBDs, the structure component list from the RAMS database, and selected plant walkdowns. PED-GEI-69 described the source design documentation to be used for the evaluation of structures meeting the criteria in 10 CFR 54.4(a)(1-3). The applicant initially identified all components within those structures and assigned component intended functions to each. These intended functions were defined as those functions the component must perform in order for the structure to be able to perform the structure intended function(s). For each structure within scope, the applicant (1) documented a list of the structural components within the evaluation boundaries for the structure, (2) identified the component intended function(s) for the structural components, and (3) identified the applicable design or licensing basis references used to make the determinations.

Design features and associated SCs that prevent potential seismic and other interactions for in-scope structures housing both safety-related and non-safety-related systems were also identified through the review of plant-specific analyses and design information related to internal and external events. Like the mechanical SCs, the structural component intended functions for in-scope SCs were identified based on the guidance provided in NEI 95-10.

The audit team reviewed PED-GEI-69, discussed the structural scoping methodology with the applicant's cognizant engineers, reviewed several plant structural drawings, and sampled several EAs to verify proper implementation of the scoping process for structural components. The team also compared a sample of structural components identified in the RAMS database to the structural list in the LRDB to ensure consistency. Based on these audit activities, the team did not identify any discrepancies between the documented methodology and the implementation results.

As a result of its inspection and audit activities, the staff concludes that the applicant's scoping methodology to address scoping of structural components meets the requirements of 10 CFR 54.4(a).

2.1.3.1.3.3 Electrical and I&C Component Scoping

The applicant performed its electrical/I&C scoping in accordance with the detailed methodology defined in PED-GEI-71. The audit team reviewed PED-GEI-71, discussed the electrical scoping methodology with the applicant's cognizant engineers, and sampled several EAs to verify

proper implementation of the scoping process for electrical/I&C components. The team also reviewed the list of CQE and LCQE electrical components that were extracted from the RAMS database for each system used to create the list of components in the LRDB. The information in the RAMS and FACTS databases was used to create the license renewal database for the electrical SSCs.

The audit team found that the applicant evaluated the following electrical/I&C systems that were determined to be within the scope of license renewal, in accordance with 10 CFR 54.4: cables and connections, containment electrical penetrations, engineered safeguards, nuclear instrumentation, reactor protection system, 4160 volt alternating current (VAC), 480 VAC, 125 volt direct current (VDC), 120 VAC, plant computer, qualified safety parameter display system, radiation monitors, auxiliary instrumentation, control boards, DSS, communications, emergency lighting, and bus bars.

In PED-GEI-71, Attachment 1, the applicant evaluated the following electrical components for license renewal scope: alarm units, annunciators, cables and connections, buses, chargers, converters, invertors, circuit breakers, electrical controls and panels-internal, electrical penetration assemblies, elements, resistance temperature detectors (RTDs), sensors, thermocouples, and transducers, generators, motors, heat tracing, heaters, fuses, insulators, isolators, light bulbs, loop controllers, meters, power supplies, radiation monitors, recorders, voltage regulators, relays, signal conditioners, solenoid operators, solid state devices, surge arresters, and switches. In addition, each of these components was further subdivided into component types. For example, switches may include a differential pressure switch, flow switch, temperature indicating switch, level indicating switch, vibration switch, control switch, manual transfer switch, current switch, knife switch, etc. The intended function of a switch is to open, close, or change the connections of an electrical circuit. Some electrical components are grouped into commodity component types so that EAs could identify similar passive and long-lived intended functions and their specific failure modes.

The audit team reviewed a sampling of electrical and I&C system scoping results and determined that for the items reviewed, the scoping results appeared to be adequate. Additionally, the team did not identify any discrepancies between the documented methodology and the implementation results. Therefore, the audit team determined that the applicant's electrical and I&C scoping methodology was adequate for the identification of equipment within the scope of license renewal.

As a result of its inspection and audit activities, the staff concludes that the applicant's scoping methodology to address scoping of electrical components meets the requirements of 10 CFR 54.4(a).

2.1.3.1.3.4 Conclusion

On the basis of the staff's review of the applicant's methodology to identify mechanical, structural, and electrical components within the scope of the Rule, in accordance with 10 CFR 54.4, including:

1. review of the applicant's governing procedures and administrative controls related to scoping of mechanical, structural, and electrical SCs,

2. review of a sample of scoping result reports to ensure mechanical, structural, and electrical SCs were appropriately identified, and the scoping rationale documented,

3. review of a sample of the design basis information used by the applicant to assure that the applicant had adequately captured the mechanical, structural, and electrical component intended functions,

4. review of the license renewal database to ensure the applicant had adequately captured the mechanical, structural, and electrical components of interest in the scoping result documentation, and

5. discussions with the applicant's cognizant personnel responsible for implementation of the scoping methodology,

and as a result of NRC inspection and audit activities, the staff concludes that the applicant's mechanical, structural, and electrical component scoping methodology is adequate.

2.1.3.2 Screening Methodology

2.1.3.2.1 Evaluation of the Methodology for Identifying Structures and Components Subject to an Aging Management Review

The audit team reviewed the methodology used by the applicant to identify mechanical, structural, and electrical components within the scope of license renewal that would be subject to further aging management evaluation. The applicant provided the staff with a detailed discussion of the processes used for each discipline and provided technical reports that described the screening methodology as well as a sample of the engineering analyses for a selected group of safety-related and non-safety-related systems.

2.1.3.2.1.1 Mechanical Component Screening

During the audit of the applicant's license renewal scoping and screening process, the audit team reviewed the methodology used by the applicant to identify and list the mechanical components subject to an AMR, as well as the applicant's technical justification for this methodology. The team also examined the applicant's results from the implementation of this methodology by reviewing a sample of the mechanical systems identified as being within the scope, the evaluation boundaries drawn within those systems on the P&IDs, the resulting components determined to be within the scope of the rule, the corresponding component-level intended functions, and the resulting list of mechanical components subject to an AMR.

The applicant referenced PED-GEI-67 during the review of the screening process. This procedure was used to establish the applicant's screening methodology requirements and to establish requirements for developing EAs containing the screening results. These engineering analyses contain the record of the applicant's screening efforts to meet 10 CFR 54.37(a). Initially, the system's intended functions, in conjunction with component information in the RAMS database, pertinent design information related to the 10 CFR 54.4(a)(1-3) evaluations, and the applicable system drawings, were used to identify the passive components within the scope of license renewal. Screening criteria applied to this effort included identifying passive components in accordance with the Rule and industry guidance, as appropriate. Specifically,

the in-scope SCs that perform an intended function without moving parts or without a change in configuration or properties (i.e., screening criterion of 10 CFR 54.21(a)(1)(i)) were identified. These active/passive screening determinations are based on the guidance in Appendix B to NEI 95-10. The passive, in-scope SCs that are not subject to replacement based on a qualified life or specified time period (i.e., screening criterion of 10 CFR 54.21(a)(1)(ii)) were identified as requiring an AMR. The determinations of whether passive, in-scope SCs have a qualified life or specified replacement time period were based on the review of plant-specific information, including the RAMS component database, maintenance programs and procedures, vendor manuals, and plant experience. The in-scope SCs 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 methodology for identifying mechanical components within the scope of the Rule included both uniquely identified (i.e., components identified in the applicant's electronic component database) and non-uniquely identified components. For the uniquely identified components, the individual components were identified and reviewed. For the non-uniquely identified components, the components were categorized by component groups or commodities. These component groups were then evaluated as part of the system screening table development.

The audit team reviewed a sample of the mechanical system EAs and discussed the process and results with the cognizant engineers who performed the review. The audit team did not identify any discrepancies between the documented methodology and the implementation results.

As a result of staff's inspection and audit activities, the staff concludes that the applicant's screening methodology to address screening of mechanical components meets the requirements of 10 CFR 54.21(a)(2).

2.1.3.2.1.2 Structural Component Screening

During the audit of the applicant's license renewal scoping and screening process, the audit team reviewed the methodology used by the applicant to identify and list the structural components and structural commodities subject to an AMR, as well as the applicant's technical justification for this methodology. The team discussed the methodology and results with the applicant's cognizant engineers. The team also examined the applicant's results from the implementation of this methodology by reviewing a sample of the plant structures (auxiliary building and turbine building) identified as being within the scope, including the evaluation boundaries and resultant components determined to be within the scope, the corresponding component-level intended functions, and the resulting list of structural components and structural commodity groups subject to an AMR.

The applicant referenced PED-GEI-69 during the review of the structural component and structural commodity screening process. This procedure was used to establish the applicant's screening methodology requirements and to establish requirements for developing EAs containing the screening results. These EAs contain the record of the applicant's screening efforts to meet 10 CFR 54.37(a). Initially, the applicant identified pertinent design information and applicable structural drawings to identify the passive structural components within the scope of license renewal. Specifically, the applicant determined that all structural components and structural commodities, with the exception of snubbers, were considered long-lived and passive and therefore subject to an AMR. The in-scope SCs identified as requiring an AMR

were then compared to the GALL Report to ensure that differences are valid and justified. The methodology for identifying structural components within the scope of the Rule included both uniquely identified (i.e., components identified in the applicant's electronic component database) and non-uniquely identified components. For the uniquely identified components, the individual components were identified and reviewed. For the non-uniquely identified components, the components were categorized by component groups or commodities. These component groups were then evaluated as part of the system screening table development.

The audit team reviewed a sample of the structural drawing 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 documented methodology and the implementation results.

As a result of staff's inspection and audit activities, the staff concludes that the applicant's screening methodology to address screening of structural components meets the requirements of 10 CFR 54.21(a)(2).

2.1.3.2.1.3 Electrical and I&C Component Screening

During the audit of the applicant's license renewal scoping and screening process, the audit team reviewed the methodology used by the applicant to identify and list the electrical components and electrical commodities subject to an AMR, as well as the applicant's technical justification for this methodology. The team discussed the methodology and results with the applicant's cognizant engineers. The team also sampled several EAs to verify proper implementation of the screening process for electrical/I&C components.

The applicant referenced PED-GEI-71 during the review of the electrical components and electrical commodities screening process. This procedure was used to establish the applicant's screening methodology requirements and to establish requirements for developing EAs containing the screening results. The screening results reports provided a description for each of the electrical/I&C component groups identified by the applicant during its review. The passive functions for each electrical/I&C component are also identified, along with the AMP information credited for the electrical components and electrical commodities. The applicant used a commodity evaluation approach based on a plant-level evaluation of electrical/I&C systems and components. After identifying the SSCs within the scope of license renewal, the applicant performed the following screening review to determine which electrical components would be subject to an AMR. As part of this effort, the applicant relied on the requirements stated in 10 CFR 54.21(a)(1)(i), as supplemented by industry guidance in NEI 95-10, to develop a commodity evaluation approach. The majority of electrical/I&C component groups (such as transmitters, switches, breakers, relays, actuators, radiation monitors, recorders, isolators, signal conditioners, meters, batteries, analyzers, chargers, motors, regulators, transformers, and fuses) are considered active, in accordance with 10 CFR 54.21(a)(1)(i) and the supplemental guidance in NEI 95-10, and therefore do not require an AMR. For the passive electrical/I&C component commodity groups, component commodity groups that are not subject to replacement based on a qualified life or specified time period (screening criterion of 10 CFR 54.21(a)(1)(ii)) were identified as requiring an AMR. Electrical/I&C component commodity groups covered by the FCS 10 CFR 50.49, "Environmental Qualification Program," were considered to be subject to replacement based on qualified life. Certain passive, long-lived electrical/I&C component commodity groups that do not support license renewal system

intended functions were eliminated. The in-scope SCs identified as requiring an AMR were compared to the GALL Report to ensure differences are valid and justified. The audit team determined that the methodology used in PED-GEI-71 was adequate for identifying passive and long-lived electrical components that are subject to an AMR. The audit team did not identify any discrepancies between the documented methodology and the implementation results.

As a result of staff's inspection and audit activities, the staff concludes that the applicant's screening methodology to address screening of electrical and I&C components meets the requirements of 10 CFR 54.21(a)(2).

2.1.3.2.1.4 Conclusion

On the basis of the staff's review of the applicant's methodology to identify mechanical, structural, and electrical components subject to an aging management review in accordance with 10 CFR 54.21, including:

1. review of the applicant's governing procedures and administrative controls related to screening of mechanical, structural, and electrical SCs,

2. review of a sample of screening result reports to ensure mechanical, structural, and electrical SCs were appropriately identified, and the screening rationale documented,

3. review of a sample of the design basis information used by the applicant to assure that the applicant had adequately captured the mechanical, structural, and electrical component intended functions (i.e., passive functions),

4. review of the license renewal database to ensure the applicant had adequately captured the mechanical, structural, and electrical components of interest and identified relevant commodity groups for non uniquely-identified components in the screening result documentation , and

5. discussions with the applicant's cognizant personnel responsible for implementation of the screening methodology,

and as a result of NRC inspection and audit activities, the staff concludes that the applicant's mechanical, structural, and electrical component screening methodology is adequate.

2.1.4 Evaluation Findings

The staff review of the information presented in Section 2.1 of the LRA, the supporting information in the FCS USAR, the information presented during the scoping and screening audit, the NRC scoping and aging management review inspections, 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 adequate to meet the requirements of the Rule. On the basis of this review, the staff concludes that the applicant's methodology for identifying the systems, structures, and components within the scope of

license renewal and the structures and components requiring an aging management review satisfies 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. 10 CFR 54.21(a)(1) requires the applicant to identify and list structures and components subject to an AMR. These are passive and long-lived SCs that are within the scope of license renewal.

In LRA Table 2.2-1, the applicant provided a list of the plant systems and structures, identifying 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 DBEs considered in the plant's CLB, and 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 focused its review on the implementation results to confirm that there is no omission of plant-level systems and structures within the scope of license renewal.

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 function(s) 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 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 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 USAR based on the listing of systems and structures in LRA Table 2.2-1 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.

During its review, the staff determined that additional information and/or clarification was needed to complete its review. By letter dated October 11, 2002, the staff issued RAIs 2.2-1, 2.2-2, and 2.2-3 to obtain the necessary information and clarification from the applicant in the following areas:

- A legend was not provided for the system drawings. A legend is needed to ensure the staff can properly identify system components. In a letter dated December 19, 2002, the applicant provided a legend.

- For some of the systems highlighted on the system drawings, the license renewal boundaries appear to start/stop at the boundary between two design classes. The staff requested definitions of the design classes used at FCS and clarification on which design classes contain critical quality element (CQE) components and limited CQE (LCQE) components. In a letter dated December 19, 2002, the applicant provided the requested information.

The staff determined that the applicant's responses were acceptable because they provided the information needed by the staff to complete its review.

By letter dated October 11, 2002, the staff issued RAI 2.1.4-1 to request that the applicant identify which SSCs are credited for meeting the requirements of 10 CFR 54.4(a)(3) for 10 CFR 50.61, "Pressurized Thermal Shock," and 10 CFR 50.62, "Anticipated Transient Without Scram." In a letter dated December 19, 2002, the applicant identified the design and installation of the diverse scram system (DSS) as meeting the requirements found in 10 CFR 50.62(c)(1) and (2). As described in USAR Section 7.2.11, the DSS provides an independent means of initiating a reactor trip as required by 10 CFR 50.62(c)(1). USAR Section 7.2.11 does not identify that the DSS performs the functions required by 10 CFR 50.62(c)(1). By letter dated February 20, 2003, the staff issued Potential Open Item (POI)-1(b), requesting the applicant to address its compliance with 10 CFR 50.62(c)(1). By letter dated March 14, 2003, the applicant responded to POI-1(b) by stating that the DSS performs the turbine trip function required by 10 CFR 50.62(c)(1). The DSS design description states that the DSS provides an inherent diverse turbine trip. When the DSS causes a reactor trip, it also causes the turbine to trip because the DSS interrupts power to the control element assembly (CEA) coils. The turbine trip is then initiated when clutch power supply relays are deenergized. When power is interrupted to the coils, the undervoltage relays on the clutch power supplies are deenergized and a turbine trip is initiated. With the implementation of the DSS, the existing turbine trip becomes a diverse turbine trip due to the diversity between the DSS and the existing reactor trip system. The clutch power relays of the reactor protection system (RPS) are the "final actuation device," as specified in 10 CFR 50.62(c)(1).

The DSS also fulfills the requirements of 10 CFR 50.62(c)(2) by providing an independent means to initiate a reactor trip, as described in USAR Section 7.2.11.1.

The AFW system is not initiated by the DSS or the RPS. The AFW system is stand-alone, in that its initiation devices are completely diverse from the RPS. Therefore, the AFW system also meets the intent of 10 CFR 50.62(c)(1). The DSS, RPS, and AFW system meet the requirements of 10 CFR 50.62(c)(1) and (2) and are within the scope of license renewal. Their SSCs have been screened per NEI 95-10, Revision 3.

The staff reviewed the applicant's response to POI-1(b) and finds it acceptable because the response adequately addresses compliance with 10 CFR 50.62(c)(1). POI-1(b) is resolved.

In the same letter, the applicant identified the reactor vessel beltline plates and welds as the only SSCs included within the scope of license renewal for PTS. On the basis of its review of

the applicant's response, the staff determined that the PTS portion of the response was acceptable because it identified the components that the applicant believed to be required for compliance with the PTS Rule.

The staff also determined that additional information was needed to complete its review based on information provided by the applicant during the AMR inspection. During the AMR inspection and audit, the team reviewed the onsite engineering analysis (EA)-FC-00-149, "NSR Steam and Water Systems Impacting SSC Within Scope For License Renewal." In this EA, the applicant identified piping systems and associated reference drawings for those systems that have met the 10 CFR 54.4(a)(2) criteria for spatial interaction. However, after discussions with the staff, the applicant indicated that some of these systems are already identified as being within the scope of license renewal but were not identified as being within scope in the LRA. The applicant also stated that the Flow-Accelerated Corrosion (FAC), Chemistry, General Corrosion of External Surfaces, and Structures Monitoring Programs are the applicable AMPs to manage aging effects for components in these systems.

On the basis of its review, the staff determined that the information, as provided by the applicant, was not sufficient for the staff's scoping and AMRs for these 10 CFR 54.4(a)(2) SSCs. For the additional SSCs that had been brought into scope to meet the 10 CFR 54.4(a)(2) criterion, the applicant was requested to provide scoping information to the component level equivalent to that of the original LRA. This information was necessary for the staff to be able to determine that all the components required by 10 CFR 54.4(a)(2) to be within the scope of license renewal and subject to an AMR had been correctly identified. Also, the applicant was requested to provide revised and/or new Section 2 tables, including links to Section 3 tables, so that the staff could perform an AMR to determine whether the applicant had identified the proper aging effects for the combination of the materials and environments, and had provided an adequate AMP for managing the corresponding aging effects for these SSCs.

By letter dated February 20, 2003, the staff issued POI-1(a) requesting that the applicant provide the above information. By letter dated March 14, 2003, the applicant provided the requested information. The staff reviewed the information and found that the applicant had adequately identified the SSCs within the scope of license renewal as a result of meeting the 10 CFR 54.4(a)(2) scoping criterion. POI-1(a) is resolved. However, the staff still had to review the AMR results for the additional components brought into scope and subject to an AMR to determine whether they would be adequately managed during the period of extended operation. This was identified as Open Item 2.2-1.

The staff has completed its review of the aging management information provided by the applicant and has determined that the structures and components discussed above will be adequately managed during the period of extended operation. On this basis, Open Item 2.2-1 is closed.

The staff performed a complete review of SSCs at FCS and determined that no other SSCs were omitted from scope based on the 10 CFR 54.4(a)(2) criterion.

Functional Realignment

"Functional realignment" for license renewal is defined as the transfer of in-scope components from one system into another system based on a common in-scope function, common materials and environments, or alignment to the GALL Report.

The staff's review, supported by the findings of the scoping and screening inspection (see Inspection Open Item 50-285/02-07-03) found that the LRA did not clearly describe the methodology used to functionally realign components between systems. During the scoping and screening inspection, the inspection team reviewed the applicant's onsite scoping documents to determine how functional realignment was implemented for license renewal. Specifically, the team reviewed engineering analysis (EA) FC-00-127, "Miscellaneous Systems, Penetrations, and Components," to determine if the EA described the functional realignment methodology. The EA did not clearly describe the functional realignment methodology. The applicant clarified that at FCS, all mechanical and electrical components have an assigned system in which they are grouped. Most structural components such as beams, columns, floors, and walls have no component identification assigned to them. The applicant performed the scoping portion of the integrated plant assessment (IPA) in two phases. The first phase was the plant-level scoping, which evaluated all systems and structures to identify the systems and structures which performed intended functions and eliminate those which had no intended function. The second phase of the IPA was the system-level scoping, which evaluated the individual components within each system to determine the component intended function, screened in the boundary components, and performed the aging management evaluation for the components.

Component transfers occur for one of three reasons. The first reason is the use of commodity groups. Once the plant-level scoping was completed and the list of in-scope systems was compiled, the applicant identified certain commodity groups that would be used to simplify the IPA process. These commodity groups would then be populated with the matching components from the in-scope systems. Examples of components that were commoditized are cables, duct banks, component supports, bus bars, pilings, fuel-handling equipment and heavy loads cranes, and containment penetration and pressure boundary components.

Components which fell into the commodity groups identified above were transferred from the original system to the commodity group for component scoping, screening, and aging management evaluation. Because there are some systems whose only intended function was performed by the transferred components (such as containment penetration components for the service air system), those systems no longer performed an intended function and were eliminated from Phase 2 of the IPA.

Secondly, there are some components which are located at the interface between two systems. During original plant design, these components were assigned to systems based mainly on engineering judgment. During the IPA process, some of these components at the system interfaces were realigned from one system to another based on materials and environments. For example, a control valve on an instrument air line to the actuator on a safety injection valve may be classified as a safety injection valve. However, for the purposes of aging management, it is transferred to the instrument air system because the materials and environment for that component better align with instrument air.

The third reason for component transfers was for better alignment with the GALL Report. If a component type is identified in GALL as being evaluated in a different system such as the component cooling water heat exchangers being evaluated in the system generating the heat load, then it was typically transferred to the heat generating system to align with GALL.

In all cases, the functional realignment of components was strictly controlled. The engineers working on the system-level scoping analysis were prevented from realigning any components into or out of his/her system until agreement was made with the owner of the system to which, or from which, the component was being realigned. The discipline lead would then get the approval of the IPA supervisor, who would then authorize the realignment of the component in the license renewal database. On the basis of the applicant's explanation of the realignment methodology, along with its review of functionally realigned components, the inspection team concluded that in-scope components in systems which have no other in-scope functions were appropriately functionally realigned based on their common in-scope function. The applicant also committed to revising the onsite documentation to clearly describe the methodology used to realign components between systems.

The EA stated that the compressed air, demineralized water, and steam generator feedwater blowdown systems contain components that were functionally realigned. The team noted that this was inconsistent with LRA Table 2.2-1 and LRA Section 2.3.2.2. LRA Table 2.2-1 stated that containment isolation and/or pressure boundary components in the compressed air, demineralized water, and blowpipe (containment integrated leak rate test pressure penetration) systems were functionally realigned to the commodity group, "Containment Penetration and System Interface Components for Non-CQE Related System." However, LRA Section 2.3.2.2, which described this commodity group, stated that the group contains containment isolation valves (CIVs) from the feedwater blowdown, compressed air, blowpipe, and demineralized water systems, as well as the piping between the containment penetrations and the CIVs. It also stated that the demineralized water heat exchangers are included in the commodity group in order to maintain the component cooling water (CCW) system pressure boundary. LRA Table 2.2-1 and the description in LRA Section 2.3.2.2 are inconsistent in that the blowdown system was not identified in LRA Table 2.2-1 as having components that were functionally realigned. By letter dated February 20, 2003, the staff issued POI-1(d) requesting the applicant to resolve this discrepancy between LRA Table 2.2-1 and the description in LRA Section 2.3.2.2, and to provide revised Section 2 tables and, if necessary, revised Section 3 tables to accurately describe which systems and/or components have been functionally realigned and how the components will be managed.

By letter dated March 14, 2003, the applicant responded to POI-1(d), providing revisions to LRA Table 2.2-1 and LRA Section 2.3.2.2 and an additional drawing to clearly identify the blowpipe system. On the basis of the applicant's response, POI-1(d) was resolved. However, the staff still needed to review the information provided to ensure that all components within scope and subject to an AMR had been identified. This was identified as Open Item 2.2-2.

The staff has now completed its review and confirmed that no components within these systems were omitted from scope and none that are subject to an AMR were omitted. On the basis of the staff's review, as described above, Open Item 2.2-2 is closed.

2.2.3 Evaluation Findings

The staff reviewed all SSCs at FCS to determine whether any SSCs that met the 10 CFR 54.4 scoping criteria had been omitted. On the basis of its review, the staff found several systems and components that were reviewed by the applicant and identified as outside the scope of license renewal, and for which the staff disagreed. These systems and components were subsequently brought into scope. The staff reviewed the remainder of the out-of-scope SSCs and found no other omissions. On the basis of its review, including the identification of additional systems and components brought into scope, the staff concludes that all systems, structures, and components within the scope of license renewal have been identified, in accordance with the requirements of 10 CFR 54.4. The staff's evaluation of the additional SSCs brought into scope is provided as part of the resolution of Open Items 2.2-1 and 2.2-2.

2.3 Scoping and Screening Results: Mechanical Systems

This section addresses the mechanical systems' scoping and screening results for license renewal. The following mechanical systems and their corresponding SER sections are addressed.

