2.1 Scooping and Screening Methodology

2.1.1 Introduction

Title 10 of the Code of Federal Regulations, Part 54 (10 CFR Part 54), "Requirements for Renewal of Operating Licenses for Nuclear Power Plants," Section 54.21, "Contents of Application - Technical Information," requires that each application for license renewal contain an 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 accordance with 10 CFR 54.4.

In Section 2.1, "Scoping and Screening Methodology," of the Catawba and McGuire LRA, the applicant described the scoping and screening methodology used to identify SSCs at Catawba and McGuire 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 set forth in 10 CFR 54.4(a) and the screening requirements set forth in 10 CFR 54.21.

In developing the scoping and screening methodology for the Catawba and McGuire LRA, the applicant considered the requirements of the license renewal rule, the SOCs for the rule, and the guidance provided by the NEI, "Industry Guideline for Implementing the Requirements of 10 CFR Part 54 - The License Renewal Rule," Revision 2, August 2000 (NEI 95-10). In addition, the applicant also considered the NRC staff's correspondence with other applicants and with NEI in the development of this methodology.

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

Additionally, LRA Section 2.2, "Plant Level Scoping Results;" Section 2.3, "System Scoping and Screening Results: Mechanical;" Section 2.4, "Scoping and Screening Results: Structures;" and Section 2.5, "Screening Results: Electrical and Instrumentation and Controls," describe in detail the process that the applicant uses to identify the SCs that are subject to an AMR.

Chapter 3 of the LRA, "Aging Management Review Results," contains the following information: Section 3.1, "Aging Management of Reactor Vessel, Internals and Reactor Coolant System"; Section 3.2, "Aging Management of Engineered Safety Features"; Section 3.3, "Aging Management of Auxiliary Systems"; Section 3.4, "Aging management of Steam and Power Conversion Systems"; Section 3.5, "Aging Management of Containment, Structures, and Component Supports"; Section 3.6, "Aging Management of Electrical and Instrumentation and Controls." Chapter 4 of the LRA, "Time-Limited Aging Analyses," contains the applicant's evaluation of time-limited aging analyses.

2.1.2.1 Scoping Methodology

Section 2.1.1 of the LRA , “Scoping Methodology,” discussed the scoping methodology as it related to the safety-related criteria in accordance with 10 CFR 54.4(a)(1), non-safety-related criteria in accordance with 10 CFR 54.4(a)(2), and the scoping criteria in accordance with 10 CFR 54.4(a)(3) for regulated events.

2.1.2.1.1 Safety-related Systems, Structures and Components

The LRA stated that the SSCs within the scope of license renewal include safety-related SSCs, which are those relied upon to remain functional during and following design basis events (as defined in 10 CFR 50.49(b)(1)) to ensure the following functions: (i) the integrity of the reactor coolant pressure boundary; (ii) the capability to shut down the reactor and maintain it in a safe shutdown condition; or (iii) the capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposure comparable to the guidelines in 10 CFR 50.34(a)(1), 10 CFR 50.67(b)(2), or 10 CFR 100.11, as applicable.

The applicant used the guidance contained in RG 1.26, “Quality Group Classifications and Standards for Water-, Steam-, and Radioactive-Waste-Containing Components of Nuclear Power Plants,” and RG 1.29, “Seismic Design Classification,” to establish those mechanical systems which met the scoping criteria of 10 CFR 54.4(a)(1). Piping Classes A, B, and C were designated as safety-related and subject to the requirements of 10 CFR 54.(a)(1).

The plant structures had been previously classified in accordance with 10 CFR Part 100, Appendix A, “Seismic and Geological Siting Criteria for Nuclear Power Plants.” The classification indicated that certain structures, systems and components must remain functional during a safe-shutdown earthquake. The applicant determined the intended functions met the intent of the scoping criteria in 10 CFR 54.4(a)(1). The specific structures required to meet these criteria are identified in RG 1.29 as Seismic Category I and were considered within the scope of license renewal. The classification of each structure had been previously identified and documented in the Updated Final Safety Analysis Report (UFSAR).

The scoping criteria were not applied globally to all electrical systems and components. The scoping criteria were applied only to specific electrical systems in order to demonstrate that they were not within the scope of license renewal. The majority of electrical systems and components were included within the scope of license renewal by default without a detailed scoping evaluation having been performed.

2.1.2.1.2 Non-safety-related Systems, Structures and Components

Certain non-safety-related piping and components had been designated as Piping Class F. This pipe classification applied to piping and components whose pressure boundary loss could adversely affect safety-related systems and components due to physical interactions. All Piping Class F piping and components met the criteria of 10 CFR 54.4(a)(2) and were included within the scope of license renewal. Non-safety-related structures whose failure could affect the intended function of safety-related SSCs had been previously designated as Seismic Category II in accordance with RG 1.29. The applicant determined that these structures met the criteria of 10 CFR 54.4(a)(2) and were within the scope of license renewal. Structures not identified as Category I or II had been designated as Category III. Failure of a Category III structure would

not have an impact on the integrity of Category I or II structures. Category III structures were not included within the scope unless they met the criteria of 10 CFR 54.4(a)(3). Specific non-safety-related electrical systems and components were reviewed against the scoping criteria of 10 CFR 54.4(a)(2).

2.1.2.1.3 Regulated Events

The systems, structures and components required to maintain compliance with 10 CFR 54.4(a)(3) were determined through a review of the UFSAR, safety evaluation reports, licensing correspondence files, and other appropriate design documents.

2.1.2.2 Screening Methodology

Following the determination of SSCs within the scope of license renewal, the applicant implemented a process for determining which SCs, among those SSCs that were determined to be within the scope of renewal, would be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1). Section 2.1.2 of the LRA, "Screening Methodology," discussed the screening activities as they related to the SSCs that are within the scope of license renewal. The specific screening activities for the various engineering disciplines were further described in the application in Section 2.1.2.1 for mechanical components, Section 2.1.2.2 for structural components, and Section 2.1.2.3 for electrical components.

2.1.2.2.1 Screening Methodology for Mechanical Components

Following identification of the SSCs within the scope of license renewal, the applicant performed the following screening review to determine which mechanical components would be subject to an AMR.

The mechanical components within the scope of 10 CFR Part 54 were reviewed to determine those components subject to an AMR in accordance with 10 CFR 54.21(a)(1). An AMR of a mechanical component is required if the component performs an intended function without moving parts or without a change in configuration or properties (i.e., passive) and if it is not subject to replacement on the basis of a qualified life or specified time period (i.e., long-lived).

The screening methodology involved three steps:

- establishment of the license renewal evaluation boundaries
- identification of the intended function(s) of each component
- identification of mechanical components subject to an AMR

The applicant established the evaluation boundaries as either safety-related, non-safety-related, or regulated event boundaries. Piping Classes A, B, and C were designated as safety-related. The intended functions were determined on the basis of the system function which had been the basis for including the system within the scope of license renewal and the component function which is required to enable the system to perform its intended function. Class F piping was designated as non-safety-related piping and components whose pressure boundary loss could adversely affect safety-related systems and components due to physical interactions. All Class F piping and components met the criteria of 10 CFR 54.4(a)(2). Identification of the

components subject to an AMR was performed using plant system flow diagrams, equipment databases, and the guidance of NEI 95-10, Appendix B.

2.1.2.2.2 Screening Methodology for Structural Components

The intended functions of the structural components were determined through a review of the UFSAR, engineering specifications, regulated event documentation, and the commitments made in response to design basis events. Structural component functions were reviewed to determine whether the structural component (1) supported the intended function of the structure or (2) had a unique function, not required to support the intended function of the structure. In addition, structural components were reviewed to determine whether the component was required to physically support non-safety-related components to prevent physical interaction with safety-related components in order to meet the requirements of 10 CFR 54.4(a)(2).

Following identification of the structural components within the scope of license renewal, the applicant performed the following screening review to determine which structural components would be subject to an AMR.

The structural components within the scope of 10 CFR Part 54 were reviewed to determine those components subject to an AMR in accordance with 10 CFR 54.21(a)(1). An AMR of a structural component is required if the component performs an intended function without moving parts or without a change in configuration or properties (i.e., passive) and if it is not subject to replacement on the basis of a qualified life or specified time period (i.e., long-lived).

The screening methodology involved three steps:

- generation of a list of structural components types
- identification of the intended functions of each component
- identification of structural components subject to an AMR

The applicant developed a list of structural components using the guidance of NUMARC 90-01, NUMARC 90-06, and Appendix B of NEI 95-10. Additional components were added on the basis of commitments made for compliance with regulated events, including fire protection, environmental qualification, pressurized thermal shock, anticipated transients without scram, and station blackout. In addition, the applicant reviewed other specific documents to determine any other structural components not previously identified.

2.1.2.2.3 Screening Methodology for Electrical Components

After identifying the SSCs within the scope of license renewal, the applicant also 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 set forth in 10 CFR 54.21(a)(1)(i) as supplemented by industry guidance in NEI 95-10 to develop a commodity evaluation approach on the basis of a plant-level evaluation of electrical equipment. The applicant reviewed the component to determine whether the component was passive and long-lived.

The passive components were identified as:

- electrical portions of electrical and I&C penetration assemblies
- high-voltage insulators
- insulated cables and connections
- phase bus
- switchyard bus
- transmission conductors
- uninsulated ground conductors

The application stated that all other electrical and I&C components were active and were not subject to an AMR.

Other electrical and I&C components were in scope only because they performed a passive pressure boundary function (elements, resistance temperature detectors, sensors, thermocouples, transducers, and heaters). These components were electrically active but were subject to an AMR only for the pressure boundary function.

Electrical components that were included in the applicants environmental qualification program in accordance with 10 CFR 50.49 are replaced on the basis of a qualified life and therefore were not subject to an AMR. These components included certain insulated cables and connections and all electrical and I&C penetration assemblies. No other electrical components were screened out on the basis of the long-lived screening criterion so that the remainder of the integrated plant assessment involved only non-environmentally-qualified electrical and I&C components.

2.1.3 Staff Evaluation

From October 15 through 18, 2001, the staff performed an audit of the applicant's license renewal scoping and screening methodology developed to support the license renewal process and documented in the LRA.

The focus of the staff's audit was to evaluate the applicant's administrative control documents governing the implementation of its LRA scoping and screening methodology and to review selected design documents, including scoping and screening result reports, which provided the technical basis for various plant systems, structures, and components evaluated as part of the LRA scoping and screening methodology.

2.1.3.1 Evaluation of the Methodology for Identifying Systems, Structures, and Components Within the Scope of License Renewal

Definition of Safety-related Structures, Systems, and Components

In LRA Section 2.1.1.1, "Safety Related Structures, Systems, and Components," the applicant appropriately stated that plant systems, structures, and components within the scope of license renewal that satisfy the scoping criteria in 10 CFR 54.4(a)(1) are:

> (1) safety-related systems, structures, and components which are those relied upon to remain functional during and following design-basis events (as defined in 10 CFR 50.49(b)(1)) to ensure the following functions:
>
> (i) the integrity of the reactor coolant pressure boundary;
>
> (ii) the capability to shut down the reactor and maintain it in a safe shutdown condition; or
>
> (iii) the capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposures comparable to the guidelines in §50.34(a)(1), §50.67(b)(2), or § 100.11 of this chapter, as applicable.

However, during the staff's scoping and screening audit, conducted from October 15 to 19, 2001, the staff noted that Section 3.0, "Scoping Methodology," of both Specifications CNS-1274.00-00-0002, "Catawba Systems and Structures Scoping for License Renewal," and MCS-1274.00-00-0002, "McGuire Systems and Structures Scoping for License Renewal," cited superseded regulatory text in establishing the scoping criteria to be used in identifying Catawba and McGuire structures, systems, and components in accordance with 10 CFR 54.4(a)(1) requirements. Specifically, these specifications cited the following criteria in reference to 10 CFR 54.4(a)(1) scoping requirements:

> (a) Plant systems, structures, and components within the scope of this part are
>
> (1) Safety-related systems, structures, and components which are those relied upon to remain functional during and following design bases events (as defined in 10 CFR 50.49(b)(1)) to ensure the following functions:
>
> (i) The integrity of the reactor coolant pressure boundary,
>
> (ii) The capability to shut down the reactor and maintain it in a safe shutdown condition, or
>
> (iii) The capability to prevent or mitigate the consequences of accidents that could result in potential off-site exposure comparable to the 10 CFR Part 100 guidelines.

By letter dated January 17, 2002, the staff requested, in RAI 2.1-1, the applicant to addresses the impact, if any, of not having explicitly considered in its scoping methodology for Catawba and McGuire those structures, systems, and components that are relied upon to ensure "the capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposures comparable to the guidelines in 10 CFR 50.34(a)(1), 10 CFR 50.67(b)(2), or 10 CFR 100.11, as applicable," consistent with the CLB.

In its response dated March 1, 2002, the applicant indicated that it had reviewed the scoping criteria in §50.34(a)(1), §50.67(b)(2), and §100.11 as currently written in §54.4(a)(1)(iii) and

determined that there was no impact on the scoping review it had described in its LRA. The applicant stated that for §50.34(a)(1), only §50.34(a)(1)(i) was applicable and referred to Part 100 for specific site evaluation factors. Section 100.11 was applicable and was used in the scoping process. The applicant further indicated that §50.34(a)(1)(ii) was only applicable to 10 CFR Part 50 applications filed on or after January 10, 1997, and was therefore not applicable to Catawba and McGuire. In addition, the applicant stated that §50.67(b)(2) was not applicable because license amendments had not been made at either station to allow use of the revised accident source term. The applicant stated that the scoping methodology specifications would be revised to incorporate the current criteria of §54.4(a)(1)(iii) by June 30, 2002. On the basis of its review of the information provided by the applicant, the staff concluded that the applicant had documented that only a portion of the criteria was applicable to the applicant's plants and that the applicable portion had been incorporated into the license renewal activities. Therefore the staff concluded that the response to the issue raised met the applicable regulations and was acceptable.

Definition of Non-safety-related Systems Structures and Components

Non-safety-related SSCs that are within the scope of license renewal are defined in 10 CFR 54.4(a)(2) as:

> All non-safety-related systems, structures, and components whose failure could prevent satisfactory accomplish of any of the functions identified in paragraphs (a)(1) (i), (ii), or (iii) of this section.

In LRA Section 2.1.1.2, "Non-safety-related Systems, Structures and Components," the applicant provides its methodologies for identifying mechanical SSCs and electrical systems and components that satisfy the scoping criterion in 10 CFR 54.4(a)(2).

On the basis of its review of information provided by the applicant, the staff concluded that the applicant had adequately documented the 10 CFR 54.4(a)(2) criteria and had incorporated the information into the license renewal activities with the exception of one issue. The staff identified an issue concerning mechanical scoping as RAI 2.1-2, which is discussed in Section 2.1.3.1.1 "Mechanical Scoping Methodology." The staff concluded that the applicant's response to RAI 2.1-2 described a methodology that met the applicable regulations and, therefore, was acceptable.

Regulated Events

The staff determined, as stated in the LRA, that for regulated events, the systems, structures, and components required to maintain compliance with 10 CFR 54.4(a)(3) were determined through a review of the UFSAR, safety evaluation reports, licensing correspondence files, and other appropriate design documents and were included in scope on the basis of the requirements of 10 CFR 54.4(a)(3). The staff reviewed examples of documents that used this method and did not identify any discrepancies between the methodology documented and the implementation results.

2.1.3.1.1 Mechanical Scoping Methodology

The applicant based the scoping activities on several sets of information. The applicant had developed a set of flow diagrams (F'S) in 1971 using all design basis information and the F'S had been subsequently maintained current to date. Design basis documents (DADS) had been prepared during design basis reconstitution (performed prior to license renewal activities). The DADS were developed on the basis of the F'S or compared to the F'S with the F'S being the reference standard. The F'S and DADS were used to provided the basis for those mechanical systems meeting the criteria of 10 CFR 54.4(a)(1) and (a)(2). In addition, the appendices in N.D. 307, "Quality Standards Manual," were used, after the F'S were reviewed, to identify any systems which had not been previously identified.

The applicant used the guidance contained in RG 1.26 and RG 1.29 to establish those mechanical systems which met the scoping criteria of 10 CFR 54.4(a)(1). Piping Classes A, B, and C were designated as safety-related and subject to requirements of 10 CFR 54.4(a)(1). The applicant identified the safety-related mechanical boundaries using the F'S.

Certain non-safety-related piping and components had been designated as Class F piping. This was applied to piping and components whose pressure boundary loss could adversely affect safety-related systems and components due to physical interactions. All Class F piping and components met the criteria of 10 CFR 54.4(a)(2) and were included within the scope of license renewal. The applicant identified the Class F boundaries using the F'S and all non-safety-related functions using the DADS, UFSAR, calculations, specifications, and licensing correspondence. In addition, the applicant used the DADS, UFSAR, calculations, specifications, and licensing correspondence to identify all mechanical components required to meet 10 CFR 54.4(a)(3).

The staff noted that piping Classes E, G, and H, which were seismically supported so as not to affect safety-related components, were not included in the scope of license renewal (the piping hangers were) but were possibly in the proximity of safety-related components. The staff discussed the applicant's approach to identifying non-safety-related components that could affect safety-related components with the applicant and, by letter dated January 17, 2002, requested, in RAI 2.1-2, specific clarification regarding the applicant's approach to scoping and screening non-safety-related SSCs in accordance with 10 CFR 54.4(a)(2).

In its response dated April 15, 2002, the applicant indicated that the initial design of the modern-vintage plants had incorporated detailed consideration of both fluid and spatial interactions of non-safety-related sources on safety-related equipment, was continued through the modification process, and provided the basis for meeting the scoping requirements of 10 CFR 54.4(a)(2). The analyses used had been performed for every area of the plants that housed safety-related equipment and included both spatial and fluid interaction. This response was further clarified during a May 24, 2002, telephone call, which was documented by memorandum issued June 7, 2002.

The applicant stated that all non-safety-related, high-energy piping in proximity of safety-related equipment was designated Class F and was within the scope of license renewal. Piping Classes E, G, and H were moderate-energy pipe. The moderate-energy pipe had been analyzed on the basis of a postulated through-wall crack on pipes greater than 1-inch nominal pipe size. The spray was assumed to impact equipment up to 30 feet in all directions from the spray source. When potential impact had been identified, piping was rerouted, equipment was relocated, or the equipment was qualified for the effects of spray, temperature, and wetting.

Piping less than 1-inch nominal size was physically located in parallel runs with piping of various sizes. The smaller pipes were proximal to larger pipes that were evaluated for spray effects and such evaluations bounded the potential spray effects from the smaller piping. The applicant indicated that the potential of small-piping runs proximal to safety-related equipment but not proximal to larger pipes had been reviewed and that this did not exist in areas containing safety-related equipment.

The staff concluded that the applicant's approach to identifying non-safety-related SCs that could potentially affect safety-related SCs (e.g. designating pipe in high-energy systems and seismic hangers supporting pipe in moderate-energy pipe systems as within scope) and the rationale for excluding the less than 1-inch pipe due to its potential impact being bounded by the larger, proximal pipes met the requirements of 10 CFR 54.4(a)(2) and was acceptable. The audit team did not identify any discrepancies between the methodology documented and the implementation results.

For non-safety-related equipment (other than piping systems) in proximity to safety-related systems, the applicant indicated that it had taken the mitigative approach and determined that the seismic supports and restraints would prevent physical interaction and that the seismic supports and restraints were included within the scope of license renewal. The staff concluded that the inclusion of the seismic supports was adequate to restrain non-fluid-bearing equipment since the method of potential impact was physical contact. On the basis of its review of the information, the staff concludes that the response to RAI 2.1-2 was acceptable because the applicant had demonstrated that it performed its scoping review in accordance with 10 CFR 54.4(a)(2).

2.1.3.1.2 Structural Scoping Methodology

As stated in Section 2.1.1.1.2 of the LRA, "Safety-related Structures," the staff determined that all structures at both the McGuire and Catawba Nuclear Stations were classified according to their design function. Appendix A to 10 CFR Part 100, "Seismic and Geological Citing Criteria for Nuclear Power Plants," requires that all nuclear power plants be designed so that, if a safe-shutdown earthquake occurs, certain SSCs remain functional.

The applicant determined that the three functions meet the intent of those specified in the scoping criteria in 10 CFR 54.4(a)(1). The specific structures that are required to ensure these functions are satisfactorily implemented are identified in Regulatory Guide (RG) 1.29 as Seismic Category I structures. All safety-related structures were designated as Seismic Category I and are within the scope of license renewal. The classification of each structure had been previously determined and documented in the McGuire UFSAR and Catawba UFSAR. Category I structures had been identified through a review of the plant UFSAR.

Section 2.1.1.2.2 of the LRA , “Nonsafety-Related Structures,” stated that structures whose continued function is not required, but whose failure could impact the function of safety-related SSCs or could injure control room occupants are designated as Seismic Category II in accordance with RG 1.29 Position C. The structures are classified as non-safety-related, but are designed to prevent detrimental effects to safety-related SSCs. Category II structures meet the intent of 54.4(a)(2) and were determined to be within the scope of license renewal.

Structures at McGuire and Catawba that were not identified as either Category I or II were classified as Category III structures. Category III structures were those whose functions were not related to nuclear safety and whose collapse under earthquake loading would not impair the integrity of seismic Category I or II items. Category III structures were not within the scope of license renewal unless they were determined to meet the criteria of 54.4(a)(3).

The classification of each structure had been previously determined and documented in the McGuire UFSAR and Catawba UFSAR. Category II structures were identified through a review of the plant UFSAR. The staff reviewed the classification of structure types, and discussed the process with the applicant, and the applicant provided a demonstration of the scoping process, including examples of application of the process and the resulting documentation. On the basis of this review, the staff did not identify any discrepancies between the methodology documented and the implementation results.

2.1.3.1.3 Electrical Scoping Methodology

The staff reviewed Sections 2.1.1.1.3, 2.1.2.3, and 2.5 of the LRA to determine the adequacy of the method that the applicant had used to identify the electrical components within the scope of license renewal in accordance with 10 CFR 54.4. During the scoping and screening methodology audit, the staff met with applicant representatives to discuss the applicant’s methodology for electrical scoping and to review design basis documents that support the LRA.

The staff reviewed document D.S. (MCS,CNS) 1274.00-00-0006, “Electrical Component Integrated Plant Assessment and Evaluation of Time-Limited Aging Analysis for License Renewal,” Rev. 01, 6/12/2001. This document applied to both McGuire and Catawba plants. The purpose of the document was to describe the scoping and screening process used by the applicant to identify electrical components that were subject to an AMR and to present the results of that process.

The scoping criteria were not applied globally to all electrical systems and components. The majority of electrical systems and components were included within the scope of license renewal by default without a detailed scoping evaluation having been performed. The scoping criteria were applied only to specific electrical systems in order to demonstrate that they were not within the scope of license renewal. The staff finds this approach conservative and acceptable because it would identify more electrical components subject to an AMR than are required by the rule.

The staff reviewed the document MCS-1274.00-00-0002, “McGuire Systems and Structures Scoping For License Renewal,” Rev 05, September 12, 2001, and a nearly identical document for Catawba. Section 3.3 described the applicant’s electrical system and component scoping process. The applicant assumed that all electrical components were within the scope of license renewal unless a specific scoping evaluation was performed that demonstrated they were not within the scope of license renewal. The scoping process described by the applicant was used

to determine that an electrical component or commodity group was not in scope for license renewal. In order to demonstrate that an electrical system, component, or commodity group was not within the scope of license renewal, a scoping evaluation was performed. The evaluation involved describing the system, component, or commodity group functions and then evaluating these functions against the scoping criteria of 10 CFR 54.4(a).

The staff reviewed several sections of the documents which evaluated specific systems and components for application of the methodology: (1) Section 4.3.1 (phase bus in the switchyard systems EA, EB, and ES of both plants); (2) Section 4.3.2 (unit main power system EPA); and Section 4.3.3 (6.9 kV normal auxiliary power system EPB). The applicant concluded that the only electrical components in the scope of license renewal and subject to an AMR were non-EQ insulated cables and connections. The staff reviewed the classification of electrical components and discussed the process with the applicant. The applicant provided a demonstration of the scoping process, including examples of how the process was applied and the resulting documentation. On the basis of this review, the staff did not identify any discrepancies between the methodology documented and the implementation results.

The staff considered the original information supplied in the LRA and additional information supplied by the applicant during the audit and subsequent responses to staff RAIs, particularly RAIs 2.5-1 and 2.5-2 (discussed in detail in Section 2.5.2 of this SER). This information included identification and inclusion in scope of the SSCs meeting the requirements of 10 CFR Part 54.4(a)(1); identification and inclusion in scope of the SSCs meeting the requirements of 10 CFR Part 54.4(a)(2); and identification and inclusion in scope of the SSCs meeting the requirements of 10 CFR Part 54.4(a)(3). On the basis of this information, the staff concludes that the method developed and implemented by the applicant is sufficient to ensure that all applicable SSCs are considered in scope of license renewal.

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

2.1.3.2.1 Mechanical Component Screening Methodology

The mechanical components within the scope of 10 CFR Part 54 were reviewed to determine those components subject to an AMR in accordance with 10 CFR 54.21(a)(1). An AMR of a mechanical component is required if the component performs an intended function without moving parts or without a change in configuration or properties (i.e., passive) and if it is not subject to replacement on the basis of a qualified life or specified time period (i.e., long-lived).

The screening methodology involved three steps: (1) establishment of the license renewal evaluation boundaries; (2) identification of the intended function(s) of each component; and (3) identification of mechanical components subject to an AMR.

The staff determined, as stated in the LRA, that the applicant had established the evaluation boundaries as either safety-related, non-safety-related, or regulated event boundaries. The applicant's Piping Classes A, B, and C were designated as safety-related. The applicant's Class F piping was designated as non-safety-related piping and components whose pressure boundary loss could adversely affect safety-related systems and components due to physical interactions. All Class F piping and components met the criteria of 10 CFR 54.4(a)(2). The intended functions were determined based on the system function which is the basis for

including the system within the scope of license renewal and the component function which is that which is required to enable the system to perform its intended function. Identification of the components subject to an AMR was performed using plant system flow diagrams, equipment databases, and the guidance of NEI 95-10, Appendix B.

The staff reviewed the “Feedwater System Component Screening and Aging Management Review for License Renewal” and the “Safety Injection System Component Screening and Aging Management Review for License Renewal” as examples to determine how the methodology had been applied. The applicant determined that the evaluation boundaries for the feedwater system had extended onto the FD of the auxiliary feedwater system. For the purposes of the feedwater system screening, the extended portions had been included in the feedwater system specification for completeness.

Again, using the feedwater system and safety injection system as examples, the applicant demonstrated how it used scoping results to indicate evaluation boundaries on F’S. The applicant demonstrated how it had evaluated components to determine if they were subject to an AMR. Specifically, the applicant described how it (1) identified the components’ intended functions (using DADS and the UFSAR); (2) determined the materials of construction (using F’S and vendor drawings); and (3) identified the internal and external environments (using F’S and DADS). The audit team did not identify any inconsistencies between the methodology described in the LRA and implementing procedures and the process demonstrated by the applicant.

Some components that are common to many systems were evaluated separately by the applicant in Section 2.1.2.1.2 of the LRA as "replace on condition" commodities. Examples of these commodities include filter media, such as paper filters, charcoal filters, and resins. On page 2.1-21 of the LRA, the applicant stated that periodic testing and inspection programs are in place to monitor filter performance, degradation of which may be indicated by an increase in differential pressure or a change in absorption efficiency. The filter mediums are replaced as conditions warrant and, therefore, are not subject to an AMR. As stated in the SRP-LR, system filters, fire extinguishers, fire hoses and air packs may be excluded, on a plant-specific basis, from an AMR under 10 CFR 54.21(a)(1)(ii) in that they are replaced on condition; however, the application should identify the standards that are relied on for replacement as part of the methodology description. Since the applicant indicated that periodic testing and inspection programs are in place to monitor filter performance, degradation of which may be indicated by an increase in differential pressure or a change in absorption efficiency, the staff finds the applicant’s treatment of these consumables acceptable because it conforms to 10 CFR 54.21(a)(1)(ii).

2.1.3.2.2 Structural Screening Methodology

The staff determined that Section 2.1.2.2, "Screening Methodology for Structural Components," of the LRA provided the methodology for determining the structural components subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1) of the license renewal rule. The component screening methodology for McGuire and Catawba involved:

- generation of a list of structural component types
- identification of the intended function(s) of each structural component
- identification of structural components subject to AMR

Consistent with the guidance provided in NEI 95-10, the structures and structural components within the scope of license renewal are long-lived and passive; therefore they require an AMR. The tables contained in Section 3.5 of the LRA list the structural components that are subject to AMR along with their intended functions. The staff reviewed the list of structural component types, reviewed the intended functions for several examples of structures and structural components, and reviewed the process of identification of structural components subject to an AMR. The audit team did not identify any discrepancies between the methodology documented and the implementation results.

2.1.3.2.3 Electrical Screening Methodology

The staff reviewed Sections 2.1.1.1.3, 2.1.2.3, and 2.5 of the LRA to determine the adequacy of the method used by the applicant to identify the electrical components subject to an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1). The staff met with applicant representatives to discuss their methodology for electrical screening and to review basis documents that support the LRA.

The staff reviewed document D.S.(MCS,CNS) 1274.00-00-0006, "Electrical Component Integrated Plant Assessment and Evaluation of Time-Limited Aging Analysis for License Renewal," Rev. 01, 6/12/2001. This document applied to both McGuire and Catawba plants. The purpose of the document was to describe the scoping and screening process used by the applicant to identify electrical components that were subject to an AMR and to present the results of that process.

The applicant began the process with a list of electrical commodities which is the generic list from Appendix B of NEI 95-10. Next the applicant applied passive screening that eliminated from the list all commodities that were active rather than passive (i.e.,components that performed an intended function without moving parts or without a change in configuration). The remaining seven passive commodities were insulated cables and connections, uninsulated ground connectors, transmission conductors, phase bus, switchyard bus, electrical portions of electrical penetrations, and high-voltage insulators.

The applicant applied long-lived screening criteria to the remaining passive components. Components that were to be replaced on the basis of a qualified life were removed from any further consideration for an AMR. The applicant concluded that all electrical components included in the applicant's environmental qualification program that were short-lived were screened out. The resulting list includes only non-EQ electrical components.

The staff reviewed several sections of the documents which evaluated specific systems and components for application of the methodology: (1) Section 4.3.1 (phase bus in the switchyard systems EA, EB, and ES of both plants); (2) Section 4.3.2 (unit main power system EPA); and (3) Section 4.3.3 (6.9 kV normal auxiliary power system EPB). The applicant had concluded that the only electrical components in the scope of license renewal and subject to an AMR were non-EQ insulated cables and connections. The audit team did not identify any discrepancies between the methodology documented and the implementation results.

The staff reviewed information related to the methods used for screening of mechanical, structural, and electrical SCs. On the basis of the its review of information provided in the LRA, and additional information supplied by the applicant during the audit, the staff concludes that the applicant's methodology for identifying structures and components subject to an AMR meets the requirements of 10 CFR 54.21.

2.1.4 Conclusions

The staff review of the information presented in Section 2.1 of the LRA, the supporting information in the plants' UFSARs, the information presented during the scoping and screening audit and inspection, and the applicant's responses to the staff's RAIs, as discussed above, 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, was consistent with the requirements of the license renewal rule and the staff's position on the treatment of non safety-related SSCs. The staff concludes that there is reasonable assurance that the scoping and screening methodology used by the applicant to identify SSCs within the scope of the rule and SCs that are subject to an AMR is consistent with the requirements of 10 CFR 54.4 and 10 CFR 54.21.

2.1.5 References

NEI 95-10, Revision 2, "Industry Guideline for Implementing the Requirements of 10 CFR Part 54 - The License Renewal Rule," Nuclear Energy Institute, August 2000.

"Pressurized Water Reactor Containment Structures License Renewal Industry Report," NUMARC Report Number 90-01, Nuclear Management and Resources Council, Revision 1, September 1991.

"Class I Structures License Renewal Industry Report," NUMARC Report Number 90-06, Nuclear Management and Resources Council, Revision 1, December 1991.

2.2 Plant-Level Scoping Results

2.2.1 Introduction

The applicant described the process for identifying the systems, structures, and components (SSCs) within the scope of license renewal in Section 2.1.1 of the LRA. Using that scoping methodology, the applicant identified the SSCs that are within the scope of license renewal and the systems and structures (SSs) that are not within the scope of license renewal. The applicant provided the results of its scoping review in Section 2.2 of the LRA, "Plant Level Scoping Results." The staff reviewed Section 2.2 of the LRA to determine whether there is reasonable assurance that the applicant has properly identified all plant-level SSCs that are relied upon to mitigate design basis events as required by 10 CFR 54.4(a)(1) or whose failure could prevent mitigation of design basis events as required by 10 CFR 54.4(a)(2), as well as the SSCs relied on in safety analyses or plant evaluations to perform a function that is required by one of the regulations referenced in 10 CFR 54.4(a)(3).

2.2.2 Technical Information in the Application

2.2.2.1 Systems, Structures, and Components Within the Scope of License Renewal

The SSCs that the applicant has determined to be within the scope of license renewal are presented in Table 2.2-1, "McGuire Systems and Structures within the Scope of License Renewal," and Table 2.2-2, "Catawba Systems and Structures within the Scope of License Renewal," of the LRA. The mechanical systems listed in Tables 2.2-1 and 2.2-2 are described in Section 2.3 of the LRA. The structures listed in Tables 2.2-1 and 2.2-2 are described in Section 2.4 of the LRA. The electrical and instrumentation and control (I&C) components are described in Section 2.5. In regard to electrical systems, the applicant stated on pages 2.2-6 and 2.2-10 that, except for the switchyard systems, unit main power system, nonsegregated-phase bus in the 6.9kV normal auxiliary power system, and uninsulated ground conductors, all other electrical, instrumentation, and control systems and components were found to be within the scope of license renewal.

2.2.2.2 Systems and Structures Not Within the Scope of License Renewal

The SSs that the applicant has determined not to be within the scope of license renewal are presented in Table 2.2-3, "McGuire Systems and Structures Not within the Scope of License Renewal," and Table 2.2-4, "Catawba Systems and Structures Not within the Scope of License Renewal," of the LRA. In regard to electrical systems and components, the applicant stated on pages 2.2-13 and 2.2-16 that the switchyard systems, unit main power system, nonsegregated-phase bus in the 6.9kV normal auxiliary power system, and uninsulated ground conductors were found not to be within the scope of license renewal.

2.2.3 Staff Evaluation

The staff reviewed Section 2.2, and specifically Tables 2.2-1, 2.2-2, 2.2-3, and 2.2-4 of the LRA, to determine whether there is reasonable assurance that the applicant had properly identified all plant-level SSCs that are within the scope of license renewal as required by 10 CFR 54.4. The staff focused its review on verifying that the implementation of the applicant's

methodology discussed in Section 2.1.1 of this SER did not result in the omission of SSCs from the scope of license renewal.

The staff used the UFSARs for both units of McGuire and Catawba in performing its review. Pursuant to 10 CFR 50.34(b), the UFSAR contains a description and analysis of the SSCs of the facility, with emphasis upon performance requirements, the bases, with technical justification, upon which such requirements have been established, and the evaluations required to show that safety functions will be accomplished. The UFSAR is required to be updated periodically pursuant to 10 CFR 50.71(e). Thus, the UFSAR contains updated plant-specific licensing basis information regarding the SSCs and their functions

The staff sampled the contents of the UFSAR, based on the listing of the SSs in Tables 2.2-3 and 2.2-4 of the LRA, to identify whether there are SSs that may have intended functions in accordance with the scoping requirements of 10 CFR 54.4 but were listed by the applicant as not within the scope of license renewal.

During its review, the staff determined that additional information was needed to complete its review. By letter dated January 23, 2002, the staff requested, in RAI 2.2.1-1, that the applicant provide the basis for listing the control rod drive ventilation system and the incore instrumentation area ventilation system on Table 2.2-3 as not within the scope of license renewal. The staff referred to Table 8-1 of McGuire UFSAR that lists both the control rod drive ventilation fans and the incore instrumentation room air handling units as receiving power from the 4160 volt essential auxiliary power system during a blackout or accident condition. In its response dated March 1, 2002, the applicant stated that the control rod drive ventilation system and the incore instrumentation area ventilation system are non-safety related ventilation systems and are not credited for any design basis event. The applicant further stated that the control rod drive ventilation system and the incore instrumentation area ventilation system are listed in Table 8-1 of McGuire UFSAR as loads on the EDGs and that these systems, when powered by the EDGs, provide additional containment cooling and are not required to mitigate the consequences of design basis events. The staff finds the applicant's response acceptable because the control rod drive ventilation system and the incore instrumentation area ventilation system are not safety-related or credited for any design basis event and are not, therefore, within the scope of license renewal as defined in 10 CFR 54.4.

By letter dated January 23, 2002, the staff requested, in RAI 2.2.1-2 that the applicant provide the basis for listing the diesel building in Table 2.2-3 as not being within the scope of license renewal, and for listing the Unit 1 and 2 diesel generator buildings in Table 2.2-1, as within the scope of license renewal. In its response dated March 1, 2002, the applicant stated that the diesel building (#7434) is outside the protected area, houses power for the non-vital telecommunications building and, as such, is not within the scope of license renewal. The applicant further explained that the Unit 1 and 2 diesel generator buildings house the emergency diesel generators and are within the scope of license renewal. Since the applicant explained
that the diesel building listed in Table 2.2-3 does not meet any of the scoping criteria for license renewal, the staff finds the applicant's response acceptable.

By letter dated January 23, 2002, the staff requested, in RAI 2.2.1-3, that the applicant provide the basis for listing the radwaste facility and the retired steam generator (SG) storage facility on Table 2.2-3 as not being within the scope of license renewal. These structures contain

significant levels of radioactivity and, as documented in Section 12.1.2.1 of the McGuire UFSAR, are shielded by thick concrete walls. In its RAI, the staff asked if an intended function of these walls is to mitigate the consequences of accidents that could result in potential offsite exposure. In its response dated March 1, 2002, the applicant stated that the walls of the radwaste facility and of the retired SG storage facility are designed for shielding, and are not designed to mitigate the consequences of design basis events. Since the applicant demonstrated that the walls of the radwaste facility and of the retired SG storage facility do not meet the scoping criteria for license renewal as defined in 10 CFR 54.4, the staff finds the applicant's response acceptable.

By letter dated January 23, 2002, the staff requested, in RAI 2.2.1-4, that the applicant provide the basis for listing the condensate system and the condensate storage system on Table 2.2-3, as not being within the scope of license renewal. In its RAI, the staff referred to its February 19, 1992, safety evaluation for station blackout (SBO) for McGuire. In that safety evaluation, the staff stated that there was sufficient water to cope with decay heat removal during a 4-hour SBO event at McGuire, based on the ability to align the turbine-driven auxiliary feedwater (AFW) pump to the auxiliary feedwater storage tank, the upper surge tank, and the condenser hotwell, as well as the ability to align the AFW to the condenser circulating water (CCW) system. In its response dated March 1, 2002, the applicant quoted another section of the February 19, 1992, safety evaluation:

> There are, however, no technical specifications limits on the levels of these water sources, and therefore, there are no guarantees that these sources of condensate will be available during an SBO event. If, for any reason, sufficient sources of condensate-grade water are unavailable, the licensee can align the turbine-driven AFW pumps to take suction from the CCW system, which can provide non-condensate-grade water for 72 hours. Therefore, McGuire has sufficient sources of water to cope with a four-hour SBO.

The staff finds the applicant's response acceptable because, as stated in the February 19, 1992, safety evaluation, there are no technical specifications limits on the condensate system and the condensate storage system water level, the systems are not relied upon in the plant evaluation to perform a function that demonstrates compliance with the SBO regulations, and, therefore, these systems are not within the scope of license renewal as defined in 10 CFR 54.4(a)(3).

By letter dated January 23, 2002, the staff requested, in RAI 2.2.1-5, that the applicant provide the basis for listing the retired SG facility on Table 2.2-4 as not being within the scope of license renewal. This structure contains significant levels of radioactivity and, as documented in Section 12.1.2.1 of the Catawba UFSAR, is shielded by thick concrete walls. In its RAI, the staff questioned the intended function of these walls to mitigate the consequences of accidents that could result in potential offsite exposure. In its response dated March 1, 2002, the applicant stated that the walls of the retired SG facility are designed for shielding and are not designed to mitigate the consequences of design basis events. Because the applicant explained that these structures did not meet the scoping criteria for license renewal as defined in 10 CFR 54.4, the staff finds the applicant's response acceptable.

2.2.4 Conclusion

On the basis of its review of the information presented in Sections 2.2-1 and 2.2-2 of the LRA, the supporting information in the McGuire and Catawba UFSARs, and the information provided in response to RAIs, the staff concludes that there is reasonable assurance that the applicant has identified all SSCs whose intended functions meet the scoping requirements of 10 CFR 54.4.

2.3 System Scoping and Screening Results: Mechanical

2.3.1 System Scoping and Screening Results: Reactor Coolant System

In Section 2.3.1, "Reactor Coolant System," of the LRA, the applicant described the SSCs of the reactor coolant system (RCS) that are subject to AMR for license renewal. The following RCS Class 1 components were described in Section 2.3.1 of the LRA:

- Class 1 piping, valves, and pumps
- pressurizer
- reactor vessel and control rod drive mechanism pressure boundary
- reactor vessel internals
- steam generator

2.3.1.1 Reactor Coolant System

In the McGuire and Catawba LRA, Section 2.3.1.1, "Reactor Coolant System Description," the applicant describes the RCS and RCS components that are within the scope of license renewal and subject to an AMR for McGuire and Catawba. The RCSs are similar for both facilities, and unless otherwise specified, the information provided below is applicable to the McGuire and Catawba RCSs. The McGuire UFSAR Chapter 5, "Reactor Coolant System," and the Catawba UFSAR Chapter 5, "Reactor Coolant System," provide additional information concerning the McGuire and Catawba RCSs, respectively.

2.3.1.1.1 Technical Information in the Application

As described in the LRA, the RCS consists of four similar heat transfer loops connected in parallel to the reactor pressure vessel. Each loop contains a reactor coolant pump, steam generator, and associated piping and valves. In addition, the system includes a pressurizer, a pressurizer relief tank (Class F), interconnecting piping, and instrumentation necessary for operational control. All major components are located in the reactor building.

During operation, the RCS transfers the heat generated in the core to the SGs, where steam is produced to drive the turbine generator. Borated demineralized water is circulated in the RCS at a flow rate and temperature consistent with achieving the reactor core thermal-hydraulic performance. The water also acts as a neutron moderator and reflector and as a solvent for the neutron absorber used in chemical shim control.

The RCS pressure boundary provides a barrier against the release of radioactivity generated within the reactor, and is designed to ensure a high degree of integrity throughout the life of the unit. RCS pressure is controlled by the use of the pressurizer, where water and steam are maintained in equilibrium by electrical heaters or water sprays. Steam can be formed (by the heaters) or condensed (by the pressurizer spray) to minimize pressure variations due to contraction and expansion of the reactor coolant. Spring-loaded safety valves and power-operated relief valves are mounted on the pressurizer and discharge to the pressurizer relief tank, where the steam is condensed and cooled by mixing with water.

Chapter 5, "Reactor Coolant System," of both McGuire and Catawba UFSARs provides additional information concerning the McGuire and Catawba reactor coolant systems. The

component types, component functions, materials of construction, environments, aging effects, and aging management programs/activities for the McGuire and Catawba RCS are listed in Table 3.1-1 of the LRA. The component types that were identified in the table include exterior surfaces of pressure boundary components; valve bolting material; reactor coolant pump main flange bolts; pressurizer manway cover bolts/studs; reactor vessel closure studs; nuts and washers; SG bolting; reactor vessel; and pressurizer integral attachments.

2.3.1.1.2 Staff Evaluation

The staff reviewed this section of the LRA to determine whether there is reasonable assurance that the RCS components and supporting structures within the scope of license renewal and subject to AMR have been identified in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1). 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 UFSARs for McGuire and Catawba pertaining to the RCS and associated pressure boundary components and compared the information in the UFSAR with the information in the LRA to identify those portions that the LRA did not identify as 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). For those structures and components that have an applicable intended function or functions, the staff sought to verify that they either perform the function or functions 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 UFSAR 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 extended period of operation. The staff did not identify any omissions.

2.3.1.1.3 Conclusions

On the basis of its review of the information presented in Section 2.3.1.1 of the LRA and the supporting information in the McGuire and Catawba UFSARs, the staff did not find any omissions by the applicant and, therefore, concludes that there is reasonable assurance that the applicant adequately identified those portions of the RCS and its associated (supporting) structures and components that fall within the scope of license renewal and are subject to an AMR, in accordance with 10 CFR Part 54.4(a) and 10 CFR Part 54.21(a)(1).