- Reactor Systems

  Reactor Vessel Internals (2.3.1.1)
  Reactor Coolant (2.3.1.2)
  Reactor Vessel (2.3.1.3)

- Engineered Safety Feature Systems

  Safety Injection and Containment Spray (2.3.2.1)
  Containment Penetration and System Interface Components for Non-CQE Systems (2.3.2.2)

- Auxiliary Systems

  Chemical and Volume Control (2.3.3.1)
  Spent Fuel Pool Cooling (2.3.3.2)
  Emergency Diesel Generators (2.3.3.3)
  Emergency Diesel Generator Lube Oil and Fuel Oil (2.3.3.4)
  Auxiliary Boiler Fuel Oil and Fire Protection Fuel Oil (2.3.3.5)
  Emergency Diesel Generator Jacket Water (2.3.3.6)
  Starting Air (2.3.3.7)
  Instrument Air (2.3.3.8)
  Nitrogen Gas (2.3.3.9)
  Containment HVAC (2.3.3.10)
  Auxiliary Building HVAC (2.3.3.11)
  Control Room HVAC and Toxic Gas Monitoring (2.3.3.12)
  Ventilating Air (2.3.3.13)
  Fire Protection (2.3.3.14)
  Raw Water (2.3.3.15)
  Component Cooling (2.3.3.16)

Liquid Waste Disposal (2.3.3.17)
Gaseous Waste Disposal (2.3.3.18)
Primary Sampling (2.3.3.19)
Radiation Monitoring-Mechanical (2.3.3.20)

- Steam and Power Conversion Systems

  Feedwater (2.3.4.1)
  Auxiliary Feedwater (2.3.4.2)
  Main Steam and Turbine Steam Extraction (2.3.4.3)
  Steam Generator Blowdown

10 CFR 54.21(a)(1) requires an applicant to identify and list structures and components 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 mechanical system components that are subject to an AMR.

2.3.1 Reactor Systems

In LRA Section 2.3.1, "Reactor Coolant System," the applicant described the SSCs of the reactor coolant system (RCS) that are subject to an AMR for license renewal.

Reactor systems are those systems designed to contain and support the nuclear fuel, contain the reactor coolant, and transfer the heat produced in the reactor to the steam and power conversion systems for the production of electricity. The following systems are included in this subsection:

- reactor vessel internals (2.3.1.1)
- reactor coolant (2.3.1.2)
- reactor vessel (2.3.1.3)

2.3.1.1 Reactor Vessel Internals

2.3.1.1.1 Summary of Technical Information in the Application

The applicant describes the reactor vessel internals in LRA Section 2.3.1.1 and provides a list of components subject to an AMR in LRA Table 2.3.1.1-1.

As described in the LRA, the reactor vessel internals (RVI) were designed to support and align the fuel assemblies, control element assemblies (CEAs), and in-core instrumentation (ICI) assemblies and to guide reactor coolant through the reactor vessel. The RVI were also designed to absorb static and dynamic loads and transmit these loads to the reactor vessel flange.

The RVI were designed to safely perform their functions in normal operating, upset, and emergency conditions and to safely withstand the forces due to deadweight, handling, system pressure, flow impingement, temperature differential, shock, and vibration.

All RVI components are considered Class 1 for seismic design. The design of the RVI limits deflection where such limits are required by function. The stress values of all structural components under normal operating and expected transient conditions are not greater than those established by Section III of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code. The effects of neutron embrittlement on materials and accident loadings on the internals have been considered in the design analysis.

The license renewal boundary for the RVI consists of all components internal to the reactor vessel, excluding the reactor vessel and head, the control element drive mechanisms (CEDMs), and integral attachments to the reactor vessel and head.

The components of the RVI consist of the following major components and their associated subcomponents:

- upper guide structure (UGS)
- core support barrel (CSB)
- thermal shield
- flow skirt
- core shroud
- CEA shroud assemblies
- ICI support assemblies
- lower support structure
- CEA
- fuel assemblies

The main system interfaces for the RVI are the reactor coolant system (RCS) and the reactor vessel (RV).

RVI figures can be found in the FCS USAR Section 3, Figures 3.1-1, 3.1-2, and 3.7-1.

More information about RVI can be found in USAR Section 3.7.1.

The RVI component types subject to aging management review and their intended functions are shown in Table 2.3.1.1-1 of the LRA. The component types which were identified for the RVI include CEA shroud bolts, CSB snubber bolts, thermal shield bolts and core shroud bolts, CEA shroud spanner nuts, and ICI support, CSB bolts and lower internals assembly bolts, CEA shrouds (base, tube, and transition piece), CEA shrouds (dual shrouds), CSB, core support ring, CSB alignment key and CSB upper flange, CSB nozzle, CSB - spacer, locking collar, dowel pin and locking bar, CSB snubber spacer block, core shroud, core shroud - dowel pin, flow skirt, fuel assembly alignment plate, ICI guide tube & supports, ICI support plate & gusset, instrument tube & supports, lower internals assembly - manhole cover plate & bottom plate, lower internals assembly - core support columns, lower internals assembly - core support plate and support beams and flanges, lower internals assembly - anchor block and dowel pins, thermal shields, thermal shield support - pin & shim, UGS - ring shim, tab & plate, UGS - dowel pin, guide pin & locking strip, UGS - guide pin, UGS - alignment lug, UGS - alignment lug screw and nut, UGS - key slot tab, UGS - hold-down ring, UGS - support plate & sleeves.

The intended functions identified for the RVI components were structure functional support, flow distribution, and radiation shielding.

2.3.1.1.2 Staff Evaluation

The staff reviewed LRA Section 2.3.1.1 to determine whether the reactor vessel internals and supporting structures within the scope of license renewal and subject to AMR have been identified in accordance with the requirements of 10 CFR 54.4 and 10 CFR 54.21(a)(1), respectively. This was accomplished as described below.

As part of the evaluation, the staff determined whether the applicant had properly identified the systems, structures, and components within the scope of license renewal and subject to an AMR, pursuant to 10 CFR 54.4(a) and 10 CFR 54.21(a)(1). The staff reviewed the relevant portions of the USAR for the reactor vessel internals and associated pressure boundary components and compared the information in the USAR with the information in the LRA to identify those portions that the LRA did not identify as being within the scope of license renewal and subject to an AMR. The staff then reviewed the structures and components that were identified as not being within the scope of license renewal to verify that these structures and components do not have any of the intended functions delineated under 10 CFR 54.4(a), and for those structures and components that have an applicable intended function(s), to verify that they either perform this function(s) with moving parts or a change in configuration or properties, or that they are subject to replacement based on a qualified life or specified time period, as described in 10 CFR 54.21(a)(1).

The staff also reviewed the USAR for any function(s) delineated under 10 CFR 54.4(a) that were not identified as intended function(s) in the LRA, to verify that the systems, structures, and components with such function(s) will be adequately managed so that the function(s) will be maintained consistent with the CLB for the period of extended operation.

The staff did not identify any omissions.

2.3.1.1.3 Conclusions

The staff reviewed the information presented in Section 2.3.1.1 of the LRA and the supporting information in the FCS USAR 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 this basis, the staff concludes that the applicant has adequately identified the RVI 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 RVI components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.1.2 Reactor Coolant System

2.3.1.2.1 Summary of Technical Information in the Application

The RCS consists of two heat transfer loops connected in parallel to the reactor vessel. Each loop contains one steam generator, two reactor coolant pumps, connecting piping, and instrumentation. A pressurizer is connected to one of the reactor vessel outlet (hot leg) pipes by a surge line. The pressurizer has both power-operated relief valves (PORVs) and safety

valves, which discharge to the quench tank (Class 4, non-CQE) to condense and cool valve discharges. All components of the RCS are located within the containment building.

The RCS is designed to remove heat from the reactor core and internals and transfer it to the secondary (steam generating) system by the controlled circulation of pressurized, borated water that serves both as a coolant and a neutron moderator. The RCS serves as a barrier to the release of radioactive materials to the containment building and is equipped with controls and safety features that ensure safe conditions within the system. The design pressure is 2500 psia. The design temperature is 650 °F (pressurizer - 700 °F).

The RCS pressure is maintained and controlled through the use of the pressurizer, where steam and water are maintained in thermal equilibrium. Steam is formed by energizing immersion heaters in the pressurizer or is condensed by subcooled pressurizer spray, as necessary, to maintain operating pressure and limit pressure variations due to plant load transients. Overpressure protection for the system is provided by two PORVs and two spring loaded American Society of Mechanical Engineers (ASME) Code safety valves. These valves discharge to the quench tank where the steam is released under water to be condensed and cooled. If the steam discharge exceeds the capacity of the tank, the tank is relieved to the containment atmosphere.

The RCS boundary includes all the components in the RCS except the reactor vessel and head. The main RCS components include the reactor coolant pumps and motors, reactor coolant piping, pressurizer, pressurizer heaters, PORVs and safety valves, steam generators, and associated instrumentation and controls.

The steam generator boundaries are set at the ends of the nozzles connecting the steam generators to other components or systems. The nozzles include main feedwater, auxiliary feedwater, steam, RCS inlet and outlet, and instrumentation. The nozzles and integral attachments are considered part of each steam generator.

The major system interfaces with the RCS are the CVCS, SI, RPS, reactor regulating system, the engineered safety features actuation system (ESFAS), and the reactor vessel.

GALL Report Item IV.C2.6-a, discusses the pressurizer relief tank. The analogous FCS component, the quench tank, is not within the scope of license renewal at FCS, as it has no intended function. The staff reviewed the information and agrees with the applicant's conclusion.

The pressurizer spray head listed in GALL Report Item IV.C2.5-d, is not within the scope of license renewal at FCS, as it has no intended function. The spray head and its spray function are not credited for the mitigation of any accidents addressed in the USAR accident analyses and therefore does not meet the scoping requirements of 10 CFR 54.4(a)(1). The function of the pressurizer spray is to reduce RCS pressure under normal operating conditions. Also, its failure would not prevent satisfactory accomplishment of any of the functions identified in 10 CFR 54.4(a)(1). On the basis of this clarification, the staff agrees with the applicant's conclusion that the spray head need not be within the scope of license renewal.

SRP-LR Table 2.3-1, includes a pressurizer spray head with no intended functions as an example of a component not within the scope of license renewal.

More information about the RCS can be found in USAR Section 4.

The RCS component types subject to aging management review and their intended functions are shown in Table 2.3.1.2-1 of the LRA. The component types identified for the RCS include bolting, flow element / orifice, feedwater (FW) nozzle safe ends, pressurizer and SG nozzle welds, pressurizer bottom plate (cladding), pressurizer heater sleeves, pressurizer heater support assembly, pressurizer manway, pressurizer RV (relief valve) nozzle insert and pressurizer upper and lower level nozzle inserts, pressurizer RV and upper and lower level nozzles, pressurizer RV, spray, surge, SV (safety valve), and Upper and lower level nozzle welds, pressurizer RV, spray, surge, temperature, and upper and lower level nozzle safe ends, pressurizer shell and plates, pressurizer shell and top head plate (cladding), pressurizer spray and surge nozzle thermal sleeves, pressurizer spray, surge, and SV nozzles (base), pressurizer spray, surge, and SV nozzles (cladding), pressurizer support assembly, pressurizer SV nozzle flange and temperature nozzle, pressurizer temperature nozzle and SV nozzle flange, pressurizer vessel welds, pressurizer welds, primary and secondary manways / handholes, reactor coolant (RC) hot and cold leg piping, RC piping charging, drain, pressure measurement, pressure measurement and sampling, shutdown cooling (SDC) inlet and outlet, spray, and surge nozzles, RC piping charging, SDC inlet, and surge nozzle thermal sleeves, RC piping nozzle thermal sleeves, RC piping nozzles, RC piping thermowells and stainless steel welds, RC piping welds, RC vent gas system, pressurizer spray, CVCS, and PORV line piping, RC surge line piping, RCP driver mounts, RCP pump cover, RCP seal cover and bleed-off flange, RCP seal water cooler tubes, RCP pressure breakdown devices, RCP casing, SG blowdown nozzles, SG FW nozzle safe end, SG FW, primary, instrument, and steam nozzles, SG nozzle welds, SG primary head (base and cladding), SG primary manways, SG primary nozzle, SG primary nozzle safe end, SG secondary head, shell, and transition cone, SG secondary manways and handholes, SG steam nozzle safe end, SG tube plugs, SG tube sheet, SG tube supports, SG blowdown nozzles, SG tubes, and valve bodies.

The intended functions identified for the RC components were pressure boundary, fission product retention, component structural support, fatigue prevention, structure functional support, and heat transfer.

2.3.1.2.2 Staff Evaluation

The staff reviewed LRA Section 2.3.1.2 of the LRA to determine whether the RCS and associated components and supporting structures within the scope of license renewal and subject to AMR have been identified in accordance with the requirements of 10 CFR 54.4 and 10 CFR 54.21(a)(1), respectively. This was accomplished as described below.

As part of the evaluation, the staff determined whether the applicant had properly identified the systems, structures, and components within the scope of license renewal and subject to an AMR, pursuant to 10 CFR 54.4(a) and 10 CFR 54.21(a)(1). The staff reviewed the relevant portions of the USAR for FCS for the RCS and associated components and compared the information in the USAR with the information in the LRA to identify those portions that the LRA did not identify as being within the scope of license renewal and subject to an AMR. The staff then reviewed the structures and components that were identified as not being within the scope of license renewal to verify that these structures and components do not have any of the intended functions delineated under 10 CFR 54.4(a), and for those structures and components that have an applicable intended function(s), to verify that they either perform this function(s) with moving parts or a change in configuration or properties, or that they are subject to

replacement based on a qualified life or specified time period, as described in 10 CFR 54.21(a)(1).

The staff also reviewed the USAR for any function(s) delineated under 10 CFR 54.4(a) that were not identified as intended function(s) in the LRA, to verify that the systems, structures, and components with such function(s) will be adequately managed so that the function(s) will be maintained consistent with the CLB for the period of extended operation.

After completing the initial review, the staff requested the applicant to provide additional information on the RCS. By letter dated December 19, 2002, the applicant responded to the staff's request for additional information (RAI) as discussed below.

The FCS CLB for fire protection (FP) complies with certain sections of Appendix R, particularly Section III.G, which provides the requirements for the fire protection safe shutdown capability. In RAI 2.3.1.2-1, the staff requested the applicant to discuss if the pressurizer spray head and associated piping are credited and relied upon in the fire protection safe shutdown analysis to bring the plant to cold shutdown conditions within a given time for compliance with Appendix R. If it is credited in the fire protection safe shutdown analysis, the pressurizer spray head and associated piping would satisfy 10 CFR 50.48 Appendix R requirements and, therefore, should be included within the scope of license renewal. The specific intended function of the subject components which meets the 10 CFR 54.4(a)(3) requirement is the spray function, and the particular components which help perform this function are the section of piping and the spray head located inside the pressurizer. The subject components do not have a pressure boundary function. The staff believed that with the loss of spray function, it may not be possible to bring the plant to cold shutdown conditions in a timeframe that complies with Appendix R and, therefore, the spray head and associated piping inside the pressurizer and the spray function should be identified as within the scope of license renewal. Furthermore, the staff believed that the applicant should propose an AMP for the spray head and associated piping inside the pressurizer, which would ensure that adequate spray function will be maintained during the period of extended operation. In response, the applicant stated that, on the basis of its analysis, the spray nozzle pattern is not credited for the pressure reduction that is accomplished during spray function activation, should it be necessary to bring the plant to cold shutdown conditions within the allowable time for compliance with Appendix R. It is stated that the analysis only takes credit for the volume of water added to the pressurizer steam bubble through the spray nozzle, and that the generation of a spray pattern by the spray nozzle is not, therefore, a license renewal intended function.

As part of this RAI response, the applicant further added that the pressurizer spray is one of three means available for RCS pressure reduction and subsequent cooldown. In the event of a fire followed by a reactor trip, the auxiliary spray system (which uses the pressurizer spray head supplied by CVCS) or the PORVs may be used to depressurize the RCS. In the event that these two methods are unavailable, primary system depressurization is accomplished by RCS charging and sufficient secondary decay heat removal via the steam generator safety valves and auxiliary feedwater system. The SSCs associated with this depressurization method are within the scope of license renewal, and those that are passive and long-lived are subject to an AMR.

The staff finds the applicant's response to RAI 2.3.1.2-1 acceptable on the basis that, in spite of reduced efficiency of the pressurizer with an aged and degraded spray head, FCS can still

comply with the Appendix R requirements. Thus, the pressurizer spray head and associated piping are not within the scope of license renewal.

Pursuant to 10 CFR Part 50, Appendix R, Section III.O, the RCP lube oil collection subsystem is designed to collect oil from the RCPs and drain it to a collection tank to prevent a fire in the containment building during normal plant operations. The staff believes that the subsystem and the tank should be within the scope of license renewal and require aging management. However, it appears that the subject components were not identified in the LRA (Tables 2.3.1.2-1 or 2.3.3.14-1); therefore, in RAI 2.3.1.2-2, the staff requested the applicant to provide an explanation. In response, the applicant stated that the RCP lube oil collection subsystem is included within the scope of license renewal and addressed in Table 2.3.3.14-1, "Fire Protection," under the component types "Pipes & Fittings, Piping Spray Shield," and "Pressure Vessels." The applicable components are linked to AMR results item 3.3.2.73. The staff finds the applicant's response acceptable because it clarified that the subject components are within scope.

SGs are generally equipped with flow restrictors, one of whose intended functions is to limit steam line flow during a steam line rupture. Over the extended life of the plant, it is essential to maintain the flow area of the flow restrictors used in the CLB to calculate the amount of steam released. The staff also believes that such components are susceptible to aging effects such as loss of material and cracking. Accordingly, in RAI 2.3.1.2-3, the staff requested the applicant to provide the following information:

- Are the SGs at FCS equipped with such components?

- If so, include the components within the scope of license renewal and subject to an AMR, so that the intended function mentioned above can be maintained over the period of extended operation, or provide a justification for their exclusion.

In response, the applicant stated that the FCS flow limiters are of the venturi type and are fabricated of Inconel. They are built into the piping downstream of the first elbow in the horizontal main steam system piping runs leaving the steam generators. For license renewal, they are treated as part of the piping in which they are contained. This piping, including the limiters, is included in Table 2.3.4.3-1 of the LRA, "Main Steam and Turbine Steam Extraction," under the component type "Pipes & Fittings." The applicant further stated that the flow limiters are credited for a main steam line break by limiting the cross sectional area equivalent to 50 percent of that of the inside diameter of the main steam piping such that steam flow is restricted to less than $11x10^6$ pounds per hour following a main steam line break incident. As a result, the applicant agreed to add "Flow Restriction" as a license renewal intended function in Table 2.3.4.3-1 of the LRA. The applicant, however, concluded that since the venturi is fabricated of Inconel, there are no plausible aging effects in the secondary side steam flow environment, and as a result, no AMP is needed to manage the venturi throat diameter.

By letter dated February 20, 2003, the staff requested that the applicant submit the revised LRA Table 2.3.4.3-1, showing "Flow Restriction" as an intended function to be maintained during the period of extended operation and provide a corresponding link in the table. The link should take the reader to an appropriate subsection within Section 3 of the LRA, "Aging Management Review," for a discussion as to why the applicant believes that no AMP is required. This was identified as POI-2. By letter dated March 14, 2003, the applicant responded to POI-2 by providing the revised LRA Table 2.3.4.3-1. The revised table included "Flow Restriction" as a

component intended function. On this basis, the staff considers POI-2 resolved. The response also stated that loss of material due to FAC is not a plausible aging effect for the venturi because it's made of Inconel. The staff agrees that the venturi is not subject to loss of material due to FAC because it's made of Inconel, and Inconel materials are not susceptible to loss of material due to FAC because they have a high chromium content, which makes them inherently more resistant to loss of material due to FAC. Therefore, an AMP is not required.

2.3.1.2.3 Conclusions

The staff reviewed the LRA, the supporting information in the USAR, the applicant's response to the staff's RAI and POI, 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 RCS 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 RCS components that are subject to an aging management review, as required by 10 CFR 54.21(a)(1).

2.3.1.3 Reactor Vessel

The applicant describes the reactor vessel (RV) in LRA Section 2.3.1.3 and provides a list of components subject to an AMR in LRA Table 2.3.1.3-1.

2.3.1.3.1 Summary of Technical Information in the Application

The RV is a 140-inch beltline inner diameter two-loop vessel. This configuration has four coolant inlet nozzles and two coolant outlet nozzles. The vessel comprises a removable head with multiple penetrations (control element drive mechanisms, in-core instrumentation nozzles, and the reactor vessel vent line); upper, intermediate, and lower shell courses; and bottom head and vessel supports. The vessel includes two leakage detection lines that are located between the vessel flange O-rings. The vessel is an all welded, manganese molybdenum-nickel steel plate and forging construction. Welds were made with submerged arc welding processes using manganese-molybdenum-nickel (Mn-Mo-Ni) steel consumable wire, a Linde welding flux, and shield metal arc repair welds. The interior surfaces of the vessel in contact with reactor coolant are clad with austenitic stainless steel.

The major system interfaces with the RV are the RCS and the RVI.

More information about the RV can be found in USAR Section 4.

The list of RV component types subject to aging management review and their intended functions are shown in Table 2.3.1.3-1 of the LRA. The component types which were identified for the RV include closure studs, CEDM housing studs, ICI studs, CEDM nozzles, core stabilizing lugs, core support lugs, ICI and RC vent nozzles, keyways and core barrel support ledge, pipes and fittings, CEDM housings, primary nozzle supports, RV closure head lift rig pads, RV closure head, RV lower shell, RV middle shell, RV bottom head, RV flange, and associated cladding, RV nozzle safe ends, RV nozzles and associated cladding, and surveillance capsule holders.

The intended functions identified for the RV components were pressure boundary, fission product retention, limit vibration, core displacement, structural support, and non-safety affecting safety.

2.3.1.3.2 Staff Evaluation

The staff reviewed this section of the LRA to determine whether the RV and supporting structures 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 10 CFR 54.21(a)(1), respectively. This was accomplished as described below.

As part of the evaluation, the staff determined whether the applicant had properly identified the systems, structures, and components within the scope of license renewal and subject to an AMR, pursuant to 10 CFR 54.4(a) and 10 CFR 54.21(a)(1). The staff reviewed the relevant portions of the USAR for FCS for the RV and associated pressure boundary components and compared the information in the USAR with the information in the LRA to identify those portions that the LRA did not identify as being within the scope of license renewal and subject to an AMR. The staff then reviewed the structures and components that were identified as not being within the scope of license renewal to verify that these structures and components do not have any of the intended functions delineated under 10 CFR 54.4(a), and for those structures and components that have an applicable intended function(s), to verify that they either perform this function(s) with moving parts or a change in configuration or properties, or that they are subject to replacement based on a qualified life or specified time period, as described in 10 CFR 54.21(a)(1).

The staff also reviewed the USAR for any functions delineated under 10 CFR 54.4(a) that were not identified as intended functions in the LRA, to verify that the systems, structures, and components with such functions will be adequately managed so that the functions will be maintained consistent with the CLB for the period of extended operation.

After completing the initial review, the staff requested the applicant to provide additional information on the RV. By letter dated December 19, 2002, the applicant responded to the staff's RAI as discussed below.

LRA Section 2.3.1.3 states that the vessel includes two leakage detection lines that are located between the vessel flange O-rings. The staff believes that the inner O-ring, the leakoff lines, and the outer O-ring all support the reactor vessel closure head flange pressure boundary (see letter dated October 27, 1999, from the NRC to the Babcock & Wilcox Owners Group (B&WOG)). Although in select cases the staff has accepted a site-specific technical justification, in general, the leakoff lines require an aging management review. It appears that the leakage detection lines at FCS have not been identified in the LRA (Table 2.3.1.3-1) as within scope, nor has a plant-specific justification been provided. In RAI 2.3.1.3-1, the staff requested the applicant to provide a site-specific technical justification for FCS as to why aging management is not required, or perform an aging management review for these components. In response, the applicant stated that the leakage detection lines, or closure head vent lines, have been included within the scope of license renewal and are addressed in LRA Table 2.3.1.3-1 under the component type "Pipes & Fittings, CEDM Housings." The applicable components are linked to AMR results items 3.1.1.01, 3.1.1.06, and 3.1.1.14. The staff finds the applicant's response acceptable because it clarified that the subject components are within scope.

The staff did not identify any omissions.

2.3.1.3.3 Conclusions

The staff reviewed the LRA, the supporting information in the FCS USAR, and the applicant's responses to the staff's RAI 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 this basis, the staff concludes that the applicant has adequately identified the RV 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 RV components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.1.4 Evaluation Findings

On the basis of this review, the staff concludes that the applicant has adequately identified the reactor systems 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 reactor system components that are subject to an aging management review, in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.2 Engineered Safety Features Systems

In LRA Section 2.3.2, "Engineered Safety Features Systems," the applicant described the SSCs of the engineered safety features (ESF) that are subject to an AMR.

ESF systems consist of systems and components designed to function under accident condition to minimize the severity of an accident or to mitigate the consequences of an accident. In the event of a loss-of-coolant accident (LOCA), the ESF systems provide emergency coolant to assure structural integrity of the core, to maintain the integrity of the containment, and to reduce the concentration of fission products expelled to the containment building atmosphere. This subsection of the LRA includes the safety injection and containment spray (SI&CS) system and the containment penetration, and system interface components for non-CQE systems.

2.3.2.1 Safety Injection and Containment Spray

2.3.2.1.1 Summary of Technical Information in the Application

As described in the LRA, the safety injection (SI) system injects borated water into the RCS to provide emergency core cooling following a LOCA. This provides core cooling to ensure there is no significant alteration of core geometry, no clad melting, no fuel melting, and less than 1 percent cladding water reaction. This also limits fission product release and ensures adequate shutdown margin regardless of temperature. The SI system also provides continuous long-term post-accident cooling of the core by recirculation of borated water from the containment recirculation line inlet located in the containment sump.

The major components of the SI system are the three high-pressure safety injection (HPSI) pumps, two low-pressure safety injection (LPSI) pumps, four safety injection tanks, four safety

injection leakage coolers, eight HPSI control valves, four LPSI control valves, and other various valves, instrumentation, and piping.

During normal plant operation, the SI system is maintained in a standby mode with all of its components lined up for emergency injection. In standby mode, none of the major system components are operating. Following an incident that results in a safety injection actuation signal (SIAS), the HPSI and LPSI pumps automatically start, and the high-pressure and low-pressure injection valves automatically open.

During the injection mode of operation, the HPSI and LPSI pumps take suction from the safety injection and refueling water tank (SIRWT) (the SIRWT is addressed in Section 2.4.2 of the LRA, “Auxiliary Building”) and inject borated water into the RCS via the safety injection nozzles located on the RCS cold legs.

The four safety injection tanks constitute a passive injection system since no electrical signal, operator action, or outside power source is required for the tanks to function. The tanks are designed to inject large quantities of borated water to cover the core in the event of a rapid depressurization of the RCS due to a large break LOCA.

The function of the containment spray (CS) system is to limit the containment structure pressure rise by providing a means for cooling the containment atmosphere after the occurrence of a LOCA. Pressure reduction is accomplished by spraying cool, borated water into the containment atmosphere. Heat removal is accomplished by recirculating and cooling the water through the shutdown cooling heat exchangers. The CS system also reduces the leakage of airborne radioactivity by effectively removing radioactive particulates from the containment atmosphere. Removal of radioactive particulates is accomplished by spraying water into the containment atmosphere. The particulates become attached to the water droplets, which fall to the floor and are washed into the containment sump.

The CS system consists of three spray pumps, two shutdown cooling heat exchangers and all necessary piping, valves, instruments, and accessories. The pumps discharge the borated water through the two heat exchangers, during recirculation, to a dual set of spray headers and spray nozzles in the containment. These spray headers are supported from the containment roof and are arranged to give essentially complete spray coverage of the containment horizontal cross sectional area.

More information about SI&CS can be found in USAR Section 6.2 and USAR Section 6.3, respectively.

The SI&CS component types subject to an AMR and their intended functions are shown in Table 2.3.2.1-1 of the LRA. The component types which were identified for the SI&CS include leakage accumulators, bolting, filter/strainer, flow element/orifice, heat exchanger, orifice plate, pipes and fittings, pump casings, injection tanks, tubing, and valve bodies.

The intended functions identified for the SI&CS components were pressure boundary/fission product retention, filtration, heat transfer, and flow restriction.

2.3.2.1.2 Staff Evaluation

The staff reviewed this section of the LRA to determine whether the SI&CS components and supporting structures 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 10 CFR 54.21(a)(1), respectively. This was accomplished as described below.

As part of the evaluation, the staff determined whether the applicant had properly identified the systems, structures, and components within the scope of license renewal and subject to an AMR, pursuant to 10 CFR 54.4(a) and 10 CFR 54.21(a)(1). The staff reviewed the relevant portions of the USAR for the SI&CS and associated pressure boundary components and compared the information in the USAR with the information in the LRA to identify those portions that the LRA did not identify as being within the scope of license renewal and subject to an AMR. The staff then reviewed the structures and components that were identified as not being within the scope of license renewal to verify that these structures and components do not have any of the intended functions delineated under 10 CFR 54.4(a), and for those structures and components that have an applicable intended function(s), to verify that they either perform this function(s) with moving parts or a change in configuration or properties, or that they are subject to replacement based on a qualified life or specified time period, as described in 10 CFR 54.21(a)(1).

The staff also reviewed the USAR for any function(s) delineated under 10 CFR 54.4 (a) that were not identified as intended function(s) in the LRA, to verify that the systems, structures, and components with such function(s) will be adequately managed so that the function(s) will be maintained consistent with the CLB for the period of extended operation.

After completing the initial review, the staff requested the applicant to provide additional information on the SI&CS. By letter dated December 19, 2002, the applicant responded to the staff's RAI as discussed below.

LRA Section 2.3.2.1 states that the function of the CS system is to limit the containment structure pressure rise by providing a means for cooling the containment atmosphere after the occurrence of a LOCA. Pressure reduction is accomplished by spraying cool, borated water into the containment atmosphere. The CS system also reduces the leakage of airborne radioactivity by effectively removing radioactive particulates from the containment atmosphere. Removal of radioactive particulates is accomplished by spraying water into the containment atmosphere. The particulates become attached to the water droplets, which fall to the floor and are washed into the containment sump. During recirculation, the CS pumps discharge the borated water through two heat exchangers to a dual set of spray headers and spray nozzles in the containment. These spray headers are supported from the containment roof and are arranged to give essentially complete spray coverage of the containment horizontal cross sectional area. The staff believes that the above-mentioned statements in the LRA justify the need to include the spray headers and spray nozzles within the scope of license renewal and that an aging management review should be submitted in order to preserve the spraying function from degradation due to cracking, corrosion, loss of material, and/or blockage. However, it appears that the subject components and the intended functions were not identified in LRA Table 2.3.2.1-1 as being within scope and requiring aging management. In RAI 2.3.2.1-1, the staff requested the applicant to include these components within scope and subject to an AMR, or to identify the component type under which the subject components are included in the LRA. In response, the applicant clarified that the containment spray ring and

nozzles are within the scope of license renewal and that they are included in LRA Table 2.3.2.1-1 under the component type, “Pipes & Fittings.” The applicable components are linked to AMR results items 3.2.1.01, 3.2.1.10, and 3.2.2.04. The staff finds the applicant’s response acceptable because it clarified that the subject components are within scope.

The staff did not identify any omissions.

2.3.2.1.3 Conclusions

The staff reviewed the LRA, the supporting information in the FCS USAR, and the applicant’s responses to the staff’s RAI, 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 this basis, the staff concludes that the applicant has adequately identified the SI&CS 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 SI&CS components that are subject to an AMR as required by 10 CFR 54.21(a)(1).

2.3.2.2 Containment Penetration and System Interface Components for Non-CQE Systems

2.3.2.2.1 Summary of Technical Information in the Application

The applicant describes the containment penetration and system interface components for non-CQE systems in LRA Section 2.3.2.2 and provides a list of components subject to an AMR in LRA Table 2.3.2.2-1.

The containment penetration and system interface components for the non-CQE systems group includes the containment isolation valves of the feedwater blowdown, compressed air, blowpipe, and demineralized water systems, as well as the piping between the containment penetrations and the containment isolation valves. The CQE heat exchangers in the demineralized water system are included to maintain the CCW system pressure boundary. The mechanical portions of all electrical penetrations that provide containment isolation are also included.

2.3.2.2.2 Staff Evaluation

The staff reviewed LRA Section 2.3.2.2 to determine whether the components of the containment penetration and system interface components for non- CQE systems 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), respectively.

In the performance of the review, the staff selected system functions described in the USAR 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.

2.3.2.2.3 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. 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 containment penetration and system interface components for non-CQE 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 containment penetration and system interface components for non-CQE systems that are subject to an aging management review as required by 10 CFR 54.21(a)(1).

2.3.2.3 Evaluation Findings

On the basis of this review, the staff concludes that the applicant has adequately identified the engineered safety features systems 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 components of the engineered safety features systems that are subject to an aging management review in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.3 Auxiliary Systems

In LRA Section 2.3.3, “Auxiliary Systems,” the applicant described the SSCs of the auxiliary systems that are subject to an AMR for license renewal.

Auxiliary systems are those systems used to support normal and emergency plant operations. The systems provide cooling, ventilation, sampling, and other required functions. The following systems are included in this subsection of the LRA.

- chemical and volume control (CVCS)
- spent fuel pool cooling (SFPC)
- emergency diesel generators (EDGs)
- diesel generator lube oil and fuel oil (DGLO and DGFO)
- auxiliary boiler fuel oil and fire protection fuel oil
- diesel jacket water
- diesel starting air
- instrument air (IA)
- nitrogen gas (NG)
- containment ventilation
- auxiliary building ventilation
- control room HVAC and toxic gas monitoring
- ventilating air
- fire protection (FP)
- raw water (RW)
- component cooling water (CCW)
- liquid waste disposal (LWD)
- gaseous waste disposal (GWD)

- primary sampling (PS)
- radiation monitoring–mechanical

2.3.3.1 Chemical and Volume Control

2.3.3.1.1 Summary of Technical Information in the Application

The applicant describes the CVCS in LRA Section 2.3.3.1 and provides a list of components subject to an AMR in LRA Table 2.3.3.1-1

As described in the LRA, the CVCS maintains desired water level, water chemistry/purity, and boron concentration in the reactor coolant through continuous feed-and-bleed operation. The CVCS includes one regenerative heat exchanger, one letdown heat exchanger, five ion exchangers, two purification filters, one volume control tank, three positive-displacement charging pumps, one boric acid batching tank, two boric acid storage tanks, two centrifugal boric acid transfer pumps, one chemical additional tank with metering pump, piping, valves, instrumentation, and controls.

More information about the CVCS can be found in USAR Section 9.2.

The CVCS component types subject to an AMR and their intended functions are shown in LRA Table 2.3.3.1-1. The component types which were identified for the CVCS include bolting, filter/strainer housing, flow element/orifice, heat exchanger, ion exchangers, pipes, fittings and tubing, pump casings, tanks, and valve bodies.

The intended functions identified for the CVCS components were pressure boundary, filtration, and heat transfer.

2.3.3.1.2 Staff Evaluation

The staff reviewed this section of the LRA to determine whether the CVCS components and supporting structures 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 10 CFR 54.21(a)(1), respectively. This was accomplished as described below.

As part of the evaluation, the staff determined whether the applicant had properly identified the systems, structures, and components within the scope of license renewal and subject to an AMR, pursuant to 10 CFR 54.4(a) and 10 CFR 54.21(a)(1). The staff reviewed the relevant portions of the USAR for the CVCS and associated pressure boundary components and compared the information in the USAR with the information in the LRA to identify those portions that the LRA did not identify as being within the scope of license renewal and subject to an AMR. The staff then reviewed the structures and components that were identified as not being within the scope of license renewal to verify that these structures and components do not have any of the intended functions delineated under 10 CFR 54.4(a), and for those structures and components that have an applicable intended function(s), to verify that they either perform this function(s) with moving parts or a change in configuration or properties, or that they are subject to replacement based on a qualified life or specified time period, as described in 10 CFR 54.21(a)(1).

The staff also reviewed the USAR for any function(s) delineated under 10 CFR 54.4 (a) that were not identified as intended function(s) in the LRA, to verify that the systems, structures, and components with such function(s) will be adequately managed so that the function(s) will be maintained consistent with the CLB for the period of extended operation.

After completing the initial review, the staff requested the applicant to provide additional information on the CVCS. By letter dated December 19, 2002, the applicant responded to the staff's RAI as discussed below.

On drawing E-23866-210-121, Sheet 2, the de-borating filter is not included in the scope for pressure boundary function. The drawing shows normally open valves with no signal to close on either side of the de-borating filter. In RAI 2.3.3.1-1, the staff stated its belief that this portion of the system meets the 10 CFR 54.4(a) scoping criteria and should be included within scope. Further, the staff also believed that the filter housing is passive and long-lived and, thus, should be subject to an AMR. The applicant, therefore, should include this component within the scope of license renewal and subject to an AMR or justify its exclusion. In response, the applicant stated that the borated water filter housing is not in scope for license renewal because the filter is not used. Its isolation valves are normally closed. It was further stated that drawing E-23866-210-121, Sheet 2, has been revised to show valves CH-131 and CH-134 (the filter isolation valves) as normally closed. A copy of this drawing has been provided.

The staff reviewed the applicant's response and finds it acceptable because it clarified that the subject components are not used.

The staff did not identify any omissions.

2.3.3.1.3 Conclusions

The staff reviewed the LRA, the supporting information in the FCS USAR, and the applicant's response to the staff's RAI 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 this basis, the staff concludes that the applicant has adequately identified the CVCS 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 CVCS components that are subject to an AMR as required by 10 CFR 54.21(a)(1).

2.3.3.2 Spent Fuel Pool Cooling

2.3.3.2.1 Summary of Technical Information in the Application

The applicant describes the spent fuel pool cooling system in LRA Section 2.3.3.2 and provides a list of components subject to an AMR in LRA Table 2.3.3.2-1.

The SFPC system consists of a stainless-steel-lined storage pool, two storage pool circulation pumps, a storage pool heat exchanger, a demineralizer and filter, two fuel transfer canal drain pumps, piping, manual valves, and instrumentation. The pool concrete and liner are evaluated with the auxiliary building. The storage pool pumps circulate borated water through the storage pool heat exchanger and return it to the pool. Cooling water to the heat exchanger is provided

by the CCW system. The purity and clarity is maintained by diverting a portion of the circulated water through the demineralizer and the filter.

The fuel transfer canal drain pumps are used to provide pool makeup water from the SIRWT and also to drain the fuel transfer canal and return the refueling water to the SIRWT or the radioactive waste disposal system.

2.3.3.2.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.2 and USAR Section 9.6 to determine whether 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), respectively.

In the performance of the review, the staff selected system functions described in the USAR 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 2.3.3.2 and referenced drawings, the staff determined that additional information was needed to complete its review. The drawings referenced by the LRA identify the portions of each system that the applicant determined to be within the scope defined by 10 CFR 54.4, and the applicant prepared a separate license renewal boundary drawing for each system appearing on a single piping and instrumentation drawing. The staff identified discrepancies between the license renewal drawings for the safety injection and spent fuel pool cooling systems on Piping and Instrumentation Drawing (P&ID)11405-M-11 and between the license renewal drawings for the safety injection, spent fuel pool cooling, and liquid waste disposal systems on P&ID 11405-M-6, Sheet 2. In a letter dated October 11, 2002, the staff asked the applicant to clarify whether the embedded piping adjacent to valve AC-307 on P&ID 11405-M-11 (RAI 2.3.3.2-1) and whether the piping between valves WD-843 and WD-1161, including the spent fuel pool cooling system branch piping from drawing 11405-M-11, on P&ID 11405-M-6, Sheet 2 (RAI 2.3.3.2-2), are within the scope of license renewal and subject to an AMR.

By letter dated November 22, 2002, the applicant responded to RAI 2.3.3.2-1 by stating that the embedded piping adjacent to valve AC-307 on P&ID 11405-M-11 is within the scope of license renewal and subject to an AMR. By a separate letter dated November 22, 2002, the applicant provided a revised version of license renewal P&ID 11405-M-11 for the spent fuel pool cooling system that corrected the identified discrepancy. The staff reviewed the information provided in response to the RAI and finds it acceptable because it corrected the discrepancies identified by the staff and clarified the components that are within scope.

By letter dated December 12, 2002, the applicant responded to RAI 2.3.3.2-2 by stating that the piping between valves WD-843 and WD-1161, including the spent fuel pool cooling system branch piping from P&ID 11405-M-11, on P&ID 11405-M-6, Sheet 2, is within the scope of license renewal and subject to an AMR. By a separate letter dated December 12, 2002, the applicant provided revised license renewal boundary drawings for the spent fuel pool cooling, safety injection, and liquid waste disposal systems on P&ID 11405-M-6, Sheet 2, that corrected the identified discrepancies. The staff determined that the applicant's response was acceptable because it corrected the discrepancies identified by the staff and clarified the components that are within scope.

2.3.3.2.3 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. 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 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).

2.3.3.3 Emergency Diesel Generators

2.3.3.3.1 Summary of Technical Information in the Application

The applicant describes the EDGs in LRA Section 2.3.3.3 and provides a list of components subject to an AMR in LRA Table 2.3.3.3-1.

The EDGs are designed to furnish reliable in-plant alternating current (AC) power adequate for safe plant shutdown and for operation of engineered safeguards when no energy is available from the 345 kV or 161 kV systems. For adequate reliability, two units are provided. Each unit is connected to one of the two separate 4160 V systems between which engineered safeguards and other essential auxiliaries are divided. The division of loads is such that operation of either system alone provides the minimum engineered safeguards requirement.

Each EDG is provided with an exhaust silencer, an engine control panel, an exciter, an electrical panel, and auxiliaries. Each EDG interfaces with an integral cooling system, two starting-air systems, a lubricating system, two fuel systems between the engine mounted fuel oil tanks, and the engine fuel lines. Both EDGs are supplied fuel from a common, underground fuel oil storage tank by redundant transfer pumps. No external energy source other than 125V direct current (DC) control power is required for starting or subsequent operation of the EDGs. Immersion heaters are provided to maintain engine jacket water and lubricating oil temperatures at desirable temperatures for quick, reliable starting. The EDGs are located in separate rooms of the auxiliary building.

The Rule recognizes that the EDGs are active and excludes them from the group of equipment that is subject to an AMR. The auxiliary subsystems for the EDGs are treated as separate systems from the EDG (i.e., EDG jacket water, EDG fuel and lube oil, and EDG starting air). The auxiliary subsystems stop at the connection to the engine skid. The components on the engine side of the auxiliary subsystem connection are considered part of the EDGs for the purposes of license renewal.

2.3.3.3.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.3 and USAR Section 8.4.1 to determine whether the EDG 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), respectively. This was accomplished as described below.

In the performance of the review, the staff selected system functions described in the USAR 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 2.3.3.3, the staff determined that additional information regarding the components (expansion joints and mufflers) was needed to complete its review. These components were identified in Drawing E-4183, Revision 1, "Diesel Generator Intake Air & Exhaust Diagram," as being within the scope of license renewal; however, they were not included in LRA Table 2.3.3.3-1, which lists components subject to an AMR. The staff believed that expansion joints and mufflers should be subject to an AMR. By a letter dated October 11, 2002, in RAI 2.3.3.3-1, the staff requested the applicant to clarify whether these components were subject to an AMR or to justify their exclusion.

In its response dated November 22, 2002, the applicant stated that the expansion joints and mufflers are included in LRA Table 2.3.3.3-1 under the component type "Pipes and Fittings." The expansion joints and mufflers are managed for aging per the AMR results items listed for the component type. The staff finds this clarification (i.e., that these components are within the scope of license renewal and subject to an AMR) acceptable.

Also, the staff found that the components (inlet air filter boxes, turbocharger housing, exhaust reducers, aftercoolers, radiator exhaust ductworks, and EDG air boxes) were neither identified in drawing E-4183 as being within the scope of license renewal nor included in LRA Table 2.3.3.3-1. The staff believed that these components should be subject to an AMR. In the October 11, 2002, letter, in RAI 2.3.3.3-2, the staff also requested the applicant to clarify whether these components were subject to an AMR or to justify their exclusion.

In its response dated November 22, 2002, the applicant stated that although not shown on the referenced drawing as being within the scope of license renewal, the air inlet filter boxes, turbochargers, aftercoolers, air boxes, exhaust manifolds, and crankcases are part of the diesel engine, which is an active component, and therefore, not subject to an AMR. The exhaust reducers are within the scope of license renewal and are included in LRA Table 2.3.3.3-1 under the component type "Pipes and Fittings." The radiator exhaust ductworks are within the scope of license renewal and are included with the ventilating air system, LRA Table 2.3.3.13-1, under the component type "Ducts and Fittings." They are indicated as being within the scope of license renewal in drawing 11405-M-97, Sheet. 2.

The staff concurs with the applicant that the above-cited components (air inlet filter boxes, turbochargers, aftercoolers, air boxes, exhaust manifolds, and crankcases) are part of the diesel engine and, therefore, not subject to an AMR. In addition, the staff finds the applicant's clarification that the exhaust reducers and radiator exhaust ductwork are within the scope of license renewal and subject to an AMR, acceptable.

2.3.3.3.3 Conclusions

The staff reviewed the LRA, the supporting information in the FCS USAR, and the applicant's responses to the staff's 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 this

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

2.3.3.4 Emergency Diesel Generator Lube Oil and Fuel Oil

2.3.3.4.1 Summary of Technical Information in the Application

The applicant describes the DGLO and fuel oil DGFO system in LRA Section 2.3.3.4 and provides a list of components subject to an AMR in LRA Table 2.3.3.4-1.

The DGLO system lubricates the diesel engine components and filters and cools the engine lube oil. The lube oil system supports operation of the EDGs, which provide a reliable source of 4160 VAC power for safe plant shutdown and operation of engineered safeguards when the normal sources of offsite power are lost.

The DGFO system provides fuel to the engine in the proper amount to maintain engine speed and load. The fuel oil system supports operation of the EDGs, which provide a reliable source of 4160 VAC power for safe plant shutdown and operation of engineered safeguards when the normal sources of offsite power are lost. An 18,000-gallon underground storage tank serves both engines. This tank can be replenished from the auxiliary boiler fuel oil storage tank if necessary. Two transfer pumps for each diesel transfer fuel from the underground storage tank to a wall-mounted auxiliary tank. Fuel gravity-drains from the wall-mounted tank to the engine base tank. One engine-driven fuel oil pump and one motor-driven fuel oil pump deliver fuel to the engine fuel injectors.

2.3.3.4.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.4 and USAR Section 8.4.1 to determine whether the emergency diesel generator lube oil and fuel 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), respectively. This was accomplished as described below.

In the performance of the review, the staff selected system functions described in the USAR 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 2.3.3.4, the staff determined that additional information regarding the air box drain drums and camshaft counter weight housings was needed to complete its review. These components were identified in drawing B120F03001, Sheets 1 and 2, “Lube Oil System Schematic,” as being within the scope of license renewal; however, they were not included in LRA Table 2.3.3.4-1, which lists components subject to an AMR. The staff believed that these components are passive and long-lived and therefore should be subject to an AMR. In the October 11, 2002, letter, in RAI 2.3.3.4-1, the staff requested the applicant to clarify whether these components were subject to an AMR or to justify their exclusion.

In its response dated December 19, 2002, the applicant stated that the air box drain drums are included in LRA Table 2.3.3.4-1 under the component type “Tanks” and are managed for aging

per the AMR results items 3.3.1.05 and 3.3.1.07. The camshaft counter weight housing is considered to be part of the engine. For this reason, consistent with the response to RAI 2.3.3.4-1 above, it is not subject to AMR.

Based on the review of the applicant's rationale, the staff concurs with the applicant that the camshaft counter weight housing is part of the diesel engine and therefore not subject to an AMR. In addition, the staff finds the above applicant's clarification that the air box drain drums are within the scope of license renewal and subject to an AMR, acceptable.

2.3.3.4.3 Conclusions

The staff reviewed the LRA, the supporting information in the FCS USAR, and the applicant's response to the staff's RAI 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 this basis, the staff concludes that the applicant has adequately identified the DGLO and DGFO 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 DGLO and DGFO components that are subject to an AMR as required by 10 CFR 54.21(a)(1).

2.3.3.5 Auxiliary Boiler Fuel Oil and Fire Protection Fuel Oil

2.3.3.5.1 Summary of Technical Information in the Application

The applicant describes the auxiliary boiler fuel oil and fire protection fuel oil in LRA Section 2.3.3.5 and provides a list of components subject to an AMR in LRA Table 2.3.3.5-1.

The fire protection fuel oil (FP-FO) system supplies fuel oil to the diesel engine fire pump. The pump is located at the north end of the intake structure and takes its suction from a chamber immediately inside the traveling screens. The fire pump's diesel engine is independent of site power. A 10-gallon fuel oil day tank for the diesel engine is located adjacent to the engine. Fuel oil is transferred from the diesel fire pump fuel oil tank to the day tank. The 550-gallon capacity diesel fire pump fuel oil tank is located outside the intake structure and is contained within an enclosure.

The license renewal boundary of the FP-FO system includes the diesel fire pump fuel oil tank; the priming tank and its hand pump; the fuel oil day tank; the fuel transfer pump; and the filter, valves, and piping between the diesel fire pump fuel oil tank and the injector unit of the fire pump diesel engine.

The auxiliary boiler fuel oil (AB-FO) system stores and delivers diesel fuel oil for operation of the plant auxiliary boiler. The AB-FO storage tank also stores fuel oil for the EDGs. The system consists of an 18,000-gallon underground fuel storage tank, two fuel transfer pumps, piping, valves, and instrumentation for delivery of fuel oil to the auxiliary boiler. In addition, the license renewal boundary consists of a fuel oil transfer pump, piping, filters, instrumentation, and warehoused equipment for delivery of fuel oil from the auxiliary boiler fuel oil storage tank to the diesel engine fuel oil storage tank. The AB-FO system license renewal boundary includes the AB-FO storage tank; below-grade piping associated with the tank; and filters, pumps, valves and piping between the AB-FO storage tank and the AB-FO supply solenoid valve. In addition,

the pump, filters, and valves within the supply pipeline from the AB-FO storage tank through the fuel oil transfer pump discharge valve are included.

2.3.3.5.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.5 to determine whether the AB-FO and FP-FO 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), respectively.

In the performance of the review, the staff selected system functions described in the USAR 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 the review of LRA Section 2.3.3.5, the staff determined that additional information was needed to complete the review. The staff found that the LRA description stated the intended function of the individual components but did not state the license renewal intended function of the system. Additionally, the LRA description did not provide sufficient information on the license renewal intended function of the system to determine whether all the components required by 10 CFR 54.4 to be within the scope of license renewal and subject to an AMR have been correctly identified. By letter dated October 11, 2002, the staff requested in RAI 2.3.3.5-1 that the applicant provide more information concerning the intended function(s) of this system. In a letter dated November 22, 2002, the applicant stated that the license renewal intended function of the AB-FO system is to provide a backup fuel oil supply to the diesel generators. Therefore, the components included within the scope of license renewal are the AB-FO oil storage tank; below-grade piping associated with the tank; and the filters, pumps, valves, and piping between the AB-FO storage tank and the AB-FO supply solenoid valve since these comprise a pressure boundary that must be maintained to ensure the integrity of the supply system. In addition, the pump, filters, and valves within the supply pipeline from the AB-FO storage tank through the fuel oil transfer pump discharge valve are included since these comprise a pressure boundary to transfer fuel oil from the AB-FO storage tank to the diesel generator fuel oil day tank. Based on the above information, the staff was able to complete its review.

LRA Table 2.3.3.5-1 states that hose and hose couplings will be replaced based on performance or condition in accordance with the periodic surveillance and preventive maintenance program. In accordance with the guidance provided in Table 2.1-3 of the SRP-LR, hoses and hose couplings are consumable components and, as such, are typically replaced based on performance or condition monitoring that identifies whether these components are at the end of their qualified lives and may be excluded, on a plant-specific basis, from an AMR. The guidance further states that the applicant should identify the standards that are relied on for the replacement as part of the methodology description. Since the periodic surveillance and preventive maintenance program, as described in the LRA, did not provide such a methodology description, the staff requested the applicant in RAI 2.3.3.5-2 to identify the standards that are relied on for replacement. In a letter dated November 22, 2002, the applicant responded that the hoses and hose couplings identified in LRA Table 2.3.3.5-1 are inspected for fraying, cracking, splitting, embrittlement, corrosion damage, or degradation which could prevent them from performing their intended function. This inspection is performed per approved plant procedures in accordance with the periodic surveillance and preventive maintenance program. Condition determination is made by craft and engineering judgement and, if necessary, the

hose and/or couplings are replaced based on condition in accordance with the corrective action program. The staff finds this response acceptable because the applicant has a proceduralized mechanism to replace consumable parts.