2.3.1.2 Class 1 Piping, Valves and Pumps

In the McGuire and Catawba LRA, Section 2.3.1.2, “Class 1 Piping, Valves and Pumps,” the applicant describes the RCS Class 1 piping and associated components that are within the scope of license renewal and subject to an AMR for McGuire and Catawba. The Class 1 piping and associated components are similar for both facilities, and unless otherwise specified, the information provided below is applicable to McGuire and Catawba. The McGuire UFSAR Section 5.5, “Component and Subsystem Design,” and the Catawba UFSAR Section 5.4, “Component and Subsystem Design,” provide additional information concerning the McGuire and Catawba RCS Class 1 piping and associated components, respectively.

2.3.1.2.1 Technical Information in the Application

The RCS Class 1 piping and associated pressure boundary components consist of:

- Westinghouse-supplied primary loop piping which interconnects the reactor vessel, SGs, and reactor coolant pumps
- Duke-designed Class 1 piping
- pressure boundary portion of Class 1 valves (bodies and bonnets, bolting)
- pressure boundary portion of the reactor coolant pump (casing, main closure flange thermal barrier heat exchanger and bolting)

The Westinghouse-supplied primary loop piping consists of four loops of piping interconnecting the reactor vessel, SG, and reactor coolant pump in each loop. This piping includes branch connection nozzles and special items such as the resistance temperature detector (RTD) scoop elements, pressurizer spray scoop, sample connection scoop, reactor coolant temperature element installation boss, and the temperature element well.

Class 1 branch piping consists of piping connected at the Westinghouse-supplied primary loop piping out to and including (1) the outermost containment isolation valve in piping which penetrates primary containment, or (2) the second of two valves normally closed during normal reactor operation in piping which does not penetrate primary containment. Some Class 1 branch lines and instrument connections in the RCS are equipped with ⅜-inch inner diameter (ID) flow restricting orifices that limit the maximum flow from a break downstream of the flow restriction to below the makeup capability of the RCS. This orifice is used instead of double isolation valves to make the break from Class 1 to Class 2.

For Class 1 valves, the pressure-retaining portion of the component consists of the valve body, bonnet, and closure bolting. The valves are welded in place with the exception of the pressurizer safety valves that have flanged connections.

For the reactor coolant pumps, the pressure-retaining portion of the component includes the pump casing, the main closure flange, the thermal barrier heat exchanger within the reactor coolant pump, the reactor coolant pump seals, and the pressure retaining bolting. The reactor coolant pump seals are excluded from AMR because they are periodically replaced. Preventive maintenance is currently scheduled every three cycles for the reactor coolant pump seals unless data indicates that the inspection must be done more frequently.

The component types, component functions, materials of construction, environments, aging effects, and aging management programs/activities for the McGuire and Catawba reactor coolant system Class 1 piping and associated pressure boundary components are listed in Table 3.1-1 of the LRA. The component types that were identified in the table include hot- and cold-leg pipes; elbows; pipe fittings; branch connections; orifices; valve bodies and/or bonnets; reactor coolant pump casings; main pump closure flange; and thermal barrier heat exchanger piping (tubing) and flanges.

2.3.1.2.2 Staff Evaluation

The staff reviewed this section of the LRA to determine whether there is reasonable assurance that the Class 1 piping and associated pressure boundary components and supporting structures within the scope of license renewal and subject to AMR have been identified in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1). 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 UFSARs for McGuire and Catawba for the Class 1 piping and associated pressure boundary components and compared the information in the UFSAR with the information in the LRA to identify those portions that the LRA did not identify as 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). For those structures and components that have an applicable intended function(s), the staff sought 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 UFSAR 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 extended period of operation. The staff did not identify any omissions.

2.3.1.2.3 Conclusions

On the basis of its review of the information presented in Section 2.3.1.2 of the LRA, and the supporting information in the McGuire and Catawba UFSARs, the staff did not find any omissions by the applicant and, therefore, concludes that there is reasonable assurance that the applicant adequately identified those portions of the Class 1 piping and its associated (supporting) structures and components that fall within the scope of license renewal and are subject to an AMR, in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1).

2.3.1.3 Pressurizer

In the McGuire and Catawba LRA, Section 2.3.1.3, “Pressurizer,” the applicant describes the pressurizer and associated components that are within the scope of license renewal and subject to an AMR for McGuire and Catawba. The pressurizer and associated components are similar for both facilities, and unless otherwise specified, the information provided below is applicable to the McGuire and Catawba. The McGuire UFSAR Section 5.5.10, “Pressurizer,” and the Catawba UFSAR Section 5.4.10, “Pressurizer,” provide additional information concerning the McGuire and Catawba pressurizers and associated components, respectively.

2.3.1.3.1 Technical Information in the Application

The pressurizer is a vertical, cylindrical vessel with hemispherical top and bottom heads that is connected to the RCS on one of the hot legs of a coolant loop. Electrical heaters are installed through the bottom head of the pressurizer while the spray nozzle, relief, and safety valve connections are located in the top head of the pressurizer. The component types, component functions, materials of construction, environments, aging effects, and aging management programs/activities for all four of the McGuire and Catawba pressurizers are listed in Table 3.1-1 of the LRA. The component types that were identified in the table include lower head shell; upper head manway; surge nozzle; spray nozzle; relief nozzle; safety nozzle; immersion heaters sheath; surge and spray nozzle thermal sleeves; support skirt and flange; manway insert; heater well nozzle; instrument nozzles; surge nozzle safe end; spray nozzle safe end; relief nozzle safe end; and safety nozzle safe end.

2.3.1.3.2 Staff Evaluation

The staff reviewed this section of the LRA to determine whether there is reasonable assurance that the pressurizer components and supporting structures within the scope of license renewal and subject to AMR have been identified in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1). 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 UFSARs for McGuire and Catawba for the pressurizer and associated pressure boundary components and compared the information in the UFSAR with the information in the LRA to identify those portions that the LRA did not identify as 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). For those structures and components that have an applicable intended function(s), the staff sought 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 UFSAR 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 extended period of operation.

During its review, the staff noted that some Westinghouse pressurizers are designed with seismic lugs and valve support bracket lugs. By letter dated January 28, 2002, the staff requested, in RAI 2.3.1-2, the applicant to verify whether such components exist in McGuire and Catawba plants; and if they do, then to explain why the subject components do not require an AMR. Based on past license renewal reviews, the staff believes that the subject components should be within scope requiring aging management, provided the pressurizers are designed with such components. In its response dated April 15, 2002, the applicant stated that the pressurizer seismic lugs are integral attachments to the pressurizer and are included in LRA Table 3.1-1 as "Reactor Vessel and Pressurizer Integral Attachments" (page 3.1-6, row 2). The valve support brackets are not used at McGuire and Catawba to provide support for safety and relief valves. The safety and relief valves are supported by pipe supports that attach to the pressurizer cavity wall. The staff agrees that the valve support brackets are outside the scope of license renewal, because they do not perform an intended function under 10 CFR 54.4(a)(1) and are not necessary to demonstrate compliance with any requirements referenced in 10 CFR 54.4(a)(3). The staff did not identify any omissions.

2.3.1.3.3 Conclusions

On the basis of its review of the information presented in Section 2.3.1.3 of the LRA, the supporting information in the McGuire and Catawba UFSARs, and the applicant's response to the requests for additional information, the staff did not find any omissions by the applicant and, therefore, concludes that there is reasonable assurance that the applicant adequately identified those portions of the pressurizer system and its associated (supporting) structures and components that fall within the scope of license renewal and are subject to an AMR, in accordance with 10 CFR Part 54.4(a) and 10 CFR Part 54.21(a)(1).

2.3.1.4 Reactor Vessel and Control Rod Drive Mechanism (CRDM) Pressure Boundary

In the McGuire and Catawba LRA, Section 2.3.1.4, "Reactor Vessel and Control Rod Drive Mechanism Pressure Boundary," the applicant describes the reactor vessel and CRDM and associated components that are within the scope of license renewal and subject to an AMR for both McGuire and Catawba. The reactor vessel and CRDM and associated components are similar for both facilities, and unless otherwise specified, the information provided below is applicable to the McGuire and Catawba. The McGuire UFSAR Section 5.4, "Reactor Vessel," and the Catawba UFSAR Section 5.3, "Reactor Vessel," provide additional information concerning the McGuire and Catawba reactor vessel and associated components, respectively.

2.3.1.4.1 Technical Information in the Application

The reactor vessel is cylindrical, with a welded hemispherical bottom head and a removable, flanged and gasketed, hemispherical upper head. The vessel contains the core, core supporting structures, control rods and other parts directly associated with the core. The upper (closure) head contains 82 penetrations (78 for CRDM and 4 auxiliary head adapters). The vessel has inlet and outlet nozzles located in a horizontal plane just below the reactor vessel flange but above the top of the core. Coolant enters the vessel through the inlet nozzles and flows down the annulus between the core barrel and the vessel wall, turns at the bottom, and flows up through the core to the outlet nozzles.

The bottom head of the vessel contains 58 penetrations for connection and entry of the nuclear incore instrumentation. Each penetration consists of a tubular member made of Inconel. Each tube is attached inside the bottom head by a partial penetration weld. Stainless steel conduits extend from the Inconel penetration in the bottom head of the reactor vessel down through the concrete shield area and up to a thimble shield table. The retractable thimble tubes, which travel within the conduit, are closed at the leading ends, are dry inside, and serve as the pressure barrier between the reactor water pressure and the reactor building atmosphere. Mechanical seals between the retractable thimbles and the conduits are provided at the seal table.

The component types, component functions, materials of construction, environments, aging effects, and aging management programs/activities for all four of the McGuire and Catawba reactor vessels are listed in Table 3.1-1 of the LRA. The component types that were identified in the table include closure head dome; flange; ring and vessel flange; upper (nozzle) shell; primary inlet and outlet nozzles; inlet and outlet nozzle safe ends; intermediate shell; lower shell; bottom head spherical ring; dome; CRDM housings; upper head injection (UHI) auxiliary head adapter flange; head vent penetration; thimble assembly; bottom-mounted instrumentation tubes (penetrations); thimble guide tubes; thimble seal table; and core support pads.

2.3.1.4.2 Staff Evaluation

The staff reviewed this section of the LRA to determine whether there is reasonable assurance that the reactor vessel and CRDM components and supporting structures within the scope of license renewal and subject to AMR have been identified in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1). 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 UFSARs for McGuire and Catawba for the reactor vessel, CRDM, and associated pressure boundary components and compared the information in the UFSAR with the information in the LRA to identify those portions that the LRA did not identify as 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). For those structures and components that have an applicable intended function(s), the staff sought 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 UFSAR 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 extended period of operation.

Wastage of carbon steel induced by borated water leakage through the pressure boundary in PWRs is a potential aging degradation for the components. Reactor vessel head lifting lugs are considered to be such components requiring aging management. However, if the components are currently covered under Boric Acid Wastage Surveillance Program, then they may not

require additional aging management. It appears that the subject components were not discussed in the LRA. By letter dated January 28, 2002, the staff requested, in RAI 2.3.1-1, the applicant to verify whether the components are within the surveillance program; and if not, to provide an explanation.

In its response dated April 15, 2002, the applicant stated that the reactor vessel head lifting lugs are considered to be a part of the exterior surfaces of RCS pressure boundary components that are listed in Table 3.1-1 (page 3.1-5, row 1) of the LRA. The aging effect of the reactor vessel head lifting lugs is managed by the Fluid Leak Management Program, which is described in Appendix B.3.15 of the LRA. The Fluid Leak Management Program is credited for managing loss of material due to boric acid wastage for alloy steel components such as the reactor vessel head lifting lugs. The staff agrees that the lifting lugs are within the scope of license renewal and are subject to the Fluid Leak Management Program, since the lugs are considered to be piece parts of the RCS pressure boundary. The staff did not identify any omissions.

2.3.1.4.3 Conclusions

On the basis of its review of the information presented in Section 2.3.1.4 of the LRA, the supporting information in the McGuire and Catawba UFSARs, and the applicant's response to staff's RAI, the staff did not find any omissions by the applicant and, therefore, concludes that there is reasonable assurance that the applicant adequately identified those portions of the reactor vessel and CRDM system and its associated (supporting) structures and components that fall within the scope of license renewal and are subject to an AMR, in accordance with 10 CFR Part 54.4(a) and 10 CFR Part 54.21(a)(1).

2.3.1.5 Reactor Vessel Internals (RVI)

In the McGuire and Catawba LRA, Section 2.3.1.5, "Reactor Vessel Internals," the applicant describes the RVI and associated components that are within the scope of license renewal and subject to an AMR for McGuire and Catawba. The RVI and associated components are similar for both facilities, and unless otherwise specified, the information provided below is applicable to the McGuire and Catawba. The McGuire UFSAR Section 4.2.2, "Reactor Vessel Internals," and the Catawba UFSAR Section 3.9.5, "Reactor Vessel Internals," provide additional information concerning the McGuire and Catawba reactor vessel internals and associated components, respectively.

2.3.1.5.1 Technical Information in the Application

The components of the reactor internals are divided into three parts consisting of the lower core support structure (including the entire core barrel and neutron shield pad assembly), the upper core support structure, and the in-core instrumentation support structure. The RVI support the core, maintain fuel alignment, limit fuel assembly movement, maintain alignment between fuel assemblies and CRDMs, direct coolant flow past the fuel elements and to the pressure vessel head, provide gamma and neutron shielding, and provide guides for the in-core instrumentation. The component types, component functions, materials of construction, environments, aging effects, and aging management programs/activities for all four of the McGuire and Catawba RVI are listed in Table 3.1-1 of the LRA. The component types that were identified in the table include upper support assembly; upper support column; upper support column bolts; upper core plate; upper core plate alignment pins; fuel alignment pins; hold-down spring; thermocouple column and crossrun assemblies; 17x17 and 15x15 guide tube assembly; upper head injection (UHI) flow columns; core barrel flange; core barrel outlet nozzles; neutron panels; irradiation specimen holder; fasteners; baffle and former plates; baffle bolts; lower core plate; lower support column bolts; lower support plate; lower core support columns; radial keys and fasteners; clevis inserts and fasteners; and bottom-mounted instrumentation.

2.3.1.5.2 Staff Evaluation

The staff reviewed this section of the LRA to determine whether there is reasonable assurance that the RVI components and supporting structures within the scope of license renewal and subject to AMR have been identified in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1). 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 UFSARs for McGuire and Catawba for the RVI and associated pressure boundary components and compared the information in the UFSAR with the information in the LRA to identify those portions that the LRA did not identify as 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). For those structures and components that have an applicable intended function(s), the staff sought 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 UFSAR 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 extended period of operation.

Section 3.9.1.3, page 3.9-4 of McGuire UFSAR states that the diffuser plate was relied upon when performing the dynamic system load analyses for reactor internals at McGuire to determine the behavior of lower structures when subjected to loads. Furthermore, based on past license renewal reviews of Westinghouse plants, the staff believes that the diffuser plate (provided there is one) should be within the scope requiring aging management because the component provides the safety function of structural and/or functional support for in-scope equipment, and/or provides flow distribution. By letter dated January 28, 2002, the staff requested, in RAI 2.3.1-3, the applicant to confirm whether the subject component was identified to be within scope requiring aging management for McGuire; and if not, to explain why. The staff further requested that the applicant update the UFSAR to correct the information. In its response dated April 15, 2002, the applicant stated that Duke's investigation in preparing the response to RAI 2.3.1-3 had revealed that the summary analysis provided in UFSAR Section 3.9.1.3 of the McGuire UFSAR is a generic analysis that was provided by Westinghouse, the McGuire NSSS vendor. The analysis described in the UFSAR reflects an earlier Westinghouse plant design that bounds the McGuire design. A review of plant drawings and communications between the applicant and Westinghouse confirmed that the McGuire RVI do not have a diffuser plate. The applicant stated that a Problem Investigation Process (PIP) report was initiated to clarify McGuire UFSAR Section 3.9.1.3. The applicant's assessment is acceptable, and the staff did not identify any omissions.

2.3.1.5.3 Conclusions

On the basis of its review of the information presented in Section 2.3.1.5 of the LRA, the supporting information in the McGuire and Catawba UFSARs, and the applicant's response to the requests for additional information, the staff did not find any omissions by the applicant and, therefore, concludes that there is reasonable assurance that the applicant adequately identified those portions of the RVI and its associated (supporting) structures and components that fall within the scope of license renewal and are subject to an AMR, in accordance with 10 CFR Part 54.4(a) and 10 CFR Part 54.21(a)(1).

2.3.1.6 Steam Generator

In the McGuire and Catawba LRA, Section 2.3.1.6, "Steam Generator," the applicant describes the steam generator and associated components that are within the scope of license renewal and subject to an AMR for McGuire and Catawba. The SGs and associated components are similar for both facilities, and unless otherwise specified, the information provided below is applicable to the McGuire and Catawba. The McGuire UFSAR Section 5.5.2, "Steam Generator," and the Catawba UFSAR Section 5.4.2, "Steam Generator," provide additional information concerning the McGuire and Catawba SGs and associated components, respectively.

2.3.1.6.1 Technical Information in the Application

The replacement steam generators (RSGs) at McGuire 1 and 2 and Catawba 1 were manufactured by Babcock & Wilcox International in Cambridge, Ontario, Canada. The McGuire 1 SGs were replaced in May 1997, and the McGuire 2 SGs were replaced in December 1998. The Catawba 1 SGs were replaced in October 1996. For Catawba 2, the SGs that were installed during original construction have not been replaced.

All SGs at both stations are vertical shell and U-tube evaporators with integral moisture separating equipment. Reactor coolant flows through the inverted U-tubes, entering and leaving through nozzles equipped with stainless steel safe ends located in the hemispherical bottom head of the SG. Steam is generated on the shell side of the tubes and flows upward through the moisture separators to the outlet nozzle at the top of the SG. Feedwater flows directly into a downcomer section and is mixed with saturated recirculation flow before entering the tube bundle for the replacement SGs. The Catawba 2 SGs are equipped with a preheater and feedwater flow restriction with main feedwater delivered just above the tube sheet. Subsequently, the water-steam mixture flows upward through the tube bundle and into the steam drum section. Centrifugal moisture separators, located above the tube bundle, remove most of the entrained water from the steam.

The component types, component functions, materials of construction, environments, aging effects, and aging management programs/activities for all 16 of the McGuire and Catawba SGs are listed in Table 3.1-1 of the LRA. The component types that were identified in the table include primary head/cladding; primary nozzle closure rings; secondary manway; secondary manway covers; handhole covers; handhole pad; tubesheet/primary and secondary cladding; tubes/plugs; primary nozzles; primary nozzle safe ends; primary manway cover; plate/diaphragm; primary divider plate; steam drum boiler shells; steam dome conical shells; handhole; handhole diaphragm; small nozzles; primary manway and manway insert; primary chamber drain and coupling; feedwater thermal sleeve; feedwater limiter; steam outlet nozzle; flow restriction; steam outlet nozzle safe end; auxiliary feedwater nozzle; main feedwater nozzle; steam outlet nozzle; auxiliary feedwater nozzle safe end; and auxiliary feedwater distribution system.

2.3.1.6.2 Staff Evaluation

The staff reviewed this section of the LRA to determine whether there is reasonable assurance that the SG 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). 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 UFSARs for McGuire and Catawba for the SG and associated pressure boundary components and compared the information in the UFSAR with the information in the LRA to identify those portions that the LRA did not identify as 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). For those structures and components that have an applicable intended function(s), the staff sought 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 UFSAR 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 extended period of operation.

Table 3.1-1 of the LRA identifies components for the SGs that require AMR. The following components were not listed in the table: anti-vibration bars, stay rod, tube bundle wrapper, and tube support plates. Based on past LRA reviews for the Westinghouse plants, and on the information provided in McGuire and Catawba UFSARs, the staff believes that these components perform the intended function of providing structural and/or functional support for in-scope equipment, namely the SG tubes, and, therefore, should be within the scope of license renewal and subject to an AMR. By letter dated January 28, 2002, the staff requested, in RAI 2.3.1-4, the applicant to determine if the intended function of the above components to provide structural and/or functional support for the SG tubes is within the scope of license renewal in accordance with 10 CFR 54.4(a)(2) by confirming that none of the above-mentioned components in McGuire and Catawba units are credited for preventing tube failure during seismic events or during a main steam-line break accident. In its response dated April 15, 2002, the applicant stated that upon further review, Duke concluded that tube support structures on the secondary side of the SGs are within scope and subject to AMR. The tube support structures include items such as lattice grid support plates; U-bend anti-vibration bars; the shroud; lattice ring; and
U-bend arch bars for the replacement SGs at McGuire 1 and 2 and Catawba 1). For Catawba 2 SGs, items such as anti-vibration bars; stay rods; tube bundle wrapper; and tube support plates are included. The applicant further stated that the items for all four units are included as "Tube Supports." The AMR results for the tube supports, as proposed in the RAI response, are provided below and used to supplement Table 3.1.1 of the LRA:

- Component Type: SG Tube Supports
- Component Function: Support
- Material: Alloy Steel, Stainless Steel, Carbon Steel
- Environment: Treated Water
- Aging Effect: Cracking, Loss of Material
- Aging Management Programs and Activities: Chemistry Control Program, SG Surveillance Program

Because the applicant agreed that the SG subcomponents described in RAI 2.3.1-4 are within the scope of license renewal, the applicant's assessment of scoping and screening of SG sub-components is acceptable. The staff did not identify any additional omissions. The adequacy of the proposed aging management programs and activities for the tube supports is discussed in Section 3.1.5.2 of this SER.

2.3.1.6.3 Conclusions

The staff identified that the applicant did not include the tube supports of the SGs as within the scope of license renewal and subject to an AMR for McGuire and Catawba. However, the applicant subsequently added the SG tube supports to the scope of components subject to an AMR and provided the AMR results to the staff for review. The staff's evaluation of the AMR results for the SG support components is provided in Section 3.1.5.2 of this SER. Since no additional omissions were identified, the staff concludes that, on the basis of its review of the information presented in Section 2.3.1.6 of the LRA, the supporting information in the McGuire and Catawba UFSARs, and the applicant's response to RAIs, there is reasonable assurance

that the applicant adequately identified those portions of the SG and its associated (supporting) structures and components that fall within the scope of license renewal and are subject to an AMR, in accordance with 10 CFR Part 54.4(a) and 10 CFR Part 54.21(a)(1).

2.3.2 System Scoping and Screening Results: Engineered Safety Features

In Section 2.3.2, “Engineered Safety Features,” of the McGuire and Catawba LRA, the applicant described the SSCs of the engineered safety features (ESFs) that are subject to AMR for license renewal.

2.3.2.1 Annulus Ventilation System (VE)

In Section 2.3.2.1 of the LRA titled, "Annulus Ventilation System," the applicant identified portions of the VE system and its components that are within the scope of license renewal and subject to AMR. The applicant noted in Section 2.3.2.1 of the LRA that the VE system is further described in Section 6.2 of both the McGuire and Catawba UFSARs.

The applicant evaluated component supports for HVAC ductwork listed in Table 3.5-3 of the LRA. The applicant evaluated electrical components that support the operation of the VE system in Section 2.1.2 of the LRA. The staff’s scoping evaluation of structures and component supports is provided in Section 2.4 of this SER. The staff’s evaluation of electrical components and instrumentation and controls in the VE system is documented in Section 2.5 of this SER.

2.3.2.1.1 Technical Information in the Application

The independent VE system for all four units is considered an engineered-safety-feature (ESF). Each VE system has redundant trains consisting of a makeup air supply fan, a moisture eliminator, a filter train and associate piping, valves, and controls as necessary to accomplish the design bases. All major annulus ventilation components are located in the auxiliary building.

Two 100 percent capacity VE system exhaust fans and corresponding filtration trains are provided for each unit. The fans and filtration trains are supplied with both normal and class 1E emergency power. The moisture eliminator consists of a mechanical demister and a heater which are designed to limit the relative humidity entering the filter train to below 70 percent assuming intake air at 100 percent relative humidity. Each carbon filter is sized to accommodate the fission products released into the annulus following any of the postulated accidents. If one ventilation subsystem fails, the transfer of function to the other ventilation subsystem is performed manually from the control room by the operator.

The VE system functions to discharge sufficient air from the annulus to achieve and maintain a negative pressure with respect to the containment and the outside atmosphere following an LOCA. In order to mix the inleakage in as large a volume as possible, a large flow of air is displaced from the upper level of the annulus, passed through the filter, and returned to the annulus at a low level. The applicant stated in the LRA that the VE system is further described in Section 6.2 of the UFSAR. In Section 2.3.2.1 of the LRA, and Sections 6.1.8 and 9.4.9.1 of the UFSAR, the applicant identified the following intended functions of the McGuire and Catawba VE system based on 10 CFR 54.4(a)(1) and 10 CFR 54.4(a)(2):

McGuire

Section 2.3.2.1 of the LRA:

- •To create and maintain a negative pressure zone in the annular space between the steel primary containment and reactor building (secondary containment).
- •To prevent the leakage of radioisotopes through the reactor building and into the environment, following a LOCA.
- •To maintain containment isolation integrity.

Section 6.1.8 of the UFSAR:

- •To maintain a post-accident negative pressure in the annulus between the containment and the reactor building, and collect and filter gaseous leakage from the containment during accident conditions.
- •To produce a slight negative pressure within the annulus, thus preventing outleakage and relieving the post-accident thermal expansion of air in the annulus.
- • To keep outleakage minimal (the reactor building also serves as a protective structure).
- • To collect, delay, and filter gases leaking from the containment vessel.

Catawba

Section 2.3.2.1 of the LRA-

- • To limit operator and site boundary dose, following a design basis accident, to within the guidelines specified in 10 CFR Part 100.
- • To provide long-term fission product removal capability within the annulus through holdup and filtration.

Section 9.4.9.1 of the UFSAR:

- • To limit operator and site boundary doses following a design basis accident to within 10 CFR 100 guidelines.
- • To produce and maintain a negative pressure of 0.25 inches water gauge throughout the annulus.
- • To reduce the concentration of radioactivity (specifically radioiodines) in the air within, and discharged from, the annulus through filtration and recirculation of annulus air.
- • To provide long-term fission product removal capacity within the annulus through holdup, decay, and filtration.
- • To minimize the release of radioactivity (specifically radioiodines) from the containment to the environment following a design basis LOCA.

On the basis of the intended functions identified above for the McGuire and Catawba VE systems, the portions of these systems that were identified by the applicant as within the scope of the LRA include all VE system safety-related components (electrical, mechanical, and instruments). The applicant described its methodology for identifying the mechanical components subject to an AMR in Section 2.1.2.1.2 of the LRA. On the basis of this methodology, the applicant identified the portions of the VE system that are within scope on the flow diagrams listed in Section 2.3.1 of the LRA. Using the methodology described in Section 2.2.1 of the LRA, the applicant compiled a list of the mechanical components and component types subject to an AMR that are within the evaluation boundaries highlighted on the flow diagrams and identified their intended functions. The applicant provided this list in Table 3.2-1 of the LRA.

The following component types are identified as within the scope of license renewal and subject to an AMR in Table 3.2-1 of the LRA: air flow monitors, ductwork, filters, pipe, and tubing. The applicant further noted in Table 3.2-1 of the LRA that the VE system pressure boundary function is the only applicable intended function of annulus mixing components that are subject to an AMR.

2.3.2.1.2 Staff Evaluation

To verify that the applicant identified the components of the VE system that are within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1), the staff reviewed the flow diagrams listed in Section 2.3.2.1 of the LRA that show the evaluation boundaries for the highlighted portion of the VE system that are within scope, and Table 3.2-1 of the LRA, which lists the mechanical components and the applicable intended functions that are subject to an AMR. The staff also reviewed UFSAR Sections 6.1.8 and 9.4.9 to determine if there were any portions of the VE system that met the scoping criteria in 10 CFR 54.4(a), but were not identified as within the scope. The staff also reviewed the McGuire and Catawba UFSARs to determine if any safety-related system functions were not identified as intended functions in the LRA, and to determine if any structures or components that have intended functions were omitted from the scope of structures or components that require an AMR. The staff compared the functions described in the UFSARs to those identified in the LRA.

The applicant identified the structures and components subject to an AMR for the VE system using the screening methodology described in Section 2.1 of the LRA and listed them in Table 3.2-1 of the LRA. The staff evaluated the scoping and screening methodology in Section 2.1 of this SER. The staff sampled components from Table 3.2-1 of the LRA to verify that the applicant did identify the components subject to an AMR. The staff also sampled the structures and components that were within the scope of the LRA but not subject to an AMR. Based on this sample, the staff verified that these structures and components perform their intended functions without moving parts or without a change in configuration or properties and are not subject to replacement on the basis of a qualified life or specified time period.

To ensure that those portions of the VE system excluded from the scope of license renewal do not perform any intended functions, the staff requested additional information based on a review of the UFSAR and LRA descriptions. The staff noted that Section 2.3.2.1 of the LRA provides a summary description of the system functions and a listing of flow diagrams. The flow diagrams highlight the evaluation boundaries, and Table 3.2-1of the LRA tabulates the components within the scope and subject to an AMR for the VE system. The corresponding drawings and UFSARs however, show additional components that were not listed in Table 3.2-1 of the LRA.

The staff noted that the applicant did not identify housings for active components that require an AMR. The determination should consider whether failure of the housing would result in a failure of the associated active component to perform its intended function and whether the housing meets the long-lived and passive criteria as defined in the rule.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-1, specific information concerning the exclusion of fan housings from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant stated that cooling fans are not included in the AMR results tables in the LRA. The applicant added that cooling fans, without sub-component exceptions, are explicitly excluded from an AMR by 10 CFR 54.21. The staff reviewed this response and determined that the applicant's basis for excluding fan housings is not consistent with the license renewal rule because the housings are relied upon to maintain pressure boundary integrity (as are valve bodies and pump casings) and are, therefore, within the scope of license renewal. Furthermore, because the fan housings are passive ling-lived components, they are subject to an AMR. The staff finds this response unacceptable and characterizes this issue as open item 2.3-1.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-2, specific information concerning the exclusion of damper housings from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant stated that dampers are not included in the AMR results tables in the LRA. The applicant added that ventilation dampers, without sub-component exceptions, are explicitly excluded from an AMR by 10 CFR 54.21. The staff reviewed this response and has determined that the applicant's basis for excluding damper housings is not consistent with the license renewal rule because the housings are relied upon to maintain the pressure boundary integrity (as are valve bodies and pump casings) and are, therefore, within the scope of license renewal. Furthermore, because the damper housings are passive ling-lived components, they are subject to an AMR. The staff finds this response unacceptable and characterizes this issue as open item 2.3-2.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-4, specific information concerning the exclusion of building sealants from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant stated that it does not define materials such as sealants to be structures or components. The applicant stated the pressure boundary function is addressed by TS surveillance testing. However, the applicant did not indicate that any of the TS surveillance requirements listed in its response were credited for aging management (and identified as AMPs). Nor did the applicant furnish a description of or information pertaining to a TS surveillance AMP (including discussion of the 10 elements of the AMP) for the staff's review.

On page 2.1-4 of the LRA, the applicant stated that "seals associated with maintaining pressure boundary are limited to the divider barrier seals in the reactor building." Since the applicant does not discuss the treatment of structural sealants other than the divider barrier seal, it is not clear to the staff that building (structural) sealants were considered during an AMR of the structure (building) for which they are a sub-component. Furthermore, according to page 3.5-10 of the LRA, the Inspection Program for Civil Engineering Structures and Components is credited by the applicant to monitor the aging of building concrete structural components (reinforced concrete beams, columns, floor slabs, and walls). According to Section B.3.21 of the LRA, the scope of the Inspection Program for Civil Engineering Structures and Components does not include structural sealants. Table 2.1-3, on page 2.1-15 of the SRP-LR, states that an applicant's structural AMP is expected to address structural sealants "with respect to an AMR program." The intent of this statement is that an applicant's structural AMP is expected to manage or monitor the aging effects of the structure and associated sub-components that are identified during the AMR. The basis for this SRP guidance is documented in the summary (issued January 21, 2000) of a December 8, 1999, meeting to discuss the staff's position on the

treatment of consumables. This summary clearly states, on page 3, that structural sealants would be implicitly included at the component level and considered during the AMR. Since the structural AMP identified for the concrete structural components does not address structural sealants, and since that applicant did not identify the TS surveillances listed in its response as AMPs or provide appropriate information to support the staff's review of these surveillances as AMPs, the staff characterizes this issue as open item 2.3-3.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-5, specific information concerning the exclusion of passive components associated with ductwork from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant identified these passive components as a sub-components of ductwork. The applicant also stated that ventilation grilles were installed only for aesthetic purposes and perform no intended license renewal function. Because passive components associated with ventilation ductwork referenced in RAI 2.3-5 perform no intended function, the staff agrees that they are not within the scope of license renewal.

Some components that are common to many systems, including the VE system, have been evaluated separately by the applicant in LRA Section 2.1.2.1.2 as "replace on condition" commodities. The staff's evaluation of applicant's treatment of these consumables is documented in Section 2.1.3.2.1 of this SER.

In Section 2.4.3 of this report the staff evaluated component supports for piping, cables, and equipment, which are discussed in LRA Section 2.4, "Scoping and Screening Results: Structures." In Section 2.5 of this report the staff evaluated electrical components that support the operation of the VE system, which are discussed in LRA Section 2.5, "Scoping and Screening Results: Electrical and Instrumentation and Controls." The VE system instrumentation lines are evaluated with the VE system and are listed in Table 3.2-1 of the LRA as tubing.

The staff reviewed the LRA, supporting information in the UFSAR, and the applicant's responses to RAIs. In addition, the staff sampled several components from the VE system flow diagram, as identified in LRA Section, to determine whether the applicant properly identified the components within scope and subject to an AMR. No omissions were identified, except as identified in the RAIs.

2.3.2.1.3 Conclusions

On the basis of its review, with the exception of open items identified in this SER section, the staff has reasonable assurance that the applicant has adequately identified the VE system structures and components that are within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4 and 10 CFR 54.21, respectively.

2.3.2.2 Containment Isolation System

In Section 2.3.2.2 of the LRA, the applicant described the systems isolated by the containment isolation system and the components therein which are within the scope of license renewal and subject to an AMR. The containment isolation system is further described in Section 6.2.4 of the McGuire and Catawba UFSARs.

2.3.2.2.1 Technical Information in the Application

The containment isolation system is an ESF with the intended function of isolating all nonessential fluid-bearing lines penetrating the containment in order to prevent the uncontrolled or unmonitored release of radioactivity to the environment. The applicant identified the following 12 systems as being isolated by the containment isolation system:

- breathing air system
- containment air release and addition system
- containment hydrogen sample and purge system (Catawba only)
- containment purge ventilation system
- containment ventilation cooling water system (McGuire only)
- conventional chemical addition system (McGuire only)
- equipment decontamination system
- ice condenser refrigeration system
- makeup demineralized water system
- station air system
- steam generator blowdown recycle system
- steam generator wet lay-up recirculation system

Based on the intended function of the containment isolation system identified above, the applicant identified the following five component types in this system as within the scope of license renewal and subject to an AMR: valve bodies, piping, tubing, orifices, and annubars. The applicant further identified the intended function of these component types to be maintaining the integrity of the containment isolation system pressure boundary.

2.3.2.2.2 Staff Evaluation

The staff reviewed Section 2.3.2.2 of the LRA and the associated piping and instrumentation diagrams to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the containment isolation system that are within the scope of license renewal in accordance with 10 CFR 54.4. The staff then reviewed the AMR results provided in Table 3.2-2 of the LRA to determine whether the applicant appropriately identified the components belonging to the containment isolation system that are subject to an AMR in accordance with 10 CFR 54.21(a)(1). In order to perform a conservative review, the staff focused on those components of the containment isolation system that were not identified as meeting the above requirements. The staff also reviewed Section 6.2.4 of the McGuire and Catawba UFSARs and did not identify any intended system functions meeting the scoping criteria in 10 CFR 54.4 that were omitted from Section 2.3.2.2 of the applicant's LRA.

As discussed below, the applicant considered within the scope of license renewal only the components of the containment isolation system which function as a pressure boundary to support containment isolation. The staff finds this approach to be acceptable because the twelve systems included in the containment isolation system are nonessential except for their containment isolation function. In its initial review, however, the staff identified seven instances on five containment isolation system piping and instrumentation diagrams where piping and valve bodies that appeared to serve as a pressure boundary for the containment isolation intended function had not been highlighted as within the scope of license renewal. As detailed in a telecommunication summary dated November 14, 2001, the applicant confirmed that these

seven license renewal scoping boundaries had been incorrectly highlighted on the diagrams, and that the piping and valve bodies inadvertently omitted were actually considered to be within the scope of license renewal and subject to an AMR. In the same telecommunication summary, the staff also questioned whether the Catawba containment hydrogen sample and purge system was used to provide post-accident containment hydrogen concentration samples on which the manual operation of the containment hydrogen recombiners would be based. The applicant indicated that the containment hydrogen sample and purge system was not credited for this function, and that the safety-related hydrogen analyzers (which the applicant classified as part of the miscellaneous instrumentation system, reviewed in Section 2.3.2.9 of this SER) are credited with providing an indication of post-accident hydrogen concentration. The staff finds the applicant's responses satisfactory because they (1) support the conclusion that all components required for the containment isolation intended function are considered within the scope of license renewal; (2) support the conclusion that the twelve non-essential systems isolated by the containment isolation system do not have intended functions other than containment isolation; and (3) are consistent with the general information and descriptions concerning the containment isolation system provided in the LRA.

2.3.2.2.3 Conclusions

The staff concludes that, for both McGuire and Catawba, there is reasonable assurance that the applicant has appropriately identified the components of the containment isolation system that are 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).

2.3.2.3 Containment Air Return Exchange and Hydrogen Skimmer System

In Section 2.3.2.3 of the LRA, the applicant described the containment air return exchange and hydrogen skimmer system and the components therein which are within the scope of license renewal and subject to an AMR. This system is further described in Section 6.2 of the McGuire and Catawba UFSARs.

2.3.2.3.1 Technical Information in the Application

The containment air return exchange and hydrogen skimmer system is an ESF with the following three intended functions: (1) maintaining containment pressure less than its design value during a postulated high-energy line break by recirculating air from the upper containment to the lower containment; (2) ensuring the hydrogen concentration remains less than the flammability limit following a postulated loss-of-coolant accident by preventing hydrogen pocketing in dead-ended compartments within containment; and (3) maintaining containment isolation capability for the system piping penetrating containment. The containment air return portion of this system employs two redundant air return fans, dampers, and ductwork (Catawba only) to recirculate air from upper containment to lower containment in response to a postulated high-energy line break. The hydrogen skimmer portion of this system employs two redundant hydrogen skimmer fans, piping, dampers (McGuire only), and expansion joints (Catawba only) to skim hydrogen from compartments in which hydrogen may accumulate following a postulated loss-of-coolant accident. The pressure boundary of the hydrogen skimmer portion of this system consists of piping, rather than ductwork, to prevent rupture and consequent ice condenser bypass leakage following a postulated accident.

Based on the three intended functions of the containment air return exchange and hydrogen skimmer system identified above, the applicant identified the following five component types of this system as within the scope of license renewal and subject to an AMR: piping, tubing, valve bodies, ductwork (Catawba only), and expansion joints (Catawba only). The applicant further identified the intended function of these component types to be maintaining the integrity of the containment air return exchange and hydrogen skimmer system pressure boundary.

2.3.2.3.2 Staff Evaluation

The staff reviewed Section 2.3.2.3 of the LRA and the associated piping and instrumentation diagrams to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the containment air return exchange and hydrogen skimmer system that are within the scope of license renewal in accordance with 10 CFR 54.4. The staff then reviewed the AMR results provided in Table 3.2-3 of the LRA to determine whether the applicant appropriately identified the components belonging to the containment air return exchange and hydrogen skimmer system that are subject to an AMR in accordance with 10 CFR 54.21(a)(1). In order to perform a conservative review, the staff focused on those components of the containment air return exchange and hydrogen skimmer system that were not identified as meeting the above requirements. The staff also reviewed Section 6.2 of the McGuire and Catawba UFSARs and did not identify any intended system functions meeting the scoping criteria in 10 CFR 54.4 that were omitted from Section 2.3.2.3 of the applicant's LRA.

As described in detail below, the staff questioned the applicant's omission from the scope of license renewal of certain ductwork (for McGuire only) in the containment air return portion of this system. Additionally, the staff questioned the applicant's apparent omission from the scope of license renewal of the containment hydrogen recombiners, and the omission of certain piping in the hydrogen skimmer portion of the system. Finally, the staff questioned the applicant's omission of the fan bodies and damper bodies throughout the containment air return exchange and hydrogen skimmer system.

By letter dated January 23, 2002, the staff requested, in RAI 2.3.2.3-1, the applicant to indicate whether or not certain ductwork (for McGuire only) performs the intended function of serving as a passive pressure boundary in the containment air return portion of this system. In its response dated April 15, 2002, the applicant stated that the ductwork identified by the staff, which is indicated on the piping and instrumentation diagrams for the McGuire containment air return system, does not physically exist at the plant. In actuality, the containment air return fans and dampers at McGuire are bolted together directly without intervening ductwork and mounted directly upon the floor of the upper containment. Therefore, staff finds the applicant's exclusion of containment air return ductwork from the scope of license renewal to be acceptable for McGuire.

By letter dated January 23, 2002, the staff also requested, in RAI 2.3.2.3-3, additional information to address the apparent omission of the containment hydrogen recombiners and any supporting mechanical components from the scope of license renewal. In its response dated April 15, 2002, the applicant stated that the hydrogen recombiners are electrical (rather than mechanical) components, but that they were considered within the scope of license renewal for McGuire and Catawba. The applicant further stated that, in accordance with 10 CFR 50.49, the recombiners are included within the Environmental Qualification Program at each site, and, as they are subject to replacement based on a qualified lifetime, they are not

subject to an AMR. The staff finds the applicant's response to be acceptable because (1) it is consistent with the regulatory guidance provided in the Standard Review Plan for License Renewal and the Generic Aging Lessons Learned Report; and (2) it indicates that the hydrogen recombiners are addressed in the Electrical and Instrumentation and Controls section of the LRA. The staff's evaluation of the Electrical and Instrumentation and Controls section is documented in Section 2.5 of this SER.

The staff asked why the non-safety-related carbon steel piping used to skim hydrogen from various containment compartments was not considered to be within the scope of license renewal for McGuire and Catawba. As documented in a telecommunication summary dated November 14, 2001, the applicant explained that the piping not highlighted was embedded in concrete, and that a breach of the embedded piping would not result in a loss of the intended pressure boundary function of the piping. The applicant stated that the surrounding concrete would alternately provide a hydrogen skimmer system flow-path, and that this concrete is a safety-related structure that is within the scope of license renewal and subject to an AMR. Although the staff recognizes that the gaseous permeability of concrete is greater than that of carbon steel, the staff finds the applicant's response to be satisfactory because reasonably postulated localized failures of the hydrogen skimmer system piping would not be expected to have a noticeable effect on the system's performance due to the relatively small differential pressures postulated between the hydrogen skimmer system and the ambient containment atmosphere and to the high quality of the structural concrete used in the containment design. Although the applicant has not demonstrated that a complete disintegration of the embedded hydrogen skimmer system would not degrade the hydrogen skimmer system's performance, the staff does not consider complete disintegration to be a reasonably postulated failure because the secure and relatively benign internal and external environments for embedded carbon steel piping used in ventilation systems is not expected to promote rapid and undue aging effects. Therefore, the staff has concluded that (1) the applicant has appropriately addressed 10 CFR 54.4(a)(2) for the embedded piping in the hydrogen skimmer system; and (2) the applicant's response is consistent with the general information and descriptions provided in the LRA.

By letter dated January 23, 2002, the staff requested, in RAIs 2.3-1 and 2.3-2, additional information to determine whether fan and damper housings in the containment air return exchange and hydrogen skimmer system perform the intended function of serving as a passive pressure boundary. In its response dated April 15, 2002, the applicant indicated that fan and damper bodies for ventilation systems at McGuire and Catawba were not subject to an AMR due to specific exceptions stated in 10 CFR 54.21(a)(1)(i). The staff finds the applicant's response to be unacceptable because it interprets 10 CFR 54.21(a)(1)(i) in a manner that is contrary to the basis for this regulation. Although fans and dampers are considered to be active components, their bodies are passive structural components that perform an intended pressure boundary function (i.e., the pressure boundary provided by the fan bodies and damper bodies is necessary for the success of these components' associated active functions). Therefore, the staff considers that (1) all of the fan bodies and damper bodies that perform an intended pressure boundary function for the containment air return exchange and hydrogen skimmer system are within the scope of license renewal and subject to an AMR, and (2) the applicant's basis for excluding these fan bodies and damper bodies is not adequate since it inherently contradicts the requirements of 10 CFR 54.21(a)(1)(i). This issue is characterized as open items 2.3-1 (fan housings) and 2.3-2 (damper housings), which are discussed in detail in the

staff's evaluation of scoping and screening for numerous ventilation systems in Section 2.2 and 2.3 of this SER.