2.3.3.5.3 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. 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 AB-FO and FP-FO 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 AB-FO and FP-FO systems that are subject to an aging management review as required by 10 CFR 54.21(a)(1).

2.3.3.6 Emergency Diesel Generator Jacket Water

2.3.3.6.1 Summary of Technical Information in the Application

The applicant describes the EDG jacket water system in LRA Section 2.3.3.6 and provides a list of components subject to an AMR in LRA Table 2.3.3.6-1.

The EDG jacket water system for each EDG provides cooling to the engine in order to ensure that the diesel rated load can be maintained. Each jacket water system supports operation of an EDG, which provides a reliable source of 4160 V power for safe plant shutdown and operation of engineered safeguards when the normal sources of offsite power are lost. Each engine has its own self-contained radiator-type cooling system.

2.3.3.6.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.6 and USAR Section 8.4.1 to determine whether the emergency diesel jacket 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), respectively. This was accomplished as described below.

In the performance of the review, the staff selected system functions described in the USAR 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 2.3.3.6, the staff determined that additional information regarding the instrument manifolds was needed to complete its review. Instrument manifolds are identified in Drawing B120F04002, Sheets 1 and 2, “Jacket Water Schematic,” as being within the scope of license renewal. However, the instrument manifolds were not included in LRA Table 2.3.3.6-1, which lists components subject to an AMR. The staff believed that these components were passive and long-lived and therefore should be subject to an AMR. In the October 11, 2002, letter, the staff requested the applicant to clarify whether the instrument manifolds were subject to an AMR or to justify their exclusion.

In its response dated December 19, 2002, the applicant stated that the instrument manifolds are included in LRA Table 2.3.3.6-1 under the component type “Pipes and Fittings” and are managed for aging per the AMR results items 3.3.2.29 and 3.3.2.30. The staff finds the applicant’s clarification that the instrument manifolds are within the scope of license renewal, and subject to an AMR, acceptable.

2.3.3.6.3 Conclusions

The staff reviewed the LRA, the supporting information in the FCS USAR, and the applicant’s responses to the staff’s RAI 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 this basis, the staff concludes that the applicant has adequately identified the EDG jacket water 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 EDG jacket water components that are subject to an AMR as required by 10 CFR 54.21(a)(1).

2.3.3.7 Starting Air

2.3.3.7.1 Summary of Technical Information in the Application

The applicant describes the starting air system in LRA Section 2.3.3.7 and provides a list of components subject to an AMR in LRA Table 2.3.3.7-1.

The starting air system provides stored pressurized air for starting the EDGs. Each diesel is provided with a system that contains redundant air storage, piping, air start motors, and compressors for charging the storage tanks. Each tank has the capacity for 5 starts of the diesel (combining for a total of 10 emergency starts). Because 10 starts is the design basis requirement, those portions of the system used for charging the storage tanks are non-CQE and are not required for the diesels to meet the design basis. Therefore, the compressors and associated equipment are not included within the license renewal scope.

2.3.3.7.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.7 and USAR Section 8.1.4 to determine whether the starting air 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), respectively. This was accomplished as described below.

In the performance of the review, the staff selected system functions described in the USAR 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 2.3.3.7, the staff determined that additional information regarding filters/strainers was needed to complete its review. LRA Table 2.3.3.7-1 includes filters/strainers; however, these components are not shown in drawing B120F07001, Sheets 1 and 2, “Starting Air System Schematic,” as being within the scope of license renewal. In the

October 11, 2002, letter, in RAI 2.3.3.7-1, the staff requested the applicant to clarify whether the filters/strainers were subject to an AMR or to justify their exclusion.

In its response dated November 22, 2002, the applicant stated that not all filters shown on the drawing are in scope. For example, the oil removal filters, SA-2-2-F, are not in scope as shown on B120F07001, Sheets 1 and 2. The filters that are in scope, as shown on these drawings, are included in LRA Table 2.3.3.7-1 under the component type "Filters/Strainers." They are managed for aging per the LRA AMR items listed for the component type.

Based on the review of the applicant's response, the staff finds the above applicant's clarification regarding filters/strainers acceptable.

2.3.3.7.3 Conclusions

The staff reviewed the LRA, the supporting information in the FCS USAR, and the applicant's responses to the staff's RAI 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 this basis, the staff concludes that the applicant has adequately identified the starting air system 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 starting air system components that are subject to an AMR as required by 10 CFR 54.21(a)(1).

2.3.3.8 Instrument Air

2.3.3.8.1 Summary of Technical Information in the Application

The applicant describes the IA system in LRA Section 2.3.3.8 and provides a list of components subject to an AMR in LRA Table 2.3.3.8-1.

The IA system provides oil-free, filtered, and dried air for pneumatic controls, instrumentation, and the actuation of valves, dampers and similar devices. The IA system is considered to be that equipment required to store and deliver air to pneumatic instruments, controls, valves, and dampers. The CA system supplies compressed air to and interfaces with the IA system at the IA distribution system downstream of the after-filter sets. Instrument air is distributed to the various pneumatic components it serves through a network of supply headers and distribution risers. The IA system also feeds the suction of the compressors for the starting air system (starting air is evaluated as a separate system in Section 2.3.3.7 of this SER).

Backup accumulators containing IA or nitrogen are provided on selected pneumatic devices to ensure their operability if IA pressure drops.

Drawing 11405-M-264, Sheet 1, "Instrument Air Diagram Auxiliary Building and Containment P&ID," shows the license renewal boundary for the system penetration into the containment building. The remainder of the IA components within scope for license renewal are associated with air-operated valves (AOVs). The IA piping and components for the individual valves are not shown on P&IDs. Typical IA supply configurations for AOVs are shown on drawing C-4175, Sheet 1, "Typical Control Valve Air Source Valve Configurations P&ID." The styles shown on that drawing cover the bulk of AOV-related items which are within scope for license renewal.

The boundary flags on that drawing illustrate where the typical license renewal boundaries are for AOV-related items. There are several non-AOV-related pneumatic items in scope for license renewal, but the license renewal boundary locations for those items are generally similar to those for AOVs.

2.3.3.8.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.8 and USAR Section 9.12 to determine whether 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), respectively.

In the performance of the review, the staff selected system functions described in the USAR 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 the review of LRA Section 2.3.3.8, the staff determined that additional information was needed to complete the review. By letter dated October 11, 2002, the staff issued RAIs 2.3.3.8-1 and 2.3.3.8-2 on the CA and IA systems, respectively. LRA Section 2.3.2.2 states that containment isolation valves and associated piping in the CA system are subject to an AMR. LRA Section 2.3.3.8 states that the function of the CA system is to serve as the source of air for the IA system. Section 9.12 of the USAR describes the CA system to include air compressors, receivers, and air dryers. The staff requested the applicant to justify the exclusion of these components, as well as valve bodies, piping, bolting, and valve operator bodies of the CA system, from the scope of license renewal. The staff also requested more information concerning the intended function of this system. In a letter dated November 22, 2002, the applicant responded that as described in Section 9.12 of the USAR, the non-safety-related CA system provides compressed air to the instrument air and the service air headers. The instrument air header provides air for pneumatic controls and the actuation of valves, dampers, and similar devices, as well as the fuel-handling machine in containment. The CA system is not relied on to perform any intended function as defined in 10 CFR 54.4. The air compressors are not loaded onto the EDGs, and during a design basis event, the CA system is assumed to be unavailable. Because the air supply is unavailable during a design basis event, all air-operated valves and dampers required to control design basis events are (1) designed to fail to the required post-accident position on loss of air pressure, (2) provided with safety grade instrument air accumulators, or (3) provided with nitrogen backup systems. Most of the IA system is not safety-related and does not meet the scoping criteria for license renewal. The portions of the IA system that meet the scoping requirements of 10 CFR 54.4 are those components required to operate engineered safety features or essential safeguards and are included within the scope of license renewal. Drawing C-4175, Sheet 1, shows how boundaries for the typical arrangement were scoped. The boundaries were determined to occur at a check valve or trip valve, as applicable. For the IA system, the component types determined to be in scope are accumulators (tanks, bolting, filter housing, pipes and fittings, tubing, valve bodies, and valve operators). Pressure boundary is the only intended function for license renewal. On the basis of the information provided in response to RAIs 2.3.3.8-1 and 2.3.3.8-2, the staff finds that the applicant has provided adequate justification for the exclusion of components in the CA system, and provided information on the IA and CA system functions. On the basis of this additional information, the staff concludes that the applicant has adequately identified the SSCs within the IA system that are within the scope of license renewal and subject to an AMR.

2.3.3.8.3 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. 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 aging management review, as required by 10 CFR 54.21(a)(1).

2.3.3.9 Nitrogen Gas

2.3.3.9.1 Summary of Technical Information in the Application

The applicant describes the NG system in LRA Section 2.3.3.9 and provides a list of components subject to an AMR in LRA Table 2.3.3.9-1.

The NG system is used to charge the safety injection tanks to provide the passive motive force to discharge the contents of the safety injection tanks to re-flood the reactor during an unexpected depressurization of the RCS. It also provides a continuous nitrogen gas supply to various contained areas or vessels within the plant for the control of oxygen to minimize general corrosion. The NG system consists of valves, piping, instruments, and controls. Nitrogen gas is also used for multiple valves in the plant as a backup to the IA system. The NG system components that provide that backup are covered in the IA results, which are covered in LRA Section 2.3.3.8 and evaluated in Section 2.3.3.8 of this SER.

2.3.3.9.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.9 to determine whether the NG 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), respectively.

In the performance of the review, the staff selected system functions described in the USAR 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 the review of LRA Section 2.3.3.9, the staff determined that additional information was needed to complete the review. By letter dated October 11, 2002, the staff issued RAI 2.3.3.9-1. The system description in LRA Section 2.3.3.9 describes the function of the NG system to be to charge the safety injection tanks and to provide nitrogen cover for various tanks. In the review, the staff noted that the referenced drawings show the license renewal boundaries only going from the tanks to the first isolation valve. The staff also found that the LRA description stated the intended function of the individual components but did not state the license renewal intended function of the system. The staff requested information concerning the intended function of this system. In a letter dated November 22, 2002, the applicant responded that the license renewal intended function of the NG system is to maintain the pressure boundary of the nitrogen gas supply lines providing nitrogen to the various tanks. Therefore, the portions of the

nitrogen gas system within the scope of license renewal are the supply lines from the tanks, which are supplied with nitrogen gas by this system, to the first isolation valve. On the basis of this information, the staff was able to complete its review.

During the review, the staff found that on Drawing 11405-M-42, Sheet 1, Location C3, valve NG-116 was highlighted as being within the scope of license renewal. The upstream and downstream side piping connected to NG-116 is not highlighted as being within the scope of license renewal. According to LRA Table 2.3.3.9-1, the intended function of the valve body component group is pressure boundary. The failure to include the connected piping within scope and subject to an AMR could defeat that function. The staff requested in RAI 2.3.3.9-2 that the applicant include the subject piping within the scope of license renewal and subject to an AMR or provide justification for not including the connected piping within the license renewal boundary. In a letter dated November 22, 2002, the applicant responded that the referenced drawing has an error at that location. The license renewal boundary flag on the downstream side of NG-116 should not end as shown but continue on and direct the reader to the CVCS. The staff finds the response acceptable because it clarifies the scope of the license renewal boundary for the NG system.

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. 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 NG 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 NG system that are subject to an aging management review, as required by 10 CFR 54.21(a)(1).

2.3.3.10 Containment Heating, Ventilation, and Air Conditioning

2.3.3.10.1 Summary of Technical Information in the Application

The applicant describes the containment HVAC system in LRA Section 2.3.3.10 and provides a list of components subject to an AMR in LRA Table 2.3.3.10-1.

The function of the containment HVAC system is to provide ventilation and cooling of the containment. The containment HVAC system consists of four separate subsystems. These subsystems are (1) containment air recirculating and cooling, (2) nuclear detector well cooling, (3) containment purge, and (4) hydrogen purge. In the context of engineering safeguards, during a design basis event, the containment HVAC system removes heat released to the containment atmosphere, restricts leakage of airborne activity from containment, reduces fission product inventory in the containment atmosphere, controls the concentration of hydrogen, and provides measurement of specific containment parameters such as pressure and temperature. During normal plant operations, the containment HVAC system also maintains the concrete temperature in the biological shield surrounding the reactor vessel.

2.3.3.10.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.10 and USAR Section 9.10 to determine whether the containment 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), respectively.

In the performance of the review, the staff selected system functions described in the USAR 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 the review of LRA Section 2.3.3.10, the staff determined that additional information was needed to complete the review. The staff asked the applicant in a letter dated October 11, 2002, to clarify if the nuclear well cooling subsystem is included within the scope of license renewal since it was described as part of the containment HVAC system but not highlighted on the accompanying drawings (RAI 2.3.3.10-1). By letter dated December 19, 2002, the applicant responded that the SCs in question should be within the scope of license renewal and subject to an AMR. The applicant provided the appropriate drawing correction with its response. The staff determined that the applicant's response was acceptable because it provided the clarifications needed by the staff to determine that the nuclear well cooling subsystem is within scope.

The staff also asked the applicant in a letter dated October 11, 2002, to clarify if dampers as listed in the table are subject to an AMR since they are active components and to clarify if damper housings should be included on the list as being subject to an AMR (RAI 2.3.3.10-2). By letter dated December 19, 2002, the applicant responded that dampers are subject to an AMR due to the pressure boundary function provided by their bodies/housings. This is indicated by the pressure boundary function identified in the table. The staff determined the applicant's response was acceptable because it clarified whether the dampers and their housings are within scope.

The staff asked the applicant in a letter dated October 11, 2002, to clarify if the fan or blower housings of the fans that provide flow to the seismic skirt are subject to an AMR and to identify if other components associated with this function are subject to an AMR (RAI 2.3.3.10-3). By letter dated December 19, 2002, the applicant responded that fan and blower housings are subject to an AMR by the pressure boundary function and are included in LRA Table 2.3.3.10-1. The staff determined the applicant's response was acceptable because it clarified what components are subject to an AMR.

2.3.3.10.3 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. 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 containment HVAC 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 HVAC system that are subject to an aging management review, as required by 10 CFR 54.21(a)(1).

2.3.3.11 Auxiliary Building Heating, Ventilation, and Air Conditioning

2.3.3.11.1 Summary of Technical Information in the Application

The applicant describes the auxiliary building HVAC in LRA Section 2.3.3.11 and provides a list of components subject to an AMR in LRA Table 2.3.3.11-1.

The auxiliary building is ventilated and cooled with ambient outside air. It is divided into two zoned systems for ventilation purposes. These are in the controlled access area and the uncontrolled access area. Both systems are of the once-through, nonrecirculating type using supply and exhaust fans. Portions of the auxiliary building HVAC system are utilized by the hydrogen purge system, which is an ESF system and is part of the plant's engineered safeguards.

Controlled access area system:

The controlled access area ventilation supply system consists of an air handling unit containing roughing filters and preheat and reheat steam coil banks, two 50 percent capacity vane axial fans, and distribution ductwork. The exhaust system consists of three 33-1/3 percent capacity vane axial fans drawing air through return ducts from each ventilated space to a common filtering unit containing high-efficiency particulate air (HEPA) filters. The exhaust air is continuously monitored for radioactive contamination at the ventilation discharge duct before discharge to the atmosphere.

Charcoal filters are installed in normally bypassed ducts at the exhaust of the safety injection and spray pump rooms and the spent regenerate tank room. These filters can be manually aligned remotely in the event of an accidental release of activity in these rooms (see USAR Section 9.10-1).

A charcoal filter is also installed in a normally bypassed section of the return ductwork drawing air from the spent fuel storage pool area. A differential pressure gauge is installed across each filter to provide a means of determining the condition of each filter (see USAR Sections 9.10-1 and 9.10-9).

Uncontrolled access area system:

The uncontrolled access area system is similar to that in the controlled access area, except that shutoff dampers are not installed, the exhaust is not filtered, and a single roof mounted centrifugal exhaust fan is employed.

Part of the uncontrolled access area, Room 81, houses a ventilation fan that is utilized in an Appendix R scenario to provide, if necessary, fresh air and help limit temperature rise. The applicant described the process for identifying the mechanical components within the scope of license renewal in LRA Section 2.1.5.1, "Mechanical Systems," referencing the criteria identified in LRA Section 2.1.3.2, "10 CFR 54.4" which reflects the Federal regulations pertinent to licensing renewal.

2.3.3.11.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.11 and USAR Sections 9.10-1 and 9.10-9 to determine whether 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 USAR 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 the review of LRA Section 2.3.3.11, the staff determined that additional information was needed to complete the review. The staff asked the applicant in a letter dated October 11, 2002, to clarify highlighted portions of referenced drawings to determine if continuation portions not highlighted should be included within the scope of license renewal (RAI 2.3.3.11-1). By letter dated December 19, 2002, the applicant responded that Drawing 11405-M-2, Sheet 2, was in error and provided a corrected drawing. The staff also asked the applicant as part of this RAI to clarify if dampers, as listed in the table, are subject to an AMR since they are active components and to clarify if damper housings should be included on the list as being subject to an AMR. The applicant responded that the response to RAI 2.3.3.10-2 was applicable in this case. The response to RAI 2.3.3.10-2 stated that dampers are subject to AMR because the pressure boundary function provided by their bodies/housings was applicable. The staff determined the applicant's response was acceptable because it clarified what components are within scope 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 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 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 adequately identified the components of the auxiliary building HVAC system that are subject to an aging management review, as required by 10 CFR 54.21(a)(1).

2.3.3.12 Control Room Heating, Ventilation, and Air Conditioning, and Toxic Gas Monitoring

2.3.3.12.1 Summary of Technical Information in the Application

The applicant describes the control room HVAC and toxic gas monitoring system in LRA Section 2.3.3.12 and provides a list of components subject to an AMR in LRA Table 2.3.3.12-1.

The control room HVAC system conditions three individually controlled temperature zones: shift manager/mezzanine/lunchroom areas (Zone 1), the main control room area (Zone 2), and the computer room (Zone 3). Part of the air supply for Zone 2 is ducted through the control panels and instrumentation cabinets to provide direct cooling of the enclosed equipment.

The toxic gas monitoring system provides a means of protecting the control room operators from an accidental release of toxic gas to meet NUREG-0737, Item III.D.3. The toxic gas monitoring system includes redundant ammonia detectors located inside the control room, with tubing run from the detectors to the fresh air intake to the control room HVAC system.

2.3.3.12.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.12 and USAR Sections 9.10 and 9.23 to determine whether the control building HVAC and toxic gas monitoring 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), respectively.

In the performance of the review, the staff selected system functions described in the USAR 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, the staff determined that additional information was needed to complete its review. The staff asked the applicant in a letter dated October 11, 2002, to describe the areas that constitute the main control room envelope (MCRE) and verify that all components which have safety-related functions and are subject to an AMR are identified in LRA Table 2.3.3.12-1 (RAI 2.3.3.12-1). By letter dated December 19, 2002, the applicant described the areas constituting the MCRE and clarified that housings for the components are included within the component types. The housings are subject to an AMR for a pressure boundary intended function. The staff determined the applicant's response was acceptable because it clarified what components are included within the MCRE and are subject to an AMR.

The staff also asked the applicant in a letter dated October 11, 2002, to clarify whether sealant materials used to maintain the MCRE at positive pressure are included within the scope of license renewal (RAI 2.3.3.12-1). By letter dated December 19, 2002, the applicant responded that the elastomer (neoprene) seal and flex connections in the control room HVAC system are within scope for license renewal and linked to LRA Table 3.3-1, Item 3.3.1.02. In addition, fire barrier penetration seals used to maintain the MCRE pressure boundary are within scope and linked to LRA Table 3.3-1, Item 3.3.1.19. The staff determined the applicant's response was acceptable because it clarified what components are within scope.

2.3.3.12.3 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. 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 control room HVAC and toxic gas monitoring 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 control room HVAC and toxic gas monitoring system that are subject to an aging management review, as required by 10 CFR 54.21(a)(1).

2.3.3.13 Ventilating Air

2.3.3.13.1 Summary of Technical Information in the Application

The applicant describes the ventilating air (VA) system in LRA Section 2.3.3.13 and provides a list of components subject to an AMR in LRA Table 2.3.3.13-1.

The VA system is designed to maintain a suitable environment for equipment and personnel. Although the VA system consists of equipment located in numerous areas, the passive equipment within the license renewal boundary is contained within the EDG rooms. This equipment is identified as EDG air inlet louvers and radiator exhaust dampers (including the ductwork). The safety-related function of the EDG air inlet louvers is to admit air to the EDG rooms of the auxiliary building for combustion and cooling of the EDGs. The safety-related function of the radiator exhaust dampers (located in the radiator exhaust ducts) and ductwork is to discharge exhaust air from the EDG radiators to the outside atmosphere.

2.3.3.13.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.13 and USAR Section 9.10 to determine whether the VA 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), respectively.

In the performance of the review, the staff selected system functions described in the USAR 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, the staff determined that additional information and/or clarification was needed to complete the review. The staff asked the applicant in a letter dated October 11, 2002, if the housing for exhaust fans in the EDG rooms should be included within the scope of license renewal (RAI 2.3.3.13-1). By letter dated December 19, 2002, the applicant responded that there are no fans within the scope of license renewal for this system, but in other systems where installed fans are within the scope of license renewal, their housings have also been included within scope. The staff determined the applicant's response was acceptable because it clarified that the fan housings do not perform an intended function and therefore are not included within scope.

2.3.3.13.3 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. 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 VA 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 VA system that are subject to an aging management review, as required by 10 CFR 54.21(a)(1).

2.3.3.14 Fire Protection

2.3.3.14.1 Summary of Technical Information in the Application

The applicant describes the FP system in LRA Section 2.3.3.14 and provides a list of components subject to an AMR in LRA Table 2.3.3.14-1.

The FP system provides the means for detecting, alarming, isolating, and suppressing fires in the plant. The system comprises the following subsystems and attributes:

- The fire detection and alarm system is an instrumentation system that alerts control room operators of a fire and indicates its location.

- The fire suppression system includes fire-fighting equipment such as automatic sprinklers, automatic halon systems, standpipe hose stations, and outside fire hydrants.

- Fire rated assemblies are features of plant design and construction (e.g., fire barriers) which contribute to the separation of fire hazards into zones and fire areas and are addressed as part of the structure. Fire doors, fire dampers, and penetration seals provide the necessary closures associated with openings in the fire rated barriers. Fire dampers are addressed in LRA Section 2.3.3.12, “Auxiliary Building HVAC,” and fire barriers including penetration seals and fire doors are addressed in LRA Section 2.4.2.1, “Auxiliary Building.”

- The RCP lube oil collection subsystem is designed to collect oil from the RCPs and drain it to a collection tank to prevent a fire in the containment building during normal plant operations. This system is provided to comply with 10 CFR 50, Appendix R, Section III.0, “Oil Collection System for Reactor Coolant Pump.”

The FP system at FCS is relied upon to meet the requirements of 10 CFR 50.48, “Fire Protection Rule,” and Appendix R to Part 50, “Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979." In accordance with 10 CFR 50.48, the plant is divided into unique fire areas as required by Appendix A of Branch Technical Position (BTP) APCSB 9.5-1, "FP for Nuclear Power Plants.” The SSCs satisfying the safe shutdown requirements of Appendix R are contained in the safe shutdown equipment list (SSEL) and captured by the review conducted for 10 CFR 54.4(a)(1) and 10 CFR 54.4(a)(2). The non-CQE FP SSCs required for compliance with 10 CFR 50.48 are identified in the FHA and are captured within the scope of license renewal. FCS is licensed to 10 CFR 50.48(b) as specifically stated in SERs and their respective facility operating license. In accordance with the FCS license condition, the USAR also contains the provisions of the NRC-approved FP program.

2.3.3.14.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.14 and USAR Section 9.11 to determine whether the FP 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), respectively. The staff sampled portions of the USAR to identify any additional FP system function that met the scoping requirements of 10 CFR 54.4 but was not identified as an intended function in the LRA.

The staff also reviewed SERs referenced for the FP program, which were listed directly in the FCS FP license condition. These SERs summarize the FP program and commitments made to meet 10 CFR 50.48 using the guidelines of Appendix A to BTP APCSB 9.5-1 and Appendix R. The staff sampled portions of these SERs to verify that the functions of the FP components relied upon to satisfy the provisions of Appendix A to BTP APCSB 9.5-1 and Appendix R were included within the scope of license renewal as intended functions in the LRA.

In a letter dated October 11, 2002, the staff requested in RAI 2.3.3.14-1 that the applicant clarify how plant commitments contained in drawings, the USAR, and other plant documentation which may also reflect the FCS FP CLB were reviewed to ensure that all FP SSCs relied upon for compliance with 10 CFR 50.48 were included within the scope of license renewal. In a letter to the NRC dated November 22, 2002, the applicant stated that it reviewed all applicable sources which reflect its CLB. It responded that the scoping documents are the FCS USAR, Updated Fire Hazards Analysis (UFHA), Appendix R Safe Shutdown Analysis, and P&IDs per PED-GEI-67, “Mechanical Scoping for License Renewal.” In addition, the Resource Acquisition Management System (RAMS) database and the FP DBDs were also referred to for making scoping determinations. The applicant also stated that the UFHA is updated in accordance with PED-GEI-04, “Fire Protection System Interaction.” This procedure provides the direction for reviewing engineering design changes to the plant and incorporating any changes that affect the FP DBDs, including the UFHA, into those documents, where applicable.