2.3.2.3.3 Conclusions

With the exception of open items 2.3-1 and 2.3-2 concerning the fan and damper housings in the containment air return exchange and hydrogen skimmer system, the staff concludes that, for both McGuire and Catawba, there is reasonable assurance that the applicant has appropriately identified the components of this system that are 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).

2.3.2.4 Containment Spray System

In Section 2.3.2.4 of the LRA, the applicant described the containment spray system and the components therein which are within the scope of license renewal and subject to an AMR. This system is further described in Section 6.5 of the McGuire UFSAR and Section 6.2.2 of the Catawba UFSAR.

2.3.2.4.1 Technical Information in the Application

The containment spray system is an ESF with the following three intended functions: (1) removing thermal energy from the post-accident containment atmosphere to help maintain containment pressure below its design value; (2) removing fission product iodine from the post-accident containment atmosphere; and (3) suppressing steam partial pressure in the upper containment volume from operating deck leakage due to a loss-of-coolant accident. The containment spray system consists of two redundant trains, each with a motor-driven pump, piping, a heat exchanger, two spray headers, and a residual heat removal spray header.

Based on the three intended functions identified above, the applicant identified the following 10 component types of the containment spray system as within the scope of license renewal and subject to an AMR: flow orifices, heat exchanger channel heads, heat exchanger shells, heat exchanger tubes, heat exchanger tube sheets, piping, pump casings, spray nozzles, tubing, and valve bodies. The applicant further identified the intended function of these component types to be maintaining the integrity of the containment spray system pressure boundary, throttling flow, transferring heat, and/or inducing spray flow.

2.3.2.4.2 Staff Evaluation

The staff reviewed Section 2.3.2.4 of the LRA and the associated piping and instrumentation diagrams to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the containment spray system that are within the scope of license renewal in accordance with 10 CFR 54.4. The staff then reviewed the AMR results provided in Table 3.2-4 of the LRA to determine whether the applicant appropriately identified the components belonging to the containment spray system that are subject to an AMR in accordance with 10 CFR 54.21(a)(1). In order to perform a conservative review, the staff focused on those components of the containment spray system that were not identified as meeting the above requirements. The staff also reviewed Section 6.5 of the McGuire UFSAR and Section 6.2.2 of the Catawba UFSAR and did not identify any intended system functions meeting the scoping criteria in 10 CFR 54.4 that were omitted from Section 2.3.2.4 of the applicant's LRA.

The applicant considered within the scope of license renewal all of the components of the containment spray system which support the performance of the system's three intended functions, including the unisolable portions of nonessential miscellaneous piping lines (e.g., fill, drain, and vent lines) connected to essential parts of the system. These unisolable portions do not serve any intended function other than maintaining the pressure boundary of the containment spray system. The staff finds this approach to be acceptable because it is consistent with the scoping criteria of 10 CFR 54.4. However, the staff questioned the applicant's omission of five capped drain and vent lines connected to the main containment spray discharge lines which were not highlighted as within the scope of license renewal on two of the containment spray system piping and instrumentation diagrams. As detailed in a telecommunication summary dated November 14, 2001, the applicant confirmed that these five capped piping lines were considered to be within the scope of license renewal and should have been highlighted. The staff finds the applicant's response satisfactory because (1) it is consistent with license renewal scoping regulation, 10 CFR 54.4, and (2) it is consistent with the general information and descriptions provided in the LRA concerning the containment isolation system.

2.3.2.4.3 Conclusions

The staff concludes that, for both McGuire and Catawba, there is reasonable assurance that the applicant has appropriately identified the components of the containment spray system that are 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).

2.3.2.5 Containment Valve Injection Water System

In Section 2.3.2.5 of the LRA, the applicant described the containment valve injection water system and the components therein which are within the scope of license renewal and subject to an AMR. This system is exclusive to Catawba and is further described in Section 6.2.4 of the Catawba UFSAR.

2.3.2.5.1 Technical Information in the Application

Catawba's containment valve injection water system is an ESF with the intended function of injecting water at a pressure exceeding containment design peak pressure between the two seating surfaces of double-disc gate valves used for containment isolation. The containment valve injection water system thus helps reduce potential offsite dose consequences to less than the values specified in 10 CFR Part 100. The containment valve injection water system has two trains, each consisting of piping headers and a nitrogen-pressurized surge tank.

Based on the intended function identified above, for Catawba only, the applicant identified the following four component types of the containment valve injection water system as within the scope of license renewal and subject to an AMR: piping, tanks, tubing, and valve bodies. The applicant further identified the intended function of these component types to be maintaining the integrity of the containment valve injection water system pressure boundary.

2.3.2.5.2 Staff Evaluation

The staff reviewed Section 2.3.2.5 of the LRA and the associated piping and instrumentation diagrams to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the containment valve injection water system that are within the scope of license renewal in accordance with 10 CFR 54.4. The staff then reviewed the AMR results provided in Table 3.2-5 of the LRA to determine whether the applicant appropriately identified the components belonging to the containment valve injection water system that are subject to an AMR in accordance with 10 CFR 54.21(a)(1). To perform a conservative review, the staff focused on those components of the containment valve injection water system that were not identified as meeting the above requirements. The staff also reviewed Section 6.2.4 of the Catawba UFSAR and did not identify any intended system functions meeting the scoping criteria in 10 CFR 54.4 that were omitted from Section 2.3.2.5 of the applicant's LRA.

The applicant considered all essential portions of the containment valve injection water system as within the scope of license renewal. However, the staff noted that two segments of piping did not appear to be highlighted correctly on one of the containment valve injection water system piping and instrumentation diagrams. As detailed in a telecommunication summary dated November 14, 2001, the applicant confirmed that these two segments of piping were considered to be within the scope of license renewal and should have been highlighted. The staff finds the applicant's response satisfactory because it is consistent with 10 CFR 54.4, and notes that the additional information provided by the applicant is consistent with the general information and descriptions of the containment valve injection water system provided in the LRA.

2.3.2.5.3 Conclusions

The staff concludes that there is reasonable assurance that the applicant has appropriately identified the components of Catawba's containment valve injection water system that are 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).

2.3.2.6 Refueling Water System

In AMR Section 2.3.2.6, "Refueling Water System," the applicant described the components of the refueling water system that are within the scope of license renewal and subject to an AMR.

Section 9 of the Catawba and McGuire UFSARs provides additional information concerning their respective refueling water systems.

2.3.2.6.1 Technical Information in the Application

The Catawba refueling water system provides an adequate supply of borated water to the ECCS and containment spray system in order to mitigate the consequences of a design basis event. The refueling water system, safety injection system, residual heat removal system, and chemical and volume control system together form the ECCS.

The McGuire refueling water system provides a source of borated water to be used during refueling for the ECCS to mitigate the consequences of a UFSAR Chapter 15 accident or as borated makeup water for the spent fuel pool. The system can remove impurities from the refueling cavity and transfer canal during refueling, and it can clean up the refueling water storage tank water following refueling. This can be accomplished by routing flow through the purification loop of the spent fuel pool cooling system. The refueling water system provides a means of transferring the final 30 percent of the refueling water between the refueling cavity and the refueling water storage tank. It also provides a secondary means of filling the refueling cavity from the refueling water storage tank.

Using the methodology described in LRA Section 2.1.2, “Screening Methodology,” the applicant compiled a list of mechanical component commodity groupings within the license renewal boundaries that are subject to an AMR and identified their intended functions. The mechanical components subject to AMR, their intended functions, and materials of construction for the refueling water system are listed in Table 3.2-6. In LRA Table 3.2-6, the applicant lists the following four component commodity groups as subject to an AMR: pipe, refueling water storage tank, tubing, and valve bodies. Table 3.2-6 also lists expansion joints as a component commodity group that is subject to an AMR for the McGuire refueling water system. The applicant states that maintaining pressure boundary integrity is the intended function of the SCs subject to an AMR.

2.3.2.6.2 Staff Evaluation

The staff reviewed Section 2.3.2.6 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the refueling water system SCs that are within the scope of license renewal in accordance with 10 CFR 54.4 and subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the text and diagrams submitted by the applicant in Section 2.3.2.6 of the LRA and the Catawba and McGuire UFSARs to determine if the applicant adequately identified the SSCs of the refueling water system that are in the scope of license renewal. The staff verified that those portions of the refueling water system that meet the scoping requirements of 10 CFR 54.4 are included within the scope of license renewal, and are identified as such by the applicant in Section 2.3.2.6 of the LRA. The staff then focused its review on those portions of the refueling water system that were not identified as within the scope of license renewal to verify that they do not meet the scoping requirements of 10 CFR 54.4. The staff also reviewed the UFSAR to determine if there were any additional system functions that were not identified in the LRA, and verified that those additional functions did not meet the scoping requirements of 10 CFR 54.4.

The staff then determined whether the applicant had properly identified the SCs that are subject to an AMR from among those portions of the refueling water system that are identified as within the scope of license renewal. The applicant identifies and lists the SCs subject to AMR for the refueling water systems in Table 3.2-6 of the LRA using the screening methodology described in Section 2.1 of the LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER. The staff performed its review by sampling the SCs that the applicant determined were within the scope of license renewal but not subject to AMR to verify that these SCs performed their intended functions with moving parts or with a change in configuration or properties or were subject to replacement based on qualified life or specified time period.

The applicant identified the portions of the refueling water system that are within the scope of license renewal in the drawings referenced in the LRA. The detailed flow diagrams were highlighted to identify those portions of the system that are within the scope of license renewal. The applicant highlighted those components which it believed perform at least one of the scoping requirements of 10 CFR 54.4. The staff compared the LRA flow diagrams to the system drawings and the descriptions in the UFSAR to ensure they were representative of the refueling water system. The staff sampled portions of the flow diagram that were not highlighted to verify that these components did not meet any the scoping criteria in 10 CFR 54.4.

During its review, the staff identified several potential discrepancies in the drawings used by the applicant to show which refueling water system components for both Catawba and McGuire are within the scope of license renewal. The discrepancies were that components that should have been shown as within the scope of license renewal were not appropriately marked. By letter dated January 23, 2002, the staff requested, in RAIs 2.3.2.6-2 and 2.3.2.6-3, clarification from the applicant. In its responses dated April 15, 2002, the applicant stated that the components in question were within the scope of license renewal and the drawings had been improperly marked. Based on the above, the staff finds the applicant's responses acceptable.

One of the McGuire refueling water system drawings for Unit 2, MCFD-2571-01.00, shows that the refueling cavity is within the scope of license renewal. The equivalent drawings for Unit 1 and both Catawba units indicate that the refueling cavity is not with the scope of license renewal. In addition, the refueling cavity is not listed in Table 3.2-6, "Aging Management Review Results - Refueling Water System." The UFSARs for both Catawba and McGuire credit the refueling cavity walls as protecting vital equipment and components from the dynamic effects of a postulated pipe break. Accordingly, the staff believed the refueling cavity should be within the scope of license renewal. By letter dated January 23, 2002, the staff requested, in RAI 2.3.2.6-1, the applicant to explain why this component was not highlighted as within scope. In its response dated April 15, 2002, the applicant stated that the refueling cavity is a structural component, and it is within the scope of license renewal. According to the applicant, structural components are not normally shown on flow diagrams, but where they are, the structural components are not addressed by the highlighting conventions. The applicant also stated that AMR results for the refueling cavity are located in Table 3.5-1 of the LRA. Based on the above, the staff finds the applicant's response acceptable.

During its review, the staff identified a potential discrepancy in the drawings used by the applicant to show the minimum-flow piping for the safety injection pumps. The drawings showed that the non-safety-related portion of minimum-flow piping from the isolation valve to

the RWST was not within the scope of license renewal. The staff was concerned that the failure of that piping could prevent the minimum-flow piping from performing its function and result in damage to the safety injection pump. By letter dated January 23, 2002, the staff requested, in RAI 2.3.2.3-4, the applicant to explain why this piping was not indicated as within scope. In its response dated April 15, 2002, the applicant stated that the non-safety-related portions of the minimum-flow piping were not within the scope of license renewal because they did not support any safety injection system intended function. The applicant also stated that a loss of pressure boundary of the non-safety-related portion of the minimum-flow piping did not adversely affect the ability of the safety injection pump to achieve minimum recirculation flow. Because failure of the non-safety-related portions of the minimum flow piping would not prevent the safety-related portion of the safety injection pump from performing its intended function, the staff concludes that the minimum flow piping is outside the scope of license renewal.

2.3.2.6.3 Conclusions

On the basis of its review of the information contained in Section 2.3.2.6 of the LRA, the supporting information in the Catawba and McGuire UFSARs, as described above, and the response to the staff's RAI, dated April 15, 2002, no omissions by the applicant were identified. The staff concludes that there is reasonable assurance that the applicant adequately identified those portions of the refueling water system that are within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.2.7 Residual Heat Removal (RHR) System

2.3.2.7.1 Technical Information in the Application

McGuire Nuclear Station
As described in the LRA, the RHR system transfers heat from the reactor coolant system to the component cooling system to reduce the temperature of the reactor coolant to the cold-shutdown temperature at a controlled rate during the second part of unit cooldown and maintains this temperature until the unit is started up. The RHR system also serves as part of the emergency core cooling system during the injection and recirculation phases of small-break and large-break loss-of-coolant accidents.

Catawba Nuclear Station
The RHR system transfers heat from the reactor coolant system to the component cooling system to reduce the temperature of the reactor coolant to the cold-shutdown temperature at a controlled rate during the second phase of unit cooldown and maintains this temperature until the unit is started up. The RHR system also serves as part of the emergency core cooling system during the injection and recirculation phases of design basis events. The RHR system has several secondary functions, which include transferring refueling water between the refueling water storage tank and the refueling cavity before and after refueling operations, providing overpressure protection to the reactor coolant system, providing reactor coolant letdown flow for pressure control and purification during shutdown and refueling, and providing residual heat removal auxiliary pressurizer spray.

The component types, component functions, materials of construction, environments, aging effects, and aging management programs/activities for the McGuire and Catawba RHR systems are listed in Table 3.2-7 of the LRA. The component types that were identified in the

table include heat exchanger (tubes, tube sheet, channel head and shell); RHR pump seal water (tubes and shell); orifices; heat exchanger RHR pump seal water (cover); pipe; pump casings; tubing; and valve bodies.

2.3.2.7.2 Staff Evaluation

The staff reviewed this section of the LRA to determine whether there is reasonable assurance that the RHR components and supporting structures within the scope of license renewal and subject to AMR have been identified in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1). 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 portions of the McGuire and Catawba UFSARs relevant to the RHR system and associated pressure boundary components and compared the information in the UFSAR with the information in the LRA to identify those portions that the LRA did not identify as 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). For those structures and components that have an applicable intended function(s), the staff sought 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 UFSAR 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 extended period of operation.

The Catawba UFSAR (page 5.4-48) states that “a minimum number of charging auxiliary spray has been included in the piping analysis for inadvertent operation and for emergencies.” Also the McGuire UFSAR (page 9.3-25) states that “after the Residual Heat Removal System is placed in service and the reactor coolant pumps are shut down, further cooling of the pressurizer liquid is accomplished by charging through the auxiliary spray line.” If these statements imply that auxiliary spray is relied upon to mitigate design-basis events, or is relied on in safety analyses or plant evaluations to perform a function that is required by the regulations governing fire protection and station blackout, then the staff believes that the applicant should explain why the spray head (the component which actually sprays the water inside the pressurizer) does not require aging management to detect cracking and/or clogging of the spray holes, or any other age-related degradation over the extended period of operation. The staff requested, in RAI 2.3.2.7-1, that the applicant determine whether the intended function of the pressurizer spray head to depressurize the reactor coolant system is within the scope of license renewal in accordance with 10 CFR 54.4(a)(2) or (3). The staff requested confirmation that the spray head is not credited for immediate pressure reduction during design basis events, postulated fire events, or station blackout. In its response dated April 15, 2002, the applicant provided the following:

Auxiliary spray is not relied upon to mitigate design basis events or to demonstrate compliance with requirements associated with Station Blackout. However, Auxiliary spray is used during the transition between Hot Shutdown (Mode 4) and Cold Shutdown (Mode 5) in order to achieve cold shutdown following a postulated fire in the plant pursuant to the requirements of §50.48. The pressurizer spray head is a full cone center jet nozzle with a flow opening that is approximately three inches in diameter at both McGuire and Catawba Nuclear Stations. The spray nozzle does not resemble a shower head, therefore clogging of spray holes is not a potential aging effect. Cracking of the spray head due to either (1) stress corrosion cracking or (2) reduction in fracture toughness (due to thermal embrittlement) of the cast austenitic stainless steel (CASS) is a potential aging effect. Stress corrosion cracking is managed by the Chemistry Control Program. The Chemistry Control Program is described in Appendix B.3.6 of the Application. Uncertainty exists as to whether reduction in fracture toughness could manifest itself to the point where cracking could occur. Gross cracking and structural damage would be required for the spray head to function improperly. Because of this uncertainty, Duke commits to perform a one time inspection of the pressurizer spray head on one unit as described below to assess the condition of the spray head regarding cracking. The details of the Pressurizer Spray Head Examination follow.

Table 3.[1*]-1 of the Application is supplemented with the following information:

Component Type	Component Function	Material	Environment	Aging Effect	Aging Management Programs and Activities
[**Pressurizer***]					
Pressurizer Spray Head	Spray	Cast Stainless Steel	Borated Water	Cracking	Chemistry Control Program Pressurizer Spray Head Examination

[* corrections were made by the staff to reflect the correct table and component]

Pressurizer Spray Head Examination

Note: The Pressurizer Spray Head Examination is generically applicable to both McGuire Nuclear Station and Catawba Nuclear Station, except as otherwise noted.

The purpose of the Pressurizer Spray Head Examination is to characterize any cracking of the spray head due to reduction in fracture toughness (due to thermal embrittlement) of the cast austenitic stainless steel (CASS) in the environment of the pressurizer steam space. Uncertainty exists as to whether exposure of the CASS spray head in this environment could result in cracking such that the spray head spray function could become degraded or completely lost during the period of extended operation. This examination will visually inspect one spray head for cracking. The Pressurizer Spray Head Examination is a one-time-inspection.

Duke plans to inspect the operating unit with the most hours at operating temperature among the four units at McGuire and Catawba. McGuire Unit 1 is expected to be the lead unit for this inspection since it is expected to have the most hours of operation among the four units at McGuire and Catawba. After the results of the McGuire Unit 1 inspection are evaluated, additional examinations may be performed on the spray heads at McGuire Unit 2 and Catawba Units 1 and 2.

[Scope] The scope of the Pressurizer Spray Head Examination is the internal spray heads of the McGuire and Catawba pressurizers.

[Preventive Actions] No actions are taken as part of this program to prevent aging effects or mitigate aging degradation.

[Parameters Monitored of Inspected] The parameter inspected by the Pressurizer Spray Head Examination is cracking of the pressurizer spray head due to reduction in fracture toughness (thermal embrittlement).

[Detection of Aging Effects] The Pressurizer Spray Head Examination is a one-time inspection and will detect the presence of cracking of the pressurizer spray heads.

[Monitoring & Trending] The Pressurizer Spray Head Examination is a visual examination (VT-3) of the pressurizer spray head. No actions are taken as part of this program to trend inspection or test results.

For McGuire, this new inspection will be completed following issuance of renewed operating licenses for McGuire Nuclear Station and by June 12, 2021 for McGuire Unit 1. Any required inspection of the Unit 2 pressurizer spray head will be completed following issuance of renewed operating licenses for McGuire Nuclear Station and by March 3, 2023 for McGuire Unit 2.

For Catawba, if necessary following the results of the McGuire Unit 1 examination, this new inspection will be completed following issuance of renewed operating licenses for Catawba Nuclear Station by December 6, 2024 for Catawba Unit 1 and by February 24, 2026 for Catawba Unit 2.

[Acceptance Criteria] The acceptance criterion for Pressurizer Spray Head Examination will be in accordance with ASME Section XI, VT-3 examinations.

[Corrective Action & Conformation Process] If the results of the inspection do not meet the specified acceptance criterion, then corrective actions will be taken such as replacing the affected spray heads. If cracks are detected in the initial spray head visual examination, then visual examinations will be conducted on the spray heads for McGuire Unit 2 and Catawba Units 1 and 2. Specific corrective actions and confirmation are implemented in accordance with the corrective action program.

[Administrative Controls] The Pressurizer Spray Head Examination will be implemented by plant procedures and the work management system.

[Operating Experience] The Pressurizer Spray Head Examination is a new inspection for which there is not operating experience. However, a similar inspection was reviewed and deemed acceptable by the NRC staff for Oconee, as stated in the conclusions below.

Conclusion - The Pressurizer Spray Head Examination is similar to the corresponding Pressurizer Examination described and evaluated in NUREG-1723. Based on the above review, the implementation of the Pressurizer Spray Head Examination will ensure the pressurizer spray head will continue to perform its intended function for the period of extended operation.

The McGuire and Catawba UFSAR Supplements will be revised to include the above mentioned summary description of the Pressurizer Spray Head Examination.

The staff agrees with the applicant's conclusion that the pressurizer spray head is within the scope of license renewal and is subject to an AMR. The staff's evaluation of the proposed aging management programs and activities for the pressurizer spray head, as presented above, is documented in Section 3.1.2.2 of this SER.

2.3.2.7.3 Conclusions

On the basis of its review of the information presented in Section 2.3.2.7 of the LRA, the supporting information in the McGuire and Catawba UFSARs, and the applicant's response to the requests for additional information, the staff determined that the applicant did not include the pressurizer spray head of the auxiliary spray system as within the scope of license renewal and subject to an AMR for McGuire and Catawba. However, the applicant subsequently added the pressurizer spray head to the scope of components subject to an AMR. No additional omissions were identified; therefore, the staff concludes that there is reasonable assurance that the applicant adequately identified those portions of the RHR and its associated (supporting) structures and components that fall within the scope of license renewal and are subject to an AMR, in accordance with 10 CFR Part 54.4(a) and 10 CFR Part 54.21(a)(1).

2.3.2.8 Safety Injection System (SIS)

2.3.2.8.1 Technical Information in the Application

The SIS constitutes a major portion of the emergency core cooling system. Along with the RHR, chemical and volume control, and refueling water systems, the SIS provides emergency cooling to the reactor core in the event of a break in either the primary (reactor coolant) or secondary (steam) systems. The three primary functions of the emergency core cooling system are (1) removing stored (sensible) and fission product decay heat, (2) controlling reactivity, and (3) precluding reactor vessel boron precipitation. The SIS supports each of these functions.

The component types, component functions, materials of construction, environments, aging effects, and aging management programs/activities for the McGuire and Catawba SISs are listed in Table 3.2-8. The component types that were identified in the table include orifices; pipe; cold-leg accumulators; pump casings; tubing; and valve bodies.

2.3.2.8.2 Staff Evaluation

The staff reviewed this section of the LRA to determine whether there is reasonable assurance that the SIS and associated pressure boundary components and supporting structures within the scope of license renewal and subject to AMR have been identified in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1). 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 portions of the McGuire and Catawba UFSARs relevant to the SIS and associated pressure boundary components and compared the information in the UFSAR with the information in the LRA to identify those portions that the LRA did not identify as 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). For those structures and components that have an applicable intended function(s), the staff sought 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 UFSAR 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 extended period of operation.

The UFSARs for Catawba (page 6.2-46) and McGuire (page 17.1-2), state that screen assemblies and vortex suppressors are used in the containment sump, which provides water for the ECCS recirculation phase, and one of the intended functions is to protect the ECCS pumps from debris and cavitation due to harmful vortex following an LOCA. The staff noted that the sump screens were identified in Table 3.5-1, “(AMR Results - Reactor Building;” however, the vortex suppressors were not identified in the LRA as within scope and requiring an AMR. By

letter dated January 23, 2002, the staff requested, in RAI 2.3.2.8-1, the applicant to explain the reason for the omission. In its response dated April 15, 2002, the applicant explained that the vortex suppressor is a sub-component of the recirculation intake sump screen assembly, is subject to AMR and is addressed in Table 3.5-1 (page 3.5-9, row 3) of the LRA. Each sump screen assembly consists of filtering screen panels which surround the recirculation lines intake and extend to the floor. The screen panels consist of vortex suppressor grates, which prevent local vortex disturbances and large debris from reaching the inner fine screen. The inner fine screen prevents particles that are large enough to impair ECCS or containment spray performance from being drawn into these systems. UFSAR Figures 6-111 (Catawba) and 6-196 (McGuire) provide diagrams of the containment sump assemblies (including vortex suppressors). This above clarification is acceptable, and the staff did not identify any omissions.

2.3.2.8.3 Conclusions

On the basis of its review of the information presented in Section 2.3.2.8 of the LRA, the supporting information in the McGuire and Catawba UFSARs, and the applicant's response to the RAI, the staff did not find any omissions by the applicant and, therefore, concludes that there is reasonable assurance that the applicant adequately identified those portions of the SIS and its associated (supporting) structures and components that fall within the scope of license renewal and are subject to an AMR, in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1).

2.3.2.9 Miscellaneous Instrumentation System

In its April 15, 2002, response to RAI 2.3.2.3-2, the applicant described the miscellaneous instrumentation system at McGuire and Catawba and the components therein which are within the scope of license renewal and subject to an AMR. The applicant had inadvertently omitted this system from the scoping and AMR screening review submitted in the LRA.

2.3.2.9.1 Technical Information in the Application

The mechanical components of the miscellaneous instrumentation system support the following three components or systems: (1) the safety-related containment hydrogen analyzers; (2) the containment integrated leakage rate testing system; and (3) the containment radiation monitors. The intended function of the safety-related hydrogen analyzers is to provide the capability for monitoring the hydrogen concentration within the containment at three different locations following a postulated accident. The intended function of the mechanical components supporting the integrated leakage rate testing system and containment radiation monitors is to isolate the non-essential containment penetrations serving these components to prevent the uncontrolled or unmonitored release of radioactivity to the environment.

Based on the intended functions identified above, the applicant identified the following three component types of the miscellaneous instrumentation system as within the scope of license renewal and subject to an AMR: valve bodies, tubing, and piping (McGuire 1 only). The applicant further identified the intended function of these component types as maintaining the integrity of the miscellaneous instrumentation system pressure boundary.

2.3.2.9.2 Staff Evaluation

The staff reviewed RAI Response 2.3.2.3-2, dated April 15, 2002, to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the miscellaneous instrumentation system that are within the scope of license renewal in accordance with 10 CFR 54.4. The staff then reviewed the LRA table of AMR results included with the applicant's response to RAI 2.3.2.3-2 to determine whether the applicant appropriately identified the components belonging to the miscellaneous instrumentation system that are subject to an AMR in accordance with 10 CFR 54.21(a)(1). In order to perform a conservative review, the staff focused on those components of the miscellaneous instrumentation system that were not identified as meeting the above requirements. The staff also reviewed the McGuire and Catawba UFSARs and did not identify any intended system functions meeting the scoping criteria in 10 CFR 54.4 that were omitted by the applicant.

The applicant considered the safety-related hydrogen analyzers and their supporting mechanical components to be within the scope of license renewal. The hydrogen analyzers employ an electrochemical process and, as their functioning involves a change of state, are not subject to an AMR. However, the applicant identified that the tubing and valve bodies which connect the containment atmosphere to the hydrogen analyzers are passive, long-lived components subject to an AMR. For the containment integrated leakage rate testing system and the containment radiation monitors, the applicant considered only the safety-related valve bodies, tubing, and piping used for containment isolation to be within the scope of license renewal and subject to an AMR. As the integrated leakage rate testing system and containment radiation monitors are not otherwise relied upon to satisfy assumptions made in the safety analyses for McGuire or Catawba, the staff finds the applicant's approach acceptable.

2.3.2.9.3 Conclusions

The staff has concluded that, for both McGuire and Catawba, there is reasonable assurance that the applicant has appropriately identified the components of the miscellaneous instrumentation system that are 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).

2.3.3 System Scoping and Screening Results: Auxiliary Systems

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

2.3.3.1 Auxiliary Building Ventilation (VA) System

In LRA Section 2.3.3.1, “Auxiliary Building Ventilation System,” the applicant identified portions of the VA system and the components that are within the scope of license renewal and subject to AMR. In this section of the LRA, the applicant stated that the VA system is further described in McGuire UFSAR Section 9.4.2 and Catawba UFSAR Section 9.4.3.

The applicant evaluated component supports for VA system ductwork within Table 3.5-3 of the LRA. The applicant evaluated electrical components that support the operation of the systems in Section 2.1.2 of the LRA. The staff’s scoping evaluation of structures and component supports is provided in Section 2.4 of this SER. The staff’s evaluation of electrical components and instrumentation and controls in the VA system is documented in Section 2.5 of this SER.

2.3.3.1.2 Technical Information in the Application

The VA system automatically aligns to maintain the emergency core cooling system (ECCS) pump rooms at a negative pressure with respect to the adjacent areas so that effluent from these rooms is filtered prior to being released to unit vents following a design basis accident. The ECCS pump rooms include the safety injection pumps, residual heat removal pumps, centrifugal charging pumps, and containment spray pumps.

The VA system serves all areas of the auxiliary building with the exception of the control room and fuel handling areas. Ventilation air is supplied to both clean and potentially contaminated areas of the auxiliary building. Control of airborne activity is accomplished by exhausting air supplied to clean areas through the potentially contaminated areas. This air in turn is processed by the filtered exhaust subsystem. This provides a positive flow of air from clean areas to areas of potential contamination. The remaining air supplied to clean areas is exhausted by the unfiltered exhaust subsystem. All air exhausted from the auxiliary building, both filtered and unfiltered, is directed to the unit vent. Exhaust air is monitored for radiation prior to an atmosphere release.

During normal operation, the VA system supply and exhaust fans are automatically stopped upon indication of high radiation level in the unit vent. Upon receipt of an ESF actuation signal, all VA system components automatically stop. The filtered exhaust subsystems have two separate and redundant trains. The filtered exhaust subsystem automatically cycles on with emergency Class 1E standby power. With the exception of the ECCS pump rooms, all areas of the auxiliary building are automatically isolated from the filtered exhaust system.

In Section 2.3.3.1 the LRA and Sections 9.4.2 and 9.4.3 of the UFSAR, the applicant identified the following intended functions of the McGuire and Catawba VA system based on 10 CFR 54.4(a)(1) and 10 CFR 54.4(a)(2):

McGuire

Section 2.3.3.1 of the LRA:

- To automatically align to maintain the ECCS pump rooms at a negative pressure so that air exhausted from these rooms is filtered prior to being released following a DBA.

Section 9.4.2 of the UFSAR:

- To maintain a suitable environment for the operation of equipment and personnel access as required for inspection, testing, and maintenance.
- To hold the auxiliary building at a slightly negative pressure to minimize outleakage.
- To purge the auxiliary building to the unit vent. The air that is exhausted to the environment from potentially contaminated areas is monitored and filtered so that the limits of 10 CFR Part 20 and the technical specifications are not exceeded.
- Provide a suitable environment for the operation of vital equipment during an accident.

Catawba

Section 2.3.3.1 of the LRA:

- To automatically align and maintain the ECCS pump rooms at a negative pressure so that air exhausted from these rooms are filtered prior to release following a design basis accident.

Section 9.4.3 of the UFSAR:

- To maintain a suitable environment for the operation, maintenance, and testing of equipment.
- To maintain a suitable environment for personnel access.
- To minimize the release of radioisotopes from the ECCS pump rooms during accident conditions.

On the basis of the intended functions identified above for the VA system, the portions of this system that were identified by the applicant as within scope include all VA system safety-related components (electrical, mechanical, and instruments). The applicant described its methodology for identifying the mechanical components subject to an AMR in Section 2.1.2.1.2 of the LRA. On the basis of this methodology, the applicant identified the portions of the VA system that are within the scope of license renewal on the flow diagrams listed in Section 2.3.3.1 of the LRA. Using the methodology described in Section 2.2.1 of the LRA, the applicant compiled a list of the mechanical components and component types subject to an AMR that are within the evaluation boundaries highlighted on the flow diagrams and identified their intended functions. The applicant provided this list in Table 3.3-1 of the LRA.

The following component types are identified in Table 3.3-1 as within scope of LRA and subject to an AMR: airflow monitors, ductwork, filters, tubing, and containment spray pump motor air handling unit plenum and heat exchanger. In Table 3.3-1 of the LRA the applicant noted that the VA system pressure boundary and heat exchanger functions are the only applicable intended functions of VA system components subject to an AMR.

2.3.3.1.3 Staff Evaluation

To verify that the applicant identified the components of the VA system within the scope of license renewal and subject to an AMR, in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1), the staff reviewed the flow diagrams listed in Section 2.3.3.1 of the LRA showing the evaluation boundaries for the highlighted portion of the VA system within the scope of license renewal, and Table 3.3-1 of the LRA, which lists the mechanical components and applicable intended functions subject to an AMR. The staff also reviewed Sections 9.4.2 and 9.4.3 of the UFSAR to determine if there were any portions of the VA system that met the scoping criteria in 10 CFR 54.4(a) but were not identified as being within the scope. The staff reviewed the UFSAR also to determine if there were any safety-related system functions that were not identified as intended functions in the LRA, and if there were any structures or components that have an intended function that might have been omitted from the scope of structures or components that require an AMR. The staff compared the functions described in the UFSAR to those identified in the LRA.

The applicant identified the structures and components subject to an AMR for the VA system using the screening methodology described in Section 2.1 of the LRA and listed them in Table 3.3-1 of the LRA. The staff evaluated the scoping and screening methodology in Section 2.1 of this SER. The staff sampled structures and components from Table 3.3-1 of the LRA to verify that the applicant identified the structures and components subject to an AMR. The staff also sampled the structures and components that are within the scope of license renewal but not subject to an AMR. Based on the sample, the staff verified that these structures and components perform their intended functions without moving parts or without a change in configuration or properties and are not subject to replacement on the basis of a qualified life or specified time period.

To ensure that those portions of the VA system excluded from scope do not perform any intended functions, the staff determined that additional information was needed to clarify information in the UFSAR and LRA. The staff noted that LRA Section 2.3.3.1 presents a summary description of the system functions and a listing of flow diagrams. The flow diagrams highlight the evaluation boundaries and Table 3.3-1 of the LRA tabulates the components within the scope of license renewal and subject to an AMR for the VA system. However, the corresponding drawings and information in the UFSAR indicate that additional components were not listed in Table 3.3-1 of the LRA.

The staff noted that the applicant did not identify housings for active components that require an AMR. The determination should consider whether failure of the housing would result in a failure of the associated active component to perform its intended function and whether the housing meets the long-lived and passive criteria as defined in the rule.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-1, specific information concerning the exclusion of fan housings from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant stated that cooling fans are not included in the AMR results tables in the LRA. The applicant goes on to state that those cooling fans, without sub-component exceptions, are explicitly excluded from an AMR by 10 CFR 54.21. The staff reviewed this response and determined that the applicant's basis for excluding fan housings is not consistent with the license renewal rule because the housings are relied upon to maintain pressure boundary integrity (as are valve bodies and pump casings) and are within the scope of license renewal. Furthermore, because the fan housings are passive and long-lived

components, they are subject to an AMR. The staff finds this response unacceptable and characterizes this issue as open item 2.3-1.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-2, specific information concerning the exclusion of damper housings from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant stated that dampers are not included in the AMR result tables in the LRA. The applicant added that ventilation dampers, without sub-component exceptions, are explicitly excluded from an AMR by 10 CFR 54.21. The staff reviewed this response and has determined that the applicant's basis for excluding damper housings is not consistent with the license renewal rule because the housings are relied upon to maintain pressure boundary integrity (as are valve bodies and pump casings) and are within scope of license renewal. Furthermore, because the damper housings are passive and long-lived components, they are subject to an AMR. The staff finds this response unacceptable and characterizes this issue as open item 2.3-2.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-3, specific information concerning the exclusion of housings for radiation monitors, smoke detectors and air flow monitors from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant stated that, based on guidance provided in NEI 95-10, Revision 3, radiation monitors, smoke detectors, and chlorine detectors are not considered passive components and are therefore not subject to an AMR. Because these monitors and detectors do not perform an intended function as defined in 10 CFR 54.4, the staff finds the applicant's response acceptable.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-4, specific information concerning the exclusion of building sealants from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant stated that it does not classify materials such as sealants to be structures or components. The applicant stated the pressure boundary function is addressed by TS surveillance testing. However, the applicant did not indicate that any of the TS surveillance requirements listed in its response were credited for aging management (and identified as AMPs). Nor did the applicant furnish a description of or information pertaining to a TS surveillance AMP (including discussion of the 10 elements of the AMP) for the staff's review.

On page 2.1-4 of the LRA, the applicant stated that "seals associated with maintaining pressure boundary are limited to the divider barrier seals in the reactor building." Since the applicant does not discuss the treatment of structural sealants other than the divider barrier seal, it is not clear to the staff that building (structural) sealants were considered during an AMR of the structure (building) for which they are a sub-component. Furthermore, according to page 3.5-10 of the LRA, the Inspection Program for Civil Engineering Structures and Components is credited by the applicant to monitor the aging of building concrete structural components (reinforced concrete beams, columns, floor slabs, and walls). According to Section B.3.21 of the LRA, the scope of the Inspection Program for Civil Engineering Structures and Components does not include structural sealants. Table 2.1-3, on page 2.1-15 of the SRP-LR, states that an applicant's structural AMP is expected to address structural sealants "with respect to an AMR program." The intent of this statement is that an applicant's structural AMP is expected to manage or monitor the aging effects of the structure and associated sub-components that are identified during the AMR. The basis for this SRP guidance is documented in the summary (issued January 21, 2000) of a December 8, 1999, meeting to discuss the staff's position on the

treatment of consumables. This summary clearly states, on page 3, that structural sealants would be implicitly included at the component level and considered during the AMR. Since the structural AMP identified for the concrete structural components does not address structural sealants, and since that applicant did not identify the TS surveillances listed in its response as AMPs or provide appropriate information to support the staff's review of these surveillances as AMPs, the staff characterizes this issue as open item 2.3-3.

By letter dated January 23, 2002, the staff requested, in RAIs 2.3-5 and 2.3-7(4), specific information concerning the exclusion of passive components associated with ductwork from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant identified these passive components as sub-components of ductwork. The applicant also stated that ventilation grilles were installed only for aesthetic purposes and perform no intended license renewal function. Because the components serve only an aesthetic purpose and perform no intended function, the staff concludes they are outside the scope of license renewal.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-7(1), specific information concerning the exclusion of passive components associated with moisture eliminators from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant clarified the highlighting and identified moisture eliminators as sub-components subject to an AMR. On the basis of the information provided, the staff finds the applicant's response acceptable.

Some components that are common to many systems, including the VA system, have been evaluated separately by the applicant in Section 2.1.2.1.2 of the LRA as "replace on condition" commodities. The staff's evaluation of applicant's treatment of these consumables is documented in Section 2.1.3.2.1 of this SER.

In Section 2.4.3 of this report the staff evaluated component supports for piping, cables, and equipment that supported the design and operation of the VA system. In Section 2.5 of the LRA titled, "Scoping and Screening Results: Electrical and Instrumentation and Controls," the staff evaluated electrical and instrument components that support the operation of the VA system.

The staff reviewed the LRA, supporting information in the UFSARs, and the applicant's responses to RAIs. In addition, the NRC staff sampled several components from the VA system flow diagram, as identified in LRA Section 2.3.3.1 to determine whether the applicant properly identified the components within scope and subject to an AMR. No omissions were identified, except as identified in the RAIs.

2.3.3.1.4 Conclusions

On the basis of its review, with the exception of open items identified in this SER section, the staff has reasonable assurance that the applicant has adequately identified the VA system structures and components that are within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4 and 10 CFR 54.21, respectively.

2.3.3.2 Boron Recycle System

2.3.3.2.1 Technical Information in the Application

McGuire Nuclear Station: As described in the LRA, the boron recycle system receives borated effluent from the reactor coolant system and associated support systems. This borated effluent is demineralized, filtered, and separated into 4 weight percent boric acid and reactor makeup water for reuse. The boron recycle system also provides reactor grade flush water for components in the auxiliary and reactor buildings.

Catawba Nuclear Station: The boron recycle system receives and recycles reactor coolant effluent for reuse of the boric acid and makeup water. The system decontaminates the effluent by means of demineralization and gas stripping and uses evaporation to separate and recover the boric acid and makeup water. Portions of the boron recycle system are shared between both reactor units, while other portions are unit specific.

The component types, component functions, materials of construction, environments, aging effects, and aging management programs/activities for the McGuire and Catawba boron recycle system are listed in Table 3.3-2 of the LRA. The component types that were identified in the table include eductors, filters, flow meters, orifices, pipe, recycle evaporative feed demineralizers, recycle holdup tanks, strainers, tubing, and valve bodies.

2.3.3.2.2 Staff Evaluation

The staff reviewed this section of the LRA to determine whether there is reasonable assurance that the boron recycle system 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). 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 UFSARs for McGuire and Catawba on the boron recycle system and associated pressure boundary components and compared the information in the UFSAR with the information in the LRA to identify those portions that the LRA did not identify as 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). For those structures and components that have an applicable intended function(s), the staff sought 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 UFSAR 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 extended period of operation.

The staff did not identify any omissions.

2.3.3.2.3 Conclusions

On the basis of its review of the information presented in LRA Section 2.3.3.2 and the supporting information in the McGuire and Catawba UFSARs, the staff did not find any omissions by the applicant and, therefore, concludes that there is reasonable assurance that the applicant adequately identified those portions of the boron recycle system and its associated (supporting) structures and components that fall within the scope of license renewal and are subject to an AMR, in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1).

2.3.3.3 Building Heating Water System

In LRA Section 2.3.3.3, "Building Heating Water," the applicant described the components of the McGuire heating water system and the Catawba building heating water system that are within the scope of license renewal and subject to an AMR. For simplification the systems will be referred to as the building heating water system for both McGuire and Catawba when addressing common review attributes. The staff reviewed the LRA for McGuire and Catawba to determine whether the applicant has adequately demonstrated that the requirements of 10 CFR Part 54 have been met.

2.3.3.3.1 Technical Information in the Application

The McGuire Nuclear Station heating water system satisfies normal heating requirements of the auxiliary building ventilation system, fuel pool ventilation system, containment and incore instrumentation room purge system, service building ventilation system, and the turbine building heating system. The Catawba Nuclear Station building heating water system supplies hot water to the heating coils of various HVAC units throughout the plant.

The applicant described the process for identifying the SSCs within the scope of license renewal in LRA Section 2.1.1, "Scoping Methodology," and its process for identifying the SSCs subject to an AMR in LRA Section 2.1.2, "Screening Methodology." Using the methodology described in LRA Section 2.1.1, the applicant listed the systems and structures that are within the scope of license renewal in LRA Tables 2.2-1 and 2.2-2 for McGuire and Catawba, respectively. The McGuire heating water system is listed on page 2.2-3 of LRA Table 2.2-1. The Catawba building heating water system is listed on page 2.2-7 of LRA Table 2.2-2.

The LRA notes that the only portions of the building heating water system subject to AMR are the Duke Class F portions of the building heating water system that are in scope at Catawba and McGuire. Using the methodology described in Section 2.1.2 of the LRA, the applicant listed the McGuire and Catawba mechanical components that are subject to an AMR in Table 3.3-3, "Aging Management Results - Building Heating Water System." This table also lists the intended function of each component and the materials of construction. The applicant identified the following components from the building heating water system that are subject to an AMR: pipes and valve bodies. The applicant identified maintaining pressure boundary integrity as the only intended function of the SCs subject to an AMR.

2.3.3.3.2 Staff Evaluation

The staff reviewed Section 2.3.3.3 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the building heating water system that are within the scope of license renewal in accordance with 10 CFR 54.4 and to

verify that the applicant appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information presented in Section 2.3.3.3 of the LRA and the applicable piping and instrument drawings referenced therein to determine if the applicant adequately identified the portions of the building heating water system that are within the scope of license renewal. The building heating water system is a non-safety-related system whose postulated failure could prevent satisfactory accomplishment of certain safety-related functions. To preclude these postulated failures, portions of this system are seismically designed (i.e., Duke Class F). The applicant included all components within the seismically designed piping boundaries of this system within the scope of license renewal per 10 CFR 54.4(a)(2). The staff verified that those portions of the building heating water system that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified by the applicant in LRA Section 2.3.3.3. To verify that the applicant did include the applicable portions of the building heating water system within the scope of license renewal, the staff focused its review on those portions of the building heating water system that were not identified as within the scope of license renewal to verify that they did not meet the scoping criteria of 10 CFR 54.4.

During its review of Catawba drawings CN-1606-1, CN-1606-1.6, CN-1606-1.7, CN-1606-1.8, and CN-1606-1.9, the staff observed that the boundaries end in segments of pipe that are non-isolable and did not appear to coincide with structural boundaries (e.g., building walls). By letter dated January 28, 2002, the staff asked, in RAI 2.3.3.3-1, why the termination of Class F piping depicted on the license renewal drawings was at locations other than building walls or valves for the Catawba building heating water system. In its response dated April 15, 2002, the applicant noted that for the building heating system, it was determined that only loss of pressure boundary in the large-diameter piping in the auxiliary building is a concern for flooding; therefore, the small-diameter piping and the piping in the turbine building is not designated as Class F. The piping class breaks occur at the branch line tees and at the auxiliary building/turbine building wall. The applicant stated that the piping class breaks on the flow diagram are misleading. On drawing CN-1606-1.0, the class break is shown at a flange inside the auxiliary building. Applicant review of layout drawings indicated that the class break occurs on the turbine building side of the auxiliary building/turbine building wall. Of the other locations questioned by the staff on the remaining flow diagrams, the applicant review of layout drawings indicated that the class break occurs at the branch line tees, although the flow diagrams indicate the class break is some distance down the small-diameter piping. The applicant entered a corrective action report into the corrective action program to clarify the flow diagrams. The applicant confirmed that the piping and valves associated with the Class F portions of these lines are contained in LRA Table 3.3-3. Notwithstanding the clarification of the boundaries on the Catawba LRA drawings discussed above, the staff did not identify any omissions in the applicant's scoping review.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the building heating water system that are identified as within the scope of license renewal. The applicant listed the SCs subject to AMR for the building heating water system in Table 3.3-3 of the LRA using the screening methodology described in Section 2.1 of the LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER.

The applicant identified the portions of the building heating water system that are within the scope of license renewal by drawings referenced in LRA Section 2.3.3.3. In addition, the applicant lists the pipe and valve body mechanical component commodity groups that are subject to AMR and their intended function(s) in Table 3.3-3 of the LRA.

The license renewal drawings were highlighted by the applicant to identify those portions of the building heating water system meet at least one of the scoping criteria of 10 CFR 54.4. The staff performed its review by sampling the SCs that the applicant determined to be within the scope of license renewal but not subject to an AMR, to verify that no structure or component that performs its intended function(s) without moving parts or without a change in configuration or properties and that is not subject to replacement on the basis of qualified life or specified time period was excluded from an AMR. The staff did not identify any omissions.

2.3.3.3.3 Conclusions

On the basis of its review of the information contained in Section 2.3.3.3 of the LRA and the LRA drawings, the staff did not identify any omissions in the scoping of the building heating water system by the applicant. The staff concludes that there is reasonable assurance that the applicant has identified those portions of the McGuire heating water system and the Catawba building heating water system that are within the scope of license renewal, and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a), and 10 CFR 54.21(a)(1), respectively.

2.3.3.4 Chemical and Volume Control System (CVCS)

2.3.3.4.1 Technical Information in the Application

The CVCS is an integral part of the emergency core cooling system and provides high-pressure injection and recirculation of borated water to the reactor coolant system cold legs following small-break and large-break loss-of-coolant accidents, and main steam line breaks. The CVCS is also used to provide negative reactivity to the core by boron injection.

The component types, component functions, materials of construction, environments, aging effects, and aging management programs/activities for the McGuire and Catawba CVCS systems are listed in Tables 3.3-4 and 3.3-5 of the LRA, respectively. The component types that were identified in the tables include boric acid blenders, recirculating pump casings, filters, tank, and transfer pump casings; boron meters; cation bed demineralizer resin traps; cation bed demineralizers; centrifugal charging pump casings; excess letdown heat exchanger channel head, tube sheet, tubes, and shell; flow meters (turbine meters); letdown heat exchanger channel head, shell, tube sheet, and tubes; mixed bed demineralizers; mixed bed demineralizer resin traps; orifices; pipe; reactor coolant filters; reciprocating charging pump accumulators non-wetted and wetted; reciprocating charging pump casings and suction stabilizers; regenerative heat exchanger shell, channel head, tube sheet, tubes, and interconnecting piping; seal water heat exchanger channel head, shell, tubes, and tube sheet; seal water injection filters; seal water return filters; spray nozzles (volume control tank); standby makeup pump casings, filters, discharge strainer, pulsation dampener (non-wetted and wetted), and suction dampener (non-wetted and wetted); tubing; valve bodies; volume control tanks; reciprocating charging pump discharge pulsation dampeners (bellows exterior and interior); reciprocation charging pump suction pulsation dampeners (bellows exterior and interior); standby makeup suction pulsation dampener (bellows exterior and interior); strainers (simplex); tubing; standby

makeup discharge pulsation dampener (bellows exterior and interior); and volume control tank spray nozzles.

2.3.3.4.2 Staff Evaluation

The staff reviewed this section of the LRA to determine whether there is reasonable assurance that the CVCS system and associated pressure boundary components and supporting structures within the scope of license renewal and subject to AMR have been identified in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1). 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 UFSARs for McGuire and Catawba for the CVCS and associated pressure boundary components and compared the information in the UFSAR with the information in the LRA to identify those portions that the LRA did not identify as 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). For those structures and components that have applicable intended functions, the staff sought to verify that they either perform these functions 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 UFSAR to determine if any functions delineated under 10 CFR 54.4(a) were not identified as intended functions in the LRA to verify that the systems, structures, and components that perform these functions will be adequately managed so that the functions will be maintained consistent with the CLB for the extended period of operation.

On November 14, 2001, after completing the initial review, the staff and applicant participated in a conference call to clarify information presented in the LRA pertaining to scoping of certain components. During the conference call, the staff noted that CVCS flow diagram CN-1554-1.6 indicates that the piping from isolation valve 1NV145 to the inlet of the letdown heat exchanger is categorized as line-listing 07 (Duke Class B, ASME Class 2). Portions of this line are highlighted to be within the scope of license renewal. The staff requested that the applicant explain why a portion of the line including isolation valve 1NV145 to the inlet of the letdown heat exchanger is not within the scope of license renewal. The applicant indicated that the referenced piping was within the scope of license renewal, and noted that the drawing was in error.

The staff also referred the applicant to flow diagrams CN-1554-1.6 and CN-2554-1.6, which indicate that piping from the CVCS letdown line up to and including valve 1NV152 (for Catawba 1) and 2NV152 (for Catawba 2) are line-listing 19 (Duke Class B, ASME Class 2). The staff requested that the applicant explain why these portions of the CVCS are not within the scope of license renewal. The applicant indicated that the referenced piping was within the scope of license renewal, and noted that the drawing was in error.

The staff did not identify any omissions.

2.3.3.4.3 Conclusions

On the basis of its review of the information presented in Section 2.3.3.4 of the LRA, the supporting information in the McGuire and Catawba UFSARs, and the applicant's response to the requests for additional information, the staff did not find any omissions by the applicant and, therefore, concludes that there is reasonable assurance that the applicant adequately identified those portions of the CVCS and its associated (supporting) structures and components that fall within the scope of license renewal and are subject to an AMR, in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1).

2.3.3.5 Component Cooling System

In LRA Section 2.3.3.5, "Component Cooling System," the applicant described the components of the component cooling system that are within the scope of license renewal and subject to an AMR. This system is described in Section 9.2.4 of the McGuire UFSAR and Section 9.2.2 of the Catawba FSAR. The staff reviewed the LRA and the UFSAR for McGuire and Catawba to determine whether the applicant has adequately demonstrated that the requirements of 10 CFR Part 54 have been met.

2.3.3.5.1 Technical Information in the Application

For both McGuire and Catawba, the component cooling system is a closed-loop system relied upon to maintain cooling to the essential header components as required for plant conditions, maintain an intermediate pressure boundary between the reactor coolant system and the nuclear service water system to prevent potential radioactive release, provide containment isolation, and maintain containment closure for shutdown.

The applicant described the process for identifying the SSCs within the scope of license renewal in LRA Section 2.1.1, "Scoping Methodology," and its process for identifying the SSCs subject to an AMR in LRA Section 2.1.2, "Screening Methodology." Using the methodology described in LRA Section 2.1.1, the applicant listed the systems and structures that are within the scope of license renewal in LRA Tables 2.2-1 and 2.2-2 for McGuire and Catawba, respectively. The McGuire component cooling system is listed on page 2.2-3 of LRA Table 2.2-1. The Catawba component cooling system is listed on page 2.2-7 of LRA Table 2.2-2.

Using the methodology described in Section 2.1.2 of the LRA, the applicant listed the McGuire and Catawba mechanical components that are subject to an AMR in Table 3.3-6, "Aging Management Results - Component Cooling System (McGuire Nuclear Station)," and Table 3.3-7, "Aging Management Results - Component Cooling System (Catawba Nuclear Station)," respectively. These tables also list the intended function of each component and the materials of construction. For both McGuire and Catawba the applicant identified the following components from the component cooling system that are subject to an AMR: flexible hoses; heat exchanger tubes; heat exchanger tube sheets; heat exchanger shells; heat exchanger channel heads; manifolds; orifices; pipe; pump casings; tanks; and valves bodies. For Catawba only, the applicant additionally identified annubar tubes as components subject to an AMR.

The applicant stated that the intended functions of the components are to provide heat transfer so that system and/or component operating temperatures are maintained; maintain mechanical pressure boundary integrity to ensure that sufficient flow and/or pressure are delivered; to

isolate containment for fission product retention; to prevent physical interaction with safety-related equipment; to provide throttling so that sufficient flow and/or sufficient pressure is delivered; and to provide back-pressure, to reduce pressure, or provide differential pressure.

2.3.3.5.2 Staff Evaluation

The staff reviewed Section 2.3.3.5 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the component cooling system that are within the scope of license renewal in accordance with 10 CFR 54.4, and to verify that the applicant appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information presented in Section 2.3.3.5 of the LRA and the applicable piping and instrument drawings referenced therein, and the McGuire and Catawba FSARs, to determine if the applicant adequately identified the portions of the component cooling system that are within the scope of license renewal. The staff verified that those portions of the component cooling system that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were so identified by the applicant in Section 2.3.3.5 of the LRA. To verify that the applicant did include the applicable portions of the component cooling system within the scope of license renewal, the staff focused its review on those portions of the component cooling system that were not identified as within the scope of license renewal to verify that they did not meet the scoping criteria of 10 CFR 54.4.

As a result of this review, the staff identified the need for additional information to complete its review. By letter dated January 28, 2002, the staff asked, in RAI 2.3.3.5-1, why two pipe segments attached to the component cooling water pumps on Catawba 1 drawing CN-1573-1.0 contain license renewal boundary changes immediately adjacent to the pumps without valving for isolation. The staff added that, for Catawba 2 drawing CN-2573-1.0, the corresponding pipe segments also were not highlighted; however, these segments did not have a license renewal flag to indicate the boundary. In its response dated April 15, 2002, the applicant noted that the non-highlighted pipe segments at the component cooling water system pumps are stuffing box overflow lines which do not serve a pressure boundary or other intended function. The applicant noted that the boundary flags on the Unit 1 drawing are correct and a similar set of boundary flags should have been shown on the corresponding Unit 2 drawing CN-2573-1.0. The staff finds the applicant's response acceptable because the lines do not serve an intended function and the licensee clarified why the Unit 2 drawings lacked boundary flags.

By letter dated January 28, 2002, the staff asked, in RAI 2.3.3.5-2, why the post-accident liquid sample panel II+ cooler was outside the license renewal boundary on drawings CN-1573-1.0 and CN-2573-1.0 since failure of this piping would appear to prevent satisfactory prevention or the mitigation of an accident if accurate results cannot be obtained from the sample panel. In its response dated April 15, 2002, the applicant stated that results from the non-safety-related post accident liquid sample panel are not relied upon to prevent or mitigate an accident. Therefore, the sample panel, and thus its cooler, does not meet the license renewal scoping criteria. Additionally, license amendments were approved for both McGuire and Catawba after the submittal of the LRA that eliminate the requirements to have and maintain the post-accident sampling systems. Based on this response, the staff agrees with the applicant and concludes that the post-accident liquid sample panel II+ cooler discussed above is not in scope because it is not relied upon to prevent or mitigate an accident.

By letter dated January 28, 2002, the staff asked, in RAI 2.3.3.5-3, if a note stating that "Crossover/Overflow line connects near the top of each surge tank" on Catawba 1 drawing CN-1573-1.1 (and a corresponding note for Catawba 2 on drawing CN-2573-1.1) applied separately to what appeared to be a single crossover line and a single overflow line connecting surge tanks 1A and 1B; and if so, with the overflow line outside the license renewal boundary, the staff asked how the crossover line could fulfill its license renewal function if the overflow line is not intact. In its response dated April 15, 2002, the applicant stated that the note only applied to the line shown at J-5 to J-10. The applicant stated that this line is a horizontal connection off the side of each tank near the top of each tank, above the normal water level. The line serves as an overflow such that if one tank is overfilled, the contents will overflow into the other tank. The applicant stated that the note does not apply to the line shown at I-5 to I-10. This line is a vertical connection off the top of each tank and does not effectively connect the two tanks. The loop seals would prevent flow from one tank to the other. This line is not required for the system to perform its function, and because it taps off the top of the tank, its failure would not impact the ability of the system to perform its function. The applicant stated the same situation existed for corresponding note on the Catawba 2 diagram. The staff finds the applicant's response acceptable, since the failure of the line shown at I-5 to I-10 and of the corresponding line on the Catawba 2 diagram would not affect the ability of the system to perform its function. Therefore, the staff agrees that the pipe segment is outside the scope of license renewal.

The staff noted that Catawba 1 drawing CN-1573-1.2 depicts what appeared to be a (non-highlighted) blank flange at coordinates G-2. By letter dated January 28, 2002, the staff asked, in RAI 2.3.3.5-4, if the component was within the license renewal boundary. In its response dated April 15, 2002, the applicant stated that the blank flange is within the scope of license renewal. While the flange and associated piping is within the license renewal boundary defined by license renewal flags, highlighting was inadvertently left off that segment of piping. The blank flange is included with the other piping identified in Table 3.3-7 (page 3.3-78) of the LRA. Based on this clarification, the staff finds the applicant's response acceptable.

By letter dated January 28, 2002, the staff asked, in RAI 2.3.3.5-5, why the coolers for the reactor vessel supports and associated piping, which are classified as safety-related (Catawba 1 drawing CN-1573-1.3, Catawba 2 drawing CN-2573-1.3, McGuire 1 drawing MCFD-1573-03.01, and McGuire 2 drawing MCFD-2573-03.01), are considered outside the scope of license renewal. In its response dated April 15, 2002, the applicant stated that although the coolers for the reactor vessel supports and associated piping are classified as safety-related, this portion of the system is not within the scope of license renewal because the coolers are no longer used and are isolated by administratively closed valves. The exclusion of this portion of the system from the scope of license renewal represents an exception to the scoping methodology. Since a failure of the isolated piping and components could not prevent the system from performing its intended function, this portion of the system was not included within the scope of license renewal. Based on the explanation provided by the applicant, the staff finds this response acceptable.

The staff noted that Catawba 2 drawing CN-2573-1.3 appeared to have been erroneously drafted since the highlighting to depict the reactor coolant drain tank heat exchanger as within the scope of license renewal was omitted. By letter dated January 28, 2002, the staff asked, in RAI 2.3.3.5-6, why the Catawba 2 heat exchanger was not within scope when the corresponding Catawba 1 heat exchanger depicted in drawing CN-1573-1.3 is within scope and listed in Table 3.3-7, "Aging Management Review Results - Component Cooling System

(Catawba Nuclear Station." In its response dated April 15, 2002, the applicant confirmed that the Unit 2 reactor coolant drain tank heat exchanger is within the scope of license renewal. While the heat exchanger is within the license renewal boundary defined by license renewal flags, highlighting was inadvertently left off the heat exchanger. Based on this confirmation, the staff finds the applicant's response acceptable.

By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.5-11, the applicant to address why the vacuum breaker for the McGuire Unit 1 component cooling surge tank and the associated pipe segment were not highlighted as within the scope of license renewal (drawing MCFD-1573-01.01). The similar vacuum breaker for McGuire 2 was shown to be within scope. In its response dated April 15, 2002, the applicant confirmed that the vacuum breaker is within the scope of license renewal. While the piping and valve are within the license renewal boundary defined by license renewal flags, highlighting was inadvertently left off that segment of piping. The piping and valve associated with the vacuum breaker are listed in Table 3.3-6 (pages 3.3-53 and 3.3-55) of the LRA. Based on this confirmation, the staff finds the applicant's response acceptable.

By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.5-12, the applicant to address why McGuire 1 vent valve 1KC0884 and the associated 1-inch line were not depicted in scope of license renewal for the pressure boundary intended function on drawing MCFD-1573-02.00. In its response dated April 15, 2002, the applicant confirmed that vent valve 1KC0884 is within the scope of license renewal. While the piping and valve are within the license renewal boundary defined by license renewal flags, highlighting was inadvertently left off that segment of piping. The applicant stated that the piping and vent valve are listed in Table 3.3-6 (pages 3.3-54 and 3.3-56) of the LRA. Based on this information, the staff finds the applicant's response acceptable.

By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.5-13, that the applicant clarify the status of McGuire flow transmitters and associated instrument lines for the reactor coolant pump motor upper bearing coolers on drawings MCFD-1573-03.00 and MCFD-2573-03.00. These are noted as abandoned in place; however most (six of the eight transmitters) remain depicted as connected to the remaining instrumentation lines. The drawing notes that all instrument lines normally open to the process system, through and including the instrument, are included in license renewal scope. However, these lines generally are not flagged. In its response dated April 15, 2002, the applicant noted that, in accordance with plant modification practice, when instrumentation and associated tubing is "abandoned In place," the tubing is cut and capped just downstream of the root valves. The abandoned instrumentation and tubing are not within the scope of license renewal because they are isolated from the process system. For other instrumentation and tubing that is not abandoned in place and remains open to the process system, the instrumentation is within the scope of license renewal but not subject to AMR in accordance with 10 CFR 54.21(a)(1)(i). The tubing is listed in Table 3.3-6 (page 3.3-55) in the LRA. Because the abandoned instrumentation and tubing are not relied upon to perform an intended function, the staff concludes that they are outside the scope of license renewal.

The staff did not identify any other omissions in the applicant's scoping review.

The staff then determined whether the applicant had properly identified the SCs that are subject to an AMR from among those portions of the component cooling system that are identified as

within the scope of license renewal. The applicant listed the SCs subject to AMR for the component cooling system in Table 3.3-6 (McGuire) and Table 3.3-7 (Catawba) of the LRA using the screening methodology described in Section 2.1 of the LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER.

The applicant identified the portions of the component cooling system that are within the scope of license renewal on drawings referenced in LRA Section 2.3.3.5. In addition, the applicant lists the mechanical components that are subject to an AMR and their intended function(s) in Table 3.3-6 (McGuire) and Table 3.3-7 (Catawba) of the LRA.

The license renewal drawings were highlighted by the applicant to identify those portions of the component cooling system that meet at least one of the scoping criteria in 10 CFR 54.4. The staff compared the LRA drawings to the system drawings and the description in the UFSAR to ensure they were representative of the component cooling system. The staff performed its review by sampling the SCs that the applicant determines as within the scope of license renewal but not subject to AMR to verify that no structure or component that performs its intended function(s) without moving parts or without a change in configuration or properties and that is not subject to replacement on the basis of qualified life or specified time period was excluded from an AMR.

As a result of its review, the staff determined that additional information was needed to complete its review. By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.5-8, additional information regarding Note 5 on Catawba 1 drawings CN-1573-1.4 and CN-1573-1.7, and Catawba 2 drawings CN-2573-1.4, and CN-2573-1.7, which indicate that the reactor coolant pump upper motor bearing cooler connection "T" on the top of the bearing cooler should be plugged. The staff did not identify a listing for this plug on Table 3.3-7, "Aging Management Review Results - Component Cooling System Catawba Nuclear Station)." In its response dated April 15, 2002, the applicant noted that reactor coolant pump upper motor bearing cooler shell nozzles shown on the flow diagrams are labeled "J," "K," "T," and "U," and that all the nozzles and the plug are considered part of the reactor coolant pump upper motor bearing shell, which is addressed in the Table 3.3-7 (page 3.3-69) of the LRA. The staff finds the applicant's response acceptable since the plug in question is within the scope of license renewal as part of the reactor coolant pump upper motor bearing shell.

In its RAI, the staff noted that Catawba 1 drawings CN-1573-1.4 and CN-1573-1.7 and Catawba 2 drawings CN-2573-1.4 and CN-2573-1.7 depict temperature elements (1KCTE5880, 1KCTE5920, 1KCTE5890, 1KCTE5930, etc.), which appear to be installed in thermowells in piping that is within the scope of license renewal. The thermowells for these temperature elements were not highlighted and were not included in Table 3.3-7, "Aging Management Review Results - Component Cooling System (Catawba Nuclear Station)." In LRA Section 2.5, "Scoping And Screening Results: Electrical And Instrumentation And Controls," the applicant noted that the pressure boundary function associated with resistance temperature detectors and thermocouples was considered during the process of identifying the mechanical pressure boundaries. Similarly for McGuire, drawing MCFD-573-02.02 indicates that temperature transmitters (1KCTX5340 and 1KCTX5380) in piping are within the scope of license renewal. By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.5-9, the applicant to indicate if these instruments are located in thermowells and if wells are included in Table 3.3-7, "Aging Management Review Results, Component Cooling System." If these instruments were located

in wells, the staff also asked the applicant to indicate if heat transfer was an intended function of the wells.

In its response dated April 15, 2002, the applicant clarified that, on both the McGuire and Catawba mechanical flow diagrams, the instrument nomenclature identifies whether the temperature element is installed in a thermowell. The letters "TE" in the component identification number 1KCTE5880 above indicate that a temperature element is installed in a thermowell. The letters "TX" in the component identification number 1KCTX5880 above indicate that no temperature element is installed in the thermowell. The applicant stated that the portion of the thermowell that forms a mechanical system pressure boundary is within the scope of license renewal because it serves a pressure boundary function. The applicant stated that commodity type "pipe" or "piping" is used throughout the LRA to represent the host of piping pressure boundary components that must retain their pressure boundary function. These piping pressure boundary components include not only the piping itself, but also other piping-related pressure boundary components such as elbows, tees, half-couplings, and temperature element pressure boundary parts like those discussed here. The staff found the applicant's response acceptable regarding the scoping of the thermowells for pressure boundary because they are included as part of the pipe or piping commodity group.

The applicant further stated that for thermowells, pressure boundary is the only component intended function. The applicant referred to Appendix C of NEI 95-10 (Revision 3) for an understanding of the heat transfer design aspects. The applicant stated that heat transfer is a parameter considered in the design of most safety-related structures and components, but not a primary safety function like that associated with SGs and heat exchangers. For example, while the heat capacity of the containment and interior structures is included in the modeling of the pressure and temperature transient for loss-of-coolant accidents, these secondary heat transfer functions of the safety-related structures and components need not be a specific focus of the AMR for license renewal. For thermowells, heat transfer is a secondary function and does not need to be the focus of the AMR. Therefore, pressure boundary is the only component intended function of thermowells. Based on the above, the staff found the applicant's response acceptable since there is no primary safety function associated with heat transfer for thermowells in the component cooling water system.

2.3.3.5.3 Conclusions

On the basis of its review of the information contained in Section 2.3.3.5 of the LRA , the supporting information from both UFSARs and the LRA drawings, and review of the April 15, 2002, response from the applicant to the January 28, 2002, staff RAIs, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the McGuire component cooling system and the Catawba component cooling system that are within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a), and 10 CFR 54.21(a)(1), respectively.

2.3.3.6 Condenser Circulating Water System

In LRA Section 2.3.3.6, "Condenser Circulating Water System," the applicant described the components of the condenser circulating water system that are within the scope of license renewal and subject to an AMR. This system is described in Section 10.4.5 of the McGuire and Catawba UFSARs. The staff reviewed the LRA and the UFSARs for McGuire and Catawba to

determine whether the applicant has adequately demonstrated that the requirements of 10 CFR Part 54 have been met.

2.3.3.6.1 Technical Information in the Application

For both McGuire and Catawba, the condenser circulating water system is a non-safety-related cooling system relied upon to remove heat from the feedwater pump turbine and main condensers. The condenser circulating water system also provides a suction source of water to the turbine-driven auxiliary feedwater pump for events requiring the activation of the standby shutdown facility.

The applicant described the process for identifying the SSCs within the scope of license renewal in LRA Section 2.1.1, "Scoping Methodology," and its process for identifying the SSCs subject to an AMR in LRA Section 2.1.2, "Screening Methodology." Using the methodology described in LRA Section 2.1.1, the applicant listed the systems and structures that are within the scope of license renewal in LRA Tables 2.2-1 and 2.2-2 for McGuire and Catawba, respectively. The McGuire condenser circulating water system is listed on page 2.2-3 of LRA Table 2.2-1 of the LRA. The Catawba condenser circulating water system is listed on page 2.2-7 of LRA Table 2.2-2.

Using the methodology described in Section 2.1.2 of the LRA, the applicant listed the McGuire and Catawba mechanical components that are subject to an AMR in Table 3.3-8, "Aging Management Results - Condenser Circulating Water System." This table also lists the intended function of each component and the materials of construction. For both McGuire and Catawba the applicant identified the following components from the condenser circulating water system that are subject to an AMR: pipe, pump casings, and valves bodies. For Catawba only, the applicant additionally identified strainers as components subject to an AMR.

The applicant stated that the intended function of the components is to maintain mechanical pressure boundary integrity to ensure that sufficient flow and/or pressure are delivered to isolate containment for fission product retention or to prevent physical interaction with safety-related equipment.

2.3.3.6.2 Staff Evaluation

The staff reviewed Section 2.3.3.6 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the condenser circulating water system that are within the scope of license renewal in accordance with 10 CFR 54.4, and to verify that the applicant appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information presented in Section 2.3.3.6 of the LRA and the applicable piping and instrument drawings referenced therein, and the McGuire and Catawba UFSARs, to determine if the applicant adequately identified the portions of the condenser circulating water system that are within the scope of license renewal. The staff verified that those portions of the condenser circulating water system that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal, and were listed by the applicant in Section 2.3.3.6 of the LRA. To verify that the applicant did include the applicable portions of the condenser circulating water system within the scope of license renewal, the staff focused its review on

those portions of the condenser circulating water system that were not identified as within the scope of license renewal to verify that they did not meet the scoping criteria of 10 CFR 54.4.

As a result of this review, the staff determined that additional information was needed to complete its review. Section 10.4.5.1 of the McGuire UFSAR states that the condenser circulating water system also serves as a secondary supply for the nuclear service water system. By letter dated January 28, 2002, the staff asked, in RAI 2.3.3.6-1, why the LRA does not mention the supply to the nuclear service water system as an intended function of the condenser circulating water system. The staff also requested the applicant to indicate if the discharge path from the nuclear service water system to the condenser circulating water system shown on drawing MCFD-1604-01.02 (C-7) provided an intended function. In its response dated April 15, 2002, the applicant noted that the condenser circulating water system only serves as a backup supply to the nuclear service water system and does not meet any of the scoping criteria of 10 CFR 54.4. The backup supply is not safety-related and not relied upon to prevent or to mitigate a design basis event. Additionally, the failure of this backup supply will not prevent the accomplishment of a safety-related function. Furthermore, the backup supply is not relied upon to demonstrate compliance with any of the Commission's regulations specified in 10 CFR 54.4(a)(3). The fully assured primary water source for the nuclear service water system is the flow-path from the nuclear service water system pumps, which is within the scope of license renewal. The applicant further stated that the license renewal evaluation boundaries shown on the connections for the nuclear service water system on drawing MCFD-1604-01.02 (C-7) are not intended to provide a path for the discharge of water. These boundaries provide a flow-path from the condenser circulating water system to the turbine-driven auxiliary feedwater pump for certain postulated events. The staff finds the applicant's response acceptable since neither the secondary supply nor the discharge path (if any) is safety-related nor is either function relied upon for compliance with the regulations detailed in 10 CFR 54.4(a)(3).

Section 10.4.5.1 of the McGuire UFSAR notes that the condenser circulating water system also serves as the supply for the fire protection jockey pumps. By letter dated January 28, 2002, the staff asked, also in RAI 2.3.3.6-1, why the LRA does not mention the supply to fire protection jockey pumps as an intended function of the condenser circulating water system. The applicant stated that the supply to the jockey pumps is not considered an intended function of the condenser circulating water system and referred the staff to its response to a separate staff question (RAI 2.3.3.19-6) related to the scoping of jockey pumps in accordance with 10 CFR 54.4(a)(3). Although the staff finds the applicant's response to RAI 2.3.3.19-6 unacceptable because of the McGuire and Catawba licensing basis for meeting the requirements of fire protection regulations, specified in 10 CFR 50.48 (discussed in Section 2.3.3.19.2 of this SER), the staff has determined that the supply of water to the jockey pumps is not required for compliance with the fire protection regulations and the line does not serve any other intended function. Therefore, the applicant's response to RAI 2.3.3.6-1 is acceptable.

The staff noted that for all McGuire flow diagrams referenced in the LRA for the condenser circulating water system scoping review, the license renewal boundaries are, for the most part, placed in the middle of pipe runs and not at isolable boundaries such as valves. The boundaries coincide with flags for the standby shutdown facility. By letter dated January 28, 2002, the staff asked, in RAI 2.3.3.6-4, if these boundaries related to a particular volume of water that is contained within the piping; and if so, requested the applicant to explain where or how the water is contained and made available to perform its intended function. In its response dated

April 15, 2002, the applicant confirmed that the license renewal boundaries correspond to the standby shutdown system boundaries for the condenser circulating water system. These boundaries approximate a volume of water that is credited as the auxiliary feedwater suction source for a fire and station blackout event. The applicant stated that McGuire calculation MCC-1223.42-00-0003, "Determine Water Available for Secondary Side Makeup During a Security Event," Revision 3, determines the available inventory required for postulated events and was reviewed during a recent NRC inspection. NRC Inspection Report 50-369/01-06, 50-370/01-06 dated February 26, 2002, indicates that this calculation was reviewed along with other design documents and no findings were identified. Additionally, the same NRC inspector who reviewed the calculation during the above inspection also participated in the McGuire and Catawba license renewal scoping and screening inspection that was performed in March 2002. The staff found the applicant's response acceptable since the system boundaries depicted are based on calculations that determine a water volume for station blackout and fire protection safe shutdown events required to be analyzed for compliance with the regulations detailed in 10 CFR 54.4(a)(3). Since these calculations have been the subject of NRC inspection, the staff has reasonable assurance that the intended function can be met with the volume of water contained in this piping.

By letter dated January 28, 2002, the staff asked, in RAI 2.3.3.6-5, the applicant to clarify whether or not the 4-inch drain lines on the suction of the Catawba condenser circulating water pumps up to the discharge of the drain valves (e.g., 1RC34) are included in license renewal scope. These lines were not highlighted on drawings CN-1604-1.0 and CN-2604-1.0 The applicant response stated that the subject 4-inch drain lines are within the scope of license renewal. While the valves and associated piping are within the license renewal boundary defined by license renewal flags, highlighting was inadvertently left off that segment of piping. The piping and valves are listed in Table 3.3-8 (pages 3.3-84 and 3.3-85) of the LRA. The staff found the applicant's clarification acceptable.

By letter dated January 28, 2002, the staff questioned, in RAI 2.3.3.6-7, the placement of license renewal boundary flags on the suction and discharge flanges of the condenser circulating water pumps, which are depicted as within scope on Catawba 1 drawing CN-1604-1.0 and Catawba 2 drawing CN-2604-1.0. In its response dated April 15, 2002, the applicant confirmed that the condenser circulating water system pumps are within the scope of license renewal and that no flags should have been placed at the inlet and discharge of the pumps. The staff found the applicant's confirmation acceptable.

By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.6-8, the applicant to confirm that the license renewal boundary flag at coordinates C-4 on Catawba 1 drawing CN-1604-1.2 was erroneously single-sided. In its response dated April 15, 2002, the applicant confirmed that the license renewal flag was inadvertently shown as single-sided instead of double-sided. The continuation to CN-1592-1.0 is within the scope of license renewal. The staff found the applicant's confirmation acceptable.

Section 10.4.5.3 of the McGuire UFSAR addresses flooding of the turbine building from failure of the circulating water system. By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.6-9, the applicant to indicate if the circulating water system expansion joints and the turbine building basement curbs protecting the openings to the auxiliary building were within the scope of license renewal. In its response dated April 15, 2002, the applicant stated that the expansion joint in question is not within the scope of license renewal because it does not meet

the scoping criteria. The expansion joint failure is assumed to occur and the plant is accordingly designed with mitigative features, including curbs and flood seals. The curbs are within the scope of license renewal and are addressed as "flood curbs" in Table 3.5-2 (page 3.5-10). Flood seals along the wall of all in-scope structures are also within the scope of license renewal and are subject to an AMR. Flood seals are addressed in Table 3.5-2 (page 3.5-16). The staff found the applicant's response acceptable because the features to mitigate failure of the expansion joint are within the scope of license renewal as required by 10 CFR 54.4(a)(2).

Section 10.4.5.3 of the Catawba UFSAR addresses the maximum water level due to a simultaneous failure of the circulating water systems on both units and the subsequent draining of all water back to the respective turbine buildings. All penetrations and passageways from the turbine or service buildings to the auxiliary building are stated to be watertight below the maximum water level, which will protect safety-related equipment from failure caused by flooding. By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.6-10, the applicant to indicate if the watertight features of the penetrations and passageways between these buildings and the auxiliary building have been included within the scope of license renewal in accordance with 10 CFR 54.4 paragraph (a)(2). In its response dated April 15, 2002, the applicant stated that the watertight features of the penetrations and passageways between the auxiliary and turbine/service buildings have been included within the scope of license renewal. The features include curbs, flood seals, and flood doors. Curbs are addressed in Table 3.5-2 (page 3.5-10). Flood seals are addressed in Table 3.5-2 (page 3.5-16). Flood doors are addressed in Table 3.5-2 (page 3.5-13). The staff found the applicant's response acceptable because the features relied upon to mitigate failure of the circulating water systems on both units are within the scope of license renewal as required by 10 CFR 54.4(a)(2).

The staff did not identify any other omissions in the applicant's scoping review.

The staff then determined whether the applicant had properly identified the SCs that are subject to an AMR from among those portions of the condenser circulating water system that are identified as within the scope of license renewal. The applicant listed the SCs subject to AMR for the condenser circulating water system in LRA Table 3.3-8 using the screening methodology described in Section 2.1 of the LRA. The staffs evaluation of the scoping and screening methodology is documented in Section 2.1 of this SER.

The applicant identified the portions of the condenser circulating water system that are within the scope of license renewal by drawings referenced in LRA Section 2.3.3.6. In addition, the applicant lists the mechanical components that are subject to an AMR and their intended function (pressure boundary) in Table 3.3-8 of the LRA.

The license renewal drawings were highlighted by the applicant to identify those portions of the condenser circulating water system that meet at least one of the scoping criteria of 10 CFR 54.4. The staff compared the LRA drawings to the system drawings and the description in the FSAR to ensure they represented the condenser circulating water system. The staff performed its review by sampling the SCs that the applicant determines as within the scope of license renewal but not subject to AMR to verify that no structure or component that performs its intended function(s) without moving parts or without a change in configuration or properties and that is not subject to replacement on the basis of qualified life or specified time period was excluded from an AMR.

As a result of this review, the staff determined that additional information was needed to complete its review. The staff noted that red highlighting was used for the expansion joints (2RC7, etc.) on the discharge of the condenser circulating water pumps for Catawba 2 on drawing CN-2604-1.0, whereas the corresponding joints were depicted as within the license renewal boundary for Catawba 1 with blue highlighting. By letter dated January 28, 2002, the staff asked, in RAI 2.3.3.6-6, if the difference in color signified some distinction for these components. The staff additionally asked why expansion joints were not listed as a component subject to AMR in Table 3.3-8. In its response dated April 15, 2002, the applicant stated that the red highlighting of the expansion joints was an inadvertent result of the conversion of the drawing from one electronic format to another. The color change has no significance. The expansion joints were inadvertently omitted from Table 3.3-8 of the LRA. In its response, the applicant provided a supplement to Table 3.3-8, “Aging Management Review Result - Condenser Circulating Water System (Catawba only),” with the required information relating to AMR. Since the expansion joints were included in the scope of license renewal, the staff found the applicant's response acceptable. The staff’s evaluation of the AMR results for the expansion joints is documented in Section 3.3.6.2.1 of this SER.

The staff did not identify any other omissions.

2.3.3.6.3 Conclusions

The staff reviewed the information contained in Section 2.3.3.6 of the LRA, the supporting information from both UFSARs and the LRA drawings, and the applicant’s responses to staff RAIs. On the basis of its review, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the McGuire condenser circulating water system and the Catawba condenser circulating water system that are within the scope of license renewal, and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a), and 10 CFR 54.21(a)(1), respectively.

2.3.3.7 Containment Ventilation (VP) System

In Section 2.3.3.7 of the LRA titled, "Containment Ventilation System," the applicant did not identify any portions of the VP system or mechanical components that are within the scope of license renewal and subject to an AMR. Sections 9.4.5 and 9.4.6 of the McGuire and Catawba UFSARs state that the VP system is not considered an ESF and no credit has been taken for the operation of any subsystem or component in analyzing accident consequences.

2.3.3.7.2 Technical Information in the Application

The VP system provides adequate capacity to ensure that defined temperatures are maintained in the various portions of the containment under operating and shutdown conditions in all types of weather. Sufficient redundancy is included to enure proper operation of the system with one active component out of service. The system can also purge the in-core instrumentation room atmosphere so that necessary entry may be achieved.

In Section 2.3.3.7 of the LRA and Sections 9.4.5 and 9.4.6 of the UFSAR, the applicant stated that the VP system is not considered an ESF. This statement is based on the applicant’s review pursuant to 10 CFR 54.4(a)(1) and 10 CFR 54.4(a)(2).

McGuire and Catawba

Section 2.3.3.7 of the LRA:

- The VP system provides cooling to the upper and lower compartments of containment during normal operation and shutdown.
- The VP system provides required post-accident monitoring in accordance with the equipment qualification rule.

Based on the above, no mechanical components have any intended passive functions subject to a scoping review; therefore no AMR is required.

2.3.3.7.3 Staff Evaluation

The staff reviewed Section 2.3.3.7 of the LRA and supporting information in the McGuire and Catawba UFSARs, Sections 9.4.5 and 9.4.6, respectively. The staff concludes that, since the VP system is not an ESF system and is not relied on to ensure that 10 CFR Part 100 limits are not exceeded, this system is not within the scope of license renewal and subject to an AMR pursuant to 10 CFR 54.4 and 10 CFR 54.21, respectively.

2.3.3.7.4 Conclusion

On the basis of its review, the staff finds that the VP system structures and components need not be in the scope of license renewal or subject to an AMR pursuant to 10 CFR 54.4 and 10 CFR 54.21, respectively.

2.3.3.8 Control Area Ventilation (VC) System and Chilled Water (YC) System

The VC/YC system consists of a ventilation system and a chilled water system. The VC system is discussed in Section 2.3.3.8.1, and the YC system is discussed in Section 2.3.3.8.2.

2.3.3.8.1 Control Area Ventilation (VC) System

In LRA Section 2.3.3.8, "Control Area Ventilation System and Chilled Water Systems," the applicant identified portions of the VC system that are within the scope of license renewal and subject to an AMR. The applicant noted in Section 2.3.3.8 of the LRA that the VC system is further described in Sections 6.4 and 9.4 of the McGuire and Catawba UFSARs, respectively.

The applicant evaluated component supports for equipment, ventilation ductwork, pipe, and instrument lines in Section 2.4.3 and Table 3.5-3 of the LRA. The staff scoping evaluations of component supports and electrical components are provided in Sections 2.4 and 2.5, respectively, in this report. Instrument line components in the VC system were evaluated in Section 2.1 of the LRA.

2.3.3.8.1.1 Technical Information in the Application

The VC system is an ESF system designed to maintain the environment in the control room, control room area, and switchgear rooms within acceptable limits for the operation of unit controls, for maintenance and testing of the controls as required, and for uninterrupted safe occupancy of the control room during a post-accident shutdown. The control room and other

portions of the control area are designed to maintain proper temperatures according to site specifications. These conditions are maintained continuously during all modes of operation for the protection of control instrumentation and for the comfort of the operators.

Continuous pressurization of the control room proper is provided to prevent entry of dust, dirt, smoke, and radioactivity originating outside the pressurized zones. The control room envelope pressurization is slightly positive relative to the pressure outdoors and in surrounding areas. Outdoor air for pressurization can be taken from two locations such that a source of less contaminated air is available regardless of wind direction. Each intake is located outside of the reactor building diametrically opposite to that unit's vent. Each outside air intake location is monitored for the presence of radioactivity, chlorine, and combustion products. Isolation of an outside air intake occurs automatically upon indication of high chlorine concentration. If a high radiation level, chlorine concentration, or a smoke concentration is detected in the intake, station procedures direct the operator to manually close the most contaminated intake. This will ensure continuous control room positive pressure during a smoke or radiation event. Each of the outside air intakes is provided with a tornado isolation damper to prevent a depressurization of the control room and the control room area during a tornado occurrence.

The VC system consists of the following subsystems:

- control room ventilation subsystem
- control room area ventilation subsystem,
- control room and control room area pressurizing subsystem
- switchgear room ventilation subsystem

The VC subsystems serving the above areas are described in detail in Section 6.4 of the McGuire UFSAR and in Section 9.4.1 of the Catawba UFSAR.

In Section 2.3.3.8 of the LRA and Sections 6.4 and 9.4.1 of the McGuire and Catawba UFSARs, respectively, the applicant identified the following VC system intended functions based on 10 CFR 54.4(a)(1) and 10 CFR 54.4(a)(2):

McGuire
Section 2.3.3.8 of the LRA:

- To provide the normal and emergency ventilation requirements to the control room and control room area.

Section 6.4 of the UFSAR:

- To maintain the proper temperatures and cleanliness in the control room, the control room area, and the switchgear rooms during plant operation, plant shutdown, post-accident conditions, and all possible weather conditions.
- To maintain the proper post accident pressurization of the control room.
- To allow absolute and carbon filtration in the outside air intakes.
- To align VC system air handling units with filter units upon receipt of the ESF signal.
- To regulate the maximum radiation dose received by control room personnel under accident conditions within the limits of General Design Criterion (GDC) 19.
- To provide VC system instrumentation for controlling and indicating temperature, radioactivity levels, and provide an early warning of smoke.

Catawba
Section 2.3.3.8 of the LRA:

- To provide normal and emergency ventilation requirements to the control room and control room area.

Section 9.4.1 of the UFSAR:

- To maintain the environment in the control room, control room area, and switchgear rooms within acceptable limits for the operation of unit controls, for maintenance and testing, and for uninterrupted safe occupancy of the control room during a post-accident shutdown.
- To provide continuous pressurization of the control room proper and prevent entry of dust, dirt, smoke, and radioactivity originating outside the pressurized zones.
- To monitor for the presence of radioactivity, chlorine, and products of combustion during all plant operational modes.

On the basis of the intended functions identified above for the McGuire and Catawba VC system, the portions of this system that were identified by the applicant as within the scope of license renewal include all VC system safety-related components (electrical, mechanical, and instruments). The applicant described its methodology for identifying the mechanical components subject to an AMR in Section 2.1 of the LRA. On the basis of this methodology, the applicant identified the portions of the VC system that are within the scope of license renewal on the flow diagrams listed in Section 2.3.3.8 of the LRA. Using the methodology described in Section 2.2.1 of the LRA, the applicant compiled a list of the mechanical components and component types subject to an AMR that are within the evaluation boundaries highlighted on the flow diagrams and identified their intended functions. The applicant provided this list in Table 3.3-11 of the LRA.

The following component types are identified as within the scope of license renewal and subject to an AMR in Table 3.3-11 of the LRA: air handling units (heat exchanger shells, tube sheets, and tubes), control room area pressurizing filter trains, ductwork, filter trains, orifices, prefilters, tubing, and valve housings. The applicant noted in Table 3.3-11 of the LRA that pressure boundary, heat transfer, and filtration are the applicable intended functions of VC system components subject to an AMR.

2.3.3.8.1.2 Staff Evaluation

To verify that the applicant identified the components of the VC system that are within scope of the license renewal and subject to an AMR pursuant to 10 CFR 54.4 and 10 CFR staff reviewed the flow diagrams listed in Section 2.3.3.8 of the LRA that show the evaluation boundaries for the highlighted portion of the VC system within the scope of the LRA. The staff reviewed Table 3.3-11 of the LRA, which lists mechanical components and the applicable intended functions within the scope of the license renewal and subject to an AMR. The staff also reviewed Sections 6.4 and 9.4.1 of the UFSAR to determine if there were any portions of the VC system that met the scoping criteria in 10 CFR 54.4(a), but were not identified as within the scope of license renewal. The staff also reviewed the McGuire and Catawba UFSARs to determine if any safety-related system functions were not identified as intended functions in the LRA, and to determine if any structures or components that have intended functions were omitted from the

scope of structures or components that require an AMR. The staff compared the functions described in the UFSARs to those identified in the LRA.