In the staff’s October 11, 2002 letter to the applicant, the staff stated in RAI 2.3.3.14-2 and 2.3.3.14-3 that the exclusion of FP SSCs on the basis that their intended function is not required for the protection of safe shutdown equipment or safety-related equipment is not acceptable if the SSCs are required for compliance with 10 CFR 50.48 to protect equipment important to safety. In the RAI, the staff questioned the exclusion of piping leading to transformer sprinklers, the retard chambers, the fire protection jockey pump, and the CO_2 system for the turbine generator excitor. Furthermore, the staff requested that the applicant provide licensing and technical justification for the exclusion of components that were identified in the staff’s SERs as meeting the provisions of Appendix A to BTP APCSB 9.5-1 and Appendix R.

In letters dated November 22, 2002, and December 19, 2002, the applicant responded to the staff’s questions. After reviewing the staff’s licensing and technical basis which described how each of these components was tied to the FCS licensing basis, the applicant agreed to include the piping leading to transformer sprinklers, the retard chambers, and the fire protection jockey pump in the scope of license renewal. For the CO_2 system for the turbine generator excitor, the applicant adequately demonstrated to the staff that the CO_2 system was installed only to satisfy insurance and liability concerns. On November 8, 2002, the NRC completed a scoping inspection at FCS. During the scoping inspection, the applicant provided the NRC inspectors with modification completion report MR-FC-92-020, which shows that the original design did not include suppression for the turbine generator. This lack of protection was identified as a concern by American Nuclear Insurer’s and resulted in FCS installing a CO_2 system for the excitor in the early 1990s. Inspection Report 05000285-02-07, dated December 20, 2002, provides the details of the FP scoping inspection at FCS. Therefore, the applicant adequately demonstrated to the staff that the CO_2 system was never credited for compliance with 10 CFR 50.48, in accordance with the FCS CLB.

In accordance with the NRC letter from C.I. Grimes to D.J. Walters, NEI, "Consumables," dated March 10, 2000, system filters, fire extinguishers, fire hoses, and air packs are excluded from

an AMR on the basis that these SCs are replaced based on a qualified life. In RAI 2.3.3.14-4, the staff asked the applicant to provide a methodology description and identify the National Fire Protection Association (NFPA) standards and plant implementing procedures that are relied upon for replacement. In its letter dated December 19, 2002, the applicant noted the applicable NFPA standard (NFPA 162, "Standard for the Care, Use, and Service Testing of Fire Hose Including Couplings and Nozzles") for hose replacement. In addition, the staff found that site-specific procedures for each of these SCs were already evaluated in LRA Section 2.1.6.4. The staff found the applicant's response consistent with the staff's letter on consumables and, therefore, acceptable.

2.3.3.14.3 Conclusion

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. 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 aging management review, as required by 10 CFR 54.21(a)(1).

2.3.3.15 Raw Water

2.3.3.15.1 Summary of Technical Information in the Application

The applicant describes the raw water (RW) system in LRA Section 2.3.3.15 and provides a list of components subject to an AMR in LRA Table 2.3.3.15-1.

The RW system is an open-cycle cooling water system which uses screened water from the Missouri River. The system includes four parallel vertical mixed-flow pumps installed in the intake structure pump house. The pumps discharge into an interconnected header which splits into two parallel supply headers. The two supply headers run underground from the intake structure to the auxiliary building, where they join in an interconnected inlet header to the four CCW system heat exchangers.

Downstream of the CCW heat exchangers, the RW discharge header runs through the turbine building and discharges to the river via the circulating water discharge tunnel. RW piping and valves are also routed to selected equipment normally cooled by CCW to provide a means of direct cooling as a backup to CCW. The discharge from the direct cooling portion of the RW system is routed through its own separate discharge header via the turbine building into the circulating water discharge tunnel. In the unlikely event of a design basis accident (DBA), all four RW pumps are started automatically, and a safety injection actuation signal (SIAS) opens the RW isolation valves on all four CCW heat exchangers.

For license renewal purposes, the intake structure traveling screens are evaluated as part of the RW system. There are three cells in the intake structure for the intake of river water, and each cell is served by two traveling screens.

2.3.3.15.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.15 and USAR Section 9.8 to determine whether the RW 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), respectively.

In the performance of the review, the staff selected system functions described in the USAR 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's location of license renewal scoping boundaries on piping connected to a portion of the RW system discharge header piping passing through the auxiliary building and turbine building. These license renewal boundaries are located at design class boundaries, but the boundaries do not coincide with isolation valve locations. By letter dated October 11, 2002, the staff requested the applicant to justify the location of these license renewal boundaries with regard to protection of essential systems from internal flooding in the event of failure of the pressure boundary of the non-safety-related piping outside of the license renewal scope boundary (RAI 2.3.3.15-1).

By letter dated November 22, 2002, the applicant responded to this request by stating that an engineering analysis and a calculation have demonstrated that the design class boundaries are acceptable at a non-valve location. This analysis determined that internal flooding of the turbine building due to failure of the piping will not affect any safe shutdown equipment, nor will floods propagate from the turbine building to the auxiliary building. Additionally, the analysis showed that the floor drains in the auxiliary building can easily handle a postulated flood resulting from rupture of any of the lines that tie into the backup raw water header in the auxiliary building. Section 2.3.3.17 of the LRA states that the auxiliary building floor drains perform an intended function for flood mitigation, and referenced drawings show that the floor drains are within the license renewal scope boundaries. Finally, the analysis determined that a postulated break in any of the non-safety-related piping in question would not impair the ability of the RW system to perform its intended safety function.

The staff evaluated the above information and concluded that the failure of the pressure boundary of the non-safety-related piping outside of the license renewal scope boundary would not affect equipment necessary for safe shutdown or for mitigation of design basis events through flooding. However, during evaluation of this information, the staff noted that Section 2.3.3.15 of the LRA stated that the raw water (RW) discharge from the CCW system heat exchangers and the discharge from the direct cooling RW header flow into the circulating water discharge tunnel. Table 2.2-1 of the LRA designated the circulating water system as outside of license renewal scope without specific justification, but failure of the pressure boundary of buried piping or tunnels creates the potential for a loss of flow. Therefore, the location of the license renewal boundary at the discharge pipes for the RW system, rather than at the outlet from the circulating water discharge tunnel, had not been adequately justified. By letter dated February 20, 2003, the staff issued POI-3(a) requesting the applicant to justify the location of the license renewal boundary.

By letter dated March 14, 2003, the applicant responded to this POI, stating that the location for the RW discharge license renewal boundary at check valves CW-188 and CW-189, upstream of the circulating water discharge tunnel, had been revised. The applicant included the

circulating water discharge tunnel within the scope of license renewal as part of the intake structure. The applicant referenced a separate letter dated March 14, 2003, which included revised boundary drawing 11405-M-100 and new boundary drawing 11405-M-257, Sh. 2, as attachments. These drawings showed that a continuous flow path from the RW system to the river outfall had been included within the scope of license renewal. This resolves the scoping issues associated with POI-3(a), but the expansion of scope introduced the need for evaluation of the applicant's AMR for the discharge tunnel.

In its POI response, the applicant provided the following discussion regarding the AMR for the discharge tunnel.

- The circulating water discharge tunnel is constructed of reinforced concrete with a nominal wall thickness of 2' or greater and nominal floor/ceiling thicknesses of 2'-6" or greater throughout. The concrete circulating water discharge tunnel walls, floor and ceiling are constructed of Type B concrete in accordance with ACI 201.2R as specified in NUREG-1557.

- The concrete is not exposed to aggressive river water or groundwater. The concrete that surrounds the embedded steel has a pH greater than or equal to 12.5. The concrete mix design specified a water-to-cement ratio of 0.44 and air entrainment of 5.00% + 1.00% for Class B concrete. The concrete at FCS was designed in accordance with ACI 318-63 (per USAR Section 5.3.1 Revision 0 and USAR Section 5.11.3.1 Revision 2).

- The maximum flow rate in the circulating water tunnel is well below the velocity of 25 fps required to initiate abrasion. The calculated highest water velocity for a closed conduit is in the warm water recirculating tunnel at 12.6 fps. Therefore, this aging effect is not credible.

- Per NUREG-1557, corrosion of embedded steel is not significant for concrete structures above or below grade that are exposed to a non-aggressive environment. A non-aggressive environment, as defined by NUREG-1557, is one with a pH greater than 11.5 or chlorides less than 500 ppm. NUREG-1557 also concludes that corrosion of embedded steel is not significant for concrete structures exposed to an aggressive environment but have a low water-to-cement ratio, adequate air entrainment, and designed in accordance with ACI 318-63 or ACI 349-85. A low water-to-cement ratio is defined as 0.35 to 0.45 and adequate air entrainment is defined as 3 to 6 percent. Therefore, corrosion of embedded steel is not credible.

- The freeze/thaw exposure category is "Severe" since the concrete of concern is in direct contact with the soil. Based on recent analyses, the groundwater and river water contain minimal amounts of chlorides (8.0 ppm and 14.0 ppm respectively), sulfates (79 ppm and 229 ppm respectively), and the pH is slightly alkaline (7.48 and 8.39 respectively); therefore, the exposure category for sulfates, chlorides, and acids is "Mild", and concrete degradation is not credible for the circulating water discharge tunnel.

- The total flow of the raw water equates to less than 5% of the total volume of the circulating water discharge tunnel.

Based on the installation conditions enumerated above, the conditions specified in NUREG-1557 have been satisfied; therefore, minimal or no aging effects will be realized in the circulating water discharge tunnel. Tunnel failure will not occur to the point that the raw water intended function would be impacted or jeopardized during the period of extended operation. To verify this assumption, the applicant committed to performing a one-time inspection of the circulating water discharge tunnel as part of the one-time inspection program (B.3.5).

The staff evaluated the information provided in response to POI-3(a) and found it acceptable because the applicant had brought the circulating water discharge tunnel within scope.

Therefore, POI-3(a) was resolved. However, the staff still had to review the aging management results associated with the expanded scope. This was identified as Open Item 2.3.3.15-1.

By letter dated July 7, 2003, the applicant revised the response contained in its submittal dated March 14, 2003. The applicant has chosen to manage aging of the circulating water tunnel as part of the structures monitoring program instead of the one-time inspection program. The staff has reviewed the structures monitoring program to ensure that the scope of the program includes the circulating water tunnel. LRA Section B.2.10 describes the structures monitoring program. The program description states that it is consistent with GALL Program XI.S7, "RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants." The scope of GALL program XI.S7 includes intake and discharge structures. Because the circulating water tunnel is a discharge structure, it falls within the scope of XI.S7.

As stated above, the additional structural components of the circulating water discharge tunnel that were brought into scope were included and evaluated as part of the intake structure. The staff confirmed that the circulating water structural components brought into scope were already identified in LRA Table 2.4.2.3-1 for the intake structure. Therefore, the aging management results for the intake structure are applicable to the circulating water discharge tunnel. As discussed in Section 3.5.2.4.2 of this SER, the staff has concluded that the applicant has demonstrated that the aging effects associated with the components in structures outside containment (including the intake structure) will be adequately managed so that their intended functions will continue to be performed in accordance with the CLB for the period of extended operation. On this basis, the staff concludes that the components associated with the circulating water discharge tunnel, as part of the intake structure, will also be adequately managed such that the components will continue to perform their intended functions for the period of extended operation. Open Item 2.3.3.15-1 is closed.

Section 9.8.2 of the USAR states that four RW pumps are installed in the intake structure to provide screened river water to the CCW heat exchangers. These screens perform an apparent intended function of preventing large debris from blocking flow through, or otherwise causing the failure of, the RW system. However, LRA Table 2.3.3.15-1 does not specifically identify the intake structure screens as components subject to an aging management review. In the letter dated October 11, 2002, the staff also requested the applicant to clarify whether the intake structure screens are within the scope of license renewal and subject to an aging management review (RAI 2.3.3.15-2). The applicant responded to this request on November 22, 2002, by stating that intake structure screens CW-2A, CW-2B, CW- 2C, CW-2D, CW-2E, and CW-2F are included within the "filters/strainers" component type in LRA Table 2.3.3.15-1. Since the intake structure screens are within scope for license renewal and subject to an aging management review, the staff determined the applicant's response was acceptable.

NRC Inspection Report 50-285/02-07, which was focused on the scoping and screening process at FCS for license renewal, identified Inspection Open Item 50-285/02-07-04 related to warm water recirculation. During the colder winter months, a portion of the heated water in the circulating water discharge tunnel is directed to a release point upstream of the intake screens to warm the river water entering the intake structure. The purpose of this recirculation flow path is to prevent the formation of frazil ice, which can block raw water flow to the heat exchangers that help maintain adequate cooling for safety-related components. Currently, the applicant considers the systems, structures, and components supporting warm water recirculation not to be within the scope of license renewal. However, the staff found that design basis document

SDBD-STRUC-503, USAR Section 9.8 for the RW system, and USAR Section 10.2.3 for the circulating water system, discuss how warm water recirculation is used to prevent the blockage of the intake screens with surface or frazil ice.

During the scoping and screening and AMR inspections, the staff discussed with the applicant whether the SSCs that are needed to ensure warm water recirculation should be included within the scope of license renewal. The staff determined that the warm water recirculation issue is a 10 CFR Part 50 issue, in that the issue is relevant for the current operating term and not unique to license renewal. Therefore, the issue has been referred to the operating reactors staff for followup. Resolution of this issue will be incorporated into the applicant's CLB.

2.3.3.15.3 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. The staff found that the circulating water discharge tunnel has been omitted from scope. Subsequently, this component was include within scope. With the exception of the discharge tunnel, 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 SSCs within the scope of license renewal have been identified, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the RW system that are subject to an AMR, as required by 10 CFR 54.21(a)(1). The results of the staff's review of the aging management of the circulating water discharge tunnel will be provided as part of the resolution of Open Item 2.3.3.15-1.

2.3.3.16 Component Cooling Water

2.3.3.16.1 Summary of Technical Information in the Application

The applicant describes the CCW system in LRA Section 2.3.3.16 and provides a list of components subject to an AMR in LRA Table 2.3.3.16-1.

The CCW system (also known as the Auxiliary Coolant–Component Cooling Water System) is a closed loop system which transfers heat to the RW system from various plant components. It provides a monitored intermediate barrier between these fluids and the RW system. The system also serves as a cooling medium for the containment air coolers, steam generator blowdown sampling coolers, and the control room economizer coils. System components are rated for the maximum duty requirements that may occur during normal, shutdown, or accident modes of operation. The CCW system is a closed loop consisting of three motor-driven circulating pumps, four heat exchangers, a surge tank, valves, piping, instrumentation, and controls. The water in the system is demineralized and deaerated, and an inhibitor is added for protection against corrosion. Makeup is supplied to the surge tank through a level control valve from the demineralized water system. RW system piping and valves are also routed to selected equipment normally cooled by CCW to provide a means of direct cooling as a backup to CCW.

2.3.3.16.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.16 and USAR Section 9.7 to determine whether the component 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), respectively.

In the performance of the review, the staff selected system functions described in the USAR 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 2.3.3.16 and referenced drawings, the staff determined that additional information was needed to complete its review. The drawings referenced by the LRA identify the portions of each system that the applicant determined to be within the scope defined by 10 CFR 54.4, and the applicant prepared a separate license renewal boundary drawing for each system appearing on a single piping and instrumentation drawing. The staff identified discrepancies between license renewal boundary drawings for the CCW system and the same drawing for a different but connected system and also at transitions to different license renewal boundary diagrams. The staff also noted one apparent omission. These discrepancies caused the staff to question whether certain components were within the scope of license renewal for the CCW system. In a letter dated October 11, 2002, the staff asked the applicant to clarify which components on the following drawings were within scope for the CCW system and subject to an AMR:

RAI 2.3.3.16-1 Drawing 11405-M-12, Sheet 1, for the CCW and primary plant sampling systems

RAI 2.3.3.16-3 Drawing 11405-M-40, Sheet 1, for the CCW system and Drawing 11405-M-1, Sheet 1, for the containment ventilation system

RAI 2.3.3.16-4 Drawing 11405-M-10, Sheet 2, for the CCW system and Drawing 11405-M-42, Sheet 1, for the nitrogen gas system

RAI 2.3.3.16-5 Drawing E-23866-210-120, Sheet 1, for the CVCS system and Drawing 11405-M-10, Sheet 3, for the CCW system

RAI 2.3.3.16-6 Drawing 11405-M-10, Sheet 3, for the CCW system and Drawing 11405-M-98, Sheet 1, for the waste gas disposal system

RAI 2.3.3.16-7 Relief valves and inlet piping for the shutdown cooling and spent fuel pool cooling heat exchangers on Drawing 11405-M-10, Sheet 3, for the CCW system

By letter dated November 22, 2002, the applicant responded to the above RAIs by clarifying the specific components that are within the scope of license renewal and subject to an AMR. By a separate letter dated November 22, 2002, the applicant provided revised versions of several of the above license renewal drawings when revisions were necessary to correct or clarify which components are within the scope of license renewal for the CCW system. The staff reviewed the applicant's responses to the above RAI's, and the revised drawings. The staff found the revised information clearly identified components the applicant considered within the scope of license renewal and subject to an AMR and noted no omissions.

Section 2.3.3.16 of the LRA references Drawing 11405-M-119 for the CCW system, which depicts the CEA seal coolers as within license renewal scope as part of the reactor vessel internals, and the associated CCW supply and return piping as within scope for the CCW system. However, LRA Table 2.3.1.1-1, which lists components constituting the reactor vessel internals, does not include the CEA seal coolers nor their intended function of maintaining the CCW system pressure boundary. Also, LRA Section 2.3.1.1 does not reference Drawing 11405-M-119. By letter dated October 11, 2002, the staff requested the applicant to clarify whether the CEDM seal coolers are included within the scope of license renewal and subject to an AMR and to submit more detailed information regarding the configuration of the seal coolers (RAI 2.3.3.16-2).

By letter dated December 19, 2002, the applicant responded by stating that Drawing 11405-M-119 incorrectly identified the CEDM seal housing assemblies as being included within the reactor vessel internals "system." They are actually included with the RV system, and the CEDM seal housing assembly coolers are within license renewal scope. The drawing has been corrected and was included as an enclosure to a separate letter dated December 19, 2002. This letter also included as an enclosure Drawing CND-E-2935, “Seal Housing Assembly Details,” which shows the configuration of this "cooler." It consists of a machined depression in the housing over which a nippled sleeve is fitted and welded into place such that a cooling water channel is created.

The applicant stated that the CEDM seal housing assembly is a subcomponent within the component type “Pipes and Fittings, CEDM Housings” in Table 2.3.1.3-1 of the LRA. It is fabricated of austenitic stainless steel, has an internal environment of borated, treated water >482 °F, and an external environment of containment air. The applicant also added the CEDM seal housing assembly cooling channel as a new subcomponent within the component type “Pipes and Fittings, CEDM Housings” in Table 2.3.1.3-1 of the LRA. It has an internal environment of nitrite-corrosion-inhibited, treated water (CCW). Its external environment is the external environment of the housing assembly itself.

The applicant described the intended function of these seal housing assembly coolers by stating that they have only a pressure boundary function for the CCW system and that they do not have an intended function of heat transfer because the cooling is important only to CEA driving or holding. On the basis of the applicant’s response, the staff concludes that the CEDM seal housing assemblies are included within scope and subject to an AMR. RAI 2.3.3.16-2 is resolved.

NRC Inspection Report 50-285/02-07, which was focused on the scoping and screening process at FCS for license renewal, identified Inspection Open Item 50-285/02-07-01 related to the CCW system pressure boundary for the safety injection tank leakage cooler subsystem. Boundary Drawing 11405-M-40, Sheet 3, indicated that the safety injection tank leakage cooler subsystem was excluded from the scope of license renewal. This included the four coolers, associated piping, valves, and instrumentation. CCW is supplied to the four leakage coolers via 3-inch piping at approximately 300 gpm. CCW will automatically isolate on a containment isolation signal. The inspectors asked what effect a pipe break in this non-safety-related subsystem would have on the CCW system. The applicant stated that if leakage were to occur, it would be noticed in the containment sump coupled with a change in flow that would be sensed by flow elements downstream of the coolers. However, due to the size of the containment sump, leakage may not be immediately noticed. Additionally, neither the flow indicators nor flow elements were included within scope. The applicant had not submitted

sufficient information to demonstrate that loss of pressure boundary integrity within this non-safety-related subsystem would not prevent completion of the intended functions of the CCW system and, therefore, the subsystem could be excluded from the scope of license renewal in accordance with 10 CFR 54.4. By letter dated February 20, 2003, the staff issued POI-3(b) requesting the applicant to provide information demonstrating that loss of pressure boundary integrity for this system would not result in the loss of CCW intended functions.

By letter dated March 14, 2003, the applicant responded to POI-3(b) by stating that the portion of CCW that provides cooling to the safety injection leakage coolers has been included within the scope of license renewal and will be added to the CCW AMR. LRA Table 2.3.3.16-1 component types "Heat Exchanger," "Pipes and Fittings," and Valve Bodies," capture all of the components being brought into scope and subject to an AMR. The applicant referenced a separate letter dated March 14, 2003, which included revised boundary Drawing 11405-M-40, Sheet 3, as an attachment. This drawing shows that the entire safety injection leakage cooler subsystem has been included within scope for license renewal.

The staff reviewed the information provided in the POI response and finds it acceptable because the pressure boundary components of the SI leakage cooler subsystem of the CCW system have been brought within the scope of license renewal, these components were subject to an AMR, and the affected component types and associated environment had been previously captured in LRA Table 2.3.3.16-1. Therefore, POI-3(b) is resolved.

2.3.3.16.3 Conclusions

The staff reviewed the LRA, the applicant's responses to the staff's RAIs and POI, 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. 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 component cooling system that are subject to an aging management review, as required by 10 CFR 54.21(a)(1).

2.3.3.17 Liquid Waste Disposal

2.3.3.17.1 Summary of Technical Information in the Application

The applicant describes the LWD system in LRA Section 2.3.3.17 and provides a list of components subject to an AMR in LRA Table 2.3.3.17-1.

The LWD system is used to collect, store, prepare for disposal, and dispose of liquid radioactive wastes. Radioactive liquid wastes are generated as a result of plant operation, repair, and maintenance activities. These wastes must be collected, stored, processed, monitored, and disposed of in order to protect the plant personnel and the general public from exposure to radiation. The LWD system is CQE at the containment penetration isolation valves. These portions of the LWD system must provide containment isolation in the event of a containment isolation actuation signal (CIAS). The containment isolation system was designed to prevent the release of radioactivity from containment, especially in the event of an accident. In the event of

a LOCA, the release of radioactivity is mitigated by establishing containment integrity. The floor drains in the auxiliary building are part of the LWD system and perform an intended function for flood mitigation.

2.3.3.17.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.17 and USAR Section 11.1.2 to determine whether the LWD 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), respectively.

In the performance of the review, the staff selected system functions described in the USAR 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.

2.3.3.17.3 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. 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 LWD 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 LWD system that are subject to an aging management review, as required by 10 CFR 54.21(a)(1).

2.3.3.18 Gaseous Waste Disposal

2.3.3.18.1 Summary of Technical Information in the Application

The applicant describes the GWD system in LRA Section 2.3.3.18 and provides a list of components subject to an AMR in LRA Table 2.3.3.18-1.

The GWD system includes the containment isolation valves that close on a CIAS and the piping between the containment penetrations and the containment isolation valves.

For license renewal purposes, the system boundary also includes the volume control tank (VCT) pressure control valve, isolation valve, and pressure instruments in the piping from the VCT to the GWD system. Also included are the waste gas compressor seal water heat exchangers that receive cooling water from the CCW system.

2.3.3.18.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.18 and USAR Section 11.1.3 to determine whether the GWD 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 USAR 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.

2.3.3.18.3 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. 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 GWD 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 GWD system that are subject to an aging management review, as required by 10 CFR 54.21(a)(1).

2.3.3.19 Primary Sampling

2.3.3.19.1 Summary of Technical Information in the Application

The applicant describes the PS system in LRA Section 2.3.3.19 and provides a list of components subject to an AMR in LRA Table 2.3.3.19-1.

The PS system includes components used to sample reactor coolant and steam generator blowdown. Apparatus and piping that may contain radioactive fluids are shielded. The principal items of equipment are the primary sampling panel, the CVCS panel, the steam generator blowdown analyzer rack, the instrument panel, steam generator blowdown sample chiller, and the manual sampling sink and hood.

The boundary for the PS system includes the containment penetration isolation valves and upstream tubing up to and including the RCS hot leg sample flow control valves, RV vent sample flow control valve, pressurizer surge line sample flow control valve, and both steam generator blowdown sample isolation valves. Heat exchangers SL-3, -8A, and -8B, and sample cooler SL-51 shell side and tubes are in scope as pressure boundary for the CCW system.

2.3.3.19.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.19 and USAR Section 9.13.2.1 to determine whether the PS 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), respectively.

In the performance of the review, the staff selected system functions described in the USAR 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, the staff identified several potential discrepancies in the drawings used by the applicant to show which PS system components are within the scope of license renewal. Drawing 11406-M-12, Sheet 1 shows sample heat exchangers SL-3, SL-8A, and SL-8B and sample cooler SL-51 as being within the scope of license renewal for the PS system. The intended functions of these components are heat transfer and pressure boundary. In all four

cases, the PS system inlet and outlet piping is not identified as being within the scope of license renewal. The failure of this piping could compromise the pressure boundary function of the heat exchangers and sample chiller. By letter dated October 11, 2002, the staff issued RAI 2.3.3.19-1 to obtain clarification from the applicant. By letter dated November 22, 2002, the applicant stated that the heat exchangers were incorrectly identified as having a heat transfer intended function. Heat transfer is not an intended function for license renewal. In addition, the heat exchangers have a pressure boundary function for the CCW system, not for the PS system. The GALL Report has heat exchangers aligned with the process fluid system and not the cooling system. The drawing properly shows the within-scope boundaries, as required by GALL. The staff determined that the applicant's response was acceptable because it clarified component intended functions as well as provided the basis for the license renewal scoping boundaries.