The applicant identified the structures and components subject to an AMR for the VC system using the screening methodology described in Section 2.1 of the LRA and listed them in Table 3.3-11 of the LRA. The staff evaluated the scoping and screening methodology, and documented its findings in Section 2.1 of this report. The staff sampled structures and components from Table 3.3-11 of the LRA to verify that the applicant identified structures and components subject to an AMR. The staff also sampled structures and components that were within the scope of license renewal but not subject to an AMR. Based on the sample, the staff verified that these structures and components perform their intended functions without moving parts or without a change in configuration or properties and are not subject to replacement on the basis of a qualified life or specified time period.

To ensure that those portions of the VC system excluded from the scope of license renewal do not perform any intended functions, the staff requested additional information. The staff noted that Section 2.3.3.8 of the LRA provides a summary description of the system functions and a listing of flow diagrams. The flow diagrams highlight the evaluation boundaries and Table 3.3-11 of the LRA tabulates the components within the scope and subject to an AMR for the VC system. The corresponding drawings and the UFSARs, however, show additional structures and components that were not listed in Table 3.3-11 of the LRA.

The staff noted that the applicant did not identify housings for active components that require an AMR. The determination should consider whether failure of the housing would result in a failure of the associated active component to perform its intended function and whether the housing meets the long-lived and passive criteria as defined in the rule.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-1, specific information concerning the exclusion of housings for fans and air handling units from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant stated that cooling fans are not included in the AMR results tables in the LRA. The applicant added that cooling fans, without sub-component exceptions, are explicitly excluded from an AMR by 10 CFR 54.21. The staff reviewed this response and determined that the applicant's basis for excluding housings for fans and air handling units is not consistent with the license renewal rule because the housings are relied upon to maintain pressure boundary integrity (as are valve bodies and pump casings) and are within scope. Furthermore, because the fan housings are passive and long-lived components, they are subject to an AMR. The staff finds this response unacceptable and characterizes this issue as open item 2.3-1.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-2, specific information concerning the exclusion of damper housings from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant stated that dampers are not included in the AMR result tables in the LRA. The applicant added that ventilation dampers, without sub-component exceptions, are explicitly excluded from an AMR by 10 CFR 54.21. The staff reviewed this response and has determined that the applicant's basis for excluding damper housings is not consistent with the license renewal rule because the housings are relied upon to maintain pressure boundary integrity (as are valve bodies and pump casings) and are within scope. Furthermore, because the damper housings are passive and long-lived components,

they are subject to an AMR. The staff finds this response unacceptable and characterizes this issue as open item 2.3-2.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-4, specific information concerning the exclusion of building sealants from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant stated that it does not classify materials such as sealants as structures or components. The applicant stated the pressure boundary function is addressed by TS surveillance testing. However, the applicant did not indicate that any of the TS surveillance requirements listed in its response were credited for aging management (and identified as AMPs). Nor did the applicant furnish a description of or information pertaining to a TS surveillance AMP (including discussion of the 10 elements of the AMP) for the staff's review.

On page 2.1-4 of the LRA, the applicant stated that "seals associated with maintaining pressure boundary are limited to the divider barrier seals in the reactor building." Since the applicant does not discuss the treatment of structural sealants other than the divider barrier seal, it is not clear to the staff that building (structural) sealants were considered during an AMR of the structure (building) for which they are a sub-component. Furthermore, according to page 3.5-10 of the LRA, the Inspection Program for Civil Engineering Structures and Components is credited by the applicant to monitor the aging of building concrete structural components (reinforced concrete beams, columns, floor slabs, and walls). According to Section B.3.21 of the LRA, the scope of the Inspection Program for Civil Engineering Structures and Components does not include structural sealants. Table 2.1-3, on page 2.1-15 of the SRP-LR, states that an applicant's structural AMP is expected to address structural sealants "with respect to an AMR program." The intent of this statement is that an applicant's structural AMP is expected to manage or monitor the aging effects of the structure and associated sub-components that are identified during the AMR. The basis for this SRP guidance is documented in the summary (issued January 21, 2000) of a December 8, 1999, meeting to discuss the staff's position on the treatment of consumables. This summary clearly states, on page 3, that structural sealants would be implicitly included at the component level and considered during the AMR. Since the structural AMP identified for the concrete structural components does not address structural sealants, and since the applicant did not identify the TS surveillances listed in its response as AMPs or provide appropriate information to support the staff's review of these surveillances as AMPs, the staff characterizes this issue as open item 2.3-3.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-5, specific information concerning the exclusion of passive components associated with ductwork from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant identified these passive components as sub-components of ductwork. The applicant also stated that ventilation grilles were installed only for aesthetic purposes and perform no intended license renewal function. Because the components serve only aesthetic purposes and perform no intended function, the staff concludes they are outside the scope of license renewal.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-6, specific information concerning the main control room ventilation system and specific components that had not been subjected to an AMR. In its response dated April 15, 2002, the applicant stated that ventilation dampers and cooling fans are not included in the AMR result tables in the LRA. The applicant also stated that ventilation dampers and cooling fans, without sub-component exceptions, are explicitly excluded from an AMR by 10 CFR 54.21. The staff reviewed this response and has determined that the applicant's basis for excluding cooling fan and damper

housings is not consistent with the license renewal rule because the housings are passive components that are relied upon to maintain pressure boundary integrity (as are valve bodies and pump casings) and are within scope. Furthermore, because the fan and damper housings are passive and long-lived components, they are subject to an AMR. The staff finds this response unacceptable and characterizes this issue as open items 2.3-1and 2.3-2.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-7(2), specific information concerning the exclusion of housings for moisture eliminators and prefilters from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant identified moisture eliminators and prefilters as sub-components of the Catawba control room area pressurizing filter trains that are subject to an AMR. The staff finds the applicant's response acceptable based on the information provided.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-8(1), specific information concerning the exclusion of the control area ventilation orifice from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant stated that the control area ventilation orifice is identified as being within scope and subject to an AMR in Table 3.3-11 of the LRA on page 3.3-112. Because the applicant had determined that the ventilation orifice is within scope and subject to an ARM, the staff finds the applicant's response acceptable.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-8(2), specific information concerning the exclusion of the McGuire air handling unit heat exchanger shells and pre-filter components from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant stated that the McGuire air handling unit heat exchanger shells and pre-filter components were within scope and that the highlighting was simply drawn through components instead of using LRA flags on flow diagrams. Because the applicant had determined that the air handling unit heat exchangers are within the scope and subject to AMRs, the staff finds the applicant's response acceptable.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-3, specific information concerning the exclusion of radiation monitors, smoke detectors, air flow monitors, and chlorine monitors from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant stated that, based on guidance provided in NEI 95-10, Revision 3, radiation monitors, smoke detectors, and chlorine detectors are not considered passive components and are therefore not subject to an AMR. Because the monitors and detectors do not perform any intended function, the staff finds the applicant's response acceptable.

Some components that are common to many systems, including the VC system, have been evaluated separately by the applicant in Section 2.1.2.1.2 of the LRA as "replace on condition" commodities. The staff's evaluation of applicant's treatment of these consumables is documented in Section 2.1.3.2.1 of this SER.

The staff reviewed the LRA, supporting information in the UFSARs, and the applicant's responses to RAIs. In addition, the staff sampled several components from the VC system flow diagram, as identified in Section 2.3.3.8 of the LRA, to determine whether the applicant properly identified the components as within scope and subject to an AMR. No omissions were identified, except as identified in the RAIs.

2.3.3.8.1.3 Conclusions

On the basis of its review, with the exception of open items identified in this section, the staff has reasonable assurance that the applicant has adequately identified the VC system structures and components that are within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4 and 10 CFR 54.21, respectively.

2.3.3.8.2 Control Area Chilled Water System

In LRA Section 2.3.3.8, "Control Area Ventilation System and Chilled Water System," the applicant described the components of the control area chilled water system that are within the scope of license renewal and subject to an AMR. The control area chilled water system is described in Section 6.4 of the McGuire UFSAR and Section 9.4.1 of the Catawba UFSAR. The staff reviewed the LRA and the McGuire and Catawba UFSARs to determine whether the applicant has adequately demonstrated that the requirements of 10 CFR Part 54 have been met.

2.3.3.8.2.1 Technical Information in the Application

For both McGuire and Catawba, the control area chilled water system is a safety-related cooling system relied upon to remove heat from the control area ventilation system.

The applicant described the process for identifying the SSCs within the scope of license renewal in LRA Section 2.1.1, "Scoping Methodology," and its process for identifying the SSCs subject to an AMR in LRA Section 2.1.2, "Screening Methodology." Using the methodology described in LRA Section 2.1.1, the applicant listed the systems and structures that are within the scope of license renewal in LRA Tables 2.2-1 and 2.2-2 for McGuire and Catawba, respectively. The McGuire control area chilled water system is listed on page 2.2-3 of LRA Table 2.2-1. The Catawba control area chilled water system is listed on page 2.2-7 of LRA Table 2.2-2.

Using the methodology described in Section 2.1.2 of the LRA, the applicant listed the McGuire and Catawba mechanical components that are subject to an AMR in Table 3.3-9, "Aging Management Results - Control Area Chilled Water System (McGuire Nuclear Station)," and Table 3.3-10, "Aging Management Results - Control Area Chilled Water System (Catawba Nuclear Station)," respectively. These tables also list the intended functions of each component and the materials of construction. For both McGuire and Catawba the applicant identified the following components from the control area chilled water system that are subject to an AMR: pump casings, condenser tubes, condenser tube sheets, condenser shells, condenser channel heads, economizers, evaporator tubes, evaporator tube sheets, evaporator channel heads, evaporator shells, oil cooler tubes, oil cooler tube sheets, oil cooler channel heads, oil cooler shells, oil filters, oil separators, storage tanks, compression tanks, orifices, pipe, strainers, tubing, and valves bodies. For McGuire only, the applicant additionally identified chemical feeders and flow indicators as components subject to an AMR.

The applicant stated that the intended functions of the components are to provide filtration so that downstream equipment and/or environments are protected; provide heat transfer so that system and/or component operating temperatures are maintained; maintain mechanical pressure boundary integrity to ensure that sufficient flow and/or pressure are delivered; effect

containment isolation for fission product retention; prevent physical interaction with safety-related equipment; and provide throttling (to deliver sufficient flow and/or sufficient pressure, provide backpressure, reduce pressure, or provide differential pressure).

2.3.3.8.2.2 Staff Evaluation

The staff reviewed Section 2.3.3.8 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the control area chilled water system that are within the scope of license renewal in accordance with 10 CFR 54.4, and to verify that the applicant appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information presented in Section 2.3.3.8 of the LRA and the applicable piping and instrument drawings referenced therein, and the McGuire and Catawba UFSARs, to determine if the applicant adequately identified the portions of the control area chilled water system that are within the scope of license renewal. The staff verified that those portions of the control area chilled water system that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were so identified by the applicant in Section 2.3.3.8 of the LRA. To verify that the applicant did include the applicable portions of the control area chilled water system as within the scope of license renewal, the staff focused its review on those portions of the control area chilled water system that were not identified as within the scope of license renewal to verify that they did not meet the scoping criteria of 10 CFR 54.4.

As a result of this review, the staff determined that additional information was needed to complete its review. The staff noted that vent and drain lines on control area chilled water pump P-1 up to valves 1YC0011 and 1YC0012 (McGuire drawing MCFD-1618-01.00 - L-7) were not highlighted as within license renewal scope. The license renewal highlighting was omitted from several other segments of valved vent lines on this drawing (1YC0070 and 1YC0059). By letter dated January 28, 2002, the staff asked, in RAI 2.3.3.8-2, of the applicant if these segments of valved vent lines were within the scope of license renewal. In its response dated April 15, 2002, the applicant stated that the vent and drain lines on control area chilled water system pump P-1 up to valves 1YC0011 and 1YC0012 and the vent lines associated with valves 1YC0070 and 1YC0059, are within the scope of license renewal. While the valves and associated piping are within the license renewal boundary defined by license renewal flags, highlighting was inadvertently left off that segment of piping. The piping and valves are listed in Table 3.3-9 (pages 3.3-96 and 3.3-98) of the LRA. The staff found the applicant's response acceptable.

The staff noted that two refrigerant lines for chiller C-1 (between the condenser and the economizer and between the compressor and the oil cooler) were omitted from the scope of license renewal according to McGuire drawing MCFD-1618-04.00. By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.8-4, the applicant to confirm that this refrigerant line was within the scope of license renewal. In its response dated April 15, 2002, the applicant stated that the two refrigerant lines are within the scope of license renewal. While the piping is within the license renewal boundary defined by license renewal flags, highlighting was inadvertently left off that segment of piping. The piping is listed in Table 3.3-9 (page 3.3-96) of the LRA. The staff found the applicant's response acceptable.

The staff noted that Catawba control area chilled water system LRA drawings CN-1578-2.0, 2.1, 2.2, 2.3, 2.4, and 2.5 all depict one or more thermowells installed within segments of piping that are within the scope of license renewal. However, the thermowells themselves were not highlighted, nor were there any entries for thermowells in Table 3.3-10, "Aging Management Review Results - Control Area Chilled Water System." By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.8-6, the applicant to confirm that these thermowells are within scope for license renewal and address whether the thermowells should be included for AMR of their heat transfer component function in addition to pressure boundary. In its response dated April 15, 2002, the applicant confirmed that thermowells are within the scope of license renewal as part of the piping commodity listed in LRA Tables 3.3-6 and 3.3-7. The applicant stated that pressure boundary is the only intended function of the thermowells and referred to its response to a similar RAI on thermowells.

The applicant's response to this RAI clarified that, on both the McGuire and Catawba mechanical flow diagrams, the instrument nomenclature identifies whether the temperature element is installed in a thermowell. The letters "TE" in the component identification number 1KCTE5880 above indicate that a temperature element is installed in a thermowell. The letters "TX" in the component identification number 1KCTX5880 above indicate that no temperature element is installed in the thermowell. The applicant stated that the portion of the thermowell that forms a mechanical system pressure boundary is within the scope of license renewal because it serves a pressure boundary function. The applicant stated that commodity type "pipe" or "piping" is used throughout the LRA to represent the host of piping components that have a pressure boundary function. These piping pressure boundary components include not only the piping itself but other piping-related components such as elbows, tees, half-couplings, and temperature elements. The staff found the applicant's response acceptable because thermowells are included as part of the pipe or piping commodity group.

The applicant further stated that for thermowells, pressure boundary is the only component intended function. The applicant referred to Appendix C of NEI 95-10 (Revision 3) for an understanding of the heat transfer design aspects. The applicant stated that heat transfer is a parameter considered in the design of most safety-related structures and components, but not a primary safety function like that associated with steam generators and heat exchangers. For example, while the heat capacity of the containment and interior structures is included in the modeling of the pressure and temperature transient for loss-of-coolant accidents, these secondary heat transfer functions of the safety-related structures and components need not be a specific focus of the AMR for license renewal. For thermowells, heat transfer is a secondary function and does not need to be the focus of the AMR. Therefore, pressure boundary is the only component intended function of thermowells. Based on the above, the staff finds the applicant's response acceptable since there is no primary safety function associated with heat transfer for thermowells in the control area chilled water system.

By letter dated January 28, 2002, the staff asked, in RAI 2.3.3.8-8, why the tubing to (apparent) back-pressure-regulating valves 1YC116 and 1YC72, shown on drawings CN-1578-2.0 and CN-1578-2.2 was not depicted as within the scope of license renewal for pressure boundary function. In its response dated April 15, 2002, the applicant stated that these valves are Fisher self-contained pressure control valves. The piping, tubing, and valves associated with these pressure-regulating valves are within the scope of license renewal and subject to AMR. Highlighting for the small interconnecting portion from the process line to the valve controller on

drawing CN-1578-2.0 was inadvertently left off. The piping, tubing and associated valves are listed in LRA Table 3.3-10. The staff found the applicant's response acceptable.

Aside from the errors in the boundaries on the LRA drawings and other items discussed above, the staff did not identify any omissions in the applicant's scoping review.

The staff then determined whether the applicant had properly identified the SCs that are subject to an AMR from among those portions of the control area chilled water system that are identified as within the scope of license renewal. The applicant listed the SCs subject to AMR for the control area chilled water system in Table 3.3-9 (McGuire) and Table 3.3-10 (Catawba) of the LRA using the screening methodology described in Section 2.1 of the LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER.
The applicant identified the portions of the control area chilled water system that are within the scope of license renewal by drawings referenced in LRA Section 2.3.3.8. In addition, the applicant lists the mechanical components that are subject to an AMR and their intended function(s) in Table 3.3-9 (McGuire) and Table 3.3-10 (Catawba) of the LRA.

The license renewal drawings were highlighted by the applicant to identify those portions of the control area chilled water system that meet at least one of the scoping criteria of 10 CFR 54.4. The staff compared the LRA drawings to the system drawings and the description in the FSAR to ensure they were representative of the control area chilled water system. The staff performed its review by sampling the SCs that the applicant determined to be within the scope of license renewal but not subject to AMR to verify that no structure or component that performs its intended functions without moving parts or without a change in configuration or properties and that is not subject to replacement on the basis of qualified life or specified time period was excluded from an AMR.

By letter dated January 28, 2002, the staff asked, in RAI 2.3.3.8-1, why airtrol tank fittings within the license renewal boundaries on McGuire LRA drawing MCFD-1618-01.00 and Catawba LRA drawings CN-1578-2.0 and CN-1578-2.2 did not have corresponding entries in Tables 3.3-9 and 3.3-10, "Aging Management Review Results - Control Area Chilled Water System." In its response dated April 15, 2002, the applicant stated that the airtrol tank fittings depicted on drawings MCFD-1618-01.00, CN-1578-2.0, and CN-1578-2.2 are valves used to adjust the level in the compression tanks to compensate for expansion and contraction of the fluid in the chilled water system. These valves are included in the "Valve Bodies" commodity entry in Table 3.3-9 (page 3.3-97, page 3.3-98) and in Table 3.3-10 (page 3.3-108; page 3.3-109) of the LRA. The staff found the applicant's response acceptable.

By letter dated January 28, 2002, the staff asked, in RAI 2.3.3.8-3, why there are no entries for the compressor shells or cases in Tables 3.3-9 and -10, "Aging Management Review Results - Control Area Chilled Water System for McGuire and Catawba." The compressors are depicted as within license renewal scope on LRA drawings MCFD-1618-04.00, CN-1578-2.4, and CN-1578-2.5. In its response dated April 15, 2002, the applicant noted that although the compressors are within the scope of license renewal, they are not included in the AMR results tables in the LRA. The applicant further noted that compressors, without sub-component exceptions, are explicitly excluded from an AMR by 10 CFR 54.21(a)(1)(i). The staff found the applicant's response acceptable since compressors are specifically excluded from an AMR by the regulations.

The staff noted that Catawba control area chilled water system LRA drawings CN-1578-2.0, -2.1, -2.2, and -2.3 all have a note: "Actuator failed to the normally open position, power/control wiring disconnected and hydraulic fluid drained from actuator. Valve position maintained by actuator spring." These notes apply to various two-way valves that would bypass flow from the fan coolers in the alternate position. By letter dated January 28, 2002, the staff stated, in RAI 2.3.3.8-7, that these valves appeared to be passive devices held in the intended position by the springs and requested that the applicant either address why these springs are not subject to an AMR (to ensure they retain the ability to maintain the position and passive nature of these valves) or provide a basis for why these components are considered active and not subject to an AMR. In its response dated April 15, 2002, the applicant stated that all valve components (actuators, operators, disks, stems, springs, etc.) except for valve bodies are excluded from AMR in accordance with 10 CFR 54.21(a)(1)(i). The staff believed that applicant's response did not address the specific question regarding the active designation of these valves actuators because, with the stated configuration, there were no apparent moving parts or change in configuration or properties and the applicant did not document plans to replace the valves on the basis of qualified life or specified time period.

In electronic correspondence dated May 2, 2002 (ML021440229), the applicant provided clarification that the spring, which is a piece/part of the actuator, is in a relaxed state and not compressed. In the event the valve stem attempts to reposition by some unknown force, the spring would compress slightly and then restore the valve to its initial position. Compression of the spring is a change of state. In addition, the flow through the valve itself tends to keep the valve open. In the unlikely event that the spring fails and the valve stem repositions, there is no impact on the pressure boundary function of the system components. By letter dated July 9, 2002, the applicant provided this explanation of the actuator's design and configuration in official correspondence. The staff considers the applicant's position acceptable since it clarifies that the valves are open and flow will tend to keep the valve open, and the actuator will provide force to close the valve through the compression of the spring in the event the valves in question attempt to reposition.

2.3.3.8.2.3 Conclusions

On the basis of its review of the information contained in Section 2.3.3.8 of the LRA, the supporting information from the McGuire and Catawba UFSARs, LRA drawings, and the responses to RAIs, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the McGuire control area chilled water system and the Catawba control area chilled water system that are within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a), and 10 CFR 54.21(a)(1), respectively.

2.3.3.9 Conventional Waste Water Treatment System

In LRA Section 2.3.3.9, "Conventional Waste Water Treatment System," the applicant described the components of the conventional waste water treatment system that are within the scope of license renewal and subject to an AMR. The system is described in Section 9.2.8 of the McGuire UFSAR. Because of the design differences between McGuire and Catawba, the following staff evaluation applies to McGuire only.

2.3.3.9.1 Technical Information in the Application

The conventional waste water treatment system at McGuire maintains low water level in the standby shutdown facility (SSF) sump to prevent flooding of SSF equipment. The similar system at Catawba does not meet the license renewal scoping criteria.

The applicant described the process for identifying the mechanical components that are within the scope of license renewal in LRA Section 2.1.1, "Scoping Methodology." As described in the scoping methodology, the applicant identified the portions of the conventional waste water treatment system that are within the scope of license renewal on the piping and instrumentation diagrams (P&IDs) that are listed in LRA Section 2.3.3.9. Consistent with the method described in LRA Section 2.1.2, "Screening Methodology," the applicant listed the conventional waste water treatment system mechanical components that are subject to an AMR in LRA Table 3.3-12. This table also lists the component functions. Specifically, the applicant identified the following components as subject to an AMR: piping and SSF sump pump casing. The applicant stated that the intended component functions are to maintain pressure boundary and to prevent flooding of SSF equipment.

2.3.3.9.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.9 to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the conventional waste water treatment system that are within the scope of license renewal in accordance with 10 CFR 54.4(a) and that the applicant appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in LRA Section 2.3.3.9, the applicable P&IDs referenced therein, and the McGuire UFSAR to determine if the applicant adequately identified the portions of the conventional waste water treatment system that are within the scope of license renewal. The staff verified that those portions of the conventional waste water treatment system that meet the scoping requirements of 10 CFR 54.4(a) were included within the scope of license renewal and were identified by the applicant in Section 2.3.3.9 of the LRA.

In LRA Section 2.3.3.9, the applicant listed applicable P&IDs for the conventional waste water treatment system. The detailed diagrams are highlighted to identify those portions of the system that are within the scope of license renewal. The staff compared the LRA diagrams to the system drawings and descriptions in the UFSAR to ensure that the diagrams were representative of the conventional waste water treatment system. To verify that the applicant included the applicable portions of the conventional waste water treatment system within the scope of license renewal, the staff focused its review on those portions of the conventional waste water treatment system that were not identified as within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4(a). In addition, the staff reviewed the UFSAR for each facility to identify any additional system functions that were not identified in the LRA, and verified that the additional functions did not meet the scoping requirements of 10 CFR 54.4(a).

In reviewing the LRA, the staff noticed that some of the components designated as within the scope of license renewal for McGuire were not identified as within the scope of license renewal for Catawba. The staff reviewed the UFSAR in an attempt to understand the reason for these differences, but could not find an explanation. In a conference call on September 12, 2001, the

staff requested that the applicant clarify the differences in design between Catawba and McGuire that resulted in these differences in scoping. The applicant explained that the SSF sump pump was included within the scope of license renewal at McGuire because credible events involving pipe breaks could cause flooding of the SSF building, which might affect the SSF equipment. Because the piping configuration at Catawba is different, the applicant did not identify any credible pipe breaks that could cause flooding of the SSF. The Catawba SSF sump pump is not required for the mitigation of flooding effects. The applicant's explanation of why the flood-mitigating function at McGuire was not warranted at Catawba clarified these scoping differences between the two plants. On the basis of the above review, the staff did not identify any omissions by the applicant in the scoping of mechanical components according to 10 CFR 54.4(a).

The staff then determined whether the applicant had properly identified the SCs that are subject to an AMR from among those portions of the conventional waste water treatment system that were identified as within the scope of license renewal. The applicant used the screening methodology described in LRA Section 2.1.2 to identify the SCs subject to an AMR. The staff evaluation of the scoping and screening methodology is documented in Section 2.1 of this SER. In the LRA, the applicant identified the portions of the conventional waste water treatment system that are within the scope of license renewal in the P&IDs and listed the mechanical components that are subject to an AMR and their intended component functions in LRA Table 3.3-12. The staff performed its review by sampling the SCs that the applicant determined were within the scope of license renewal but not subject to AMR to verify that no structure or component that performs its intended function without moving parts or without a change in configuration or properties and that is not subject to replacement based on qualified life or specified time period was excluded from an AMR. The staff did not identify any omissions by the applicant in screening SCs according to 10 CFR 54.21(a)(1).

2.3.3.9.3 Conclusions

On the basis of its review of the information contained in LRA Section 2.3.3.9, the supporting information in the P&IDs, and the McGuire UFSAR, as described above, the staff did not identify any omissions by the applicant. Therefore, the staff finds that there is reasonable assurance that the applicant adequately identified those portions of the conventional waste water treatment system that are within the scope of license renewal and the associated SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 54.21(a)(1), respectively.

2.3.3.10 Diesel Building Ventilation (VD) System

In Section 2.3.3.10 of the LRA titled, "Diesel Building Ventilation System," the applicant identified portions of the VD system and the components that are within the scope of the LRA and subject to AMR. In this section of the LRA, the applicant noted that the VD system is further described in Sections 9.4.6 and 9.4.4 of the McGuire and Catawba UFSARs, respectively.

The applicant evaluated component supports for VD system ductwork in Table 3-7 of the UFSARs. The applicant evaluated electrical components that support the operation of the system in Section 2.1.2.3 of the LRA. The staff's scoping evaluation of structures and component supports is provided in Section 2.4 of this SER. The staff's evaluation of electrical

components and instrumentation and controls in the VD system is documented in Section 2.5 of this SER.

2.3.3.10.1 Technical Information in the Application

The VD system is designed to provide a suitable environment for the operation of equipment and personnel access for inspection, testing, and maintenance. The VD system is designed to maintain the building temperature within both standby and operating environmental limits. Essential electrical components required for ventilation of the diesel building during accident conditions are connected to Emergency Class 1E standby power. The VD system is located completely within a Seismic Category I structure. All essential fans, dampers, ductwork, and supports are designed to withstand a safe shutdown earthquake. The diesel building ventilation air supply and exhaust openings are protected from tornado missile damage.

The McGuire and Catawba VD systems consist of the following subsystems:

> Normal Ventilation Subsystems
> The normal ventilation subsystems for each diesel-generator enclosure consist of a 100 percent capacity fan, shutoff damper, filter section, and associated ductwork. The normal ventilation subsystems have no standby capacity and operate only during normal plant operation (diesel off-cycle). The normal ventilation fans will be turned off when the associated diesel generators are started, either for test purposes or by an ESF actuation signal.
>
> Emergency Ventilation Systems
> The emergency ventilation subsystems (general ventilation subsystems at McGuire) for the diesel enclosures consist of two 50 percent capacity fans, ductwork, and modulating return air and outside air dampers arranged to maintain space temperature within prescribed limits when the diesel generators are operating. Excess makeup air to the diesel enclosure is relieved through automatic (pressure-operated) relief dampers.

In Section 2.3.3.10 of the LRA and Sections 9.4.6 and 9.4.4 of the McGuire and Catawba UFSARs, respectively, the applicant identified the following VD system intended functions based on 10 CFR 54.4(a)(1) and 10 CFR 54.4(a)(2):

McGuire
Section 2.3.3.10 of the LRA:

- To maintain temperature control for each diesel building when its associated diesel generator is running.

Section 9.4.6 of the UFSAR:

- To filter the outside supply air and accommodate the combustion air flow requirements for each diesel engine.
- To maintain the diesel building within temperature limits.
- To prevent the possibility of room air short-cycling to the combustion air intakes in the event of a fan failure.

Catawba
Section 2.3.3.10 of the LRA:

• To maintain temperature control for each diesel building when the associated diesel generator is running.

Section 9.4.4 of the UFSAR:

• To provide a suitable environment for the operation of equipment and personnel access for inspection, testing, and maintenance.
• To maintain the ambient diesel building temperature within limits.

On the basis of the intended functions identified above for the McGuire and Catawba VD systems, the portions of this system that were identified by the applicant as within the scope include all VD system safety-related components (electrical, mechanical, and instruments). The applicant described its methodology for identifying the mechanical components subject to an AMR in Section 2.1 of the LRA. On the basis of this methodology, the applicant identified the portions of the VD system that are within the scope on the flow diagrams listed in Section 2.3.3.10 of the LRA. Using the scoping results methodology described in Section 2.2, the applicant compiled a list of the mechanical components and component types subject to an AMR that are within the evaluation boundaries highlighted on the flow diagrams and identified their intended functions. The applicant provided this list in Table 3.3-13 of the LRA.

The following component types are identified as within the scope of license renewal and subject to an AMR and are listed in Table 3.3-13 of the LRA: ductwork, pipe, stainless-steel pipes, tubing, and valves housings. The applicant noted in Table 3.3-13 of the LRA that it considers the pressure boundary process function as the only applicable passive intended function of VD system components subject to an AMR.

2.3.3.10.2 Staff Evaluation

To verify that the applicant identified the components of the VD system that are within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1), the staff reviewed the flow diagrams listed in LRA Section 2.3.3.10 that show the evaluation boundaries for the highlighted portion of the VD system that are within the scope. The staff also reviewed Table 3.3-13 of the LRA, which lists the mechanical components and the applicable intended functions that are within the scope of the license renewal and subject to an AMR. The staff reviewed McGuire UFSAR Section 9.4.4 and Catawba UFSAR Section 9.4.6 to determine if there were any portions of the VD system that met the scoping criteria in 10 CFR 54.4(a), but were not identified as within the scope. The staff also reviewed the McGuire and Catawba UFSARs to determine if any safety-related system functions were not identified as intended functions in the LRA, and to determine if any structures or components that have intended functions were omitted from the scope of structures or components that require an AMR. The staff compared the functions described in the UFSARs to those identified in the LRA.

The applicant identified the structures and components subject to an AMR for the VD system using the screening methodology described in Section 2.1 of the LRA and listed them in Table 3.3-13 of the LRA. The staff evaluated the scoping and screening methodology, and documented its findings in Section 2.1 of this report. The staff sampled the structures and components in Table 3.3-13 of the LRA to verify that the applicant did identify the structures and components subject to an AMR. The staff also sampled the structures and components

that were within the scope of license renewal but not subject to an AMR. Based on the sample, the staff verified that these structures and components perform their intended functions without moving parts or without a change in configuration or properties and are not subject to replacement on the basis of a qualified life or specified time period.

To ensure that those portions of the VD system excluded from scope do not perform any intended functions, the staff requested additional information. The staff noted that Section 2.3.3.10 of the LRA provides a summary description of the system functions and a list of flow diagrams. The flow diagrams highlight the evaluation boundaries and Table 3.3-13 of the LRA tabulates the components within the scope and subject to an AMR for the VD system. The corresponding drawings and above-reviewed sections of the UFSARs, however, show additional components that were not listed in Table 3.3-13 of the LRA.

The staff noted that the applicant did not identify housings for active components that require an AMR. The determination should consider whether failure of the housing would result in a failure of the associated active component to perform its intended function and whether the housing meets the long-lived and passive criteria as defined in the rule.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-1, specific information concerning the exclusion of housings for fans and air handling units from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant stated that cooling fans are not included in the AMR results tables in the LRA. The applicant also stated cooling fans, without sub-component exceptions, are explicitly excluded from an AMR by 10 CFR 54.21. The staff reviewed this response and determined that the applicant's basis for excluding fan housings is not consistent with the license renewal rule because the housings are relied upon to maintain pressure boundary integrity (as are valve bodies and pump casings) and are within scope. Furthermore, because the fan housings are passive and long-lived components, they are subject to an AMR. The staff finds this response unacceptable and characterizes this issue as open item 2.3-1.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-2 and RAI 2.3-8(3), specific information concerning the exclusion of damper housings and valve bodies from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant stated that dampers and/or valve bodies are not included in the AMR result tables in the LRA. The applicant also stated that ventilation dampers, without sub-component exceptions, are explicitly excluded from an AMR by 10 CFR 54.21. The staff reviewed this response and has determined that the applicant's basis for excluding damper housings is not consistent with the license renewal rule because the housings are relied upon to maintain pressure boundary integrity (as are valve bodies and pump casings) and are within scope. Furthermore, because the damper housings are passive and long-lived components, they are subject to an AMR. The staff finds this response unacceptable and characterizes this issue as open item 2.3-2.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-7(3) and RAI 2.3.3.10-1, specific information concerning the exclusion of duct heater housings (McGuire only) from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant stated that duct heater housings should have been highlighted on flow diagrams to indicate that they are within the scope of license renewal. The applicant further stated that the duct heaters consist of electric heating elements that are mounted inside the ductwork and do not have a pressure boundary function or any other component intended function for license renewal and

are not subject to an AMR. On the basis of the information provided related to duct heater housings, the staff finds the applicant's responses acceptable.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-8(4), specific information concerning the exclusion of pipe components (McGuire only) from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant stated that pipe components for the diesel building ventilation systems are associated with in-scope instruments that, by convention, are not highlighted on mechanical system flow diagrams. On the basis of this clarifying information, the staff finds the applicant's response acceptable.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-5 and RAI 2,.3-8(5), specific information concerning the exclusion of passive components associated with ductwork from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant identified these passive components as sub-components of ductwork. The applicant also stated that ventilation grilles were installed only for aesthetic purposes and perform no intended license renewal function. On the basis of the information provided, the staff finds the applicant's response acceptable.

Some components that are common to many systems, including the VD system, have been evaluated separately by the applicant in Section 2.1.2.1.2 of the LRA as "replace on condition" commodities. The staff's evaluation of applicant's treatment of these consumables is documented in Section 2.1.3.2.1 of this SER.

In Section 2.4.3 of this report the staff evaluated component supports for piping, cables, and equipment that supported the design and operation of the VD system. In LRA Section 2.5, "Scoping and Screening Results: Electrical and Instrumentation and Controls," the staff evaluated electrical and instrument components that support the operation of the VD system.

The staff reviewed the LRA, supporting information in the UFSARs, and applicant's response to RAIs. In addition, the staff sampled several components from the VD system flow diagrams identified in Section 2.3.3.10 of the LRA to determine whether the applicant properly identified the components within scope and subject to an AMR. No omissions were identified, except as identified in the RAIs.

2.3.3.10.3 Conclusions

On the basis of its review, with the exception of open items identified in this report section, the staff has reasonable assurance that the applicant has adequately identified the VD system structures and components that are within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4 and 10 CFR 54.21, respectively.

2.3.3.11 Diesel Generator Air Intake and Exhaust System

In LRA Section 2.3.3.11, "Diesel Generator Engine Air Intake and Exhaust System," the applicant described the components of the diesel generator air intake and exhaust system that are within the scope of the license renewal and subject to an AMR. This system is described in Section 9.5.11 of the McGuire UFSAR and Section 9.5.8 of the Catawba UFSAR. The staff reviewed the LRA and the McGuire and Catawba UFSARs to determine whether the applicant adequately demonstrated that the requirements of 10 CFR Part 54 have been met.

The LRA refers to the “diesel generator air intake and exhaust system” for McGuire, the LRA refers to the “diesel generator engine air intake and exhaust system” for Catawba. For simplicity, the system will be referred to as the “diesel generator air intake and exhaust system” for both McGuire and Catawba.

2.3.3.11.1 Technical Information in the Application

The diesel generator air intake and exhaust system supplies air to the diesel generator engines for fuel combustion and removes exhaust from the diesel generator engines to the atmosphere outside of the building.

The applicant described the process for identifying the SSCs within the scope of license renewal in Section 2.1.1 of the LRA. Using that scoping methodology, the applicant determined that the diesel generator air intake and exhaust system was within the scope of license renewal and listed it on page 2.2-3 in Table 2.2-1 for McGuire and page 2.2-7 in Table 2.2-2 for Catawba. The LRA included system drawings that were highlighted to indicate the license renewal evaluation boundary.

The applicant described the process for identifying the SCs subject to an AMR in Section 2.1.2 of the LRA. Using that screening methodology, the applicant listed the McGuire and Catawba mechanical components that are subject to an AMR in Table 3.3-14 of the LRA. This table also listed the intended function of each component and the materials of construction. The applicant identified the following components from the diesel generator air intake and exhaust system as subject to an AMR: exhaust silencers, intake air filters, intake air silencers, intake flexible connector, expansion joints, flexible hoses, pipes, tubing, and valves bodies. The applicant stated that the intended functions of the components are to maintain mechanical pressure boundary integrity to ensure that sufficient flow and/or pressure are delivered; to effect containment isolation for fission product retention; and to prevent physical interaction with safety-related equipment.

2.3.3.11.2 Staff Evaluation

The staff reviewed Section 2.3.3.11 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the diesel generator air intake and exhaust system that are within the scope of license renewal in accordance with 10 CFR 54.4 and that the applicant appropriately identified the mechanical components that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the text and the applicable drawings submitted by the applicant in Section 2.3.3.11 of the LRA. The staff verified that the applicant adequately identified the portions of the diesel generator air intake and exhaust system that meet the scoping requirements of 10 CFR 54.4 and that these portions were included within the scope of license renewal in Section 2.3.3.11 of the LRA. The staff focused its review on those portions of the diesel generator air intake and exhaust system that were not identified as within the scope of license renewal to verify that they did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions in the applicant’s scoping review.

The staff reviewed LRA Table 3.3-14, which lists the mechanical components subject to an AMR for the McGuire and Catawba diesel generator air intake and exhaust systems. The staff

verified that the applicant properly identified the mechanical components that were subject to an AMR from among those portions of the diesel generator air intake and exhaust system that were identified as within the scope of license renewal. The staff sampled the components that the applicant determined to be within the scope of license renewal but not subject to an AMR, to verify that no component that performs its intended function(s) without moving parts or without a change in configuration or properties and that is not subject to replacement based on qualified life or specified time period was excluded from Table 3.3-14.

During its review of Section 2.3.3.11, the staff determined that additional information was needed to complete its review. According to the license renewal evaluation boundary highlighted on drawings MCFD-1609-05.00, MCFD-2609-05.00, CN-1609-5.0, and CN 2609-05.0, the air intake manifold, exhaust manifold, and turbochargers were determined to be within the scope of license renewal. The passive portions of these components (e.g., turbocharger housing and tubes) that have a pressure boundary function were not listed in Table 3.3-14 as subject to an AMR. By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.11-1, that the applicant provide the basis for excluding the passive components of the diesel generator air intake manifold, exhaust manifold, and turbochargers from the lists of components subject to an AMR. In its response dated April 15, 2002, the applicant stated that, even though the diesel generators and its sub-components, such as air intake manifold, exhaust manifold, and turbochargers, are within the scope of license renewal, diesel generators, without sub-components exceptions, are explicitly excluded from an AMR by 10 CFR 54.21(a)(1)(i). The staff found the applicant's response acceptable because, even though portions of the air intake manifold, exhaust manifold, and turbochargers are passive, these components are sub-components of the diesel generator, which is active and, therefore, not subject to an AMR, in accordance with 10 CFR 54.21(a)(1)(i).

2.3.3.11.3 Conclusion

On the basis of its review of the information contained in Section 2.3.3.11 of the LRA, the supporting information from both UFSARs, applicable LRA drawings, and the RAI response, the staff concluded that there is reasonable assurance that the applicant has identified those portions of the diesel generator air intake and exhaust system that are within the scope of license renewal and those that are subject to an AMR in accordance with 10 CFR 54.4(a), and 10 CFR 54.21(a)(1), respectively.

2.3.3.12 Diesel Generator Cooling Water System

In LRA Section 2.3.3.12, "Diesel Generator Cooling Water System," the applicant described the components of the diesel generator cooling water system that are within the scope of the license renewal and subject to an AMR. This system is described in Section 9.5.5 of the McGuire and Catawba UFSARs. The staff reviewed the LRA and the McGuire and Catawba UFSARs to determine whether the applicant adequately demonstrated that the requirements of 10 CFR Part 54 had been met.

The LRA refers to the "diesel generator cooling water system" for McGuire but to the "diesel generator engine cooling water system" for Catawba. For simplificity, the system will be referred to as the "diesel generator cooling water system" for both McGuire and Catawba.

2.3.3.12.1 Technical Information in the Application

The diesel generator cooling water system maintains the temperature of each emergency diesel generator engine and its support systems within a required operating range.

The applicant described the process for identifying the SSCs within the scope of license renewal in Section 2.1.1 of the LRA. Using that scoping methodology, the applicant determined that the diesel generator cooling water system was within the scope of license renewal and listed it on page 2.2-3 in Table 2.2-1 for McGuire and page 2.2-7 in Table 2.2-2 for Catawba. The LRA included system drawings that were highlighted to indicate the license renewal evaluation boundary.

The applicant described the process for identifying the SCs subject to an AMR in Section 2.1.2 of the LRA. Using that screening methodology, the applicant listed the mechanical components that are subject to an AMR in Tables 3.3-15 and 3.3-16 of the LRA for McGuire and Catawba, respectively. These tables also listed the intended functions of the components and the materials of construction. For McGuire, the applicant identified the following components of the diesel generator cooling water system as subject to an AMR: annubars, surge tanks, heat exchangers (tube sheets, channel heads, shells, and tubes), turbocharger intercoolers (channel heads, shells, tubes, and tube sheets), intercooler pumps, jacket water circulating pumps, jacket water heaters, jacket water pumps, flow orifices, piping, tubing, and valve bodies. For Catawba, the applicant identified the following components from the diesel generator cooling water system as subject to an AMR: jacket water circulation pumps, jacket water coolers (channel heads, shells, tubes, and tube sheets), jacket water keep warm pumps, jacket water standpipes, governor lube oil coolers (end covers, shells, and tubes), piping, tubing, and valve bodies.

The applicant stated that the intended functions of the components are to provide heat transfer so that system and/or component operating temperature is maintained; to provide mechanical pressure boundary integrity so that sufficient flow and/or sufficient pressure are delivered; to effect containment isolation for fission product retention; or to prevent physical interaction with safety-related equipment.

2.3.3.12.2 Staff Evaluation

The staff reviewed Section 2.3.3.12 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the diesel generator cooling water system that are within the scope of license renewal in accordance with 10 CFR 54.4 and that the applicant appropriately identified the mechanical components that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the text and applicable drawings submitted by the applicant in Section 2.3.3.12 of the LRA to verify that the applicant adequately identified the portions of the diesel generator cooling water system that meet the scoping of requirements of 10 CFR 54.4 and that these portions were included within the scope of license renewal in Section 2.3.3.12 of the LRA. The staff focused its review on those portions of the diesel generator cooling water system that were not identified as within the scope of license renewal to verify that they did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

The staff reviewed Tables 3.3-15 and 3.3-16 of the LRA, which list the mechanical components subject to an AMR for the cooling water systems for McGuire and Catawba. The staff verified

that the applicant properly identified the mechanical components that were subject to an AMR from among those portions of the diesel generator cooling water system that were identified as within the scope of license renewal. The staff sampled the components that the applicant determined to be within the scope of license renewal but not subject to an AMR to verify that no component that performs its intended function(s) without moving parts or without a change in configuration or properties and that is not subject to replacement based on qualified life or specified time period was excluded from Tables 3.3-15 and 3.3-16.

During its review of Section 2.3.3.12, the staff determined that additional information was needed to complete its review. According to the license renewal boundary highlighted on drawings MCFD-1609-01.00, MCFD-2609-01.00, MCFD-1609-01.01, and MCFD-2609-01.01, the turbocharger turbine cooling supply/return (e.g., heat exchanger tubes) and the flexible hose (located at coordinates K4) were identified by the applicant as within the scope of license renewal. These components were not identified as subject to an AMR and were not listed in Table 3.3-15. By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.12-1, that the applicant provide the basis for not listing the turbocharger turbine cooling supply and return lines and the flexible hose in Table 3.3-15, since these components are passive and long-lived and have pressure boundary intended functions. In its response dated April 15, 2002, the applicant stated that the turbocharger turbine cooling heat exchanger tubes were included in the "piping" entry in Table 3.3-15 of the LRA. As for the flexible hose, the applicant stated that this hose is replaced during periodic maintenance. The applicant implied that the hose is replaced based on qualified life in accordance with 10 CFR 54.21(a)(1)(i) and is, therefore, not subject to an AMR. However, since this was not clearly stated in the RAI response, this issue is characterized as open item 2.3.3.12.2-1.

According to the license renewal boundary highlighted on Catawba drawings CN-1609-1.0 and CN 2609-1.0, the turbocharger aftercoolers and engine jackets are within the scope of license renewal. The passive portions of these components (e.g., turbocharger housing, tubes) that have a pressure boundary function were not listed on Table 3.3-14 as components subject to an AMR. By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.12-2, that the applicant provide the basis for excluding the passive components of the turbocharger aftercoolers and engine jackets from the lists of components subject to an AMR. In its response dated April 15, 2002, the applicant stated that, even though the diesel generators and their sub-components, such as the turbocharger aftercoolers and the engine jackets, are within the scope of license renewal, diesel generators, without sub-component exceptions, are explicitly excluded from an AMR by 10 CFR 54.21(a)(1)(i). The staff found the applicant's response acceptable because, even though portions of the diesel generator turbo charger aftercoolers and engine jacket are passive, these components are part of the diesel generator, which is active and not subject to an AMR in accordance with 10 CFR 54.21(a)(1)(i).

2.3.3.12.3 Conclusion

On the basis of its review of the information contained in Section 2.3.3.12 of the LRA, the supporting information from both UFSARs, applicable LRA drawings, and the RAI response, the staff concluded that there is reasonable assurance that the applicant has identified those portions of the diesel generator cooling water system that are within the scope of license renewal and those that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.13 Diesel Generator Crankcase Vacuum System

In LRA Section 2.3.3.13, "Diesel Generator Crankcase Vacuum System," the applicant described the components of the diesel generator crankcase vacuum system that are within the scope of the license renewal and subject to an AMR. This system is further described in Section 9.5.9 of the McGuire UFSAR. This system is not described in the Catawba UFSAR. The staff reviewed the LRA and the UFSAR for McGuire to determine whether the applicant has adequately demonstrated that the requirements of 10 CFR Part 54 have been met.

The LRA refers to the "diesel generator cooling water system" for McGuire, while the LRA refers to the "diesel generator engine cooling water system" for Catawba. For simplicity, the system will be referred to as the "diesel generator cooling water system" for both McGuire and Catawba.

2.3.3.13.1 Technical Information in the Application

The diesel generator crankcase vacuum system reduces the concentration of combustible gases in the crankcase. It also reduces oil leakage around inspection doors and explosion relief valves.

The applicant described the process for identifying the SSCs within the scope of license renewal in Section 2.1.1 of the LRA. Using that scoping methodology, the applicant determined that the diesel generator crankcase vacuum system was within the scope of license renewal and listed it on page 2.2-3 in Table 2.2-1 for McGuire and page 2.2-7 in Table 2.2-2 for Catawba. The LRA included system drawings that were highlighted to indicate the license renewal evaluation boundary.

The applicant described the process for identifying the SCs subject to an AMR in Section 2.1.2 of the LRA. Using that screening methodology, the applicant listed the mechanical components that are subject to an AMR in Table 3.3-17 of the LRA for McGuire and Catawba. This table also listed the intended functions of the components and the materials of construction. The applicant identified the following components from the diesel generator crankcase vacuum system as subject to an AMR: blowers, oil separators, orifices, pipes, tubing, and valves bodies.

The applicant states that the intended functions of the components are to provide filtration of process fluid so that the equipment and environment downstream are protected; to remove gas so that sufficient vacuum is maintained; to provide sufficient fluid system level, priming, or inventory; to maintain mechanical pressure boundary integrity so that sufficient flow and/or pressure are delivered; to effect containment isolation for fission product retention, or prevent physical interaction with safety-related equipment; and to provide throttling (to deliver sufficient flow and/or sufficient pressure, provide back pressure, reduce pressure, or provide differential pressure).

2.3.3.13.2 Staff Evaluation

The staff reviewed Section 2.3.3.13 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the diesel generator crankcase vacuum system that are within the scope of license renewal in accordance with

10 CFR 54.4 and that the applicant appropriately identified the mechanical components that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the text and applicable drawings submitted by the applicant in Section 2.3.3.13 of the LRA and the McGuire UFSAR, to verify that the applicant adequately identified the portions of the diesel generator crankcase vacuum system that are within the scope of license renewal and that those portions were included within the scope of license renewal in Section 2.3.3.13 of the LRA. The staff focused its review on those portions of the diesel generator crankcase vacuum system that were not identified as within the scope of license renewal to verify that they did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

The staff reviewed Table 3.3-17 of the LRA, which lists the mechanical components subject to an AMR for the crankcase vacuum system for McGuire and Catawba. The staff verified that the applicant properly identified the mechanical components that were subject to an AMR from among those portions of the crankcase vacuum system that were identified as within the scope of license renewal. The staff sampled the components that the applicant determined to be within the scope of license renewal but not subject to AMR to verify that no component that performs its intended functions without moving parts or without a change in configuration or properties and that is not subject to replacement based on qualified life or specified time period was excluded from an AMR.

During its review of Section 2.3.3.13, the staff determined that additional information was needed to complete its review. According to McGuire drawings MCFD-1609-06.00 and MCFD-2609-06.00, the two flexible hose connections on either side of the diesel generator crankcase vacuum blower are within the scope of license renewal. These flexible hose connections do not seem to be listed in Table 3.3-17 as subject to AMR. These components are within the scope of license renewal, are passive, and appear to have a pressure boundary function. By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.13-1, that the applicant provide the basis for excluding these flexible hose connections from the lists of components subject to an AMR. In its response dated April 15, 2002, the applicant stated that the parts identified by the staff as “flexible hose connections” are synthetic rubber flexible expansion joints, that they are replaced during the periodic maintenance on the diesel engine, and that they are not, therefore, considered long-lived components, and are not subject to AMR. However, since the applicant did not provide information about the replacement of these flexible connectors (whether they are replaced on condition based on specific performance parameters or based on a qualified life), the staff is unable to evaluate the acceptability of this response. Pending the staff’s receipt of this information, this issue is characterized as open item 2.3.3.13.2-1.

Catawba drawings CN-1609-6.0 and CN-2609-6.0 identify the portions of the diesel generator crankcase vacuum system that are within the scope of license renewal. These drawings do not show a blower. It is not apparent from these Catawba drawings how the system, without a blower, performs its intended function of reducing the concentration of combustible gases in the crankcase. The Catawba UFSAR does not provide any written description of the system. By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.13-2, that the licensee provide an explanation on how the system performs its intended function. In its response dated April 15, 2002, the applicant stated that no blower exists in the diesel generator crankcase vacuum system at Catawba. During normal operation, the crankcase is ventilated by natural flow to the atmosphere through a vent pipe which penetrates the diesel building roof. Since the

applicant confirmed that no component (blower) is relied upon to maintain a vacuum in the diesel generator crankcase, the staff found the applicant's response acceptable.

2.3.3.13.3 Conclusion

The staff reviewed the information contained in Section 2.3.3.13 of the LRA, the supporting information from the McGuire UFSAR, applicable LRA drawings, and the applicant's response to RAIs. With the exception of open item 2.3.3.13.2-1, the staff concluded that there is reasonable assurance that the applicant has identified those portions of the diesel generator crankcase vacuum system that are within the scope of license renewal and those that are subject to an AMR in accordance with 10 CFR 54.4(a), and 10 CFR 54.21(a)(1), respectively.

2.3.3.14 Diesel Generator Fuel Oil System

In LRA Section 2.3.3.14, "Diesel Generator Fuel Oil System," the applicant described the components of the diesel generator air intake and exhaust system that are within the scope of the license renewal and subject to an AMR. This system is described in Section 9.5.4 of the McGuire and Catawba UFSARs. The staff reviewed the LRA and the UFSARs for McGuire and Catawba to determine whether the applicant has adequately demonstrated that the requirements of 10 CFR Part 54 have been met.

2.3.3.14.1 Technical Information in the Application

The diesel generator fuel oil system is relied upon to maintain two trains of fuel oil storage and supply for the EDGs for a period of operation of no fewer than 5 days at McGuire and for 7 days at Catawba.

The applicant described the process for identifying the SSCs within the scope of license renewal in Section 2.1.1 of the LRA. Using that scoping methodology, the applicant determined that the diesel generator fuel oil system was within the scope of license renewal and listed it on page 2.2-3 in Table 2.2-1 for McGuire and page 2.2-7 in Table 2.2-2 for Catawba. The LRA included system drawings that were highlighted to indicate the license renewal evaluation boundary.

The applicant described the process for identifying the SCs subject to an AMR in Section 2.1.2 of the LRA. Using that screening methodology, the applicant listed the mechanical components that are subject to an AMR on Tables 3.3-18 and 3.3-19 of the LRA for McGuire and Catawba, respectively. These tables also listed the intended function of each component and the materials of construction. For McGuire, the applicant identified the following components from the diesel generator fuel oil system that are subject to an AMR: pump casings (engine-driven, booster, and transfer), tanks (day and storage), filters (duplex and transfer), flame arrestors, flow meters, orifices, pipes, strainers, tubing, and valves bodies. For Catawba, the applicant identified the following components from the diesel generator fuel oil system that are subject to an AMR: pump casings (engine-driven and motor-driven), strainers baskets (engine-driven and motor-driven), strainer bodies (engine-driven and motor-driven), filters, tanks (day and storage), flexible hoses, pipes, tubing, and valves bodies. The applicant stated that the intended functions of the components are to maintain mechanical pressure boundary integrity to ensure that sufficient flow and/or pressure are delivered; and to effect

containment isolation for fission product retention or prevent physical interaction with safety-related equipment.

2.3.3.14.2 Staff Evaluation

The staff reviewed Section 2.3.3.14 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the diesel generator fuel oil system that are within the scope of license renewal and that the applicant appropriately identified the mechanical components that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the text and applicable drawings submitted by the applicant in Section 2.3.3.14 of the LRA and the McGuire and Catawba UFSARs to verify that the applicant adequately identified the portions of the diesel generator fuel oil system that meet the scoping requirements of 10 CFR 54.4 and that these portions were included within the scope of license renewal in Section 2.3.3.14 of the LRA. The staff focused its review on those portions of the diesel generator fuel oil system that were not identified as within the scope of license renewal to verify that they did not meet the scoping requirements of 10 CFR 54.4.

The staff reviewed Tables 3.3-18 and 3.3-19 of the LRA, which list the mechanical components subject to an AMR for the diesel generator fuel oil system for McGuire and Catawba, respectively. The staff verified that the applicant had properly identified the mechanical components that were subject to an AMR from among those portions of the diesel generator fuel oil system that were identified as within the scope of license renewal. The staff sampled the components that the applicant determined to be within the scope of license renewal but not subject to AMR to verify that no component that performs its intended functions without moving parts or without a change in configuration or properties and that is not subject to replacement based on qualified life or specified time period was excluded from Tables 3.3-18 and 3.3-19.

During its review of Section 2.3.3.14, the staff determined that additional information was needed to complete its review. On McGuire drawings MCFD-1609-03.00, MCFD-1609-03.01, and MCFD-2609-03.01, the flexible hose connections on either side of the diesel generator engine are shown to be within the scope of license renewal. Although these components appear to have a pressure boundary intended function, they are not listed on Table 3.3-18 as subject to an AMR. By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.14-1, that the applicant provide the basis for excluding these flexible hose connections from the lists of components subject to an AMR. In its response dated April 15, 2002, the applicant stated that these flexible hose connections are replaced during periodic maintenance on the diesel engine and, in accordance with 10 CFR 54.21(a)(1)(ii), are not considered long-lived components and are not subject to an AMR. By electronic correspondence dated July 11, 2002, the staff requested clarification of the applicant's reference to periodic maintenance to determine if the flexible hose connections are replaced on condition or replaced based on a qualified life. Pending the staff's receipt of this information, this issue is characterized as open item 2.3.3.14.2-1.

The McGuire diesel generators are equipped with features that collect leaking fuel oil and route it to the used oil storage tank. It seems that the intended function of the fuel oil leakage collection features is to ensure that leaking oil will not lead to a fire that will damage safety-related equipment and therefore the features meet the scoping criteria of 10 CFR 54.4(a)(2)

and 10 CFR 54.4(a)(3). On McGuire 1 drawings MCFD-1609-03.00 and MCFD-1609-03-01, it appears that the fuel oil collection system is not within the license renewal boundary. On McGuire 2 drawings MCFD-2609-03.00 and MCFD-2609-03.01, however, it seems that a portion of the piping of the fuel oil collection system is shown to be within the license renewal boundary. By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.14-2, that the applicant provide clarification in regard to its scoping of the fuel oil leakage collection system piping and components for license renewal (e.g., diesel generator fuel oil drip tank, diesel generator fuel oil drip tank pump) and the basis for the results of its scoping.

In its response dated April 15, 2002, the applicant stated that, although MCFD-1609-03.00 and MCFD-1609-03-01 show the license renewal boundary flag on the schematic representation of the diesel engine body and MCFD-2609-03.00 and MCFD-2609-03.01 show the license renewal boundary flag at the connection nozzle coordinates 2-L, this highlighting inconsistency between McGuire 1 and 2 drawings does not represent a physical difference in scope. The connection point is at the diesel engine as shown on the drawings for both units. The applicant also stated that the piping and components associated with the fuel oil leaking collection system are not within the license renewal evaluation boundary because they do not perform a function that meets the criteria of 10 CFR 54.4. The applicant specified that the components are not safety-related and do not perform any function that meets the criteria of 10 CFR 54.4(a)(1). Their failure will not prevent the accomplishment of a safety-related function and therefore they do not meet the criteria of 10 CFR 54.4(a)(2). And, finally, this fuel oil leakage collection feature is not credited to meet any of the Commission's regulations as specified in 10 CFR 54.4(a)(3). Fire barriers and fire suppression are provided for compliance with 10 CFR 50.48. The staff found the applicant's response acceptable because the components do not serve a support function necessary for the diesel to perform its intended function.

According to Catawba UFSAR, the fuel oil day tank retaining wall contains any leakage that may occur in the day tank or in its piping, and a high level of oil sensed inside the retaining wall initiates an alarm in the control room to alert operators of an abnormal operating condition. On Catawba drawings CN-1609-3.0, CN-1609-3.1, CN-2609-3.0, and CN-2609-3.1, the fuel oil day tank retaining walls are not highlighted as components within the scope of license renewal, even though the intended functions of the walls seem to meet the criteria of 10 CFR 54.4(a)(2). By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.14-3, that the applicant provide the basis for not including the fuel oil day tank retaining walls within the scope of license renewal. In its response dated April 15, 2002, the applicant explained that the highlighted flow diagrams show the flow boundaries of mechanical systems and that structural components are generally not represented on flow diagrams. The applicant further clarified that in cases where structural components, such as the fuel oil day tank retaining walls, are shown on the diagrams, they are not highlighted. The applicant confirmed that each fuel oil day tank retaining wall had been identified as within the scope of license renewal and was listed in Table 3.5-2 of the LRA. Therefore, the staff finds the applicant's response acceptable.

On Catawba drawing CN-2609-3.1, it appears that the piping from valve 2FD41 to valve 2FD43 is not within the scope of license renewal, even though these components are ASME Class 3 components that meet the criteria of 10 CFR 54.4(a)(2). By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.14-4, that the applicant indicate if this pipe segment is within the scope of license renewal and whether it is included in Table 3.3-19 as subject to an AMR. In its response dated April 15, 2002, the applicant confirmed that the piping from valve 2FD41 to valve 2FD43 is within the scope of license renewal and that the highlighting was inadvertently

left off that pipe segment. The applicant also stated that this piping segment and valves 2FD41 and 2FD43 were included in Table 3.3-19 as subject to an AMR. The staff found the applicant's response acceptable.

2.3.3.14.3 Conclusion

The staff reviewed the information contained in Section 2.3.3.14 of the LRA, the supporting information from both UFSARs, applicable LRA drawings, and of the responses to RAIs. With the exception of open item 2.3.3.14.2-1, the staff concluded that there is reasonable assurance that the applicant has identified those portions of the diesel generator fuel oil system that are within the scope of license renewal and those that are subject to an AMR, in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.15 Diesel Generator Lube Oil System

In LRA Section 2.3.3.15, "Diesel Generator Lube Oil System," the applicant described the components of the diesel generator lube oil system that are within the scope of the license renewal and subject to an AMR. This system is described in Section 9.5.7 of the McGuire and Catawba UFSARs. The staff reviewed the LRA and the UFSARs for McGuire and Catawba to determine whether the applicant has adequately demonstrated that the requirements of 10 CFR Part 54 have been met.

The LRA refers to the "diesel generator lube oil system" for McGuire but to the "diesel generator engine lube oil system" for Catawba. For simplicity, the system will be referred to as the "diesel generator lube oil system" for both McGuire and Catawba.

2.3.3.15.1 Technical Information in the Application

The diesel generator lube oil system supplies lubricating oil to the diesel engine and its bearings, crankshaft, thrust faces, and other friction surfaces during both standby mode and operation mode of the diesel generators.

The applicant described the process for identifying the SSCs within the scope of license renewal in Section 2.1.1 of the LRA. Using that scoping methodology, the applicant determined that the diesel generator lubel oil system was within the scope of license renewal and listed it on page 2.2-3 in Table 2.2-1 for McGuire and on page 2.2-7 in Table 2.2-2 for Catawba. The LRA included system drawings that were highlighted to indicate the license renewal evaluation boundary.

The applicant described the process for identifying the SCs subject to an AMR in Section 2.1.2 of the LRA. Using that screening methodology, the applicant listed the mechanical components that are subject to an AMR in Tables 3.3-20 and 3.3-21 of the LRA for McGuire and Catawba, respectively. These tables also listed the intended function of each component and the materials of construction.

For McGuire, the applicant identified the following components from the diesel generator lube oil system that are subject to an AMR: pump casings (before and after and engine-driven), coolers (tube sheets, tubes, shells, and channel heads), intake strainers, filters, heaters, pipes, strainers, tubing, and valves bodies. For Catawba, the applicant identified the following

components from the diesel generator lube oil system that are subject to an AMR: pump casings (engine driven and engine prelube), coolers (tube sheets, tubes, shells, and channel heads), strainer (lube and prelube), filters (lube, prelube, and sump tank), sump tanks, flexible hoses, pipes, tubing, and valve bodies. The applicant stated that the intended functions of the components are to provide filtration of process fluid so that downstream equipment and/or environment are protected to provide heat transfer so that system and/or component operating temperature are maintained; to maintain mechanical pressure boundary integrity to ensure that sufficient flow and/or pressure are delivered; to effect containment isolation for fission product retention; or to prevent physical interaction with safety-related equipment.

2.3.3.15.2 Staff Evaluation

The staff reviewed Section 2.3.3.15 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the diesel generator lube oil system that are within the scope of license renewal and that the applicant appropriately identified the mechanical components that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the text and applicable drawings submitted by the applicant in Section 2.3.3.15 of the LRA and the McGuire and Catawba UFSARs to verify that the applicant adequately identified the portions of the diesel generator lube oil system that meet the scoping requirements of 10 CFR 54.4 and that these portions were included within the scope of license renewal in Section 2.3.3.15 of the LRA. The staff focused its review on those portions of the diesel generator lube oil system that were not identified as within the scope of license renewal to verify that they did not meet the scoping requirements of 10 CFR 54.4.

The staff reviewed Tables 3.3-20 and 3.3-21 of the LRA, which list the mechanical components subject to an AMR for the diesel generator lube oil system for McGuire and Catawba, respectively. The staff verified that the applicant had properly identified the mechanical components that were subject to an AMR from among those portions of the diesel generator lube oil that were identified as within the scope of license renewal. The staff sampled the components that the applicant determined to be within the scope of license renewal but not subject to AMR to verify that no component that performs its intended functions without moving parts or without a change in configuration or properties and that is not subject to replacement based on qualified life or specified time period was excluded from Tables 3.3-20 and 3.3-21.

During its review of Section 2.3.3.15, the staff determined that additional information was needed to complete its review. McGuire drawings MCFD-1609-02.00, MCFD-1609-02.01, MCFD-2609-02.00, and MCFD-2609-02.01, and the McGuire UFSAR do not reflect the existence of a system that collects lube oil leakage. By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.15-1, that the applicant indicate which system, if any, collects lube oil leakage, and how that system is addressed in the LRA given the potential fire hazard it represents. In its response dated April 15, 2002, the applicant stated that the diesel engines at McGuire do not have a lube oil leakage collection system. The leaking lube oil drips to the floor and enters the floor drains to be routed to the sump. The staff finds the applicant's response acceptable.

Catawba drawings CN-1609-02.00, CN-1609-02.02, CN-2609-02.00, and CN-2609-02.02 do not reflect the existence of a system that collects lube oil leakage. The UFSAR for Catawba states

that oil leakage from the diesel is collected in a sump in the diesel room. By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.15-2, that the applicant indicate what is the intended function of this oil collection feature and how it is addressed in the LRA, given the potential fire hazard it represents. In its response dated April 15, 2002, the applicant stated that the diesel engines at Catawba do not have a lube oil leakage collection system. The leaking lube oil drops to the floor and enters the floor drains to be routed to the sump. The applicant specified that leaking lube oil would not contact any component hot enough to ignite the oil and cause a fire that would threaten the functionality of the diesel engines. The staff finds the applicant's response acceptable.

During the review of McGuire drawings MCFD-2609-02.00 and MCFD-2609-02.01, the staff noticed an inconsistency. On drawing MCFD-2609-02.00, the 1-inch system low-point drain piping and associated valve 2LD0092 and the 1-inch system drain piping and associated valve 2LD0060 are not shown to be within the scope of license renewal. On drawing MCFD-2609-02.01, the equivalent piping and valves are shown to be within the scope of license renewal. By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.15-3, that the applicant verify the accuracy of the information contained in drawing MCFD-2609-02.00 and provide the basis for excluding the drain piping and associated valves from the scope of license renewal. In its response dated April 15, 2002, the applicant stated that highlighting had been inadvertently left off from that segment of piping. The applicant further stated that the piping and valves associated with that segment were listed on Table 3.3-20 of the LRA as being subject to an AMR. The staff finds the applicant's response acceptable.

On McGuire drawings MCFD-1609-02.00, MCFD-1609-02.01, MCFD-2609-02.00 and MCFD-2609-02.01, the diesel generator lube oil heater pump is shown as within the scope of license renewal. The passive portion of this component (i.e., pump housing) has a pressure boundary intended function and therefore meets the criteria of 10 CFR 54.4(a). However, it is not listed on Table 3.3-20 as subject to an AMR. By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.15-4, the applicant to explain why the diesel generator lube oil heater pump was not subject to an AMR. In its response dated April 15, 2002, the applicant stated that the diesel generator lube oil heater pump had been inadvertently omitted from Table 3.3-20 and that table 3.3-20 was supplemented to add an entry for the diesel generator lube oil heater pump as follows:

Component Type	Component Function	Material	Internal Environment / External Environment	Aging Effects	Aging Management Programs and Activity
D/G Lube Oil Heater Pump Casings	PB	CS	Oil	None Identified	None Required
			Sheltered	Loss of Material	Inspection Program for Civil Engineering Structures and Components

The staff finds the applicant's response acceptable. The staff's evaluation of the AMR results is documented in Section 3.3.15.2.1 of this SER.

2.3.3.15.3 Conclusion

On the basis of its review of the information contained in Section 2.3.3.15 of the LRA, the supporting information from both UFSARs, applicable LRA drawings, and the RAI response from the applicant, the staff concluded that there is reasonable assurance that the applicant has identified those portions of the diesel generator lube oil system that are within the scope of license renewal and those that are subject to an AMR, in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.16 Diesel Generator Room Sump Pump System

In LRA Section 2.3.3.16, "Diesel Generator Room Sump Pump System," the applicant described the components of the diesel generator room sump pump system that are within the scope of the license renewal and subject to an AMR. This system is described in Sections 9.5.10 and 9.5.9 of the McGuire and Catawba UFSARs, respectively. The staff reviewed the LRA and the UFSARs for McGuire and Catawba to determine whether the applicant has adequately demonstrated that the requirements of 10 CFR Part 54 have been met.

2.3.3.16.1 Technical Information in the Application

The diesel generator room sump pump system removes leakage from equipment drains in the diesel building and protects the diesel generator from flooding due to a nuclear service water pipe rupture in the adjacent diesel room and turbine building flood.

The applicant described the process for identifying the SSCs within the scope of license renewal in Section 2.1.1 of the LRA. Using that scoping methodology, the applicant determined that the diesel generator room sump pump system was within the scope of license renewal and listed it on page 2.2-3 in Table 2.2-1 for McGuire and page 2.2-7 in Table 2.2-2 for Catawba. The LRA included system drawings that were highlighted to indicate the license renewal evaluation boundary.

The applicant described the process for identifying the SCs subject to an AMR in Section 2.1.2 of the LRA. Using that screening methodology, the applicant listed the mechanical components that are subject to an AMR in Table 3.3-22 for McGuire and Catawba. This table also listed the intended function of each component and the materials of construction. For McGuire and Catawba, the applicant identified the following components from the diesel generator room sump pump system that are subject to an AMR: casings, orifices, pipes, and valve bodies. The applicant stated that the intended functions of the components are to provide heat transfer so that system and/or component operating temperatures are maintained; to maintain mechanical pressure boundary integrity to ensure that sufficient flow and/or sufficient pressure are delivered; to effect containment isolation for fission product retention; to prevent physical interaction with safety-related equipment; to provide throttling so that sufficient flow and/or sufficient pressure is delivered; to provide backpressure; to reduce pressure; or to provide differential pressure .

2.3.3.16.2 Staff Evaluation

The staff reviewed Section 2.3.3.16 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the diesel generator room

sump pump system that are within the scope of license renewal and that the applicant appropriately identified the mechanical components that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the text and applicable drawings submitted by the applicant in Section 2.3.3.16 of the LRA and the McGuire and Catawba UFSARs to verify that the applicant adequately identified the portions of the diesel generator room sump pump system that meet the scoping requirements of 10 CFR 54.4 and that these portions were included within the scope of license renewal in Section 2.3.3.16 of the LRA. The staff focused its review on those portions of the diesel generator room sump pump that were not identified as within the scope of license renewal to verify that they did not meet the scoping requirements of 10 CFR 54.4.

The staff also reviewed Table 3.3-22 of the LRA, which lists the mechanical components subject to an AMR for the diesel generator room sump pump system for McGuire and Catawba. The staff verified that the applicant had properly identified the mechanical components that were subject to an AMR from among the portions of the diesel generator room sump pump system that were identified as within the scope of license renewal. The staff sampled the components that the applicant determined to be within the scope of license renewal but not subject to AMR to verify that no component that performs its intended function(s) without moving parts or without a change in configuration or properties and that is not subject to replacement based on qualified life or specified time period was excluded from Table 3.3-22.

During its review of Section 2.3.3.16, the staff determined that additional information was needed to complete its review. On McGuire and Catawba drawings, the diesel generator room sump is shown not to be within the scope of license renewal. Yet, the sump is a component of the diesel generator room sump pump system, whose function is to protect the diesel generators from flooding. As a non-safety structure whose failure could prevent the diesel generator room sump pump system from remaining functional during a design basis event, the sump meets the criteria of 10 CFR 54.4(a)(2). By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.16-1, the applicant to provide the basis for not including the diesel generator room sump within the scope of license renewal. In its response dated April 15, 2002, the applicant stated that the diesel generator room sump is within the scope of license renewal and is listed in Table 3.5-2 (page 3.5-11, row 3). The applicant explained that highlighted flow diagrams show mechanical system flow boundaries and that structural components are generally not represented on flow diagrams. The applicant further clarified that, in cases where structural components, such as the diesel generator room sump, are shown on the diagrams, they are not highlighted. The staff finds the applicant's response acceptable.

2.3.3.16.3 Conclusion

On the basis of its review of the information contained in Section 2.3.3.16 of the LRA, the supporting information from both UFSARs, applicable LRA drawings, and RAI response from the applicant, the staff concluded that there is reasonable assurance that the applicant has identified those portions of the diesel generator room sump pump system that are within the scope of license renewal and those that are subject to an AMR, in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.17 Diesel Generator Starting Air System

In LRA Section 2.3.3.17, “Diesel Generator Starting Air System,” the applicant described the components of the diesel generator starting air system that are within the scope of the license renewal and subject to an AMR. This system is described in Sections 9.5.6 of McGuire and Catawba UFSARs. The staff reviewed the LRA and the UFSARs for McGuire and Catawba to determine whether the applicant has adequately demonstrated that the requirements of 10 CFR Part 54 have been met.

The LRA refers to the “diesel generator starting air system” for McGuire while the LRA refers to the “diesel generator engine starting air system” for Catawba. For simplicity, the system will be referred to as the “diesel generator starting air system” for both McGuire and Catawba.

2.3.3.17.1 Technical Information in the Application

The diesel generator starting air system provides fast-start capability for the emergency diesel engine by using compressed air to roll the engine until it starts and it also supplies air to the diesel controls to operate or shut down the engine.

The applicant described the process for identifying the SSCs within the scope of license renewal in Section 2.1.1 of the LRA. Using that scoping methodology, the applicant determined that the diesel generator starting air system was within the scope of license renewal and listed it on page 2.2-3 in Table 2.2-1 for McGuire and page 2.2-7 in Table 2.2-2 for Catawba. The LRA included system drawings that were highlighted to indicate the license renewal evaluation boundary.

The applicant described the process for identifying the SCs subject to an AMR in Section 2.1.2 of the LRA. Using that screening methodology, the applicant listed the mechanical components that are subject to an AMR in Tables 3.3-23 and 3.3-24 of the LRA for McGuire and Catawba, respectively. These tables also listed the intended function of each component and the materials of construction. For McGuire, the applicant identified the following components from the diesel generator starting air system that are subject to an AMR: filters (control and starting air line), tanks, expansion joints, pipes, tubing, and valves bodies. For Catawba, the applicant identified the following components from the diesel generator starting air system that are subject to an AMR: afterfilters, aftercoolers (tubes, channel heads, and shells, compressor inlet filter, tanks, flow meters, moisture separators, orifices, pipes, prefilters, silencers, distribution filters, tubing, valve bodies, and Y-strainers. The applicant stated that the intended functions of the components were to provide filtration of process fluid so that downstream equipment and/or environment are protected; to provide heat transfer so that system and/or component operating temperature are maintained; to maintain mechanical pressure boundary integrity to ensure that sufficient flow and/or pressure are delivered; and to effect containment isolation for fission product retention or prevent physical interaction with safety-related equipment.

2.3.3.17.2 Staff Evaluation

The staff reviewed Section 2.3.3.17 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the diesel generator starting air system that are within the scope of license renewal and that the applicant appropriately identified the mechanical components that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the text and applicable drawings submitted by the applicant in Section 2.3.3.17 of the LRA and the McGuire and Catawba UFSARs to verify that the applicant adequately identified the portions of the diesel generator starting air system that meet the scoping requirements of 10 CFR 54.4 and that these portions were included within the scope of license renewal in Section 2.3.3.17 of the LRA. The staff focused its review on those portions of the diesel generator starting air system that were not identified as within the scope of license renewal to verify that they did not meet the scoping requirements of 10 CFR 54.4.

The staff reviewed Tables 3.3-23 and 3.3-24 of the LRA, which list the mechanical components subject to an AMR for the diesel generator starting air system for McGuire and Catawba, respectively. The staff verified that the applicant had properly identified the mechanical components that were subject to an AMR from among those portions of the diesel generator starting air system that were identified as within the scope of license renewal. The staff sampled the components that the applicant determined to be within the scope of license renewal but not subject to AMR to verify that no component that performs its intended functions without moving parts or without a change in configuration or properties and that is not subject to replacement based on qualified life or specified time period was excluded from Tables 3.3-23 and 3.3-24.

During its review of Section 2.3.3.17, the staff determined that additional information was needed to complete its review. During the review of McGuire drawings MCFD-1609-04.00 and MCFD-2609-04.00, the staff noticed an inconsistency. The 1¼-inch drain piping and associated valve 2VG0040 coming off starting air tank 2B2 at coordinates B-7 are not shown to be within the scope of license renewal. The equivalent 1¼-inch drain piping and associated valves 2VG0037, 2VG0038, and 2VG0039 for starting air tanks 2A1, 2A2, and 2B1 are shown to be within the scope of license renewal. By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.17-1, that the applicant verify that the highlighting on drawing MCFD-2609-04.00 was accurate. In its response dated April 15, 2002, the applicant stated that highlighting had been inadvertently left off that segment of piping. The applicant further stated that the piping and valves associated with that segment were listed in Table 3.3-23 of the LRA as being subject to an AMR. The staff finds the applicant's response acceptable.

According to the highlighting on McGuire drawings MCFD-1609-04.00 and MCFD-2609-04.00, the diesel generator filter moisture traps are not within the scope of license renewal. Yet Table 3-4 of McGuire UFSAR states that the diesel generator "filter-moisture traps" are Safety Class 3 components. By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.17-2, that the applicant provide the basis for excluding these components from the scope of license renewal. In its response dated April 15, 2002, the applicant stated that the filters and associated moisture traps immediately downstream of the diesel generator starting air compressor aftercoolers on drawings MCFD-1609-04.00 and MCFD-2609-04.00, are Duke Class G components, are different from the filter-moisture traps in Table 3-4 of the McGuire UFSAR, and are not within the scope of license renewal. The applicant further explained that (1) the traps on the filter-moisture traps referred in Table 3-4 of the McGuire UFSAR are valves; (2) these valves are included on Table 3.3-23 of the LRA under "valve bodies;" (3) the filter component of the filter-moisture traps referred to on Table 3-4 of the McGuire UFSAR have a pressure boundary function; and (4) these filter components were mistakenly omitted from Table 3.3-23. The applicant provided the following supplemental information to Table 3.3-23 for the starting air distributor filter:

Component Type	Component Function	Material	Internal Environment / External Environment	Aging Effects	Aging Management Programs and Activity
Starting Air Distributor Filter	PB	CS	Air (Dry)	None Identified	None Required
			Sheltered	None Identified	None Required

Since the applicant clarified that the filter-moisture traps referred in Table 3-4 of the McGuire UFSAR are valves, and that these valves are included on Table 3.3-23 of the LRA under valve bodies, the staff is satisfied with this aspect of its response. Since the filter was identified as within the scope of license renewal, the staff also finds this aspect of the applicant's response acceptable. The staff's evaluation of the AMR results is documented in Section 3.3.17.2 of this SER.

On Catawba drawings CN-1609-4.0, CN-1609-4.1, CN-2609-4.0, and CN-2609-4.1, the diesel generator starting air compressor body, the diesel generator starting air dryers, and the governor oil pressure boost cylinder are shown to be within the scope of license renewal. These components are passive and long-lived with a pressure boundary intended function. Therefore, they appeared to meet the criteria of 10 CFR 54.4(a) and 10 CFR 54.21. However, these components were not listed on Table 3.3-24 as subject to an AMR. By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.17-3, that the applicant provide the basis for excluding these components from Table 3.3-24. In its response dated April 15, 2002, the applicant stated that the diesel generator starting air compressor is within the scope of license renewal but is not subject to an AMR. The applicant explained that air compressors, without sub-component exceptions, are explicitly excluded from an AMR by 10 CFR 54.21(a)(1)(i). The staff finds the applicant's response acceptable because it is the staff's position that, even though the starting air compressor body is a passive component, the air compressor body is part of the air compressor and, as such, is not subject to an AMR, in accordance with 10 CFR 54.21(a)(1)(i).

In response to the staff's question about the diesel generator starting air dryers not being listed on Table 3.3-24 as subject to an AMR, the applicant stated that Table 3.3-24 lists the air dryer components that make up the air dryer package. The air dryer components appear on Table 3.3-24 as filters, moisture separators, pipes, silencers, and valves. In response to the staff's question about the diesel generator governor oil pressure boost cylinder filters not being listed on Table 3.3-24 as subject to an AMR, the applicant responded that a visual inspection confirmed that there are no diesel generator governor oil pressure boost cylinder filters at Catawba. Since diagrams CN-2609-4.0 and CN-2609-4.1 erroneously show diesel generator governor oil pressure boost cylinder filters at coordinates B-7, the applicant stated that a corrective action report had been entered into the corrective action program to correct the diagrams in question. The staff also finds the applicant's response in regard to the starting air driers and the governor oil pressure boost cylinder filter acceptable.

2.3.3.17.3 Conclusion

On the basis of its review of the information contained in Section 2.3.3.17 of the LRA, the supporting information from both UFSARs, applicable LRA drawings, and of the April 15, 2002, response from the applicant to the January 28, 2002, staff's letter, the staff concluded that there

is reasonable assurance that the applicant has identified those portions of the diesel generator starting air system that are within the scope of license renewal and those that are subject to an AMR, in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.18 Drinking Water System

In LRA Section 2.3.3.18, "Drinking Water," the applicant described the components of the Catawba drinking water system that are within the scope of license renewal and subject to an AMR. This system is further described in Section 9.2.4 of the Catawba UFSAR. The LRA notes that no portion of the McGuire drinking water system is within the scope of license renewal. The staff reviewed the LRA and UFSAR for Catawba to determine whether the applicant has adequately demonstrated that the requirements of 10 CFR Part 54 have been met.

2.3.3.18.1 Technical Information in the LRA

The Catawba drinking water system is a municipal water system consisting of a water tower, pumps, and chemical treatment equipment providing chlorinated drinking water to the plant.

The applicant described the process for identifying the SSCs within the scope of license renewal in LRA Section 2.1.1 and its process for identifying the SSCs subject to an AMR in LRA Section 2.1.2. Using the methodology described in LRA Section 2.1.1, the applicant listed the systems and structures that are within the scope of license renewal in LRA Tables 2.2-1 and 2.2-2 for McGuire and Catawba, respectively. The Catawba drinking water system is listed in LRA Table 2.2-2.

The LRA notes that the only portions of the drinking water system subject to AMR are the Duke Class F portions of the drinking water system that are in scope at Catawba. McGuire has no Class F components in the drinking water system. Using the methodology described in Section 2.1.2 of the LRA, the applicant listed the Catawba mechanical components that are subject to an AMR in Table 3.3-25, "Aging Management Results - Drinking Water System." This table also lists the intended function of each component and the materials of construction. The applicant identified the following components of the drinking water system that are subject to an AMR: pipes and valve bodies. The applicant identifies maintaining pressure boundary integrity as the only intended function of the SCs subject to an AMR.

2.3.3.18.2 Staff Evaluation

The staff reviewed Section 2.3.3.18 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the drinking water system that are within the scope of license renewal in accordance with 10 CFR 54.4, and to verify that the applicant appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information presented in Section 2.3.3.18 of the LRA, the applicable piping and instrument drawings referenced therein, and the Catawba UFSAR to determine if the applicant adequately identified the portions of the drinking water system that are within the scope of license renewal. The Catawba drinking water system is a non-safety system whose postulated failure could prevent satisfactory accomplishment of certain safety-related functions.

To preclude these postulated failures, portions of this system are seismically designed (i.e., Duke Class F). The applicant included all components within the seismically designed piping boundaries of this system within the scope of license renewal per 10 CFR Part 54.4(a)(2). The staff verified that those portions of the drinking water system that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were so identified by the applicant in Section 2.3.3.18 of the LRA. To verify that the applicant did include the applicable portions of the drinking water system as within the scope of license renewal, the staff focused its review on those portions of the drinking water system that were not identified as within the scope of license renewal to verify that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the Catawba UFSAR to identify any additional system intended functions that were not identified in the LRA, and verified that these additional intended functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions in the applicant's scoping review.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the drinking water system that are identified as within the scope of license renewal. The applicant listed the SCs subject to AMR for the drinking water system in Table 3.3-25 of the LRA using the screening methodology described in Section 2.1 of the LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER.

The applicant identified the portions of the drinking water system that are within the scope of license renewal by highlighted Catawba 1 and 2 drawings referenced in LRA Section 2.3.3.18. In addition, the applicant lists the pipe and valve body mechanical component commodity groups that are subject to AMR and their intended function(s) in Table 3.3-25 of the LRA.

The piping and instrumentation drawings were highlighted by the applicant to identify those portions of the drinking water system meet at least one of the scoping criteria of 10 CFR 54.4. The staff performed its review by sampling the SCs that the applicant determines as within the scope of license renewal but not subject to AMR to verify that no structure or component that performs its intended function(s) without moving parts or without a change in configuration or properties and that are not subject to replacement on the basis of qualified life or specified time period was excluded from an AMR. The staff did not identify any omissions.

2.3.3.18.3 Conclusions

On the basis of its review of the information contained in Section 2.3.3.18 of the LRA, the supporting information in the Catawba UFSAR, and LRA drawings, the staff did not identify any omissions in the scoping of the drinking water system by the applicant. The staff concludes that there is reasonable assurance that the applicant has identified those portions of the Catawba drinking water system that are within the scope of license renewal, and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a), and 10 CFR 54.21(a)(1), respectively.

2.3.3.19 Fire Protection

LRA Section 2.1.1.3.1, "Fire Protection (FP)," identified that SSCs relied upon in safety analyses or plant evaluations to perform a function that demonstrated compliance with 10 CFR 50.48, the FP rule, are within the scope of license renewal. In LRA Section 2.3.3.19, "Fire Protection," the applicant identified the FP flow diagrams that had been marked to show the license renewal

evaluation boundary for the interior and exterior FP systems for McGuire and Catawba. The applicant also identified the components of the FP system that are subject to an AMR for McGuire and Catawba in LRA Tables 3.3-26 and 3.3-27, respectively. In the letters which summarize teleconferences dated October 15, 2001 and November 2, 2001, and in a letter to the applicant dated January 28, 2002, the NRC requested additional information regarding the FP systems at Catawba and McGuire. In a letter to the NRC dated January 28, 2002, the applicant provided additional information in response to the staff's RAIs.

In accordance with 10 CFR 54.4(a)(3), the SSCs that are relied on in safety analyses or plant evaluations to demonstrate compliance with 10 CFR 50.48 are included within the scope of license renewal. The FP system is relied upon to meet the requirements of 10 CFR 50.48 at Catawba and McGuire.

2.3.3.19.1 Technical Information in the Application

In accordance with 10 CFR 50.48, the applicant is required to implement and maintain a FP program. As stated in LRA Section 2.1.1.3.1, the CLB with regard to fire protection differs for McGuire and Catawba. McGuire and Catawba are both licensed to 10 CFR 50.48(b) as specifically stated in safety evaluation reports (SERs) and the respective facility operating licenses. License Conditions 2.C.(4) and 2.C.(7) apply for the McGuire FP program and License Conditions 2.C(8) and 2.C.(6) apply for the Catawba FP program. The NRC SER, NUREG-0422, provides the staff evaluation which documents McGuire's compliance with Appendix A of Branch Technical Position (BTP) APCSB 9.5-1, "FP for Nuclear Power Plants." The NRC SER, NUREG-0954, provides the staff evaluation which documents the Catawba compliance with Appendix A to BTP CMEB 9.5-1. As part of the licensee's response to satisfy Appendix A to BTP APCSB 9.5-1 during the original licensing, Duke committed to install a dedicated standby shutdown system (SSS) at McGuire and Catawba that would be used only in the event of a fire or plant security emergency.

In addition, LRA Section 2.1.1.3.1 stated that Catawba and McGuire both use a quality condition designation, Duke QA Condition 3, that applies uniquely to FP SSCs and services. Systems designated as QA Condition 3 are described in the LRA as those systems that promptly detect, control, and extinguish fires to limit their damage and to provide protection for SSCs and services so that a fire will not prevent the safe shutdown of the plant.

LRA Section 2.1.1.3.1 stated that the FP system at McGuire is designed to provide automatic and manual means to control and extinguish fires that may occur within building, yard, and transformer areas. The McGuire FP program is based on an evaluation of the potential fire hazards throughout the auxiliary and reactor buildings and areas adjacent to these facilities. The Catawba FP system is designed to provide automatic and manual means to control and extinguish fires that may occur within building, yard, and transformer areas. The Catawba FP program is based on an evaluation of the potential fire hazards throughout the auxiliary, diesel generator, and reactor buildings, the nuclear service water pump structure, and portions of the turbine and service buildings adjacent to these facilities.

The applicant states in LRA Section 2.1.1.3.1 that its evaluation demonstrates that the plant will maintain the ability to perform safe-shutdown functions and minimize radioactive releases to the environment. On the basis of the methodology described above, the applicant identified that the

highlighted components, shown on the FP flow diagrams listed in LRA Section 2.3.3.19, are included within the scope of license renewal.

In the LRA, Table 2.2-1 and Table 2.2-2, the applicant identified that the FP system is within the scope of license renewal. In LRA Tables 3.3.-26 and 3.3.-27, for McGuire and Catawba, respectively, the applicant identified the mechanical components subject to an AMR, their intended functions, and the materials of construction.