2.3.3.19.3 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. 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 PS system that are within the scope of license renewal, as required by 10 CFR 54.4, and that the applicant has appropriately identified the components of the PS system that are subject to an aging management review, as required by 10 CFR 54.21(a)(1).

2.3.3.20 Radiation Monitoring – Mechanical

2.3.3.20.1 Summary of Technical Information in the Application

The applicant describes the radiation monitoring-mechanical system (RMS) in LRA Section 2.3.3.20 and provides a list of components subject to an AMR in LRA Table 2.3.3.20-1.

Permanently installed radiation monitors are provided for surveillance of plant effluents, critical process streams (process monitors), and personnel exposure levels in hazardous and potentially hazardous plant areas (area monitors). Monitoring and recording are required for liquid and gaseous releases. The monitoring program meets the requirements of 10 CFR Part 50, Appendix I, and the Off-Site Dose Calculation Manual (ODCM). Process monitors measure RCS and primary-to-secondary leakage. The RMS consists of the CQE radiation monitors and their supporting components.

2.3.3.20.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.20 and USAR Section 11.2.3 to determine whether the RMS 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 USAR 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, the staff identified several potential discrepancies in the drawings used by the applicant to show which RMS components are within the scope of license renewal. Drawing 11405-M-1, Sheet 2, is the only drawing listed as showing the license renewal boundaries for this system. The drawing shows only three equipment cabinets as being within the scope of license renewal. This was inconsistent with LRA Table 2.3.3.20-1 which listed five component types subject to aging management review. By letter dated October 11, 2002, the staff issued RAI 2.3.3.20-1 to obtain clarification from the applicant. By letter dated December 19, 2002, the applicant stated that the components in question are shown on three proprietary vendor drawings which show the interior of the three equipment cabinets. The drawings were provided as part of the applicant's response. The staff reviewed this response and the provided drawings. Based on this review, the staff determined that additional information is needed to complete the review. The specific information required is listed below.

- On all three of the vendor drawings, license renewal boundaries end in the middle of pipes with no physical means of isolation. Justify placing the boundaries at these locations.

- The housings for the gas samplers RE-052, RM-062, and RE-051 are within the scope of license renewal but are not listed in LRA Table 2.3.3.20-1. These housings appear to perform a pressure boundary and/or fission product retention function. Therefore, these housings should be listed in Table 2.3.4.1-1 as being subject to an AMR in accordance with 10CFR54.21. Justify not making the gas samplers housings subject to an AMR.

By letter dated February 20, 2003, the staff issued POI-3(c) requesting this information from the applicant. By letter dated March 14, 2003, the applicant provided the requested information. On the basis of the additional information, the staff finds that the applicant has included the five component types within scope and subject to an AMR. POI-3(c) is resolved.

2.3.3.20.3 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. 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 RMS that are within the scope of license renewal, as required by 10 CFR 54.4, and that the applicant has appropriately identified the components of the RMS that are subject to an aging management review, as required by 10 CFR 54.21(a)(1).

2.3.3.21 Evaluation Findings

On the basis of this review, the staff concludes that the applicant has adequately identified the auxiliary systems 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 auxiliary system components that are subject to an aging management review, in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.4 Steam and Power Conversion Systems

Steam and Power Conversion Systems (SPCS) act as a heat sink to remove heat from the reactor and convert the heat generated in the reactor to the plant's electrical output. The following systems are included in this subsection:

- feedwater
- auxiliary feedwater
- main steam and turbine steam extraction

During its review, the staff identified that the steam generator blowdown system is identified in LRA Section 3.4 as being included in the SPCS group. As shown above, the steam generator blowdown system is not part of the SPCS listed in this section. Additionally, LRA Table 2.2-1, "Plant Level Scoping Results," lists the steam generator feedwater blowdown system as being within the scope of license renewal. By letter dated October 11, 2002, the staff issued RAI 2.3.4-1 to obtain clarification from the applicant concerning where in the application the steam generator feedwater blowdown system is addressed. By letter dated December 19, 2002, the applicant stated that the steam generator blowdown system is within scope of license renewal as noted in LRA Table 2.2-1, and the system has been evaluated within other in-scope systems. The steam generator blowdown system component types subject to an AMR are included with the applicable component types listed in LRA Table 2.3.1.2-1, "Reactor Coolant" (includes SGs); LRA Table 2.3.2.2-1, "Containment Penetration and System Interface"; LRA Table 2.3.3.19-1, "Primary Sampling"; and LRA Table 2.3.4.1, "Feedwater." The staff determined that the applicant's response was acceptable because it clarified that the blowdown system is within scope and where the system components are located in the LRA.

2.3.4.1 Feedwater

2.3.4.1.1 Summary of Technical Information in the Application

The FW system consists of a supply line to each of the two SGs. An FW isolation valve in each SG supply line is located just outside the containment penetration. These valves are motor-operated, closing automatically on a steam generator isolation signal (SGIS). A check valve in each supply line, located inside containment, prevents uncontrolled blowdown from the affected SG in the event of an FW line break. The license renewal boundary also includes the piping from the SGs to the isolation valves for the blowdown and PS systems.

2.3.4.1.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.1 and USAR Section 10.2 to determine whether the FW 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 USAR 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.

During its review, the staff identified numerous pressure and level transmitter housings shown on Drawing 11405-M-253, Sheet 1, that were in scope but were not subject to an AMR. From

the drawing, it appeared the instrument housings formed part of a pressure boundary with their associated piping. Therefore, the staffed believed the instrument housings should be listed in LRA Table 2.3.4.1-1 as being subject to an AMR in accordance with 10 CFR 54.21. By letter dated October 11, 2002, the staff issued RAIs to obtain clarification from the applicant. By letter dated December 19, 2002, the applicant stated that the instruments do not require an AMR in accordance with guidance contained in Appendix B of NEI 95-10, Revision 3. However, the applicant's response did not address the instrument housings. Therefore, the staff found this response unacceptable. By letter dated February 20, 2003, the staff issued POI-4, requesting the applicant to address the instrument housings.

By letter dated March 14, 2003, the applicant responded to POI-4, stating that all housings of in-scope instruments that provide a pressure boundary function are included within scope and subject to an AMR in accordance with NEI-95-10. However, the staff reviewed a letter from Dennis Crutchfield (NRC) to Charles H. Cruse (Baltimore Gas and Electric Company [BGE]), "Final Safety Evaluation (FSE) Concerning the Baltimore Gas & Electric Company Report Entitled, 'Integrated Plant Assessment Methodology,'" dated April 4, 1996, which addressed, among other issues, the scoping and screening of instrumentation. In this letter, the staff stated that it "agrees with the BGE methodology to exclude "active" instrumentation such as water level transmitters, differential pressure transmitters, and pressure switches, from an aging management review. This is because 54.21(a)(1)(i) explicitly excludes pressure transmitters, pressure indicators, and water level indicators, as examples of "active" components which perform their intended functions with moving parts or with a change in configuration or properties, from an aging management review. In addition, the staff agrees with BGE that the pressure-retaining boundary of these "active" instrumentation is also excluded from an aging management review. This is because while 54.21(a)(1)(i) explicitly states that pumps and valves are excluded from an aging management review, with the explicit exception of their pressure-retaining boundary, no such exception is stated when excluding pressure transmitters, pressure indicators, and water level indicators from an aging management review.

"However, BGE methodology indicates that the pressure retaining boundary of "active" instrumentation is excluded from an aging management review in part because the instrumentation does not contribute significantly to a pressure retaining function. The staff believes that this BGE reasoning may not be entirely consistent with the intent of the final rule. The staff believes that the pressure retaining boundary of "active" instrumentation may be excluded from an aging management review because 'functional degradation resulting from the effects of aging on active components is more readily determinable, and existing programs and requirements are expected to directly detect the effects of aging.' (60 FR 22472) ""Active" instrumentation is sensitive equipment which is subject to extensive surveillance and testing. For example, technical specification surveillance programs will detect degradation of the passive, pressure retaining function of pressure transmitters from the effects of aging on the active function through response-time testing."

The staff has reviewed the April 6, 1996 letter and finds that, on the basis of its position regarding the treatment of the housings for "active" instrumentation, the instrument housings at FCS need not be subject to an AMR.

2.3.4.1.3 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. 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 FW system that are within the scope of license renewal, as required by 10 CFR 54.4, and that the applicant has appropriately identified the components of the FW system that are subject to an aging management review, as required by 10 CFR 54.21(a)(1).

2.3.4.2 Auxiliary Feedwater

2.3.4.2.1 Summary of Technical Information in the Application

The applicant describes the AFW system in LRA Section 2.3.4.2 and provides a list of components subject to an AMR in LRA Table 2.3.4.2-1.

The AFW system supplies feedwater to the SGs whenever the RCS temperature is above 300 °F and the main FW system is not in operation. The AFW system contains one emergency feedwater storage tank (EFWST) and two pumps, plus related piping, valves, and instrumentation. One pump is electric motor-driven, and the other is steam turbine-driven. The flow path connects to the AFW nozzles on the SGs. Either AFW pump can pump water from the EFWST to the SGs. In the event of automatic initiation, the AFW system is designed to automatically start both AFW pumps and direct flow to the SGs via the flow path to the AFW nozzles.

2.3.4.2.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.2 and USAR Section 9.4 to determine whether 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 USAR 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.

2.3.4.2.3 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. 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 aging management review, as required by 10 CFR 54.21(a)(1).

2.3.4.3 Main Steam and Turbine Steam Extraction

2.3.4.3.1 Summary of Technical Information in the Application

The applicant describes the main steam and turbine steam extraction system in LRA Section 2.3.4.3 and provides a list of components subject to an AMR in LRA Table 2.3.4.3-1.

The portion of the main steam and turbine steam extraction system within the scope of license renewal consists of the piping from each SG which penetrates the containment (steam generators are discussed in LRA Section 2.3.1.2). The piping outside containment includes the main steam safety valves and the main steam isolation valves (MSIVs). Also included in the main steam system boundary is the piping to the steam-driven AFW pump and the associated drains and vents. The main steam check valves are the boundary valves for each of the individual lines, and the MSIV packing leakoff line isolation valve is the boundary after the leakoff piping connects into a common header.

2.3.4.3.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.3 and USAR Section 10.1 to determine whether the main steam and turbine steam extraction 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), respectively.

In the performance of the review, the staff selected system functions described in the USAR 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, the staff required clarification of the drawings used by the applicant to show which main steam and turbine steam extraction system components are within the scope of license renewal. The staff noted that the turbine drive casing for the steam-driven AFW pump and numerous steam traps are within the scope of license renewal but are not listed in LRA Table 2.3.4.3-1 as being subject to an AMR. These components are passive and long-lived and therefore should be subject to an AMR. By letter dated October 11, 2002, the staff issued RAI 2.3.4.3-2 to obtain clarification from the applicant. By letter dated December 19, 2002, the applicant stated that the turbine casing for the steam-driven AFW pump has been included in the AFW system. The “Turbine Casing” component type is in LRA Table 2.3.4.2-1. The applicant also stated that steam traps are included in the valve component group and therefore are subject to an AMR. The staff determined that the applicant’s response was acceptable because it clarified that the components are subject to an AMR and identified where the components can be found in the LRA.

2.3.4.3.3 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. 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 main steam and turbine steam extraction 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 main steam and turbine steam extraction system that are subject to an aging management review, as required by 10 CFR 54.21(a)(1).

2.3.4.4 Evaluation Findings

On the basis of this review, the staff concludes that the applicant has adequately identified the steam and power conversion systems 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 steam and power conversion system components that are subject to an aging management review, in accordance with the requirements of 10 CFR 54.21(a)(1).

2.4 Scoping and Screening Results: Structures

2.4.1 Containment

The FCS containment is a domed structure that houses the RV, RCS and supports, and other systems that interface with the RCS. The containment also houses a substantial amount of CQE and non-CQE mechanical and electrical equipment. The structures of the containment are divided into two classifications (i.e., containment structure and containment internal structures).

2.4.1.1 Summary of Technical Information in the Application

The applicant describes the containment structure in LRA Section 2.4.1 and provides a list of the structural components subject to an AMR in LRA Table 2.4.1-1. The design and analysis of the containment structure are described in Section 5 of the USAR.

The containment structure is composed of a cylindrical wall, domed roof, and a foundation mat that are seismic Class I reinforced concrete structures; the wall and roof are partially prestressed. The foundation mat is common to both the containment building and the auxiliary building that is supported on steel piles driven to bedrock. This foundation mat incorporates a depressed center portion for housing the reactor vessel. The interior surfaces of the containment, including wall, roof, and foundation, are lined with a ¼-in carbon steel liner to maintain a high degree of leak-tightness. The liner plate for the floor is placed on top of the foundation concrete pour and is covered with an additional concrete floor covering. The un-bonded tendons of the prestressed portion in the wall and roof are in conduits filled with waterproof grease. The tendon anchors are accessible for inspection, testing, and re-tensioning via the tendon access gallery located directly beneath the cylinder wall and at the dome roof. The applicant has determined that all the seismic Class I structures meet the intent of 10 CFR 54.4(a)(1) and are within the scope of license renewal.

The containment internal structures consist of several levels of compartments supported on the foundation mat by concrete columns. The internal structures are isolated from the containment shell by a shake space which also permits the distribution and dissipation of any internal differential pressure during postulated accident events. There are several compartments which house the mechanical equipment, including the steam generator and reactor coolant pump compartments, pressurizer compartment, and the reactor cavity. The reactor cavity, which serves as the primary shield wall, houses the reactor pressure vessel.

The applicant identified the following intended functions for the containment structure and its internal structures that fall within the scope of license renewal:

- serve as a pressure boundary or a fission-product retention barrier to protect public health and safety during a DBE
- provide shelter/protection to safety-related equipment
- provide structural and functional support to safety-related equipment
- provide structural support to non-safety-related components whose failure could prevent satisfactory accomplishment of any of the required safety equipment functions
- serve as a missile barrier (internal or external)
- provide flood protection barrier (internal and external flooding event)
- provide shielding against radiation and high-energy line breaks
- provide rated fire barrier to confine or retard a fire from spreading to or from adjacent areas of the plant
- provide spray shield or curbs for directing flow (e.g., safety injection flow to containment sump)

The boundary of the containment in scope includes all the concrete, steel, elastomer, and fire barrier components of the containment internals and the domed roof and cylinder wall of the containment building. The containment structure also includes any components attached to the outside of the cylinder wall or dome above the auxiliary building roof. Various penetrations through the containment cylindrical wall are provided for the passage of piping and electrical conduits. The pipe sleeves, welds between the sleeve and the liner of the mechanical and electrical penetrations, and welds between the sleeve and the penetration are included in the boundary of the containment structure. The component supports (e.g., pipe supports, cable tray supports, equipment supports, and associated anchorage), fuel-handling equipment, heavy load cranes, and building piles are evaluated as the commodities in LRA Section 2.4.2, "Other Structures."

In LRA Table 2.4.1-1, the applicant lists 20 structural component types and their intended functions for the containment structure and its internal structures as the result of aging management review. The components listed in the table meet the scoping criteria of 10 CFR 54.4(a) because they perform one or more of the intended functions specified in the table. They also meet the screening criteria of 10 CFR 54.21(a)(1) because they are passive and perform applicable intended functions without moving parts or without a change of configuration or properties, and they are not replaced based on a qualified life or specified time period.

2.4.1.2 Staff Evaluation

The staff reviewed the information in the LRA and the USAR to determine whether the containment 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), respectively. After completing its initial review, the staff issued RAIs for the containment and other structures in a letter to the applicant, dated October 11, 2002. The applicant responded to the staff's RAIs in letters to the NRC, dated November 22 and December 19, 2002.

The staff reviewed the scoping results in LRA Section 2.4.1, supporting information in USAR Section 5 (i.e., 5.1, 5.4, 5.5, 5.6, and 5.9), and the additional information submitted by the

applicant in response to the staff's RAIs to determine if there were any structures or components within the containment boundary that the applicant did not identify as being within the scope of license renewal or as being subject to an AMR. On the basis of this review, the staff has made the findings described below.

LRA Section 2.4.1 states that the tendon anchors are accessible for inspection, testing, and retensioning via the tendon access gallery located beneath the containment cylindrical wall and the dome roof. LRA Table 2.4.1-1 lists all the components for the containment structure and its internal structures that are subject to an AMR. However, the tendon access galleries are not included in the table. In RAI 2.4.1-1, the staff asked the applicant whether the concrete structures of the tendon access galleries are in scope and subject to an AMR for license renewal.

In its response, the applicant stated that the function of the tendon gallery is to provide access to the tendon anchorage for inspection and testing. The concrete structures of the tendon galleries are not in scope for license renewal because they do not make up part of the containment pressure boundary nor provide support for the containment. However, the concrete where the tendons are anchored in the tendon gallery is within the scope of license renewal. The staff agrees with the applicant's justification that the tendon access gallery does not have to be in scope because it does not perform a containment pressure boundary function to prevent or mitigate the consequences of an accident that could result in potential offsite exposure or any other functions under 10 CFR 54.4.

LRA Table 2.4.1-1 lists the containment equipment access hatch and personnel airlock as the components of the containment structure subject to an AMR. However, the applicant did not identify whether certain operable parts of the airlock require an AMR. In RAI 2.4.1-2, the staff requested the applicant to verify whether the airlock-door interlock system, equalizing valves, door seals, and operation mechanism (such as gears, latches, hinges, etc.) are in scope and subject to an AMR for license renewal.

In its response, dated December 19, 2002, the applicant stated that the containment equipment hatch consists of a bolted-door and a gasket. These parts are passive and long-lived components and are subject to an AMR. The containment personnel airlock interlock system, which is required to keep the door air-tight (door and seal) and in a closed position (latches), is within the scope of license renewal. The latches and door are the passive and long-lived components and therefore are subject to an AMR. The airlock seal is periodically replaced and is not subject to an AMR. The gears, equalizing valves, and hinges are the active components. They are not subject to an AMR.

The staff reviewed the RAI response in which the applicant identified certain active components that perform a passive function associated with maintaining the airlock in the closed position while others (e.g., gears, equalizing valves, and hinges) do not maintain the air lock in the closed position. However, the applicant did not explain how the periodic replacement of the airlock seal is performed. In POI-5(a), issued on February 20, 2003, the staff requested the applicant to explain (1) how often the airlock seal should be replaced and (2) how often the airlock seal is inspected.

In its response, dated March 14, 2003, the applicant stated that gaskets, O-rings, etc., are considered consumables and are not subject to AMR as per NEI 95-10, Revision 3. The periodic surveillance and preventive maintenance program (PS/PMP) performs periodic

inspections and maintenance of containment personnel airlocks. The procedure is performed on one door (alternating inner/outer door) at each refueling outage. The applicable (inner or outer) door is inspected, and the seals are replaced during each performance of the procedure.

The staff agrees with the functions and scoping of these operable parts as the applicant described. The staff also confirmed that the airlock seals are inspected and replaced periodically under the specified program (PS/PMP). Therefore, the staff found that the applicant's responses to RAI 2.4.1-2 and POI-5(a) are acceptable.

LRA Table 2.4.1-1 lists "containment concrete above grade," "containment concrete below grade," and "containment concrete in ambient air" as the component types to represent all the concrete components subject to an AMR in the containment. It is not clear from the information in the submittal which structural components are included in these groups. In RAI 2.4.1-3, the staff requested the applicant to (1) identify which reinforced concrete structures are included in each component group and (2) explain whether the refueling cavity walls, containment sumps, and missile shields are included in any of these component groups.

In its response, the applicant stated that the "concrete above grade" consists of the containment dome and cylindrical walls that are exposed to the weather. The "concrete below grade" consists of the foundation mat and the portion of the cylindrical walls that are below grade. The "containment concrete in ambient air" consists of all interior containment structures (e.g., reactor cavity, floors, and missile shields), the portion of the containment cylindrical walls which are protected from weather by the auxiliary building, and the inside of the containment dome and cylindrical walls. The refueling cavity walls, containment sumps, and missile shields are also included in the component type "Containment Concrete in Ambient Air." The staff found that the applicant's response clarifies the concrete components of the containment.

LRA Table 2.4.1-1 uses the component type "Containment Structural Steel in Ambient Air" to represent all the steel structures subject to an AMR in the containment. It is not clear from the information provided which structures are included in these component groups. In RAI 2.4.1-4, the staff asked the applicant to identify which steel structures and components in the containment are subject to an AMR.

In its response, the applicant stated that the component type "containment structural steel in ambient air" includes columns/posts, beams, base-plates, bracing, crane girders, platform hangers, checkered plate, decking, grating, stairs, ladders, ladder cages, whip restraints, pipe rupture shields, radiant energy shields, exposed faces of embedded plates/structural shapes, and the external reinforcement of the masonry walls. The applicant stated that all of these components are within the scope of license renewal and subject to an AMR. The staff found that the applicant's response clarifies the scoping process for the structural steel components.

LRA Table 2.4.1-1 lists the fuel transfer penetration as a containment component subject to an AMR. The staff believes that the components within the fuel transfer penetration, such as fuel transfer tubes, expansion bellows, and flange supports, are passive and long-lived components and therefore should be subject to an AMR. In RAI 2.4.1-5, the staff asked the applicant whether these components are subject to an AMR. The applicant responded that the fuel transfer tubes, expansion bellows, and flange supports are included in LRA Table 2.4.2.5-1. They are in scope and subject to an AMR for license renewal. The staff found that the applicant's response clarifies the component scoping of the fuel transfer penetration.

LRA Section 2.4.1 does not address the polar crane, jib cranes, and their supports. LRA Table 2.4.1-1 does not list any of their components. In RAI 2.4.1-6, the staff asked the applicant whether the main girders, runway rails, runway rail brackets, rail anchorages, and embedment that support the polar crane are within the scope of license renewal and, if so, where in the LRA they are discussed. If not, the staff asked the applicant to justify not including them within the scope of license renewal.

In its response, the applicant stated that the cranes are in scope and subject to an AMR for license renewal. These cranes are discussed in LRA Section 2.4.2.5, "Fuel Handling Equipment and Heavy Load Cranes," and their components are listed in LRA Table 2.4.2.5-1. The passive and long-lived subcomponents of the containment cranes in scope include crane/trolley rail systems, hoist monorails, and structural members used for the support of the crane bridge and trolley. The component types in LRA Table 2.4.2.5-1 associated with cranes or similar lifting devices represent only those subcomponents that are within the scope of license renewal and subject to AMR. All other subcomponents are considered to be active or have no intended function and therefore are not within the scope of license renewal. The components not in scope include brakes, antennas, motors, wheels, gears, shafts, cables, control panels, and junction boxes. The staff found that the applicant has clarified the scoping process of the components for the cranes and lifting devices in the containment.

USAR Section 5.11 states that special steel structures are used around the steam generators for the purpose of limiting the motion of the steam generator in case a rupture occurs in the reactor coolant piping, main steam piping, or the feedwater piping. These special steel structures are not addressed in LRA Section 2.4.1. The staff believes that these passive and long-lived structures perform an intended function to ensure the functionality of the steam generators and therefore should be in scope and subject to AMR for license renewal. In RAI 2.4.1-7, the staff requested the applicant to clarify whether the components addressed in USAR Section 5.11 are within the scope of license renewal or to justify their exclusion.

In its response, the applicant stated that these special structures are the cradle assemblies that support the steam generators. They are in scope and subject to an AMR for license renewal. They are included in LRA Table 2.4.2.6-1 as the component type "Component Support Weathering Carbon Steel in Ambient Air." These assemblies are shown in Drawings E-23866-321-020 and E-23866-321-210. The staff found that the applicant has included these components in scope, and therefore its response is acceptable.

The staff has reviewed the above information and LRA Table 2.4.1-1 and did not identify any omissions by the applicant relating to scoping and screening of the containment structure and its internal structures and components. The staff also found that all the passive structures and components identified as being within the scope of license renewal were subject to an AMR.

2.4.1.3 Conclusions

The staff reviewed the LRA to determine whether any structures and 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 containment and the internal 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 structural components of the containment and the internal structures that are subject to an aging management review, as required by 54.21(a)(1).

2.4.2 Other Structures

Other structures which 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 seismic Class I structures are included in the group of other structures for license renewal:

- auxiliary building
- turbine building and service building
- intake structure
- building pile
- fuel handling equipment and heavy load cranes.
- component supports
- duct banks

2.4.2.1 Auxiliary Building

2.4.2.1.1 Summary of Technical Information in the Application

The applicant describes the structures in the boundary of the auxiliary building in LRA Section 2.4.2.1 and provides a list of components in LRA Table 2.4.2.1-1. The design of the auxiliary building structure is further described in USAR Section 5.11.4.

The auxiliary building is a seismic Class I structure that houses the safety-related systems, structures, and components that support normal operation, shutdown, and accident conditions. Seismic Class I structures meet the intent of 10 CFR 54.4(a) because they are designed to prevent uncontrolled release of radioactivity and to withstand system and seismic loading without loss of function. The auxiliary building is a multi-floored reinforced concrete structure supported by a mat foundation which is shared with the containment building. The building structure is of box-type construction with interior bracing provided by vertical concrete walls and horizontal floor slabs. The mat foundation is supported on steel piles driven to the bedrock. The spent fuel pool is in the auxiliary building and is a seismic Class I reinforced concrete structure. The inside face of the pool has a stainless steel liner. The masonry walls in the area of safety-related equipment are steel reinforced to provide protection for the safety-related components and equipment located nearby.

In LRA Table 2.4.2.1-1, the applicant lists the passive structural components and their intended functions for the auxiliary building. These components listed in the table meet the scoping

criteria because they perform one or more of the intended functions specified in the table. They also meet the screening criteria for an AMR because they perform their intended functions without moving parts or without a change in configuration or properties and are not subject to periodic replacement based on qualified life or specified time period.

2.4.2.1.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.1 and USAR Section 5.11.4 to determine whether the structural components and commodities of the auxiliary building within the scope of license renewal and subject to an AMR have been properly identified in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1), respectively.