2.3.3.19.2 Staff Evaluation

The Commission's regulations in 10 CFR 54.21(a)(1) state that for those SSCs that are within the scope of Part 54, as delineated in 10 CFR 54.4, the applicant must identify and list those SSCs that are subject to an AMR. The staff reviewed Section 2.3.3.19 of the LRA, as supplemented by conference call summaries dated October 15, 2001, and November 2, 2001, and the applicant's RAI responses dated April 15, 2002, to determine whether there was reasonable assurance that the applicant had appropriately identified the SSCs that serve FP intended functions that are within the scope of license renewal in accordance with 10 CFR 54.4, and are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

LRA Section 2.3.3.19 stated that the McGuire and Catawba UFSARs, in Section 9.5.1, "Fire Protection Systems," provide additional information concerning the interior and exterior fire protection system. The staff sampled portions of each UFSAR 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 NRC staff also reviewed NUREG-0422 for McGuire and NUREG-0954 for Catawba. These NUREGs are referenced directly in the McGuire and Catawba FP license conditions, and they both summarize the FP program and commitments to 10 CFR 50.48 using the guidelines of Appendix A to BTP APCSB 9.5-1 for McGuire and Appendix A to BTP CMEB 9.5-1 for Catawba. The staff reviewed these NUREGs to verify that the function(s) of the FP components relied upon to satisfy the provisions of Appendix A to BTP APCSB 9.5-1 and Appendix A to BTP CMEB 9.5-1 were included in the Quality Assurance (QA) Condition 3 designation and in the scope of license renewal as intended functions in the LRA.

The staff then compared the FP SSCs identified in the flow diagrams to verify that the required components were highlighted as being within the evaluation boundaries on the flow diagram, and were not excluded from the scope of license renewal. As part of the evaluation, the staff also sampled portions of the same flow diagrams for the FP system to determine if there were any additional portions of the system piping or components located outside of the evaluation boundary that should have been identified as within the scope of license renewal.

During the staff's review, a technical concern was identified regarding the appropriateness of the applicant's QA Condition 3 designation applied during the scoping evaluation to identify all FP SSCs required for compliance with 10 CFR 50.48. The QA Condition 3 designation is the primary means applied by Duke to identify FP SSCs. As noted in RAI 2.3.3.19-1, issued to Duke by letter dated January 28, 2002, UFSAR Chapter 17, "Quality Assurance Topical Report," Amendment 28, states that "QA Condition 3 covers those systems, components, items, and services which are important to fire protection as defined in the Hazards Analysis for each

station. The Hazards Analysis is in response to Appendix A of NRC Branch Technical Position APCSB 9.5-1."

To ensure that all QA Condition 3 SSCs were included within the scope of license renewal, the applicant stated in conference calls, conducted on September 18 and 20, 2001, and summarized in a memorandum dated October 15, 2001, that it reviewed mechanical drawings and other QA Condition 3 program documents developed in the mid 1980s to perform their FP scoping evaluation. The QA Condition 3 designation had been identified on the mechanical drawings at the time the drawings were developed in the mid 1980s. In addition, the applicant stated in a October 3, 2001, conference call, summarized by memorandum dated November 2, 2002, that they also reviewed the UFSARs during its scoping evaluation. However, the applicant also stated that some of the SSCs referred to in the UFSARs were not identified as part of the QA Condition 3 program if they were not protecting equipment needed for safe shutdown.

By letter dated January 28, 2001, the staff stated that the exclusion of FP SSCs on the basis that the intended function is not required for the protection of safe shutdown equipment or safety-related equipment is not acceptable if the SSC is required for compliance with 10 CFR 50.48. Furthermore, the staff requested, in RAI 2.3.3.19-1, that the applicant provide justification for the exclusion of components that are relied upon in the staff's SERs as meeting the provisions of Appendix A to BTP APCSB 9.5-1 and Appendix A to BTP CMEB 9.5-1.

In its response dated April 15, 2002, the applicant stated, in the background section of the FP RAI responses, that the SSCs within the scope of license renewal that are required for compliance with 10 CFR 50.48 are those SSCs that protect only safety-related SSCs so that a fire will not prevent the performance of necessary safe plant shutdown functions and will not significantly increase the risk of radioactive releases. The applicant also provided a detailed description to explain its view that the focus of SSCs relied on to comply with 10 CFR 50.48 (and any other FP regulations or guidance documents) is directly related to the ability to safely shut down the plant and minimize radioactive releases in the event of a fire. The applicant also provided a discussion of the Commission's regulations on license renewal and fire protection, the staff's guidance related to these regulations, and Duke's plant-specific licensing documentation and technical evaluations related to 10 CFR 50.48.

The staff does not agree that the applicant's analysis of the FP regulations has completely captured the FP SSCs required for compliance with 10 CFR 50.48. Based on the information provided from the applicant pertaining to the scoping evaluation, the staff does not have reasonable assurance that the QA Condition 3 designation includes in scope all of the FP SSCs required for compliance with 10 CFR 50.48. The scope of SSCs required for compliance to General Design Criterion (GDC) 3 and 10 CFR 50.48 goes beyond preserving the ability to maintain safe shutdown in the event of a fire. The McGuire and Catawba FP license conditions state that "Duke Energy shall implement and maintain in effect all provisions of the approved fire protection program as described in the Final Safety Analysis Report (FSAR), as updated, for the facility... and as approved in the applicable SERs." In addition, 10 CFR 50.48(b) states that plants whose fire protection features were accepted by the NRC as satisfying the provisions of Appendix A to BTP APCSB 9.5-1 or were accepted in comprehensive safety evaluation reports (SERs) prior to publication of Appendix A to BTP APCSB 9.5-1 in August 1976, were only required to meet the provisions of Sections III.G, III.J, and III.O of Appendix R. Commitments to meet Appendix A to BTP APCSB 9.5-1 or Appendix A to BTP CMEB 9.5-1, as documented in

SERs which are directly referenced in the fire protection license condition, are not considered to merely mention a system, structure, or component since the commitments support a specified regulatory function. Therefore, all FP SSCs required for compliance with 10 CFR 50.48, including GDC 3, are required to be included within the scope of license renewal as required by 10 CFR 54.4(a)(3).

In the following paragraphs, the staff describes the components that appear to perform FP intended functions because they are identified and discussed as commitments in SERs or in the UFSAR, both of which are referenced in the license conditions for McGuire and Catawba. Based on the staff's review, these components appear to be required for compliance with 10 CFR 50.48, but were not designated by the applicant as QA Condition 3 SSCs on the basis that they were not protecting safe shutdown equipment or safety related equipment.

By letter dated January 28, 2002, the staff questioned, in RAI 2.3.3.19-4, the applicant's methodology, which excluded fire hydrants that can be isolated from the flowpath from the scope of license renewal. In its response dated April 15, 2002, the applicant stated that, with the exception of two hydrants at Catawba that protect the nuclear service water pump structure, hydrants in the yard are not relied upon to protect safety-related SSCs required for safe shutdown. These two credited hydrants are included in scope, along with some hydrants that are located along the flowpath and can not be isolated. The hydrants that cannot be isolated from the flowpath are included within license renewal scope. The applicant stated that the other hydrants are not in-scope because they are not relied upon for fire suppression of safety-related SSCs to ensure safe shutdown and are isolable from the flowpath (via upstream isolation valves). The applicant explained in its RAI response that these isolable, downstream hydrants and piping are beyond the requirements of 10 CFR 50.48 and are not within the scope of license renewal. The staff finds no basis for the argument that the isolable, downstream hydrants and piping are beyond the requirements of 10 CFR 50.48. GDC 3 provides for the protection of SSCs where a fire might also significantly increase the risk of radioactive releases which may not be associated with safe shutdown. Hydrants would provide for protection against fires in areas where radioactive releases could be released to the environment.

McGuire is required to meet Appendix A to BTP 9.5-1 and Catawba is required to meet the position documented in CMEB 9.5-1. Both documents state that "outside manual hose installation should be sufficient to reach any location with an effective hose stream. To accomplish this, hydrants should be installed approximately every 250 feet on the yard main system." Furthermore, the staff asked, in RAI 2.3.3.19-4, the applicant to verify that hydrants located on the yard main system were not excluded from the scope of license renewal. In its response dated April 15, 2002, the applicant did not verify or address this item. The staff is concerned that lack of maintenance of fire hydrants over time can result in partially closed or shut valves and clogging of hydrants with debris, which will affect the system flow results. Furthermore, fire hydrants are considered passive and long-lived components in accordance with 10 CFR 54.21. Therefore, this issue is characterized as open item 2.3.3.19-1.

Flow diagrams MCFD-1599-01.00 and CN-1599-1.0 do not include the jockey pump casings within the scope of license renewal. The jockey pump's importance is to prevent the main fire pumps from cycling off and on with system pressure changes. This protects the main fire pumps, which are also required for compliance with 10 CFR 50.48, from excessive use which could prevent the fire pumps from being reliable when needed to provide water during a fire event. By letter dated January 28, 2002, the staff asked, in RAI 2.3.3.19-6, the applicant to (1)

provide justification for excluding the jockey pumps; and (2) justify the appropriateness of the methodology used to identify FP systems and components that are within the scope of license renewal based solely upon their QA Condition 3 designation (or lack thereof). The staff also presented the regulatory basis, consistent with previous license renewal SERs, explaining how the jockey pumps were required to meet 10 CFR 50.48, in its RAI.

In its response dated April 15, 2002, the applicant stated that the jockey pump provided more of a support function and not an intended function in that it refills the suppression system during standby mode when the system has lost water due to normal system leakage. The applicant also stated that the jockey pumps do not protect safety-related SSCs (so that a fire will not prevent the performance of necessary safe plant shutdown functions and will not significantly increase the risk of radioactive releases) and that the jockey pump was therefore beyond the requirements of 10 CFR 50.48. The staff disagrees on the basis that the applicant did not address the fact that this component was accepted by the NRC staff in an SER as satisfying the provisions of Appendix A to BTP 9.5-1 for McGuire and Appendix A to CMEB 9.5-1 for Catawba, in accordance with 10 CFR 50.48(b). Furthermore, in its response to Appendix A to BTP 9.5-1 (McGuire, October 7, 1982) and Appendix A to CMEB 9.5-1 (Catawba, November 4, 1983), Duke described its approach to meeting each of the requirements in the BTPs and stated, for both McGuire and Catawba, that the jockey pumps are provided to maintain pressure in the system. The staff finds this response from the applicant unacceptable and characterizes this issue as open item 2.3.3.19-2.

Section 9.5.1.2.1 of the Catawba UFSAR states that the interior fire water (RF) system provides a fixed-water suppression system for charcoal filters. The RF system provides water for interior fire protection from multiple connections to the yard loop. Fire protection piping to charcoal filter units is not highlighted on flow diagrams CN-1599-2.1(at J-7 and J-10) and CN-1599-2.2 (at H-2 and H-4). In the October 3, 2001, conference call, the applicant stated that the charcoal filters are associated with a non-safety-related containment ventilation system equipment that cools the containment building to make it habitable for maintenance, operations, and radiation protection of personnel during refueling outages. The staff is concerned that charcoal filters are typically inaccessible by personnel so that in the event of a fire, the water spray system is the only credited means to suppress this type of fire. By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.19-9, the applicant to justify why RF piping to the charcoal filter units is not in scope. In its response dated April 15, 2002, the applicant stated that the subject filters are not charcoal filters but high-purity carbon filters and that the carbon used in these filter beds has an ignition temperature of approximately 330°C. Since the air temperature in the process flowpath of this filter is not designed to reach temperatures this high, the applicant stated that the carbon filters are not combustible in the environment for which they are designed to operate. The applicant concluded that the need for a fixed water suppression system has been precluded by the use of the bed filter with an essentially noncombustible material.

The staff does not agree with this justification for excluding the fixed water suppression system from the scope of license renewal. The staff believes that the applicant's distinction between charcoal filters and carbon filters is not material because, irrespective of the term, the filter medium of carbon (charcoal) is combustible. Therefore, the need for suppression capability has not been precluded by this use of alternative terminology, and exclusion of these components from the scope of license renewal is not justified.

The staff also notes that the Duke is committed to providing fire suppression features for carbon filters (purity not a criterion). By letter from Hal B. Tucker (Duke) to Harold Denton (NRC), dated November 4, 1983, Duke submitted a revised response to BTP APCSB(CMEB) 9.5-1. In this response, Duke identified the containment auxiliary carbon filters and states, on pages 48-50, "Containment Auxiliary Carbon Filter," that carbon filters are protected with a built-in water spray system. This statement is directly related to the regulatory requirement of Appendix A to BTP CMEB 9.5-1 that "fire suppression systems should be installed to protect charcoal filters in accordance with Regulatory Guide 1.52." This issue is therefore unresolved and characterized as open item 2.3.3.19-3.

Sections 9.5.1.2.1 and 9.5.1.2.2 of the McGuire and Catawba UFSARs identify and describe water suppression systems and hose stations that protect various yard structures and selected areas in the McGuire and Catawba turbine buildings. However, the staff noted that these water suppression systems and hose stations were excluded from the scope of license renewal. By letter dated January 18, 2002, the staff asked, in RAIs 2.3.3.19-1, 2.3.3.19-3, and 2.3.3.19-8, why these fire protection features for the components listed in Sections 9.5.1.2.1 and 9.5.1.2.2 of the UFSAR (e.g., hydrants that are connected to the yard main, oil storage house, oxygen and acetylene gas storage yard area, compressed flammable gas cylinder storage area, main turbine piping and bearings, unit startup and standby oil-filled power transformers, main turbine lube oil reservoirs, hydrogen seal oil unit, and the feedwater pump turbines) were excluded from the scope of license renewal.

In its response dated April 15, 2002, the applicant stated that their UFSAR contained a general description of all of the FP features in each plant, and not just those FP SSCs required for 10 CFR 50.48. This is contrary to the applicant's license conditions for McGuire and Catawba, which show that the FP CLB is defined in part by the UFSAR. Furthermore, 10 CFR 54.2 defines the UFSAR as a means to document the CLB at each facility. Therefore, the staff does not agree that the components listed in the UFSAR as satisfying the FP program can be excluded from the scope of license renewal. From a technical standpoint, water suppression systems and deluge systems are important to provide automatic suppression in areas where the fire is expected to either be controlled until the fire brigade arrives or where due to the hazard, the suppression system is provided to extinguish the fire. Manual hose stations are important because they allow the fire brigade to deliver water to quickly extinguish fires in the areas closest to the hose station. Age-related degradation of these components could lead to the inability to control or extinguish a fire, which would allow it to grow uncontrolled. Therefore, this issue is characterized as open item 2.3.3.19-4 for unresolved RAIs 2.3.3.19-1, 2.3.3.19-3, and 2.3.3.19-8.

Similarly, Section 9.5.1.2.3, "Fire Protection, Category I Safety Related," of the McGuire UFSAR states that the manually operated water spray systems provide fixed spray patterns of water for reactor building purge exhaust filters 1A, 1B, 2A and 2B, which appear to be Category 1, safety-related components. However, drawing MCFD 1599-02.01, coordinates H-3, G-3, C-5 and B-7, indicates that piping and sprinklers associated with this function are excluded from the scope of license renewal. The fire protection rule, 10 CFR 50.48, states that each operating nuclear power plant must have a fire protection plan. A license condition for Catawba states that Duke Energy Corporation shall implement and maintain in effect all provisions of the approved fire protection program as described in the UFSARs for the respective facilities. Since the UFSAR states that the manually operated water spray systems provide fixed spray patterns of water for reactor building purge exhaust filters 1A, 1B, 2A and 2B, the staff is concerned that the

manually operated water spray systems for these filters were inappropriately excluded from the scope of license renewal and an AMR. This issue is characterized as open item 2.3.3.19-6.

In some cases, the applicant was able to demonstrate to the staff that some FP SSCs installed in certain plant-specific areas were not credited for compliance with 10 CFR 50.48. For example, RAIs 2.3.3.19-2 and 2.3.3.19-7 address plant-specific areas for McGuire and Catawba where automatic suppression systems or hose stations were excluded from the scope of license renewal. The staff sampled portions of the SERs referenced in each plant's license condition as well as any Duke submittals that the NRC staff based its review upon. The staff found that these suppression systems were not credited in any staff SERs or licensing documentation which form the basis of the McGuire and Catawba license conditions. Therefore, RAIs 2.3.3.19-2 and 2.3.3.19-7 were resolved because the applicant was able to demonstrate that these particular FP SCs were not credited for compliance with 10 CFR 50.48.

After determining which components were within the scope of license renewal, the staff reviewed the components the applicant identified as being subject to an AMR. The staff reviewed selected components that the applicant identified as within the scope of license renewal to verify that the applicant had identified those SCs that perform their intended functions without moving parts or without a change in configuration or properties and are not subject to replacement based on qualified life or specified time period were subject to an AMR.

As documented in the conference call summary dated October 15, 2001, the staff noted that the system filters, fire extinguishers, fire hoses, and air packs were not as subject to in an AMR. The applicant clarified that, based on the NRC letter from C.I. Grimes to D.J. Walters, NEI, "Consumables," dated March 10, 2000, these SCs were excluded from an AMR because the applicant replaces them based on a qualified life. The applicant also noted that each SSC was identified and listed, and a site-specific evaluation for each of these SCs was included in LRA Section 2.1.2.1.2.

The staff reviewed Section 2.1.2.1.2 of the LRA and determined that filters are replaced on condition. The staff's evaluation of Section 2.1.2.1.2 and the treatment of filters is documented in Section 2.1.3.2.1 of this SER. With respect to fire extinguishers, fire hoses, and air packs, Section 2.1.2.1.2 states the following:

> Portable equipment is within the scope of license renewal but is not subject to aging management review because it is replaced on condition. Such equipment is routinely inspected for degradation. For example, fire extinguishers, self-contained breathing air packs, fire hoses and portable ductwork, credited for compliance with the Fire Protection rule, are inspected in accordance with National Fire Protection Association (NFPA) standards. These standards require replacement of portable equipment based on their condition or performance during testing and inspection. These portable components are not long-lived and are subject to replacement per NFPA standards, therefore an aging management review is not required.

As stated in Table 2.1-3 of the SRP-LR, fire extinguishers, fire hoses and air packs are typically replaced based on performance or condition monitoring that identifies whether these components are at the end of their qualified lives. Therefore these components may be excluded, on a plant-specific basis, from AMR under 10 CFR 54.21(a)(1)(ii); however, the applicant should identify the standards that are relied on for the replacement as part of the methodology description. Since the applicant stated that these components will be replaced based on their condition or performance testing in accordance with NFPA standards, the staff

finds the applicant's treatment of these consumables acceptable because it conforms to 10 CFR 54.21(a)(1)(ii).

The staff also reviewed mechanical components from flow diagrams LRA-M-2219, Sheet 5 and LRA-M-219, Sheet 1, and compared them to the list of components and corresponding intended function(s) presented in Table 3.4-2 of the LRA. The staff noticed that strainers associated with the main fire pumps were incorrectly excluded from an AMR. Duke identified the fire pumps and associated strainers as within the scope of license renewal by indicating that these components are designated as within the license renewal evaluation boundary, but did not list the strainers in AMR results Tables 3.3-27 or 3.3-27. The staff's view is that strainers provide a filter function to protect the integrity of the fire pumps. Appendix A to BTP 9.5-1 and Appendix A to CMEB 9.5-1 both state that "details of the fire pump installation should as a minimum conform to NFPA 20, 'Standard for the Installation of Centrifugal Pumps.' Page 6 of the Catawba response to the BTP, dated November 4, 1983, states that "fire pumps are arranged in accordance with the intent of NFPA 20-1978." The staff determined that McGuire is committed to NFPA 20, 1978 edition. NFPA-20-1978, Section 4-3.4, "Suction Strainers," requires strainers for vertical shaft fire pumps. The staff's technical concern is that Duke uses lake water to supply its fire protection suppression systems at McGuire and Catawba. Lake water is corrosive and may contain sedimentation that can potentially clog the fire pumps. In addition, the strainers keep debris from plugging the sprinkler nozzles in fire suppression systems in the event that sprinklers are actuated.

By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.19-5, the applicant to explain why these passive, long-lived components were excluded from an AMR. In its response dated April 15, 2002, the applicant confirmed that the strainers are within the scope of license renewal and stated that the strainer can be excluded from an AMR on the basis that it is actually a sub-component of the pump installed in the pump bowl, does not contain any pressure-retaining parts, and is inspected and maintained along with the other non-pressure-retaining pump sub-components. However, the staff's understanding of the main fire pumps is that they are multiple-stage pumps with clip-on strainers on the bottom (at the suction) of the pump bowl assembly. Additionally, since the strainers are relied upon to filter debris and protect the main fire pumps and sprinklers, their function is unique and distinct from that of the pump or the pump bowl. Since the strainers are removable and perform a distinct function in accordance with NFPA 20, the staff does not consider them sub-components of the pump. Therefore, the staff considers the strainers passive, long-lived components that perform a filtration function and are subject to an AMR. This issue is therefore unresolved and characterized as open item 2.3.3.19-5.

With the exception of the open items discussed above, the staff did not identify any further omissions in the SCs identified by the applicant as being subject to an AMR.

2.3.3.19.3 Conclusion

On the basis of the review described above, and the identification of six open items for the fire protection systems, the staff does not have reasonable assurance that the applicant has adequately identified those portions of the FP system that are within the scope of license renewal and the associated SCs that are subject to an AMR, in accordance with 10 CFR 54.4(a) and 54.21(a)(1), respectively.

2.3.3.20 Fuel Handling Building Ventilation (VF) System

In LRA Section 2.3.3.20, "Fuel Handling Building Ventilation System," the applicant identified portions of the VF system and the components that are within the scope of the LRA and subject to AMR. In the VF system section of the LRA, the applicant stated that the VF system is further described in Section 9.4.2 of the McGuire and Catawba UFSARs.

The applicant evaluated component supports for VF system ductwork listed in Table 3-4 of the UFSARs. The applicant evaluated electrical components that support the operation of the system in Section 2.1.2.3 of the LRA. The staff's scoping evaluation of structures and component supports is provided in Section 2.4 of this SER. The staff's evaluation of electrical components and instrumentation and controls in the VF system is documented in Section 2.5 of this SER.

2.3.3.20.1 Technical Information in the Application

The VF system consists of a ventilation supply air handling unit subsystem with associated dampers, ductwork, and an exhaust subsystem consisting of filter trains, associated fans, dampers, ductwork, supports, and control systems. Outside air is supplied to the fuel building area by a supply system consisting of a fan with heating and cooling coils, a filter section, and associated ductwork. The filter section contains particulate type filters. This portion of the system has no standby capacity. The fuel building supply unit normally operates continuously, but will shut down with the loss of either filtered exhaust fan is lost, a duct-mounted smoke detector is detected or if the supply air temperature drops to 40 °F.

The VF system exhaust is an ESF. Each train of filter, fans, and motor-operated dampers is served by a separate train of the Emergency Class 1E standby power. This ensures the integrity and availability of the exhaust system in the event of any single active failure. Air exhausted from the building is monitored by a radioactive gaseous detector sampling the air in the exhaust duct header between the building and the inlet to the filter trains. Additional monitoring of exhaust air is provided in each unit vent. Indication of radioactivity above allowable limits will automatically divert the flow of air through the filter trains prior to discharge into the atmosphere through each unit vent. The VF system exhaust is available following a loss of offsite power but the fuel building supply will not be available.

In Section 2.3.3.20 of the LRA and Section 9.4.2 of the McGuire and Catawba UFSARs, the applicant identified the following VF system intended functions based on 10 CFR 54.4(a)(1) and 10 CFR 54.4(a)(2):

<u>McGuire and Catawba</u>

Section 2.3.3.20 of the LRA:

- To maintain ventilation in the spent fuel pool areas to permit personnel access.
- To control airborne radioactivity in the fuel pool area during normal operation, anticipated operational transients, and following postulated fuel handling accidents.

Section 9.4.2 of the McGuire and Catawba UFSARs:

- To provide a suitable environment for the operation of equipment and personnel access as required for inspection, testing and maintenance.

- To provide exhaust purging of the building to the unit vent.
- To monitor and filter VF system exhaust air so the limits of 10 CFR Part 20 and the TS are not exceeded.
- Provide a suitable environment for the operation of vital equipment during an accident.

On the basis of the intended functions identified above for the McGuire and Catawba VF system, the portions of this system that were identified by the applicant as within the scope include all VF system safety-related components (electrical, mechanical, and instruments). The applicant described its methodology for identifying the mechanical components subject to an AMR in Section 2.1 of the LRA. On the basis of this methodology, the applicant identified the portions of the VF system that are within the scope of license renewal on the flow diagrams listed in Section 2.3.3.20 of the LRA. Using the methodology described in Section 2.2.1 of the LRA, the applicant compiled a list of the mechanical components and component types subject to an AMR that are within the evaluation boundaries highlighted on the flow diagrams and classified their intended functions. The applicant provided this list in Table 3.3-28 of the LRA.

The following component types are identified as within LRA scope and subject to an AMR and are listed in Table 3.3-28 of the LRA: air flow monitors, ductwork, filters, tubing, and valve housings. The applicant indicated in Table 3.3-28 of the LRA that the pressure boundary function is the only applicable passive intended function of the VF system components subject to an AMR.

2.3.3.20.2 Staff Evaluation

To verify that the applicant identified the components of the VF system that are within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1), the staff reviewed the flow diagrams listed in Section 2.3.3.20 of the LRA showing the evaluation boundaries for the highlighted portion of the VF system that is within scope, and Table 3.3-28 of the LRA, which lists the mechanical components and applicable intended functions subject to an AMR. The staff reviewed Section 9.4.2 of the McGuire and Catawba UFSARs to determine if there were any portions of the VF system that met the scoping criteria in 10 CFR 54.4(a), but were not identified as within the scope of license renewal. The staff also reviewed the McGuire and Catawba UFSARs to determine if any safety-related system functions were not identified as intended functions in the LRA and if any structures or components that have intended functions were omitted from the list of structures or components that require an AMR. The staff compared the functions described in the UFSARs to those identified in the LRA.

The applicant identified the structures and components subject to an AMR for the VF system using the screening methodology described in Section 2.1 of the LRA and listed them in Table 3.3-28 of the LRA. The staff evaluated the scoping and screening methodology in Section 2.1 of this SER. The staff sampled structures and components from Table 3.3-28 of the LRA to verify that the applicant identified the structures and components subject to an AMR. The staff also sampled the structures and components that were within the scope of license renewal but not subject to an AMR. Based on the sample, the staff verified that these structures and components perform their intended functions without moving parts and without a change in configuration or properties and are not subject to replacement on the basis of a qualified life or specified time period.

To ensure that those portions of the VF system excluded from scope are not performing any intended functions, the staff requested additional information. The staff noted that Section 2.3.3.20 of the LRA, contains a summary description of the system functions and a listing of flow diagrams. The flow diagrams highlight the evaluation boundaries and Table 3.3-28 of the LRA tabulates the components within the scope of license renewal and subject to an AMR for the VF system. The corresponding drawings and the UFSARs, however, show additional components that were not listed in Table 3.3-28 of the LRA.

The staff noted that the applicant did not identify housings for active components that require an AMR. The determination should consider whether failure of the housing would result in a failure of the associated active component to perform its intended function and whether the housing meets the long-lived and passive criteria as defined in the rule.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-1, specific information concerning the exclusion of fan housings from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant stated that cooling fans are not included in the AMR results tables in the LRA. The applicant also states that cooling fans, without sub-component exceptions, are explicitly excluded from an AMR by 10 CFR 54.21. The staff reviewed this response and determined that the applicant's basis for excluding fan housings is not consistent with the license renewal rule because the housings are relied upon to maintain pressure boundary integrity (as are valve bodies and pump casings) and are within scope. Furthermore, because the fan housings are passive and long-lived components, they are subject to an AMR. The staff finds this response unacceptable and characterizes this issue as open item 2.3-1.

By letter dated January 23, 2002, the staff requested, in RAIs 2.3-2 and 2.3-7(5), specific information concerning the exclusion of damper housings from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant stated that dampers are not included in the AMR result tables in the LRA. The applicant added that ventilation dampers, without sub-component exceptions, are explicitly excluded from an AMR by 10 CFR 54.21. The staff reviewed this response and has determined that the applicant's basis for excluding damper housings is not consistent with the license renewal rule because the housings are relied upon to maintain pressure boundary integrity (as are valve bodies and pump casings) and are within scope. Furthermore, because the damper housings are passive and long-lived components, thy are subject to an AMR. The staff finds this response unacceptable and characterizes this issue as open item 2.3-2.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-4, specific information concerning the exclusion of building sealants from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant stated that it does not classify materials such as sealants as structures or components. The applicant stated the pressure boundary function is addressed by surveillance testing to demonstrate compliance with technical specifications. The staff reviewed this response and has determined that the applicant's basis for excluding building sealants from an AMR is not consistent with the 10 CFR 54.21 or the staff's position on structural sealants, as stated in License Renewal Issue No. 98-0012, "Consumables," which was issued in a letter from the NRC (C. Grimes) to NEI (D. Walters) on April 20, 1999. The staff finds this response unacceptable and characterizes this issue as open item 2.3-3.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-3, specific information concerning the exclusion of housings for radiation monitors, smoke detectors, air flow monitors, and chlorine monitors from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant stated that, based on guidance provided in NEI 95-10, Revision 3, radiation monitors, smoke detectors, and chlorine detectors are not considered passive components and are therefore not subject to an AMR. Because the monitors and detectors do not perform an intended function, the staff finds the applicant's response acceptable.

By letter dated January 23, 2002, the staff requested, in RAIs 2.3-8(6) and 2.3-9(3), specific information concerning the exclusion of housings for filters from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant clarified that filter housings are within license renewal evaluation boundaries, although the filter media are excluded because filters are replaced on condition. The staff finds the applicant's response acceptable.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-5, specific information concerning the exclusion of passive components associated with ductwork from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant identified these passive components as sub-components of ductwork. The applicant also stated that ventilation grilles were installed only for aesthetic purposes and perform no intended license renewal function. The staff finds the applicant's response acceptable based on the information provided related to passive components associated with ventilation ductwork.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-8(7), specific information concerning the exclusion of housings for dampers in the fuel handling building ventilation system from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant stated that dampers are not included in the AMR results tables in the LRA. The applicant also states that ventilation dampers, without sub-component exceptions, are explicitly excluded from an AMR by 10 CFR 54.21. The staff reviewed this response and has determined that the applicant's basis for excluding damper housings is not consistent with the license renewal rule because the housings are relied upon to maintain pressure boundary integrity (as are valve bodies and pump casings) and ate within scope. Furthermore, because the damper housings are passive and long-lived the are subject to an AMR. The staff finds this response unacceptable and characterizes this issue as open item 2.3-2.

Some components that are common to many systems, including the VF system, have been evaluated separately by the applicant in Section 2.1.2.1.2 of the LRA as "replace on condition" commodities. The staff's evaluation of applicant's treatment of these consumables is documented in Section 2.1.3.2.1 of this SER.

In Section 2.4.3 of this report the staff evaluated component supports for piping, cables, and equipment that supported the design and operation of the VF system. In Section 2.5 of the LRA titled, "Scoping and Screening Results: Electrical and Instrumentation and Controls," the staff evaluated electrical and instrument components that support the operation of the VF system.

The staff reviewed the LRA, information in the UFSARs, and the applicant's RAI responses. In addition, the staff sampled several components from the VF system flow diagrams, as identified in Section 2.3.3.1 of the LRA, to determine whether the applicant properly identified the components within scope and subject to an AMR. No omissions were identified, except as identified in the RAIs.

2.3.3.20.3 Conclusions

On the basis of its review, with the exception of the open items identified in this SER section, the staff has reasonable assurance that the applicant has adequately identified the VF system structures and components that are within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4 and 10 CFR 54.21, respectively.

2.3.3.21 Groundwater Drainage System

In LRA Section 2.3.3.21, "Groundwater Drainage System," the applicant described the components of the groundwater drainage system that are within the scope of license renewal and subject to an AMR. Section 9 of the Catawba and McGuire UFSARs provides additional information concerning their respective groundwater drainage systems.

2.3.3.21.1 Technical Information in the Application

The groundwater drainage systems are identical for purposes of license renewal for both facilities without any notable differences in system design. The groundwater drainage system prevents hydrostatic loads on the reactor and auxiliary building substructures. The groundwater drainage system maintains an acceptable groundwater level for the auxiliary building by transferring water out of the Auxiliary Building and mitigates the consequences of certain postulated flooding events. The applicant described its process for identifying the mechanical components within the scope of license renewal in Section 2.1.1, "Scoping Methodology," of the LRA. On the basis of its methodology described above, the applicant identified portions of the groundwater drainage system that are within the scope of license renewal on the flow diagrams listed in Section 2.3.3.21 of the LRA. Using the methodology described in Section 2.1.2, "Screening Methodology," of the LRA, the applicant compiled a list of mechanical component commodity groupings within the license renewal boundaries that are subject to an AMR and identified their intended functions. The mechanical components subject to AMR, their intended functions, and materials of construction for the Catawba and McGuire groundwater drainage systems are listed in Table 3.3-29. In the LRA, Table 3.3-29, the applicant lists the following five component commodity groups as subject to an AMR: pipe, pump casings, orifices, tubing, and valve bodies. The applicant states that maintaining pressure boundary integrity is the only intended function of the SCs subject to an AMR.

2.3.3.21.2 Staff Evaluation

The staff reviewed Section 2.3.3.21 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the components of the Catawba and McGuire groundwater drainage systems that are within the scope of license renewal in accordance with 10 CFR 54.4 and subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the text and diagrams submitted by the applicant in Section 2.3.3.21 of the LRA and the Catawba and McGuire UFSARs to determine if the applicant adequately identified the SSCs of the groundwater drainage system that are in the scope of license renewal. The staff verified that those portions of the groundwater drainage system that meet the scoping requirements of 10 CFR 54.4 are included within the scope of license renewal, and are identified as such by the applicant in Section 2.3.3.21 of the LRA. The staff then focused its

review on those portions of the groundwater drainage system that were not identified as within the scope of license renewal to verify that they do not meet the scoping requirements of 10 CFR 54.4. The staff also reviewed the UFSARs to determine if there were any additional system functions that were not identified in the LRA, and verified that those additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff found no omissions by the applicant. Therefore, there is reasonable assurance that the applicant adequately identified all portions of the groundwater drainage system that should be included within the scope of license renewal in accordance with 10 CFR 54.4.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the groundwater drainage system that are identified as within the scope of license renewal. The applicant identifies and lists the SCs subject to AMR for the groundwater drainage systems in Table 3.3-29 of the LRA using the screening methodology described in Section 2.1 of the LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER. The staff performed its review by sampling the SCs that the applicant determines as within the scope of license renewal but not subject to AMR to verify that these SCs performed their intended functions with moving parts or with a change in configuration or properties or were subject to replacement based on qualified life or specified time period.

The applicant identified the portions of the groundwater drainage system that are within the scope of license renewal in the drawings referenced in the LRA. The detailed flow diagrams were highlighted to identify those portions of the system that are within the scope of license renewal. The applicant highlighted those components which it believes meet at least one of the scoping requirements of 10 CFR 54.4. The staff compared the LRA flow diagrams to the system drawings and the descriptions in the UFSAR to ensure they were representative of the groundwater drainage system. The staff sampled portions of the flow diagram that were not highlighted to verify that these components did not meet any the scoping criteria in 10 CFR 54.4.

2.3.3.21.3 Conclusions

On the basis of its review of the information contained in Section 2.3.3.21 of the LRA and the supporting information in the Catawba and McGuire UFSARs, as described above, no omissions by the applicant were identified. The staff concludes that there is reasonable assurance that the applicant adequately identified those portions of the groundwater drainage systems that are within the scope of license renewal, and subject to an AMR in accordance with 10 CFR 54.4(a), and 10 CFR 54.21(a)(1), respectively.

2.3.3.22 Hydrogen Bulk Storage System

2.3.3.22.1 Technical Information in the Application

The hydrogen bulk storage system supplies hydrogen to the volume control tank (CVCS). The hydrogen bulk storage system is a non-safety system whose postulated failure could prevent satisfactory accomplishment of certain safety-related functions. To preclude these postulated failures, portions of this system are seismically designed (i.e., Duke Class F). All components within the seismically designed piping boundaries of this system are within the scope of license renewal per §54.4(a)(2).

The component types, component functions, materials of construction, environments, aging effects, and aging management programs/activities for the McGuire and Catawba hydrogen bulk storage systems are listed in Tables 3.3-30 of the LRA. The component types that were identified in the table are pipe, tubing, and valve bodies.

2.3.3.22.2 Staff Evaluation

The staff reviewed this section of the LRA to determine whether there is reasonable assurance that the hydrogen bulk storage system and associated pressure boundary components and supporting structures within the scope of license renewal and subject to AMR have been identified in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1). 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 UFSARs for McGuire and Catawba for the hydrogen bulk storage system and associated pressure boundary components and compared the information in the UFSAR with the information in the LRA to identify those portions that the LRA did not identify as 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). For those structures and components that have a applicable intended functions, the staff sought to verify that they either perform these functions 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 UFSAR 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 extended period of operation.

The staff did not identify any omissions.

2.3.3.22.3 Conclusions

On the basis of its review of the information presented in Section 2.3.3.22 of the LRA and the supporting information in the McGuire and Catawba UFSARs, the staff did not find any omissions by the applicant and, therefore, concludes that there is reasonable assurance that the applicant adequately identified those portions of the hydrogen bulk storage system and the associated (supporting) structures and components that fall within the scope of license renewal and are subject to an AMR, in accordance with 10 CFR Part 54.4(a) and 10 CFR Part 54.21(a)(1).

2.3.3.23 Instrument Air System

In LRA Section 2.3.3.23, “Instrument Air System,” the applicant identified the instrument air system as one that is within scope of AMR. This section refers to LRA Table 3.3-31, which lists the mechanical components, component functions, and materials of construction of the McGuire

and Catawba instrument air system that are subject to AMR. This system is further described for McGuire in Section 9.3.1 of the McGuire UFSAR and in Section 9.3.1 of the Catawba UFSAR. The function of this system is similar for both facilities with some differences in system design. Any notable differences are specifically identified and discussed in the staff's evaluation. Unless otherwise specified, the information provided below is applicable to both the Catawba and the McGuire instrument air system.

2.3.3.23.1 Technical Information in the Application

The function of the instrument air system is to provide dry, oil-free compressed air for all air-operated instrumentation and valves for each unit at Catawba and McGuire. At McGuire the instrument air system consists of three centrifugal compressors and three reciprocating compressors. The six compressors are oil free. The centrifugal compressors operate in "base mode" supplying all plant instrument air demands. The reciprocating compressors operate in standby mode and start on decreasing air pressure. At Catawba, instrument air is supplied by three centrifugal air compressors. Two centrifugal compressors operate "base loaded" to supply the normal requirements of the instrument air system. The third centrifugal compressor is used for standby service. The compressors' intakes at Catawba and McGuire are in the service building basement and at both stations the instrument air system is a subsystem of the compressed air system. The applicant described its process for identifying the mechanical components that are within the scope of license renewal in LRA Section 2.1.1, "Scoping Methodology". The only component function for the instrument air system that meets the scoping criteria for either Catawba or McGuire is that of providing a pressure boundary. The applicant identified component types for the instrument air system that require AMR. These are listed in LRA Table 3.3-31 both Catawba and McGuire, along with the passive function, the aging effect, and the aging management program activities to be applied. The applicant identified the following component types for the Catawba and McGuire instrument air system that are subject to AMR: filter housings, supply accumulators, instrument air tanks, pipe, tubing, and valve bodies.

The applicant utilized a screening process to generate piping and instrumentation diagrams (P&IDs) applicable to the LRA. During initial scoping, the applicant identified plant systems and structures that were candidates for inclusion within the scope of 10 CFR Part 54. For systems and structures that were "scoped in," screening was then performed to identify the passive components and structural members that support an intended function of the in-scope system or structure. These systems and structures are then subject to an AMR in accordance with 10 CFR 54.21(a). The results of the screening review were used to generate the P&IDs which show components that are subject to AMR as highlighted and marked by flags.

2.3.3.23.2 Staff Evaluation

The staff reviewed Sections 2.1 and 2.2 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the Catawba and McGuire instrument air system that are within the scope of license renewal in accordance with 10 CFR 54.4. The staff reviewed Section 2.3 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the systems and structures of the instrument air system that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the text, tables, and diagrams submitted by the applicant in Section 2.3 of the LRA and the Catawba and McGuire UFSARs to determine whether any systems and structures of the instrument air system that may have been omitted from the scope of license renewal meet the scoping criteria in 10 CFR 54.4. The staff verified that those portions of the instrument air system identified by the applicant as meeting the scoping requirements of 10 CFR 54.4, do in fact meet these requirements for both stations. The staff then focused its review on those portions of the instrument air system that were not identified by the applicant as within the scope of license renewal to verify that they do not meet the scoping requirements of 10 CFR 54.4. The staff also reviewed the UFSARs to identify system functions that were not included in the LRA and verified that those additional functions did not meet the scoping requirements of 10 CFR 54.4. Therefore, there is reasonable assurance that the applicant adequately identified all portions of the Catawba and McGuire instrument air system that are within the scope of license renewal in accordance with 10 CFR 54.4.

The staff then determined whether the applicant had properly identified the in-scope systems and structures that are subject to an AMR in accordance with 10 CFR 54.21(a). The applicant identified the systems and structures that are subject to an AMR for the instrument air system and listed them in Table 3.3-31 for both Catawba and McGuire. The staff performed its review by sampling the systems and structures that the applicant identified as within the scope of license renewal but not subject to an AMR to verify that these systems and structures perform their intended functions with moving parts or with a change in configuration or properties or are subject to replacement based on qualified life or specified time period. All systems and structures reviewed by the staff met the above criteria for both Catawba and McGuire.

In Section 2.3.3.23, “Instrument Air System,” of the LRA the applicant lists 25 P&IDs for McGuire and 5 for Catawba that were marked to indicate the license renewal evaluation boundary for the instrument air system. The staff compared the P&IDs to the system drawings and descriptions in the UFSARs to ensure that the diagrams were representative of the instrument air system for the respective plant. The applicant highlighted and flagged components on the P&IDs that are subject to AMR. The staff sampled portions of the P&IDs that were not highlighted to ensure these components did not perform any of the intended functions associated with the scoping criteria of 10 CFR 54.4(a).

2.3.3.23.3 Conclusion

On the basis of its review of the information contained in Section 2.3.3.23 of the LRA, the supporting information in the Catawba and McGuire UFSARs, and the P&IDs, as described above, the staff did not identify any omissions in the scoping and screening of the Catawba and McGuire instrument air system by the applicant. Therefore, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the Catawba and McGuire instrument air system that are within the scope of license renewal, and the systems and structures that are subject to an AMR, in accordance with 10 CFR 54.4(a) and 54.21(a)(1), respectively.

2.3.3.24 Liquid Waste System

In LRA Section 2.3.3.24, “Liquid Waste System,” the applicant described the components of the liquid waste system that are within the scope of license renewal and subject to an AMR. This system is described in Section 11.2 of the McGuire and Catawba UFSARs.

2.3.3.24.1 Technical Information in the Application

The liquid waste system collects, segregates, and processes all radioactive and potentially radioactive liquids generated in the plant to control and minimize releases of radioactivity to the environment.

The applicant described the process for identifying the mechanical components that are within the scope of license renewal in LRA Section 2.1.1, "Scoping Methodology." As described in the scoping methodology, the applicant identified the portions of the liquid waste system that are within the scope of license renewal on the P&IDs that are listed in LRA Section 2.3.3.24. Consistent with the method described in LRA Section 2.1.2, "Screening Methodology," the applicant listed the liquid waste system mechanical components that are subject to an AMR in LRA Table 3.3-32. This table also lists the component functions. Specifically, the applicant identified the following components as subject to an AMR: valve bodies, piping, motor-driven auxiliary feedwater pump sump pumps (for Catawba only), residual heat removal pump and containment spray pump room sump pumps (for Catawba only), orifice (for Catawba only), separators (for Catawba only), strainers (for Catawba only), turbine-driven auxiliary feedwater pump sump pumps (for Catawba only), tubing (for Catawba only), and waste drain tanks (for Catawba only). All these components have the intended component function of PB, which is defined by the applicant as maintaining pressure boundary, affecting containment isolation, or preventing interaction with safety-related equipment. In addition to the PB function, separators and strainers have the FI (filtration) function.

2.3.3.24.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.24 to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the liquid waste system that are within the scope of license renewal in accordance with 10 CFR 54.4(a) and that the applicant appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in LRA Section 2.3.3.24, the applicable P&IDs referenced therein, and the McGuire and Catawba UFSARs to determine if the applicant adequately identified the portions of the liquid waste system that are within the scope of license renewal. The staff verified that those portions of the liquid waste system that meet the scoping requirements of 10 CFR 54.4(a) were included within the scope of license renewal and were identified by the applicant in Section 2.3.3.24 of the LRA.

In LRA Section 2.3.3.24, the applicant listed applicable P&IDs for the liquid waste system. The detailed diagrams are highlighted to identify those portions of the system that are within the scope of license renewal. The staff compared the LRA diagrams to the system drawings and descriptions in the UFSARs to ensure that the diagrams were representative of the liquid waste system. To verify that the applicant included the applicable portions of the liquid waste system within the scope of license renewal, the staff focused its review on those portions of the liquid waste system that were not identified as within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4(a). In addition, the staff reviewed the UFSARs for each facility to identify any additional system functions that were not identified in the LRA, and verified that no additional functions met the scoping requirements of 10 CFR 54.4(a). Based on the experience of reviewing the previous LRAs, the staff recognized that the

radioactive waste management function of the radwaste systems, in general, did not meet the scoping requirements of 10 CFR 54.4(a) because the dose consequences of a failure would be much lower than the dose limits specified in 10 CFR 54.4(a)(1)(iii). However, other plant-specific system functions (such as containment isolation) may meet some of the requirements in 10 CFR 54.4(a). LRA Section 2.3.3.24 describes the radioactive waste management function of the system, but does not identify which system functions meet the requirements in 10 CFR 54.4(a).