In performing this review, the staff selected the system functions described in the USAR 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 applicant listed 18 structural component types in LRA Table 2.4.2.1-1. These component types represent the groups of the structural components subject to an AMR based on their operating environment and construction materials. These component types include concrete in ambient air, structural steel, missile shields, carbon steel expansion/grout anchors, carbon steel threaded fasteners, etc. Some of the component types listed in the table are unique, such as safety injection and refueling water tank foundation, diesel fuel oil tank foundation, auxiliary building pyrocrete (fire barrier), and spent fuel pool liner.

LRA Section 2.4.2.2 states that the spent fuel pool (SFP), which consists of a stainless-steel-lined concrete structure, is contained within the auxiliary building. However, LRA Table 2.4.2.1-1 lists only the spent fuel pool liner as the component subject to an AMR. The staff believed that other components of the SFP structure meeting the 10 CFR 54.4 criteria should also be included within the scope of license renewal and be subject to an AMR. In RAI 2.4.2.1-1, the staff requested the applicant to verify what other component types listed in LRA Table 2.4.2.1-1 (or in other tables) are applicable to the spent fuel pool structure.

In its response, the applicant stated that the spent fuel pool concrete is included in LRA Table 2.4.2.1-1, “Auxiliary Building,” in the component type “Auxiliary Building Concrete in Ambient Air.” The spent fuel racks are included in the component type “Spent Fuel Storage Racks” in LRA Table 2.4.2.5-1, “Fuel Handling Equipment and Heavy Load Cranes.” The table also lists the component types “Fuel Transfer Conveyor” and “Fuel Transfer Carrier Box.” The applicant previously responded to RAI 2.4.1-5 for the fuel transfer penetration in the containment (and was found acceptable). The staff’s review of the information provided in response to RAIs 2.4.2.1-1 and 2.4.2.5-1 found that the applicant has identified the components in the spent fuel pool structure other than the SFP liner, and specified the LRA tables that contain these components. Therefore, the staff found no omissions in the scoping and screening of the SFP components.

The staff has reviewed the information in LRA Section 2.4.2.1, the USAR, 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 structures and components 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.

2.4.2.1.3 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 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 aging management review, as required by 10 CFR 54.21(a)(1).

2.4.2.2 Turbine Building and Service Building

2.4.2.2.1 Summary of Technical Information in the Application

The applicant describes the turbine building and service building in LRA Section 2.4.2.2 and provides a list of their components subject to an AMR in LRA Table 2.4.2.2-1. The design of the turbine building and service building is further described in USAR Section 5.11.

The turbine building and service building are seismic Class II structures that house both limited CQE and non-CQE systems and components. The turbine building also houses the restraints and shields which protect systems and equipment from main steam and feedwater high-energy line breaks. The CQE component (valve HCV-2861) for the raw water system is located in the basement of the service building. From the basement to the operating floor, the turbine building is a box-type reinforced concrete structure supported on a mat foundation. The mat foundation is supported on steel piles driven to bedrock. From the operating floor to roof, the turbine building is a braced steel frame structure clad with aggregate resin panels. The multi-layered built up roof is supported by metal decking spanning between open web steel joists.

The service building is a multi-floored braced steel frame structure clad with aggregate resin panels. The multi-layered built up roof is supported by metal decking spanning between open web steel joists. The building is founded on the mat foundation which is supported on steel piles driven to bedrock.

The turbine pedestal on the operating floor is independent from the turbine building structure that is included in the system boundary. The component supports (e.g., pipe supports, cable tray supports, conduit supports, equipment supports, and equipment anchorage) in the turbine building and service building are evaluated as the commodities in LRA Section 2.4.2.6, “Component Supports.” The steel piles are evaluated as a unique commodity in LRA Section 2.4.2.4, “Building Piles.”

In LRA Table 2.4.2.2-1, the applicant lists eight structural component types and their intended functions for the turbine building and service building. These components listed in the table meet the scoping criteria because they perform one or more of the intended functions specified in the table. They also meet the screening criteria for an AMR because they are passive and perform their intended functions without moving parts or without a change in configuration or properties, and are not subject to periodic replacement based on qualified life or specified time period.

2.4.2.2.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.2 and USAR Section 5.11 to determine whether the structural components of the turbine building and service building 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), respectively.

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

LRA Section 2.4.2.2 describes the turbine building and service building. LRA Table 2.4.2.2-1 lists the component types that have the intended functions to act as structural support to non-CQE pipe restraints and high-energy line break (HELB) shielding. It is not clear from the information provided which portions of the buildings are in scope and which components perform these intended functions. In RAI 2.4.2.2-1, the staff asked the applicant to specify the structural components of the turbine building and service building that are within the scope of license renewal and subject to an AMR.

In its response, the applicant stated that the intended function of providing “pipe whipping restraint” is fulfilled by the main steam and feedwater pipe whip restraints for the HELB analysis. The intended function of providing “shielding against HELB” is fulfilled by the steel plates attached to or adjacent to the turbine building side of the auxiliary building wall. The intended function of providing “structural support to non-safety-related components whose failure could prevent satisfactory accomplishment of any of the required safety-related functions” is fulfilled by the concrete and structural steel of the turbine building and service building. The turbine building concrete and structural steel provide support for the pipe restraints and HELB shielding. The service building concrete and structural steel support a CQE component (valve HCV-2861 in the service building basement) for the raw water system.

The staff has reviewed the information in LRA Section 2.4.2.2, the USAR, 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 structures and components of the turbine building and service building for license renewal. The staff’s review also finds 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 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 structural components of the turbine building and service 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 and

service building that are subject to an aging management review, as required by 10 CFR 54.21(a)(1).

2.4.2.3 Intake Structure

2.4.2.3.1 Summary of Technical Information in the Application

The applicant describes the intake structure in LRA Section 2.4.2.3 and provides a list of structural components subject to an AMR in LRA Table 2.4.2.3-1.

The intake structure houses and protects both CQE and non-CQE systems and components. The diesel-driven fire pump fuel tank enclosure is also included in the intake structure. The intake structure is a multi-floored seismic Class I structure. From the foundation mat to 7 feet above the operating floor, the intake structure is a box-type reinforced concrete structure with internal bracing provided by concrete walls and floor slabs. The mat foundation is supported on steel piles driven to bedrock. Above the operating floor level to the roof, the structure is a braced steel frame clad with aggregate resin panels. The multi-layered built up roof is supported by metal decking spanning between open web steel joists.

In LRA Table 2.4.2.3-1, the applicant lists 19 component types and their intended functions for the intake structure as the result of aging management review. These component types include concrete below grade, concrete exposed to raw water, concrete exterior in ambient air, concrete interior, structural steel in ambient air, stainless steel threaded fasteners, rubber components in flood barriers, fire protection pyrocrete, flood panel seals, grout protected from weather, cast iron stuffing box floor penetration, carbon steel pipe and pipe casing, intake structure stainless steel raw water pump gland bolting, stainless steel strainer backwash piping floor penetration, sand and gravel surrounding the diesel fire pump fuel oil storage tank, gland and gland bolting, carbon steel expansion/grouted anchors, carbon steel pipe sleeve and flange floor penetration, and carbon steel threaded fasteners inside building. These components meet the scoping criteria because they perform one or more of the intended functions specified in the table. They also meet the screening criteria for an AMR because they are passive and perform their intended functions without moving parts or without a change in configuration or properties, and they are not subject to periodic replacement based on qualified life or specified time period.

Certain components within the intake structure are not included in this table, but they are subject to an AMR. The steel piles are evaluated as a unique commodity in LRA Section 2.4.2.4, “Building Piles.” The fuel-handling equipment and heavy load cranes are evaluated in LRA Section 2.4.2.5, “Fuel Handling Equipment and Heavy Load Cranes.” The pipe supports, cable tray supports, equipment supports, and associated anchorage are evaluated in LRA Section 2.4.2.6, “Component Supports.” The cover and flange of manhole MH-31, its elastomer joint and frame, and the foam blocks inside the manhole are evaluated in LRA Section 2.4.2.7, “Duct Banks.”

2.4.2.3.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.3 and LRA Table 2.4.2.3-1 to determine whether the structural components of the intake structure 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), respectively.

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

LRA Section 2.4.2.3 states that the intake structure is a multi-floored seismic Class I structure that houses both the CQE and non-CQE systems and components and the fuel tank of the diesel-driven fire pumps. However, most of the component types listed in LRA Table 2.4.2.3-1 are not addressed in LRA Section 2.4.2.3. There are no structural drawings in the LRA that can be used to check if anything is missing. In RAI 2.4.2.3-1, the staff requested the applicant to provide additional information on the components and equipment supports within the intake structure that are subject to an AMR.

In its response, the applicant stated that all components and equipment supports are included in LRA Section 2.4.2.6, because the operating floor of the intake structure is designed to remain functional after a crane load drop. The bridge crane does not have an intended function per 10 CFR 54.4. The cable trenches in the concrete slabs are included in the component type "Concrete in Ambient Air." The conduits embedded in the concrete are included in the concrete structure (similar to the reinforcing steel in concrete). The hatches are included in the component type "Structural Steel in Ambient Air." The only missile barrier for the intake structure is the operating floor slab, which is included in the component type "Concrete in Ambient Air."

In POI-3(a), the staff requested the applicant to justify why the circulating water system should not be in scope. In its response by letter dated March 14, 2003, the applicant stated that the circulating water discharge tunnel will be included within the scope of license renewal as part of the intake structure because its aging may affect the raw water discharge. The component types "carbon steel pipe sleeve and flange floor penetration," "concrete below grade," and "concrete exposed to raw water" as listed in LRA Table 2.4.2.3-1, will represent the components of the circulating water discharge tunnel subject to an AMR. The discharge tunnel was not discussed in LRA Section 2.4.2.3. The applicant added the structure of the discharge tunnel to its scoping boundary of the intake structure because of the raw water system function. Based on the applicant's response to POI-3(a), the staff found that adding the circulating water discharge tunnel to the license renewal boundary of the intake structure is justified and acceptable.

The staff has reviewed the information in LRA Section 2.4.2.3 and the additional information submitted by the applicant in response to the staff's RAI. On the basis of its review, the staff found that the applicant had omitted the circulating water discharge tunnel from the scope of license renewal. The tunnel was subsequently brought into scope. The staff reviewed the remainder of the intake structure and components and found no other omissions. On the basis of its review, including the identification of additional systems and components brought into scope, the staff concludes that all systems, structures, and components within the scope of license renewal have been identified, in accordance with the requirements of 10 CFR 54.4. The staff also finds that all the passive structures and components identified as being within the scope of license renewal were subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2.3.3 Conclusions

The staff reviewed the LRA to determine whether any structures, systems, and components that should be within the scope of license renewal were not identified by the applicant. With the exception of the circulating water discharge tunnel, 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 structural components of the intake structure that are within the scope of license renewal have been identified, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the structural components of the intake structure that are subject to an aging management review, as required by 10 CFR 54.21(a)(1).

2.4.2.4 Building Piles

2.4.2.4.1 Summary of Technical Information in the Application

The applicant describes the building piles in LRA Section 2.4.2.4 and provides a list of the components subject to an AMR in LRA Table 2.4.2.4-1. The building piles are further described in USAR Section 5.7.

The building piles are a unique commodity that consists of four types of piles: Class A steel pipe piles, Class B steel pipe piles, concrete caissons, and steel H-piles.

Class A piles are the 20-in outside-diameter (OD) open-end steel pipe piles with 1.031-in thick walls driven to bedrock. The piles are filled with sand to the point 4 ft below the top of the pile. The remaining top 4 ft is filled with concrete. The Class A piles are capped with a 2-in thick steel plate end closure. The seismic Class I structures (e.g., containment, auxiliary building, and intake structure) are founded on the Class A piles. The Class A piles are also used to support the turbine generator foundation located in the turbine building.

Class B piles are the12.75-in OD closed-end steel pipe piles with 0.25-in thick walls and filled with concrete. The Class B piles are capped with a 1.25-in steel plate end closure. Seismic Class II structures (e.g., the turbine building and service building) are founded on the Class B piles driven to bedrock.

Concrete caissons are the 3-ft diameter reinforced concrete cylinders that extend 10 ft into bedrock. They are used to support the diesel generator missile-shield enclosure.

Steel H-piles are used in the foundations of yard structures to support the transformers, the condensate storage tank (DW-48), the auxiliary boiler fuel oil storage tank (FO-10), and the diesel engine fuel oil storage tank (FO-1). The applicant determined that only the H-piles used in the foundation of the diesel engine fuel oil storage tank have an intended function and are within the scope of license renewal.

In LRA Table 2.4.2.4-1, the applicant lists the passive structural components and their intended functions for the building piles. The components listed in the table meet the scoping criteria because they perform an intended function to support structures. They also meet the screening criteria for an AMR, because they perform the intended function without moving parts or without a change in configuration or properties and are not subject to periodic replacement based on qualified life or specified time period.

2.4.2.4.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.4 and USAR Section 5.7 to determine whether the structural components of the building piles 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), respectively.

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

LRA Table 2.4.2.4-1 lists five component types subject to an AMR, including Class A pipe piles, Class B pipe piles, Class B pipe pile concrete, concrete caissons, and steel H-piles. The steel plate end closures used to cap the Class A and Class B steel pipe piles are not included in the table. The staff's review found that these steel-plate closures capped the pile heads after they were driven into the ground and became part of the piles. However, the table listed Class B pipe pile concrete as the component subject to AMR, but Class A pipe pile concrete was not listed. The staff found that the top 4 ft of the Class A pipe pile was filled with concrete after the pile was driven into the ground. The open-end pipe piles are designed to support the seismic Class I structures. The concrete in the Class A pipe piles does not have the function to support structures but to make the pile solid for preventing lateral buckling. Therefore, the staff found no omissions in the component screening process.

In the LRA, the applicant stated that the steel H-piles are used in the foundations of yard structures to support the transformers, the condensate storage tank (DW-48), the auxiliary boiler fuel oil storage tank (FO-10), and the diesel engine fuel oil storage tank (FO-1). The applicant determined that only the H-piles used in the foundation of the diesel engine fuel oil storage tank have an intended function and are within the scope of license renewal. However, during the scoping and screening inspection in November 2002, the staff reviewed the boundaries of the auxiliary building depicted in the applicant's license renewal drawings and found that FO-10 is also used to maintain the technical specification-required amount of fuel oil. FO-10 is credited in Technical Specification Amendment 162, dated March 29, 1994, as having 8000 gallons of fuel oil that could be transferred to FO-1, and that this was necessary for the EDGs to have the required amount of fuel oil. The amount of fuel in FO-10, combined with the amount of fuel in FO-1, provides for about 7 days of diesel operation. FO-1 and FO-10 are almost identical in their design details.

The applicant had placed FO-10 within scope, but only as a 10 CFR 54.4(a)(3) item for SBO reasons. Therefore, the foundation of FO-10 would not be within scope. The inspection team determined that, since both tanks were noted in the safety evaluation associated with Technical Specification 162 as required to store the amount of fuel oil required for the EDGs to perform their design basis function, FO-10 should have been placed within scope per 10 CFR 54.4(a)(2). The applicant reviewed this item and agreed with the inspection team that the tank foundation should be included within the scope of license renewal. Inclusion of the FO-10 foundation did not result in any revisions to the applicant's evaluation results for the building piles because the piles used for the foundation of FO-10 are of the same type as those for FO-1. On this basis, the staff concludes that inclusion of the FO-10 foundation and its associated building piles within the scope of license renewal and subject to an AMR is

appropriate and acceptable. A discussion of the FO-10 foundation can be found in the staff's scoping and screening inspection report (NRC Inspection Report Number 50-285/02-07).

The inspection team reviewed the remaining tank foundations and the associated piles and found no additional foundations or piles that should have been brought into scope.

The staff has reviewed the LRA and support information in the USAR to determine whether the applicant properly identified the components that are within the scope of license renewal and subject to an AMR. The staff finds that, although the foundation for FO-10 was brought into scope, it did not affect the applicant's evaluation for the building piles. On this basis, the staff finds the applicant identified all the building piles within the scope of license renewal. The staff also finds that all the passive components 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 any structures, systems, or components that should be within the scope of license renewal were not identified by the applicant. Although the foundation for FO-10 was brought into scope, it did not affect the applicant's evaluation for the building piles. On this basis, the staff concludes that no omissions were found. In addition, the staff performed an independent assessment to determine whether any building piles 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 building piles 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 building piles that are subject to an aging management review, as required by 10 CFR 54.21(a)(1).

2.4.2.5 Fuel-Handling Equipment and Heavy Load Cranes

2.4.2.5.1 Summary of Technical Information in the Application

The applicant describes the fuel-handling equipment and heavy load cranes in LRA Section 2.4.2.5 and provides a list of components subject to an AMR in LRA Table 2.4.2.5-1. Additional information concerning fuel-handling systems and cranes is given in Section 9.5 of the FCS USAR.

In Section 2.1 of the LRA, the applicant describes its process for identifying structures within the scope of license renewal and subject to an AMR. Based on its methodology, the applicant, in LRA Table 2.2-1, identifies the fuel-handling system and heavy load cranes within the scope of license renewal and describes the results of its scoping methodology in Section 2.4.2.5 of the LRA.

This commodity includes all components used in the storage and handling of new/spent fuel and in the hoisting of loads. The fuel-handling portion of this commodity consists of the refueling machine, tilting machines in containment and auxiliary building, fuel transfer conveyor, fuel transfer carrier box, fuel transfer tube, new and spent fuel-handling tools, new and spent fuel storage racks, and spent fuel bridge. The heavy load cranes portion consists of eight cranes of varying types (e.g., overhead crane, hoist with monorail, and jib crane).

The applicant identified component types for the fuel-handling equipment and heavy load cranes that are subject to an AMR in Table 2.4.2.5-1 of the LRA. This table lists the component types with their passive function identified and a link to their AMR results. The applicant identified the following component groups for the fuel-handling equipment and heavy load cranes that are subject to an AMR: concrete slab removal cranes, containment crane, containment equipment hatch crane and jib, deborating demineralizing area crane, fuel transfer conveyor, fuel transfer carrier box, fuel transfer tube, new and spent fuel handling tools, new fuel storage racks, tilting machines, upper guide lift rig, waste evaporator equipment handling crane, and the reactor vessel closure head lift rig.

In LRA Table 2.4.2.5-1, the applicant lists the component types that are within the scope of license renewal because they are passive and long-lived and perform a structural support intended function for non-CQE SSCs.

2.4.2.5.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.5 and USAR Sections 9.5 and 14.14 to determine whether the fuel-handling equipment and heavy load crane 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), respectively.

In the performance of the review, the staff selected system functions described in the USAR 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. This was accomplished as described below.

The staff reviewed the structural component types in LRA Table 2.4.2.5-1 to determine whether any other fuel-handling equipment or heavy load cranes meet the scoping criteria of 10 CFR 54.4(a) but were not included within the scope of license renewal. The staff then reviewed portions of the USAR descriptions to ensure that all SCs of the fuel-handling equipment and heavy load cranes had been adequately identified and that they were passive, long-lived, and performed their intended functions without moving parts or without a change in configuration or properties and were not subject to replacement based on qualified life or specified time period. The staff also examined the component types listed in Table 2.4.2.5-1 of the LRA to determine whether they are the only groups subject to an AMR in accordance with 10 CFR 54.21(a)(1).

In a letter dated October 11, 2002, the staff requested additional information from the applicant regarding the component types listed in Table 2.4.2.5-1 of the LRA. In RAI 2.4.2.5-1, the staff stated that the applicant had not identified and listed the structures and components of the various cranes in accordance with 10 CFR 54.21(a)(1). Instead, LRA Table 2.4.2.5-1 lists those crane systems that are within the scope of license renewal. Although the crane systems listed in LRA Table 2.4.2.5-1 meet the scoping criteria of 10 CFR 54.4(a), the applicant did not list crane SCs subject to an aging management review. Moreover, SCs such as beams, supporting columns, base plates, rails, rail clips, crane girders, structural steel members, rail bolts, baseplates and anchors for attachments to structures, and retaining clips should be listed in LRA Table 2.4.2.5-1 as subject to an AMR.

In a letter dated December 19, 2002, in response to RAI 2.4.2.5-1, the applicant stated that since the aging management of cranes is consistent with the GALL Report, which does not

provide a detailed listing of crane/lifting device subcomponents, the applicant did not deem it necessary to list subcomponents in LRA Table 2.4.2.5-1. The GALL Report does not address scoping of structures and components for license renewal. Scoping is plant specific, and the results depend on plant design and current licensing basis. The GALL Report states that "the inclusion of a certain structure or component in the GALL Report does not mean that the particular structure or component is within the scope of license renewal for all plants. Conversely, the omission of a certain structure or component in the GALL Report does not mean that the particular structure or component is not within the scope of license renewal for any plants." In essence, the GALL Report is not applicable to plant scoping for license renewal, although, certain structures and components evaluated within the GALL Report may be within the scope of license renewal for a specific plant.

The applicant's letter of December 19, 2002, in response to RAI 2.4.2.5-1, did not identify and list the structures and components subject to an AMR in accordance with 10 CFR 54.21(a)(1). Therefore, the SCs for the fuel-handling equipment and heavy load cranes have not been identified and listed in LRA Table 2.4.2.5-1 in such manner to allow the staff to determine that all of the SCs have been included within the scope of license renewal. By letter dated February 20, 2003, the staff issued POI-5(b), requesting the applicant to provide a list of the SCs for the fuel-handling equipment and heavy load cranes.

By letter dated March 14, 2003, the applicant responded to POI-5(b) by noting that the last paragraph of the response to RAI 2.4.2.5-1 includes the subcomponent breakdown used for FCS scoping and screening. Each of the cranes, lift rigs, etc., includes the entire device from the lifting apparatus to the structural supports used to mount the crane to the structure. The mounting bolting is included in the component supports commodity.

The staff reviewed the applicant's response to POI-5(b) and finds that the response, along with the response to RAI 2.4.2.5-1, demonstrates that the applicant has identified all components in the fuel-handling equipment and heavy load cranes system that are within scope and subject to an AMR. POI-5(b) is resolved.

Also, in the December 19, 2002, letter, the applicant provided its response to RAI 2.4.2.5-2. In RAI 2.4.2.5-2, the staff stated that the boral panels protected with stainless steel, which are attached to the spent fuel pool storage racks, support the prevention of criticality, in the spent fuel pool. As such, they perform an intended function of preventing criticality and they should be included within the scope of license renewal and subject to an AMR. In addition, LRA Table 2.4.2.5-1 should be revised to include the boral panels and their stainless steel covering. The applicant in the RAI response indicated that the boral panels have been included in LRA Table 2.4.2.1-1, Auxiliary Building, with the component type "Spent Fuel Storage Racks" and are managed for aging following Item 3.3.1.09 of the LRA. The staff reviewed LRA Table 2.4.2.1-1 and did not find the component type "spent fuel storage racks" listed in the table. By letter dated February 20, 2003, the staff issued POI-5(c), requesting the applicant to provide a revised LRA Table 2.4.2.1-1, including link 3.3.1.09.

By letter dated March 14, 2003, the applicant responded to POI-5(c) by clarifying that the reference to LRA Table 2.4.2.1-1 in the RAI response was incorrect. The correct reference should have been LRA Table 2.4.2.5-1. The staff finds this response acceptable. POI-5(c) is resolved.

The staff submitted RAI 2.4.2.5-3 to the applicant via letter dated October 11, 2002. In RAI 2.4.2.5-3, the staff stated that the intake structure crane could potentially damage SSCs meeting the scoping criteria in 10 CFR 54.4(a). In addition, SCs of the intake structure crane were passive and long-lived and should be included in LRA Table 2.4.2.5-1 as subject to an AMR. In a letter dated December 12, 2002, in response to RAI 2.4.2.5-3, the applicant stated that administrative operating restrictions and the presence of rail guides (travel limiters) provide the basis for the exclusion of the intake structure crane from the scope of license renewal. NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants," addresses the installation of travel limiters to control crane movements such that interaction with safety-related equipment is avoided. Installation of travel limiters and the presence of operating restrictions satisfy the guidelines of NUREG-0612 and avoid the potential safety consequences resulting from a load dropped onto safety-related equipment meeting the scope of the Rule. On the basis of this review and the applicant's crane operating restrictions and travel limiters, the staff found the applicant's response to the RAI acceptable.

On the basis of the above review, the staff did not find any omissions by the applicant of SSCs within the scope of license renewal or SCs subject to an AMR.

2.4.2.5.3 Conclusion

The staff reviewed the LRA, the supporting information in the FCS USAR, and the applicant's responses to the staff's 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 this basis, the staff concludes that the applicant has adequately identified the fuel-handling equipment and heavy load crane 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 fuel-handling equipment and heavy load crane components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2.6 Component Supports

2.4.2.6.1 Summary of Technical Information in the Application

The applicant describes the component supports in LRA Section 2.4.2.6 and provides a list of components subject to an AMR in LRA Table 2.4.2.6-1. Additional information concerning component supports is given in Appendix F of the FCS USAR.

In Section 2.1 of the LRA, the applicant describes its process for identifying structures within the scope of license renewal and subject to an AMR. Based on its methodology, the applicant, in LRA Table 2.2-1 identifies component supports as being within the scope of license renewal and describes the results of its scoping methodology in Section 2.4.2.6 of the LRA. The component supports commodity group consists of the structural connection between a system, or components within a system, and a plant building structural concrete or steel member. Supports for both the distributive portion of systems (pipe, conduit, tubing, raceway) and the system's equipment are included. Component supports include all seismic Categories I and II/I supports for pipe, conduit, raceway, tubing, ventilation duct, and equipment supports. Electrical enclosures for junction boxes, panels, cabinets, and switchgear are also addressed with the

component supports commodity group. The exposed portion of the anchor bolts associated with the support are also included.

The component support group includes ASME piping Class 1, 2, and 3 pipe supports and equipment anchorage, CQE and limited-CQE supports for cable trays, conduits, HVAC ducts, tube track, and tubing. It also includes anchorage of racks, panels, cabinets, and enclosures for electrical equipment.

The applicant identified component types for the component supports that are subject to an AMR in Table 2.4.2.6-1 of the LRA. This table lists the component types with their passive function identified and a link to their AMR results. The applicant lists the component types in LRA Table 2.4.2.6-1 that are within the scope of license renewal because they perform one or more of the intended functions of structural support to CQEs or structural support to non-CQEs.

2.4.2.6.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.6 and Appendix F of the FCS USAR to determine whether the support 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), respectively.

In the performance of the review, the staff selected system functions described in the USAR 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. This was accomplished as described below.

The staff reviewed the component types in LRA Table 2.4.2.6-1 to determine whether any other component supports meet the scoping criteria of 10 CFR 54.4(a) but were not included within the scope of license renewal. The staff then reviewed portions of the USAR descriptions to ensure that all component supports requiring an AMR had been adequately identified and that they were passive and long-lived (i.e., performed their intended functions without moving parts and without a change in configuration or properties and were not subject to replacement based on qualified life or specified time period). The staff also examined the component types in Table 2.4.2.6-1 of the LRA to determine whether they are the only components subject to an AMR in accordance with 10 CFR 54.21(a)(1).

In a letter dated October 11, 2002, the staff requested additional information from the applicant regarding the component types listed in Table 2.4.2.6-1 of the LRA. In RAI 2.4.2.6-1, the staff stated that the applicant had not identified and listed component supports in accordance with 10 CFR 54.21(a)(1). Instead, LRA Table 2.4.2.6-1 generically refers to component supports and provides the material and environment in the first column of the table. Further, component supports such as battery racks, cable tray and conduit, cable tray and conduit supports, Class 1 nuclear steam supply system (NSSS) supports, control boards, control room ceiling, and pipe supports should be listed in LRA Table 2.4.2.6-1 as subject to an AMR.

In a letter dated December 19, 2002, in response to RAI 2.4.2.6-1, the applicant stated that component supports had been treated as a commodity group. In addition, applicable supports for all of the components that have been included within the scope of license renewal are also within the scope and contained in the commodity group of component supports. However, the applicant did not identify the types of supports included in the commodity group. Although the

applicant's response to RAI 2.4.2.6-1 indicated that supports such as piping hangars, cable conduit raceway and supports, tubing supports, equipment frames, equipment restraints, and equipment metal spring isolators and fixed bases for pumps, fans, air handlers, chillers, air compressors, and EDGs were included within the component group, the applicant did not provide a supplement to LRA Table 2.4.2.6-1.

The staff, during the November 8, 2002, scoping inspection (NRC Inspection Report 50-285/02-07), verified whether the component supports identified by the applicant were included within scope and documented in an auditable and retrievable form, in accordance with the Rule. During the inspection, the staff reviewed EA-FC-00-068, "Component Supports," dated October 20, 2002, which describes and assesses the commodity group of component supports. Attachment 9.4 of EA-FC-00-068 indicates that the boundary of this commodity group includes all steel and grout for safety-related (CQE) and important to safety (limited-CQE) component supports in the containment structure, auxiliary building, intake structure, and manholes MH-5 and MH-31. The component support commodity group includes ASME piping Class 1, 2, and 3 pipe supports and equipment anchorage, HVAC duct supports, tube track, and tubing supports. It also includes the structural portion and fasteners for racks, panels, cabinets, and enclosures for electrical equipment. Jet impingement barriers and pipe whip restraints were evaluated as part of the structure that houses those components. On the basis of its review of the applicant's response to the RAI, supplemented by the scoping inspection results, the staff found that the applicant has adequately identified the components included within the "component supports" commodity group.

On the basis of the above review, the staff did not find any omissions by the applicant of SSCs within the scope of license renewal.

2.4.2.6.3 Conclusion

The staff reviewed the LRA, the supporting information in the FCS USAR, and the applicant's response to the staff's RAI 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 this basis, the staff concludes that the applicant has adequately identified the component supports that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the component supports that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2.7 Duct Banks

2.4.2.7.1 Summary of Technical Information in Application

The applicant describes the duct banks in LRA Section 2.4.2.7 and provides a list of the components subject to an AMR in LRA Table 2.4.2.7-1. The duct banks are further described in USAR Section 8.5.

The duct banks comprise conduits encased in concrete and manholes that are located below grade. They are used to rout electrical power cables between buildings. The electrical manholes are the reinforced concrete box-type structures which allow for inspection and routing of cables. The duct banks and electrical manholes contain both CQE and non-CQE cables.

The applicant determined that only the duct banks and electrical manholes of seismic Class I design that contain CQE cables are within the scope of license renewal.

The boundary of the in-scope duct banks includes the duct banks and electrical manholes connecting the southeast corner of the auxiliary building at pull box 129T and 128T to the intake structure at manhole MH-31. All the concrete, carbon steel, gray cast iron, polyurethane foam, and elastomer materials that form the duct banks and manholes are within the scope of license renewal. From the two pull boxes, the two duct banks combine and connect to manhole MH-5. From manhole MH-5, the duct bank continues to the intake structure where it connects at manhole MH-31. A flexible elastomer joint is used to provide seismic isolation at the connection of the duct bank to manhole MH-31. The elastomer joint and frame, manhole cover and flange, and foam blocks of manhole MH-31 are within the structural boundary. Exposed conduit, conduit fittings, and seismic supports of manhole MH-31 are evaluated as component supports in LRA Section 2.4.2.6. All other portions of manhole MH-31 are evaluated as part of the intake structure in LRA Section 2.4.2.3. The embedded plastic and galvanized steel conduits were used as the form-work during construction and are not within the structural boundary or within the scope of license renewal. The component supports (e.g., cable tray, cable tray supports, pull boxes, associated anchorage) are evaluated as the commodities in LRA Section 2.4.2.6.

In LRA Table 2.4.2.7-1, the applicant lists seven structural component types and their intended functions for the duct banks. The components listed in the table meet the scoping criteria because they perform one or more of the intended functions specified in the table. They also meet the screening criteria for an AMR, because they are passive and perform their intended functions without moving parts or without a change in configuration or properties, and they are not subject to periodic replacement based on qualified life or specified time period.

2.4.2.7.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.7 and USAR Section 8.5 to determine whether the components of the duct banks within the scope of license renewal and subject to AMR have been identified in accordance with 10 CFR 54.4 and 54.21(a)(1), respectively.

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

LRA Section 2.4.2.7 states that the elastomer joint and frame, manhole cover and flange, and foam blocks of manhole MH-31 are within the structure boundary. The LRA also states that exposed conduit, conduit fittings, and seismic supports of manhole MH-31 are evaluated in LRA Section 2.4.2.6 as component supports. Other portions of the manhole are evaluated as part of the intake structure in LRA Section 2.4.2.3. It is not clear from the information provided what portions of MH-31 are evaluated in LRA Section 2.4.2.3. In RAI 2.4.2.7-1, the staff asked the applicant to identify the portions of manhole MH-31 that are evaluated in LRA Section 2.4.2.3 and identify the associated component types listed in LRA Table 2.4.2.3-1.

In its response, the applicant stated that manhole MH-31 is integral with the intake structure. Therefore, the statement “all other portions of manhole MH-31 are evaluated as part of the intake structure (Section 2.4.2.3)” indicates that the concrete structure of MH-31 is included in

Table 2.4.2.3-1 as the component types “Concrete Below Grade” and “Concrete in Ambient Air.”

USAR Section 8.5.1(F) states that there are two pull boxes along the outside of the south wall of the auxiliary building and one manhole between the pull boxes and screen house. However, these components are not identified in LRA Table 2.4.2.7-1. In RAI 2.4.2.7-2, the staff asked the applicant to explain whether the manhole and pull boxes are evaluated as part of the duct banks for license renewal.

In its response, the applicant stated that the manhole is evaluated with the duct banks. The pull boxes are included in LRA Table 2.4.2.6-1 as the component type “Component Support Carbon Structural Steel in Ambient Air.” They are included in the term “Electrical Enclosures” in LRA Section 2.4.2.6.

LRA Section 2.4.2.7 states that exposed conduit fittings and seismic supports of MH-31 are evaluated as component supports (LRA Section 2.4.2.6). However, the components are not addressed in the section. In RAI 2.4.2.7-3, the staff requested the applicant to clarify where in the LRA the exposed conduit and conduit supports associated with MH-31 are discussed. In its response, the applicant stated that the exposed conduit and conduit supports associated with MH-31 are included in Table 2.4.2.6-1 as the component type “Component Support Carbon Structure Steel in Ambient Air.”

The staff has reviewed the information in the LRA, the USAR, and the additional information submitted by the applicant in response to the staff’s RAIs. The staff did not identify any omissions by the applicant relating to scoping of the structures and components in the duct banks. The staff also found that all the passive structures and components identified as being within the scope of license renewal were subject to an AMR.

2.4.2.7.3 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 structural components of the duct banks 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 duct banks that are subject to an aging management review, as required by 10 CFR 54.21(a)(1).

2.4.3 Evaluation Findings

On the basis of this review, the staff concludes 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 aging management review, in accordance with the requirements of 10 CFR 54.21(a)(1).

2.5 Scoping and Screening Results: Electrical and Instrumentation and Controls (I&C)

In Section 2.5, "Scoping and Screening Results: Electrical and Instrumentation and Controls," of the FCS LRA, the applicant describes the electrical components that are within the scope of license renewal and subject to an AMR. The staff reviewed this section of the LRA to determine whether all safety-related SSCs within the scope of license renewal have been identified, as required by 10 CFR 54.4(a), and whether all structures and components subject to an AMR have been identified, as required by 10 CFR 54.21(a)(1).

2.5.1 Summary of Technical Information in the Application

The applicant performed the screening for electrical/I&C components on a systems, structures and commodity group basis for the in-scope electrical/I&C systems. The applicant used guidance provided in NEI 95-10, Appendix B to define electrical commodities subject to an AMR. The guidance provided in NEI 95-10, Appendix B identifies the passive, long-lived electrical components potentially subject to an aging management review.

The following electrical and I&C systems were identified by the applicant as within the scope of license renewal:

- Cables and Connectors
- Containment Electrical Penetrations
- Engineered Safeguards
- Nuclear Instrumentation
- Reactor Protection System
- 4160 VAC
- 480 VAC
- 480 VAC Motor Control Center
- 125 VDC
- 120 VAC
- Plant Computer
- Qualified Safety Parameter Display
- Radiation Monitoring
- Electrical Equipment
- Auxiliary Instrument Panel
- Control Board
- Diverse Scram System
- Communications
- Emergency Lighting
- Bus Bars

After applying the scoping and screening methodology as discussed in Section 2.1 of the LRA, the applicant determined that the electrical systems, structures and commodities requiring an AMR applicable to FCS are the following:

- Cables and connectors (connectors, splices, terminal blocks)
- Containment electrical penetrations
- Bus Bars

Portions of containment electrical penetrations are a TLAA and are addressed in Section 4.4 of the LRA. The staff's evaluation of this TLAA can be found in Section 4.4 of this SER.

2.5.2 Staff Evaluation

The staff reviewed Section 2.5 of the LRA to determine whether the applicant has identified the electrical components within the scope of license renewal, in accordance with 10 CFR 54.4, and subject to an AMR, in accordance with 10 CFR 54.21(a)(1).

The staff reviewed the basic function of each component type and the applicant's determination of which component types perform their function without moving parts or a change in configuration or properties (passive and long-lived components) and therefore are subject to an AMR.

The following is a list of in-scope electrical component types subject to an AMR:

- Insulated cables and connections (connectors, splices, terminal blocks)
- Containment electrical penetrations
- Bus bars

Finally, the staff reviewed the information submitted by the applicant and determined whether the applicant had omitted or misclassified any electrical components requiring an AMR.

The staff first reviewed the applicant's evaluation to determine whether it has appropriately identified the SSCs required to comply with 10 CFR 50.63 (the SBO rule). The staff found that the screening results in Section 2.5 did not include any offsite power system structures or components related to the recovery of offsite power from an SBO event. The license renewal rule, Section 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 be included within the scope of license renewal. Section 50.63(a)(1) of the SBO rule 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." Licensees' plant evaluations followed the guidance in NRC Regulatory Guide (RG) 1.155 and NUMARC 87-00 to determine their 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. Disregarding the offsite power system as a means of recovering from an SBO would not meet the requirements of the SBO rule and would result in a longer required coping duration. The function of the offsite power system within the SBO rule is, therefore, to provide a means of recovering from the SBO. This meets the 10 CFR 54.4(a)(3) criteria 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 structures and components need to be included within the scope of license renewal and subject to an AMR, or additional justification for its exclusion needs to be provided. Therefore, by letter dated October 11, 2002, the staff issued RAI 2.5-1, requesting the applicant to address this issue.

The applicant responded in a letter dated December 19, 2002, that it will revise the license renewal documentation to comply with the NRC Interim Staff Guidance (ISG) on SBO (ISG-02).

In response to RAI 2.5-1, the applicant furnished the following information on the applicable offsite power system structures and components that need to be included within the scope of license renewal and subject to an AMR:

> The SBO restoration includes transformers, circuit breakers, disconnect switches (manual and motor operated), high voltage bus work and transmission cables, transmission towers, supports, actuating relays, blocking relays, indicating lights, alarm logic, and miscellaneous electronic components and switches to allow isolation, transformation, and distribution of 345 kV, 161 kV, and 22 kV power to supply the plant 4.16 kV system.
>
> For recovery from an SBO, two offsite startup power sources are available. The dedicated offsite 161 kV system is brought in via two 161 kV/4.16 kV transformers. The 345 kV system can be converted to an offsite power source by opening the motor operated main generator/transformer disconnect switch DS-T1 and back feeding the plant using the main transformer as a step-down transformer to 22 kV power to feed the 22 kV/4.16 kV transformers. Either offsite power source can operate the four 4.16 kV safety-related buses.
>
> The equipment credited for an SBO includes transformers, circuit breakers, disconnect switches (manual and motor operated), high voltage bus work, aluminum conductor, steel reinforced (ACSR) transmission cables, insulators associated with the transmission conductors, transmission towers and supports, actuating relays, blocking relays, indicating lights, alarm logic, medium and low voltage cable, connectors, terminal blocks, fuse blocks, and miscellaneous electronic components and switches to allow isolation, transformation, and distribution of 345 kV, 161 kV, and 22 kV power to supply the plant 4.16 kV system.
>
> All electrical components within the Substation SBO Restoration System have been considered and were evaluated as in the license renewal boundary with the exception of enclosures, panels, terminal blocks, fuse blocks, connectors, and medium and low voltage cables. Enclosures, panels, and power supplies were identified as commodity groups and are reviewed separately. Medium and low voltage cables, terminal blocks, fuse blocks, and connectors are evaluated as a commodity group for the entire plant.

The applicant's aging management review results for the electrical components for internal environment and external environment are shown in Tables 1 and 2, respectively, of the applicant's response to RAI 2.5-1. Structure and component supports, which protect and support the offsite power system, are also included within the scope of license renewal and subject to an AMR.

The intended electrical function of the offsite power system within the scope of license renewal is to provide "recovery" power after an SBO event. The staff reviewed the basis function of each component type associated with the offsite power system within the scope of license renewal, and the applicant's determination of which component types perform their intended function and therefore are subject to an AMR. The passive, long-lived electrical components comprising the offsite power system that are within the scope of license renewal and subject to an AMR are the following:

- high voltage bus work/duct,
- aluminum conductor,
- steel reinforced (ACSR) transmission cables,
- insulators associated with the transmission conductors,
- transmission towers and supports,
- Non-EQ cables (4 kV and 600 V),

- 125 volt (120 Vac)control cables.

The applicant's aging management review results for the electrical components for external environment are shown in Table 2 of the applicant's response to RAI 2.5-1. This table also refers to plant-specific programs that have been credited for aging management of the SBO restoration system components. However, several SBO components (high voltage bus work/duct, aluminum conductor, steel reinforced (ACSR) transmission cables and insulators associated with the transmission conductors) are not identified in this table as requiring an AMR. Therefore, it was not clear to the staff whether these components are within the scope of license renewal and subject to an AMR. By letter dated February 20, 2003, the staff issued POI-6(a) requesting the applicant to clarify whether these components are within scope and subject to an AMR.

By letter dated March 14, 2003, the applicant responded to POI-6(a) by stating that:

> The high-voltage aluminum conductor is steel reinforced (ACSR) transmission cable and is considered within the scope of license renewal for SBO. In accordance with EPRI TR-114882, "Non-Class 1 Mechanical Implementation Guideline and Mechanical Tools," Rev. 2, 1999, no aging effects were identified for aluminum, aluminum alloys, copper, or copper alloys (brass, bronze) in an indoor or outdoor air environment. Transmission conductor vibration would be caused by wind loading. Wind loading that can cause a transmission line and insulators to vibrate is considered in the design installation. Loss of material (wear) and fatigue that could be caused by transmission conductor vibration or sway are not aging effects requiring management of the period of extended operation at FCS. A review of internal and external operating experience has not identified any aging effects requiring management.
>
> The insulators associated with the transmission conductors are made of porcelain and are within the scope of license renewal. Aging effects that are considered are buildup of surface contaminants and loss of material due to vibration (wear). As indicated above, (transmission line vibration), vibration due to wind loading is a design consideration and not considered an aging effect requiring management. Buildup of surface contaminants (i.e., dust, dirt, etc.) can occur, however, it is gradual and frequently washed away by rain, consequently the buildup of surface contaminants is not significant and therefore not an aging effect requiring management at Fort Calhoun. Information notices (INs) applicable to insulator contamination (IN 93-95) relate to a loss of power due to salt buildup. Fort Calhoun is not located in an area of any salt concentration (Nebraska) and, therefore does not consider this IN applicable. On the basis of the above, it has been determined that the porcelain insulators in outside air at Fort Calhoun are not subject to any aging effects requiring management.
>
> The arresters associated with the offsite power system, although within the SBO boundary, do not have any intended functions associated with license renewal, and are eliminated from the scope of license renewal as active components in accordance with NEI 95-10.
>
> The isolated phase bus duct (i.e., isophase or 22 KV bus duct) encloses bus work that connects the main generator output to the main transformer. It is not related to the underground bus duct that may carry low voltage power, control, and instrumentation wiring. The buswork has no AERM. The enclosures supports for the isophase bus are identified in the LRA and assigned to the structures monitoring program for external environment. There is no AERM for internal environment.
>
> The 125 volt dc and 120 volt ac control and instrumentation cables that are associated with breaker controls and instrumentation within the SBO Restoration System have been considered in the scope of License Renewal for SBO. Under non-EQ cables, all cables are subject to the non-EQ cable AMR. All non-EQ cable was identified in, and managed by, the non-EQ cable aging management program (B.3.4).

On the basis of the information provided in response to POI-6(a), the staff concludes that the applicant has identified the SSCs that are within scope and subject to an AMR. POI-6(a) is resolved.

In conclusion, the staff reviewed all of the electrical and I&C systems and components at FCS to determine whether any structures, systems or components that met the license renewal scoping criteria were not identified by the applicant. The staff found that the several SSCs associated with meeting the SBO Rule were not initially identified in the LRA. These SSCs were subsequently brought into scope. However, with the exception of the offsite power system structures and components related to the recovery of offsite power from an SBO event which were omitted, no other omissions were found. Therefore, on the basis of this review, the staff finds that the SSCs related to the SBO recovery path that are within the scope of license renewal have been identified, as required by 10 CFR 54.4(a), and that the SBO structures and components that are subject to an aging management review have been identified, as required by 10 CFR 54.21(a)(1).

2.5.3 Cables and Connectors

Section 2.5.1, “Cables and Connectors,” in the LRA identifies cable and connectors 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 Part 54.21(a)(1)(i).

2.5.3.1 Summary of Technical Information in the Application

Section 2.5.1 of the LRA states that cables and their associated connectors provide electrical connections to deliver electrical energy either continuously or intermittently to various equipment and components throughout the plant to enable them to perform their intended functions. It states that the cables and connectors associated with 10 CFR 50.49 (the EQ Rule) are addressed either as short lived and periodically replaced, or as long-lived time-limited aging analysis (TLAA) candidates, and therefore these are not included in the set of cables and connectors that require additional aging management review.

The applicant has evaluated the cables and connectors as commodities across system boundaries. This is termed the spaces approach in Section 2.5.3.1 of the SRP-LR. Table 2.5.1-1 of the LRA defines component types that are subject to aging management and their intended functions. The application states that these cables and connectors are within the scope of license renewal and are subject to an aging management review.

Section 2.5.1 of the LRA lists these components to be the following:

- Electrical Cable
- Connector
- Splices
- Fuse Block
- Terminal Block

2.5.3.2 Staff Evaluation

The staff reviewed Section 2.5.1 of the LRA to determine whether the applicant has identified the cables and connectors within the scope of license renewal. This is in accordance with 10 CFR 54.4. The staff also reviewed this section of the LRA to determine whether the applicant has identified the cables and connectors subject to an AMR. This is in accordance with 10 CFR 54.21(a)(1).

The applicant evaluated the cables and connectors as commodities across system boundaries on a plant-wide basis. Section 2.5.1 of the LRA states that the plant-wide evaluation included all cables and connectors in these areas to provide the complete coverage of cables and connectors within the scope of license renewal. Table 2.5.1-1 of the LRA indicates that the passive function of the cables and connectors is to conduct electricity, and the cable and connectors are subject to an AMR. The staff agrees that the applicant has correctly identified the cables and connectors as components that perform their function without moving parts or a change in configuration or properties (passive and long-lived) and are therefore subject to an AMR.

2.5.3.3 Conclusions

On the basis of the staff's review of the cable and connector information presented in Section 2.5.1 of the LRA and the supporting information in its USAR, the staff did not find any omissions by the applicant. The staff therefore concludes that the applicant has identified those cables and connectors 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).

2.5.4 Containment Electrical Penetrations

Section 2.5.2, "Containment Electrical Penetrations," of the LRA identifies electrical penetrations as a passive, long-lived component group that perform the functions of a containment boundary and provide electrical energy across the containment boundary to power various equipment and components throughout the plant to support their intended functions.

2.5.4.1 Summary of Technical Information in the Application

The LRA describes containment electrical penetrations as passive, long-lived component assemblies that provide a containment boundary and provide an electrical connection between two sections of the electrical/I&C circuits for conducting electrical power (voltage and current), either continuously or intermittently throughout the plant. The pigtail at each end of the penetration is connected to the field cable in various ways. The boundary of the electrical penetrations includes the pigtails. Containment electrical penetrations that are associated with 10 CFR 50.49 are addressed as short-lived and periodically replaced, or as long-lived TLAA components. The containment electrical penetrations that are classified as short-lived and periodically replaced, or TLAA are not included in the set of penetrations requiring aging management review.

2.5.4.2 Staff Evaluation

The staff reviewed Section 2.5.2 of the LRA to determine whether the applicant has identified the containment electrical penetrations that are within the scope of license renewal. This is in accordance with 10 CFR 54.4. The staff also reviewed this section of the LRA to determine whether the applicant has identified the electrical penetrations subject to an AMR, in accordance with 10 CFR 54.21(a)(1). The containment electrical penetrations identified by the applicant requiring an AMR are non-safety related (non-EQ) and 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 in 10 CFR 54.4(a)(2) and 10 CFR 54.4(b) and found that those categories are included in the requirements. The staff

reviewed the information in the USAR and found that the applicant has identified the containment electrical penetrations that are within the scope of license renewal and subject to an AMR.

2.5.4.3 Conclusions

On the basis of the staff's review of the containment electrical penetrations information presented in Section 2.5.2 of the LRA and the supporting information in the USAR, the staff did not find any omissions by the applicant. The staff therefore concludes that the applicant has identified those penetrations 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).

2.5.5 Bus Bars

Section 2.5.20, "Bus Bars," of the LRA identifies bus bars as a component group that performs an passive electrical function in support of its system intended function.

2.5.5.1 Summary of Technical Information in the Application

The LRA describes bus bars and its standoffs as a component assembly conducting electrical power (voltage and current), either continuously or intermittently, between various equipment and components throughout the plant. The bus bars are a pre-assembled raceway design, with bus bars mounted on insulated supports (standoffs). The intended function of the standoffs is to support the electrical bus bars.

Based on a review of the materials of construction and operating environments, there are no applicable aging affects for these materials.

The justification for the bus bar and the stand off materials not requiring aging management was presented in the electrical bus bar aging management review, and is maintained in onsite documentation for review.

2.5.5.2 Staff Evaluation

The staff reviewed Section 2.5.20 of the LRA to determine whether the applicant has identified the bus bars within the scope of license renewal. This is in accordance with 10 CFR 54.4. The staff also reviewed this section of the LRA to determine whether the applicant has identified the bus bars subject to an AMR. This is in accordance with 10 CFR 54.21(a)(1).

The bus bars identified by the applicant consist of bus bars that are safety-related, SBO-related, and fire protection-related, and are used plant-wide to conduct electrical power (voltage and current), either continuously or intermittently between various equipment. The staff reviewed these component categories against the requirements in 10 CFR 54.4(a)(1), (2) and (3), and 10 CFR 54.4(b) and found that those categories are included in the requirements. The staff reviewed the information in the USAR and found that the applicant has identified all bus bars within the scope of license renewal.

2.5.5.3 Conclusions

On the basis of the staff's review of the bus bar information presented in Section 2.5.20 of the LRA, and the supporting information in the USAR, the staff did not find any omissions by the applicant. The staff therefore concludes that the applicant has identified those bus bars 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).

2.5.6 Other Electrical Systems

The applicant determined that the following electrical systems are within the scope of license renewal, but are not subject to an aging management review because all components remaining after the commoditization of common component types, were found to be active:

- Engineered Safeguards
- Nuclear Instrumentation
- Reactor Protection System
- 4160 VAC
- 480 VAC
- 480 VAC Motor Control Center
- 125 VDC
- 120 VAC
- Plant Computer
- Qualified Safety Parameter Display
- Radiation Monitoring
- Electrical Equipment
- Auxiliary Instrument Panel
- Control Board
- Diverse Scram System
- Communications
- Emergency Lighting

On this basis, the staff finds that the components in the remaining electrical systems are not subject to an AMR.

2.5.7 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).