By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.24-1, the applicant to identify the intended system functions of the liquid waste system that the applicant used for its scoping determination. In its response dated April 15, 2001, the applicant stated that the system intended functions were not used to determine whether the liquid waste system is within the scope of license renewal. Instead, the applicant determined the portions of the liquid waste system within the scope of license renewal according to the following scoping criteria: (1) portions of the systems that are safety-related (Duke Class A, B, or C), (2) portions of the systems that are designated as non-safety-related Class F piping, (3) portions of the systems that are required to remain functional for fire protection and station blackout, and (4) portions of the systems that are environmentally qualified. The staff finds this response consistent with the methodology described in Section 2.1 of the LRA, which staff evaluated and found acceptable (refer to Section 2.1.3.1 of this SER). However, the staff sought to understand whether or not equipment that performs the radioactive waste management function of this system was identified by the applicant as within the scope of license renewal.

To accomplish this, the staff reviewed Section 3.2.2 of the McGuire UFSAR, which indicates that portions of the radioactive waste management systems whose failure would adversely affect the health and safety of the public are upgraded to Duke Class C. The staff also reviewed Catawba UFSAR Section 3.2.2, which states that portions of the radioactive waste management systems whose failure would result in dose consequences greater than 0.5 rem to the whole body or equivalent offsite doses are upgraded to Duke Class C. The applicant included Duke Class C piping and components within the scope of license renewal. The dose criteria in 10 CFR 54.4(a)(1)(iii) are exposures comparable to the guidelines in 10 CFR 50.34(a)(1), 10 CFR 50.67(b)(2), or 10 CFR 100.11. The dose limits specified in the above regulations are 25 rem to the whole body or 300 rem to the thyroid. The applicant's scoping criteria for radioactive waste management systems are more conservative than the criterion specified in 10 CFR 54.4(a)(1)(iii) and, therefore, are acceptable. On the basis of the information in the RAI responses and the UFSARs, the staff verified that portions of the radioactive waste management system that met the scoping criteria of 10 CFR 54.4 were within the scope. Therefore, the staff 's question in RAI 2.3.3.24-1 was resolved. The staff's evaluation also resolves a similar concern identified in RAI 2.3.3.38-2 for the waste gas system (see Section 2.3.3.38.2 of this SER).

Table 3-4 of the McGuire and Catawba UFSARs indicates that the reactor coolant drain tank heat exchanger and the groundwater drainage sump pump of the liquid waste system are safety-related. However, the staff was not able to find these components listed in LRA Section 2.3.3.24 as within the scope of the license renewal. Through a cross-system review, the staff found that the shells of the reactor coolant drain tank heat exchanger were included in the component cooling system (LRA Section 2.3.3.5) as within the scope of license renewal and subject to an AMR. The pump casing of the groundwater drainage sump pump was included in the groundwater drainage system (LRA Section 2.3.3.21) as within the scope of license renewal

and subject to an AMR. In addition, the staff noted that one of the liquid waste system flow diagrams, CN-1565-1.3, contains highlighted piping and valves, but the diagram is not listed in LRA Section 2.3.3.24. Through a cross-system review, the staff found that this drawing and these highlighted components were included in LRA Section 2.3.3.28, "Nuclear Service Water System." The staff found that the applicant had properly included the above components within the scope of license renewal and subject to an AMR. However, the LRA does not have the above cross-references.

In reviewing the AMR results tables for this system, the staff noticed that more components (such as sump pumps, orifices, separators, strainers, tubing, and waste drain tank) were listed for Catawba than for McGuire. The staff believed that the scoping differences resulted from design differences between Catawba and McGuire, but could not understand the design differences when it compared the system descriptions in the respective UFSARs for McGuire and Catawba. In a conference call on September 12, 2001, summarized in a memorandum dated October 10, 2001, the staff asked the applicant to explain the differences in design between Catawba and McGuire because of which components such as sump pumps, orifices, separators, strainers, tubing, and waste drain tank were determined to be within the scope of license renewal for Catawba but not for McGuire. The applicant explained that a significant portion of the liquid waste system was credited in Catawba's design basis for removing discharged fire water system inventory from flooded areas during and following fire water actuation to prevent safety-related equipment from flood-induced failure. The design basis for McGuire did not include this provision. In addition, there are more non-safety-related pipe runs (Class F) at Catawba than at McGuire, and the failure of these pipe runs at Catawba might adversely impact safety-related equipment. Therefore, more components of the liquid waste system were determined to be within the scope of license renewal at Catawba than at McGuire. The applicant's discussion of the system design differences between Catawba and McGuire provided a reasonable explanation of the differences in scoping for the liquid waste system. On the basis of its review, the staff did not identify any omissions in the applicant's scoping of mechanical components according to 10 CFR 54.4(a).

The staff then determined whether the applicant had properly identified the SCs that are subject to an AMR from among those portions of the liquid waste system that were identified as within the scope of license renewal. The applicant used the screening methodology described in LRA Section 2.1.2 to identify the SCs subject to an AMR. The staff evaluation of the scoping and screening methodology is documented in Section 2.1 of this SER. In the LRA, the applicant identified the portions of the liquid waste system that are within the scope of license renewal in the P&IDs and listed the mechanical components that are subject to an AMR and their intended component functions in LRA Table 3.3-32. The staff performed its review by sampling the SCs that the applicant determined to be within the scope of license renewal but not subject to AMR to verify that no structure or component that performs its intended function without moving parts or without a change in configuration or properties and that is not subject to replacement based on qualified life or specified time period was excluded from an AMR. The staff did not identify any omissions by the applicant in screening SCs according to 10 CFR 54.21(a)(1).

2.3.3.24.3 Conclusions

On the basis of its review of the information contained in LRA Section 2.3.3.24, the supporting information in the P&IDs, and the McGuire and Catawba UFSARs, as described above, the staff did not identify any omissions by the applicant. Therefore, the staff finds that there is

reasonable assurance that the applicant adequately identified those portions of the liquid waste system that are within the scope of license renewal and the associated SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 54.21(a)(1), respectively.

2.3.3.25 Miscellaneous Structures Ventilation (VK) System - Catawba Only

The applicant identified components of the Catawba VK system that are within the scope of license renewal and subject to an AMR. The applicant further stated in Section 2.3.3.25 of the LRA that the McGuire turbine building ventilation system performs the same functions as the Catawba VK system.

The applicant evaluated component supports for equipment, piping, ductwork, and instrument lines within this system in Section 2.4.3 and Table 3.5-3 of the LRA. The applicant evaluated electrical components that support the operation of the system in Section 2.1.2 of the LRA. The staff's scoping evaluation of structures and component supports is provided in Section 2.4 of this SER. The staff's evaluation of electrical components and instrumentation and controls in the VK system is documented in Section 2.5 of this SER.

2.3.3.25.1 Technical Information in the Application

The Catawba VK system includes the standby shutdown facility (SSF) heating ventilation and air-conditioning subsystems. The SSF heating ventilation and air-conditioning portion of the VK system provides the environmental controls necessary to ensure that SSF equipment is maintained operable during postulated fires and station blackout. The mechanical components subject to AMR, their intended functions, and the materials of construction for the SSF heating ventilation and air-conditioning portion of the Catawba VK system are listed in Table 3.3-33 of the LRA. A Catawba flow diagram (CN-1579-4.3) has been highlighted to indicate the LRA evaluation boundary for the SSF heating ventilation and air-conditioning portion of the Catawba VK system.

In Section 2.3.3.25 of the LRA the applicant identified the following Catawba VK system intended function based on 10 CFR 54.4(a)(1) and 10 CFR 54.4(a)(2):

- To provide the environmental controls necessary to ensure that standby shutdown facility equipment is maintained operable during postulated fires and station blackout.

The applicant described its methodology for identifying the mechanical components subject to an AMR in Section 2.1 of the LRA. On the basis of this methodology, the applicant identified the portions of the VK system that are within the scope of license renewal on the flow diagram listed in Section 2.3.3.25 of the LRA. Using the methodology described in Section 2.2.1 of the LRA, the applicant compiled a list of the mechanical components and component types subject to an AMR that are within the evaluation boundaries highlighted on the flow diagrams and identified their intended functions. The applicant provided this list in Table 3.3-33 of the LRA.

The following component types are identified as within the scope of license renewal and subject to an AMR and are listed in Table 3.3-33: air handling unit, ductwork, flexible connectors, and plenum section. The applicant indicated in Table 3.3-33 of the LRA that the VK system pressure boundary function is the only applicable intended function subject to an AMR.

2.3.3.25.2 Staff Evaluation

To verify that the applicant identified the components of the VK system that is within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1), the staff reviewed the flow diagram listed in Section 2.3.3.25 of the LRA. The diagram highlights the evaluation boundaries for the portions of the VK system that are within the scope of license renewal. The staff reviewed Table 3.3-33 of the LRA, which lists the mechanical components and the applicable intended functions subject to an AMR, and Table 3-4 of the Catawba UFSAR to determine if there were any portions of the VK system that met the scoping criteria in 10 CFR 54.4(a) but were not identified in the LRA. The staff also reviewed the McGuire and Catawba UFSARs to determine if any safety-related system functions were not identified as intended functions in the LRA and if any structures or components that have intended functions were omitted from the scope of structures or components that require an AMR. The staff compared the functions described in the UFSARs to those identified in the LRA.

The applicant identified the structures and components subject to an AMR for the VK system using the screening methodology described in Section 2.1 of the LRA and listed them in Table 3.3-33 of the LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this report. The staff sampled the structures and components listed in Table 3.3-33 of the LRA to verify that the applicant did identify the structures and components subject to an AMR. The staff also sampled the structures and components that are within the scope of license renewal but not subject to an AMR. Based on this sample, the staff verified that these structures and components perform their intended functions without moving parts and without a change in configuration or properties and are not subject to replacement on the basis of a qualified life or specified time period.

The NRC staff noted that Section 2.3.3.25 of the LRA provides a summary description of the system functions and specified a flow diagram. The flow diagram highlights the evaluation boundaries, and Table 3.3-33 of the LRA lists the components of the VK system within the scope of license renewal and subject to an AMR. The corresponding drawings and the UFSARs, however, show additional components that were not listed in Table 3.3-33 of the LRA.

The staff noted that the applicant did not identify housings for active components that require an AMR. The determination should consider whether failure of the housing would result in a failure of the associated active component to perform its intended function and whether the housing meets the long-lived and passive criteria as defined in the rule.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-9, specific information concerning the exclusion of Catawba refrigerant coils serving the shutdown panel areas from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant stated the refrigerant coils associated with the auxiliary shutdown panel room air-conditioning sub-system are within the scope of license renewal and should have been highlighted on flow diagram CN-1577-1.8. The coils are listed in AMR Table 3.3-1 with tubes, tube sheets, shells, and bonnets. On the basis of the information provided, the staff finds the applicant’s response acceptable.

Some components that are common to many systems, including the VK system, have been evaluated separately by the applicant in Section 2.1.2.1.2 of the LRA as "replace on condition"

commodities. The staff's evaluation of applicant's treatment of these consumables is documented in Section 2.1.3.2.1 of this SER.

In Section 2.4.3 of this report the staff evaluated component supports for piping, cables, and equipment, which are discussed in LRA Section 2.4 titled, "Scoping and Screening Results: Structures." In Section 2.5 of this report the staff evaluated electrical components that support the operation of the VK system. These are discussed in LRA Section 2.5, "Scoping and Screening Results: Electrical and Instrumentation and Controls."

The staff reviewed the LRA and supporting information in the Catawba UFSAR. In addition, the staff sampled several components from the VK system flow diagram, as identified in Section 2.3.3.25 of the LRA, to determine whether the applicant properly identified the components within scope and subject to an AMR. No omissions were identified, except as identified in the RAI.

2.3.3.25.3 Conclusions

On the basis of its review, the staff has reasonable assurance that the applicant has adequately identified the Catawba VK system structures and components that are within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4 and 10 CFR 54.21, respectively.

2.3.3.26 Nitrogen System

In LRA Section 2.3.3.26, "Nitrogen System," the applicant identified the nitrogen system as subject to an AMR. This section references Table 3.3-34 of the LRA, which lists mechanical components, component functions, and materials of construction that are subject to AMR for the McGuire and Catawba nitrogen system. This system is non-safety related for Catawba. For McGuire a part of the nitrogen system is safety-related. The function of the nitrogen system is similar for both facilities with some differences in system design. Any notable differences are specifically identified and discussed in the staff's evaluation. Unless otherwise specified, the information provided below is applicable to both the Catawba and McGuire nitrogen system.

2.3.3.26.1 Technical Information in the Application

The function of the nitrogen system is to provide a supply of nitrogen to valves that have pneumatic actuators. For McGuire the nitrogen system provides a safety-related supply of nitrogen to the pneumatic actuators on the feedwater isolation valves. The applicant has indicated that for Catawba the nitrogen system is a non-safety system whose postulated failure could prevent satisfactory accomplishment of certain safety-related functions. The applicant described its process for identifying the mechanical components that are within the scope of license renewal in LRA section 2.1.1, "Scoping Methodology." The applicant identified component types for the nitrogen system that require AMR. These are listed in LRA Table 3.3-34 for both Catawba and McGuire, along with the passive function, the aging effect, and the aging management program activities to be applied. The applicant identified the following component types for the Catawba and McGuire nitrogen system that are subject to AMR: nitrogen supply tanks (McGuire only), pipe, tubing (McGuire only), and valve bodies.

The applicant utilized a screening process to generate P&IDs applicable to the LRA. During initial scoping, the applicant identified plant systems and structures that were candidates for inclusion within the scope of 10 CFR Part 54. For systems and structures that were "scoped in," screening was then performed to identify the passive components and structural members that support an intended function of the in-scope system or structure. These systems and structures are then subject to an AMR in accordance with 10 CFR 54.21(a). The results of the screening review were used to generate the P&IDs which show components that are subject to AMR as highlighted and marked by flags.

2.3.3.26.2 Staff Evaluation

The staff reviewed Sections 2.1 and 2.2 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the Catawba and McGuire nitrogen systems that are within the scope of license renewal in accordance with 10 CFR 54.4. The staff reviewed Section 2.3 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the systems and structures of the nitrogen system that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the text, tables, and diagrams submitted by the applicant in Section 2.3 of the LRA and the Catawba and McGuire UFSARs to determine whether any systems and structures of the nitrogen system that may have been omitted from the scope of license renewal meet the scoping criteria in 10 CFR 54.4. The staff verified that those portions of the nitrogen system identified by the applicant as meeting the scoping requirements of 10 CFR 54.4 do in fact meet these requirements for both stations. The staff then focused its review on those portions of the nitrogen system that were not identified by the applicant as within the scope of license renewal to verify that they do not meet the scoping requirements of 10 CFR 54.4. The staff also reviewed the UFSARs to identify system functions that were not included in the LRA and verified that those additional functions did not meet the scoping requirements of 10 CFR 54.4. Therefore, there is reasonable assurance that the applicant adequately identified all portions of the Catawba and McGuire nitrogen systems that are within the scope of license renewal in accordance with 10 CFR 54.4.

The staff then determined whether the applicant had properly identified the in-scope systems and structures that are subject to an AMR in accordance with 10 CFR 54.21(a). The applicant identified the systems and structures that are subject to an AMR for the nitrogen system and listed them in Table 3.3-34 for both Catawba and McGuire. The staff performed its review by sampling the systems and structures that the applicant identified as within the scope of license renewal but not subject to an AMR to verify that these systems and structures perform their intended functions with moving parts or with a change in configuration or properties, or are subject to replacement based on qualified life or specified time period. All systems and structures reviewed by the staff met the above criteria for both Catawba and McGuire.

In Section 2.3.3.26, "Nitrogen system," of the LRA the applicant listed four P&IDs for McGuire and one for Catawba that were marked to indicate the license renewal evaluation boundary for the nitrogen system. The applicant highlighted and flagged components on the P&IDs that are subject to AMR. The staff sampled portions of the P&IDs that were not highlighted to ensure these components did not perform any of the intended functions associated with the scoping criteria of 10 CFR 54.4(a).

Catawba P&ID CN-1602-1.0, “Nitrogen System,” depicts nitrogen supply lines that are not in scope supplying pressure for the containment valve injection water system (NW). The NW system prevents leakage of containment atmosphere past certain containment isolation valves (CIVs) following a LOCA by injecting seal water at a pressure exceeding containment accident pressure between the two seating surfaces of the CIVs. The water that gets injected comes from one of two trains of surge chambers depicted on P&ID CN-1602-1.0 as being pressurized by nitrogen. The nitrogen pressure provides the drives the water between the valves. Section 6.2.4.2.2 of the Catawba UFSAR states that the NW system is designed to meet all regulatory and testing requirements set forth in paragraph III-C of 10 CFR Part 50, Appendix J, and ASME Code Section IX. Following a LOCA, containment isolation would be required on an ongoing basis for an extended period of time. The staff believed this function of the nitrogen system to fall under the scoping requirements of 10 CFR 54.4(a)(2) for non-safety-related systems “whose failure could prevent satisfactory accomplishment of functions identified in paragraphs (a)(1)(i), (ii), or (iii) of this section.” In this case paragraph (iii) (the capability to mitigate the consequences of accidents...) appeared to apply. The staff concluded that the nitrogen supply piping up to the containment valve injection water surge chambers and the surge chambers depicted on CN-1602-1.0 should be included in the evaluation boundary for AMR. By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.26, the applicant to provide the basis for not including these components in scope.

In its response dated April 15, 2002, the applicant indicated that the nitrogen “overpressure” on the NW system is used only under normal operating conditions and not relied upon during a design basis event. The applicant further indicated that during a design basis event, the nuclear service water system is relied upon to inject seal water at a pressure exceeding containment accident pressure between the two seating surfaces of the CIVs. The applicant indicated that the nuclear service water system essential header piping is highlighted to show that it is within the scope of license renewal. The staff verified this by inspecting P&IDs CN-1574-2.4, “Flow Diagram of Nuclear Service Water System,” and CN-1569-1.0, “Flow Diagram of Containment valve Injection Water System.” The staff finds that the applicant has appropriately identified the nuclear service water piping as in scope for the above safety function and that the nitrogen supply lines discussed above are not in scope because they do not support a safety-related function.

The staff’s review of the Catawba UFSAR indicated that a power-operated relief valve (PORV) is provided in the safety grade portion of each main steam line upstream of the isolation valve. These PORVs are required to achieve and maintain a hot-shutdown condition and are therefore safety-related. The safety grade mode of operation of the PORVs is provided by the use of an environmentally and seismically qualified nitrogen control system. Nitrogen is supplied by seismically mounted cylinders located in the “doghouse.” The staff noted that these cylinders and the piping between them and the main steam line PORVs are apparently not depicted on any nitrogen system drawing. By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.26-2, clarification of the status of this run of piping and the nitrogen cylinders (i.e, whether or not they were in scope). In its response dated April 15, 2002, the applicant confirmed that the Catawba main steam line PORVs are supplied with a nitrogen control system as a backup to the normal instrument air supply. This backup nitrogen control system consists of valves, tubing, and nitrogen bottles. The applicant supplemented Table 3.3-34 with the AMR results for valve bodies and tubing associated with this backup nitrogen control system. The staff’s evaluation of the AMR results are documented in Section 3.3.26.2.1 of this SER. The applicant stated that the nitrogen bottles are periodically replaced and, therefore, are not subject to an

AMR. However, the applicant did not specify the details of the periodic replacement. Since the staff could not determine if the nitrogen bottles are replaced based on qualified life or on condition in accordance with performance criteria or a governing program, the applicant provided supplemental information in electronic correspondence dated July 16, 2002. In this correspondence, the applicant stated the following:

> Catawba TS surveillance requirement (TSSR) 3.7.4.1 requires verification that one of the nitrogen bottles on each SG PORV is pressurized to greater than 2100 psig once every 24 hours. This TSSR is performed with a Catawba procedure entitled "Procedure for Checking and Replacing Steam Generator PORV Nitrogen Cylinders and Setting Cylinder Regulators." There are two nitrogen cylinders per SG PORV. Initial pressure in each cylinder is greater than 2500 psig. This procedure requires that if the pressure in either nitrogen cylinder is less than or equal to 2420 psig, then the nitrogen cylinder is replaced. Replacement cylinders are obtained from a warehouse. The used cylinders are returned to the warehouse. The cylinders are not permanently installed in the plant.

The applicant further states that replacement of the nitrogen cylinders is based on gas pressure and, therefore, performance monitoring consistent with the SRP-LR. Pending the staff's receipt of this information in official correspondence, this issue is characterized as confirmatory item 2.3.3.26.2-1.

On Catawba P&ID CN-1602-1.0, "Nitrogen System," at the lower right hand corner of the drawing, an independent nitrogen system is depicted as not in scope. The system is shown supplying actuators 1CF42, 1CF51, 1CF33, and 1CF60. By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.26-3, the applicant to identify the function of the system. Also, at the point on the P&ID where the nitrogen system is shown supplying the actuators listed, the diagram references "Note 8." Note 8 was missing from the P&ID. The RAI also requested the applicant to provide Note 8. In its response dated April 15, 2002, the applicant indicated that the independent nitrogen system depicted on P&ID CN-1602-1.0 has no function and, in fact, has been abandoned. The applicant also indicated that since the time the P&IDs were highlighted for license renewal, P&ID CN-1602-1.0 was revised to show the independent nitrogen system as cut and capped, nitrogen bottles removed, and the system abandoned in place with Note 10 added to indicate this status. The staff's question regarding Note 8 is moot because the system has been abandoned. The staff finds this response acceptable.

2.3.3.26.3 Conclusion

On the basis of its review of the information contained in Section 2.3.3.26 of the LRA, the supporting information in the Catawba and McGuire UFSARs, and the P&IDs, as described above, the staff did not identify any other omissions in the scoping and screening of the Catawba and McGuire nitrogen system by the applicant. Therefore, the staff concludes that, with the exception of confirmatory item 2.3.3.26.2-1, there is reasonable assurance that the applicant has identified those portions of the Catawba and McGuire nitrogen system that are within the scope of license renewal, and the systems and structures that are subject to an AMR, in accordance with 10 CFR 54.4(a) and 54.21(a)(1), respectively.

2.3.3.27 Nuclear Sampling System

In LRA Section 2.3.3.27 "Nuclear Sampling System," the applicant described the components of the nuclear sampling system that are within the scope of license renewal and subject to an

AMR. Section 9.3.2 of the Catawba and McGuire UFSARs provides additional information concerning their respective nuclear sampling systems.

2.3.3.27.1 Technical Information in the Application

The nuclear sampling systems are essentially the same and perform the same function at Catawba and McGuire. The system provides a means of obtaining the more frequently taken samples during normal plant operation from the station's nuclear-safety-related systems in a convenient, shielded, and safe environment. The system also provides a means of sampling the reactor coolant and containment atmosphere following a LOCA to monitor the reactor and determine the degree of core damage. The mechanical components subject to AMR, their intended functions, and materials of construction for the nuclear sampling system are listed in Table 3.3-35. Using the methodology described in LRA Section 2.1.2, "Screening Methodology," the applicant compiled a list of mechanical component commodity groupings within the license renewal boundaries that are subject to an AMR and identified their intended functions. In LRA Table 3.3-35, the applicant lists the following four component commodity groups as subject to an AMR: pipe, orifices, tubing, and valve bodies. The applicant states that maintaining pressure boundary integrity is the intended function of the SCs subject to an AMR. The orifices also perform a throttling function.

2.3.3.27.2 Staff Evaluation

The staff reviewed Section 2.3.3.27 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the nuclear sampling system SCs that are within the scope of license renewal in accordance with 10 CFR 54.4 and subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the text and diagrams submitted by the applicant in Section 2.3.3.27 of the LRA and the Catawba and McGuire UFSARs to determine if the applicant adequately identified the SSCs of the nuclear sampling system that are in the scope of license renewal. The staff verified that those portions of the nuclear sampling system that meet the scoping requirements of 10 CFR 54.4 are included within the scope of license renewal and are identified by the applicant in Section 2.3.3.27 of the LRA. The staff then focused its review on those portions of the nuclear sampling system that were not identified as within the scope of license renewal to verify that they do not meet the scoping requirements of 10 CFR 54.4. The staff also reviewed the UFSARs to determine if there were any additional system functions that were not identified in the LRA, and verified that no additional function met the scoping requirements of 10 CFR 54.4. The staff found no omissions by the applicant; therefore, there is reasonable assurance that the applicant adequately identified all portions of the nuclear sampling system that should be included within the scope of license renewal in accordance with 10 CFR 54.4.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the nuclear sampling system that are identified as within the scope of license renewal. The applicant identifies and lists the SCs subject to AMR for the nuclear sampling systems in Table 3.3-35 of the LRA using the screening methodology described in Section 2.1 of the LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER. The staff performed its review by sampling the SCs that the applicant determines as within the scope of license renewal but not subject to AMR to verify that these SCs performed their intended functions with moving

parts or with a change in configuration or properties andwere subject to replacement based on qualified life or specified time period.

The applicant identified the portions of the nuclear sampling system that are within the scope of license renewal in the drawings referenced in the LRA. The detailed flow diagrams were highlighted to identify those portions of the system that are within the scope of license renewal. The applicant highlighted those components which it believes meets at least one of the scoping requirements of 10 CFR 54.4. The staff compared the LRA flow diagrams to the system drawings and the descriptions in the UFSAR to ensure they were representative of the nuclear sampling system. The staff sampled portions of the flow diagram that were not highlighted to verify that these components did not meet any the scoping criteria in 10 CFR 54.4.

2.3.3.27.3 Conclusions

On the basis of its review of the information contained in Section 2.3.3.27 of the LRA and the supporting information in the Catawba and McGuire UFSARs, as described above, no omissions by the applicant were identified. The staff concludes that there is reasonable assurance that the applicant adequately identified those portions of the nuclear sampling system that are within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4(a), and 10 CFR 54.21(a)(1), respectively.

2.3.3.28 Nuclear Service Water System

In Section 2.3.3.28, “Nuclear Service Water System” (NSW), of the LRA the applicant identified the nuclear service water system as one that is within the scope of AMR. This section refers to LRA Table 3.3-36, which lists mechanical components, component functions, and materials of construction subject to AMR for both the McGuire and the Catawba nuclear service water system. This system is further described in Section 9.2.2 of the McGuire UFSAR and in Section 9.2.1 of the Catawba UFSAR. This system is similar for both facilities with some differences in system design. Any notable differences are specifically identified and discussed in the staff’s evaluation. Unless otherwise specified, the information provided below is applicable to both the Catawba and the McGuire nuclear service water system.

2.3.3.28.1 Technical Information in the Application

The applicant identified the piping and mechanical components of the NSW system for Catawba and McGuire in the LRA. The NSW system at Catawba and McGuire provides cooling water for various safety-related and non-safety related heat loads. The system at both Catawba and McGuire provides two redundant “essential headers” serving two trains of equipment necessary for safe shutdown and a “non-essential header” serving equipment not required for safe shutdown. The NSW system is designed to meet design flow rates and heads for normal station operation and also those required for safe shutdown normally or as the result of a postulated LOCA. The ultimate heat sink for McGuire consists of Lake Norman and the standby nuclear service water pond. The ultimate heat sink for Catawba consists of Lake Wylie and the standby nuclear service water pond.

The applicant described its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.1, “Scoping Methodology” of the LRA. The applicant stated in Section 2.3.3.28 of the LRA that the McGuire NSW system acts as an assured source

of makeup water for various requirements and the normal supply of water for the containment ventilation cooling water system. The applicant further stated in this section for Catawba that the NSW system supplies emergency makeup water to various safety-related systems during normal operation and design basis events, water for fire protection hose stations in the diesel buildings and nuclear service water pumphouse, and cooling flow and flush water for non-QA heat loads and functions during normal operation. The applicant identified component types for the McGuire and Catawba NSW system that require AMR. These are listed in LRA Table 3.3-36 for McGuire, along with the passive function, the aging effect, and the aging management program activities to be applied. The applicant identified the following component types for the McGuire NSW system that are subject to AMR: centrifugal charging pump bearing oil and speed reducer oil coolers, expansion joints, nuclear service water pump casings, nuclear service water strainers, orifices, pipe, reciprocating charging pump bearing oil coolers and fluid drive oil coolers, safety injection pump bearing oil coolers, tubing, and valve bodies. Component types for the Catawba NSW system that require AMR are presented in Table 3.3-37 of the LRA. The applicant identified the following component types for the Catawba nuclear service water system that are subject to AMR: annubars, flexible hoses, manways, pump casings, orifices, pipe, strainers, tubing, and valve bodies.

The applicant utilized a screening process to generate P&IDs applicable to the LRA. During initial scoping, the applicant identified plant systems and structures that were candidates for inclusion within the scope of 10 CFR 54. For systems and structures that were "scoped in," screening was performed to identify the passive components and structural members that support an intended function of the "in-scope" system or structure. These systems and structures are then subject to an AMR in accordance with 10 CFR 54.21(a). The results of the screening review were used to generate the P&IDs which show components that are subject to AMR as highlighted and marked by flags.

2.3.3.28.2 Staff Evaluation

The staff reviewed Sections 2.1 and 2.2 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the Catawba and McGuire nuclear service water system that are within the scope of license renewal in accordance with 10 CFR 54.4. The staff reviewed Section 2.3 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the systems and structures of the NSW system that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the text and diagrams submitted by the applicant in Section 2.3 of the LRA and the Catawba and McGuire UFSARs to identify any systems and structures of the NSW systems that may have been omitted from the scope of license renewal that meet the scoping criteria in 10 CFR 54.4. The staff verified that those portions of the NSW systems identified by the applicant as meeting the scoping requirements of 10 CFR 54.4 do in fact meet these requirements for both stations. The staff then focused its review on those portions of the NSW systems that were not identified by the applicant as within the scope of license renewal to verify that they do not meet the scoping requirements of 10 CFR 54.4. The staff also reviewed the UFSARs to identify system functions that were not included in the LRA and verified that those functions met the scoping requirements of 10 CFR 54.4. Therefore, there is reasonable assurance that the applicant has adequately identified all portions of the Catawba and McGuire NSW systems that are within the scope of license renewal in accordance with 10 CFR 54.4.

The staff then determined whether the applicant had properly identified the in-scope systems and structures that are subject to an AMR in accordance with 10 CFR 54.21(a). The applicant identified the systems and structures that are subject to an AMR for the NSW system and noted them in Table 3.3-36 for McGuire and Table 3.3-37 for Catawba. The staff performed its review by sampling the systems and structures that the applicant identified as within the scope of license renewal, but not subject to an AMR, to verify that these systems and structures perform their intended functions with moving parts or with a change in configuration or properties, or are subject to replacement based on qualified life or specified time period. All systems and structures reviewed by the staff met the above criteria for both Catawba and McGuire.

In Section 2.3.3.28 of the LRA, "Nuclear Service Water System," the applicant listed 28 P&IDs for McGuire and 27 P&IDs for Catawba that were marked to indicate the license renewal evaluation boundary for the NSW system. The staff compared the flow diagrams to the information and descriptions in the UFSARs to ensure that the diagrams were representative of the NSW system for the respective plant. The applicant highlighted and flagged components on the P&IDs that are subject to AMR. The staff sampled portions of the P&IDs that were not highlighted to ensure these components did not perform any of the intended functions associated with the scoping criteria of 10 CFR 54.4(a).

Paragraph 2.1.1.2.1 of the LRA states that some Duke Class G (non-safety related) components may be relied upon to remain functional during and following design basis events. Nuclear service water P&ID CN-1574-1.5, Note 16, indicates that buried Class G piping from the auxiliary building to isolation valves 1RL054 and 1RL062 is seismically designed. The staff inferred that Class G piping may be relied upon to remain functional during and following design basis events. It was not discernable from the P&ID whether or not this piping is in scope. By letter dated January 28, 2002, the staff asked, in RAI 2.3.3.28-1, the applicant if the Duke Class G piping discussed above is within the scope of license renewal, and if it is not, to provide the basis for the exclusion. In its response dated April 15, 2002, the applicant indicated that the Class G piping discussed above is not within the scope of license renewal. The applicant further indicated that this piping is the normal NSW discharge and is not relied upon to remain functional during or following design basis events. The failure of the piping will not impact the system's safety-related function because the assured, safety-related nuclear service water discharge which is within the scope of license renewal is provided by a separate discharge line routed to the nuclear service water pond. The applicant also stated that the intent of Note 16 on CN-1574-1.5 is that, since the piping is underground, it is inherently missile-protected and seismically designed. The note was not meant to imply that the piping is required to have seismic design features. The staff concludes that this is acceptable because failure of the relevant Class G piping will not impair the function of the assured, safety-related nuclear service water discharge piping, which is within the scope of license renewal.

2.3.3.28.3 Conclusion

On the basis of its review of the information contained in Section 2.3.3.28 of the LRA, the supporting information in the Catawba and McGuire UFSARs, and the P&IDs, as described above, the staff did not identify any omissions in the scoping and screening of the Catawba and McGuire NSW system by the applicant. Therefore, the staff concludes that there is reasonable assurance that the applicant identified those portions of the Catawba and McGuire nuclear service water system that are within the scope of license renewal, and the systems and

structures that are subject to an AMR, in accordance with 10 CFR 54.4(a) and 54.21(a)(1), respectively.

2.3.3.29 Nuclear Service Water Pump Structure Ventilation (VZ) System - Catawba Only

In Section 2.3.3.29 of the LRA titled, "Nuclear Service Water Pump Structure Ventilation System," the applicant identified portions of the VZ system and the components that are within the scope of the LRA and subject to AMR. The applicant noted in Section 2.3.3.29 of the LRA that a system corresponding to the Catawba VZ system does not exist at McGuire. McGuire has no nuclear service water pump structure.

The applicant evaluated component supports for the VZ system ductwork in Table 3-4 of the LRA. The staff's scoping evaluations of component supports and electrical components are provided in Sections 2.4 and 2.5, respectively of this report. Instrument line components in the VZ system were evaluated in Section 2.1 of the LRA.

2.3.3.29.1 Technical Information in the Application

The VZ system is an ESF. Two full-capacity supply fans in each pump compartment are served from separate trains of the emergency power system. Each essential fan is provided with a check damper on the fan discharge to prevent backflow through the standby fan. This ensures the integrity and availability of the ventilation system in the event of a loss of offsite power or any single active failure. A nonessential fan is provided in both pump compartments to supply ventilation air to the pool area below the pumps when maintenance or inspection is performed in this area. Modulating outside air and return air dampers are proportionally controlled to maintain space temperature.

In Section 2.3.3.29 of the LRA and Section 9.4.8 of the Catawba UFSAR, the applicant identified the following intended functions of the Catawba VZ system based on 10 CFR 54.4(a)(1) and 10 CFR 54.4(a)(2):

Section 2.3.3.29 of the LRA-

- To maintain a suitable environmental temperature for the operation of equipment located in the nuclear service water pump structure.

Section 9.4.8 of the Catawba UFSAR-

- To provide a suitable environment for the operation of equipment and personnel access for inspection, testing, and maintenance.
- To maintain ambient temperature inside the nuclear service water pump structure within acceptable temperature limits.

On the basis of the intended functions identified above for the Catawba VZ system, the portions of this system that were identified by the applicant as within the scope of license renewal include all VZ system safety-related components (electrical, mechanical, and instruments). The applicant described its methodology for identifying the mechanical components subject to an AMR in Section 2.1.2.1.2 of the LRA. On the basis of this methodology, the applicant identified the portions of the VZ system that are within the scope on the flow diagram listed in Section 2.3.3.29 of the LRA. Using the methodology described in Section 2.2.1 of the LRA, the applicant compiled a list of the mechanical components and component types subject to an

AMR that are within the evaluation boundaries highlighted on the flow diagrams and identified their intended functions. The applicant provided this list in Table 3.3-38 of the LRA.

The following component types are identified as within the scope of license renewal and subject to an AMR and are listed in Table 3.3-38 of the LRA: ductwork, pipe, tubing, and valve housings.
The applicant further noted in Table 3.3-38 of the LRA that the VZ system pressure boundary function is the only applicable intended function subject to an AMR.

2.3.3.29.2 Staff Evaluation

To verify that the applicant identified the components of the VZ system that are within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1), the staff reviewed the flow diagram listed in Section 2.3.3.29 of the LRA to confirm the evaluation boundaries for the highlighted portions of the VZ system that are within the scope of license renewal. The staff reviewed Table 3.3-38 of the LRA, which lists the mechanical components and the applicable intended functions that are subject to an AMR. The staff also reviewed Sections 7.6.21 and 9.4.8 of the Catawba UFSAR to determine if whether any portions of the VZ system that met the scoping criteria in 10 CFR 54.4(a) were not identified as within the scope of license renewal. The staff also reviewed the McGuire and Catawba UFSARs to determine if any safety-related system functions were not identified as intended functions in the LRA, and if any structures or components that have intended functions were omitted from the scope of structures or components that require an AMR. The staff compared the functions described in the UFSARs to those identified in the LRA.

The applicant identified the structures and components subject to an AMR for the VZ system using the screening methodology described in Section 2.1 of the LRA and listed them in Table 3.3-38 of the LRA. The staff sampled the structures and components in Table 3.3-38 of the LRA to verify that the applicant did identify the structures and components subject to an AMR. The staff also sampled the structures and components that are within the scope of license renewal but not subject to an AMR to verify that these structure and components performed their intended functions without moving parts or without a change in configuration or properties and are not subject to replacement on the basis of a qualified life or specified time period.

To ensure that those portions of the VZ system excluded from scope do not perform any intended functions, the staff requested additional information based on a review of the UFSAR and LRA description. The staff noted that Section 2.3.3.29 of the LRA, provides a summary description of the system functions and references a flow diagram. The flow diagram highlights the evaluation boundaries, and Table 3.3-38 of the LRA tabulates the components within the scope and subject to an AMR for the VZ system. The corresponding drawings and the UFSARs, however, show additional components that were not listed in Table 3.3-38 of the LRA.

The staff noted that the applicant did not identify housings for active components that require an AMR. The determination should consider whether failure of the housing would result in a failure of the associated active component to perform its intended function and whether the housing meets the long-lived and passive criteria as defined in the rule.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-9, specific information concerning the exclusion of the nuclear service water pump structure ventilation system fan

housings from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant stated that cooling fans are not included in the AMR results tables in the LRA. The applicant stated that cooling fans, without sub-component exceptions, are explicitly excluded from an AMR by 10 CFR 54.21. The staff reviewed this response and determined that the applicant's basis for excluding fan housings is not consistent with the license renewal rule because the housings are relied upon to maintain pressure boundary integrity (as are valve bodies and pump casings) and are within scope. Furthermore, because the fan housings are passive long-lived components, they are subject to an AMR. The staff finds this response unacceptable and characterizes this issue as open item 2.3-1.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-8, specific information concerning the exclusion of the VZ ventilation damper (or valve) housings from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant stated that VZ system dampers are not included in the AMR results tables in the LRA. The applicant stated that ventilation dampers, without sub-component exceptions, are explicitly excluded from an AMR by 10 CFR 54.21. The staff reviewed this response and has determined that the applicant's basis for excluding damper housings is not consistent with the license renewal rule because the housings are relied upon to maintain pressure boundary integrity (as are valve bodies and pump casings) and are within scope. Furthermore, because the damper housings are passive long-lived components, they are subject to an AMR. The staff finds this response unacceptable and characterizes this issue as open item 2.3-2.

Some components that are common to many systems, including the VZ system, have been evaluated separately by the applicant in Section 2.1.2.1.2 of the LRA as "replace on condition" commodities. The staff's evaluation of applicant's treatment of these consumables is documented in Section 2.1.3.2.1 of this SER.

In Section 2.4.3 of this report the staff evaluated component supports for piping, cables, and equipment that supported the design and operation of the VZ system. In LRA Section 2.5, "Scoping and Screening Results: Electrical and Instrumentation and Controls," the staff evaluated electrical and instrument components that support the operation of the VZ system.

The NRC staff reviewed the LRA, supporting information in the UFSAR, and the applicant's responses RAI. In addition, the staff sampled several components from the VZ system flow diagram, as identified in Section 2.3.3.29 of the LRA, to determine if the applicant properly identified the components within scope and subject to an AMR. No omissions were identified, except as identified in the RAIs.

2.3.3.29.3 Conclusions

On the basis of its review, with the exception of open items identified in this SER section, the staff has reasonable assurance that the applicant has adequately identified the VZ system structures and components that are within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4 and 10 CFR 54.21, respectively.

2.3.3.30 Nuclear Solid Waste Disposal System

In LRA Section 2.3.3.30, "Nuclear Solid Waste Disposal System," the applicant described the components of the nuclear solid waste disposal system that are within the scope of license

renewal and subject to an AMR. The system is described in Section 11.5 of the McGuire UFSAR and Section 11.4 of the Catawba UFSAR.

2.3.3.30.1 Technical Information in the Application

The nuclear solid waste disposal system contains and stores radioactive waste materials and prepares the waste for eventual shipment to a licensed offsite disposal facility. The applicant described the process for identifying the mechanical components that are within the scope of license renewal in LRA Section 2.1.1, "Scoping Methodology." As described in the scoping methodology, the applicant identified the portions of the nuclear solid waste disposal system that are within the scope of license renewal on the P&IDs that are listed in LRA Section 2.3.3.30. Consistent with the method described in LRA Section 2.1.2, "Screening Methodology," the applicant listed the nuclear solid waste disposal system mechanical components that are subject to an AMR in LRA Table 3.3-30. This table also lists the component functions. The applicant identified the following components as subject to an AMR: valve bodies, piping, screens, spent resin storage tanks, tubing. All these components except screens have the intended component function of PB, which is defined by the applicant as maintaining pressure boundary, affecting containment isolation, or preventing interaction with safety-related equipment. The screens have the FI (filtration) function.

2.3.3.30.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.30 to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the nuclear solid waste disposal system that are within the scope of license renewal in accordance with 10 CFR 54.4(a) and that the applicant appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in LRA Section 2.3.3.30, the applicable P&IDs referenced therein, and the McGuire and Catawba UFSARs to determine if the applicant adequately identified the portions of the nuclear solid waste disposal system that are within the scope of license renewal. The staff verified that those portions of the nuclear solid waste disposal system that meet the scoping requirements of 10 CFR 54.4(a) were included within the scope of license renewal and were identified by the applicant in Section 2.3.3.30 of the LRA.

In LRA Section 2.3.3.30, the applicant listed applicable P&IDs for the nuclear solid waste disposal system. The detailed diagrams are highlighted to identify those portions of the system that are within the scope of license renewal. The staff compared the LRA diagrams to the system drawings and descriptions in the UFSARs to ensure that the diagrams were representative of the nuclear solid waste disposal system. To verify that the applicant included the applicable portions of the nuclear solid waste disposal system within the scope of license renewal, the staff focused its review on those portions of the nuclear solid waste disposal system that were not identified as within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4(a). In addition, the staff reviewed the UFSARs for each facility to identify any additional system functions that were not identified in the LRA, and verified that the additional functions did not meet the scoping requirements of 10 CFR 54.4(a).

The staff reviewed McGuire UFSAR Table 3-4 for the solid waste disposal system and found the only components identified as safety Class 3 are the spent resin storage tank and some

valves. The staff confirmed that the spent resin storage tanks and associated piping, screens, and valve bodies are included in LRA Table 3.3-39 as subject to an AMR. For Catawba, portions of the non-safety-related solid waste disposal system whose postulated failure could prevent satisfactory accomplishment of certain safety-related functions were classified as Duke Class F components. These components meet the scoping criterion of 10 CFR 54.4(a)(2). The staff confirmed that these components are highlighted in the P&IDs of the LRA. On the basis of the information in the P&IDs and UFSARs, the staff did not identify any omissions by the applicant in scoping of mechanical components according to 10 CFR 54.4(a).

The staff then determined whether the applicant had properly identified the SCs that are subject to an AMR from among those portions of the solid waste disposal system that were identified as within the scope of license renewal. The applicant used the screening methodology described in LRA Section 2.1.2 to identify the SCs subject to an AMR. The staff evaluation of the scoping and screening methodology is documented in Section 2.1 of this SER. In the LRA, the applicant identified the portions of the solid waste disposal system that are within the scope of license renewal in the P&IDs and listed the mechanical components that are subject to an AMR and their intended component functions in LRA Table 3.3-39. The staff performed its review by sampling the SCs that the applicant determined to be within the scope of license renewal but not subject to AMR to verify that no structure or component, that performs its intended function without moving parts or without a change in configuration or properties and that is not subject to replacement based on qualified life or specified time period was excluded from an AMR. The staff did not identify any omissions by the applicant in screening SCs according to 10 CFR 54.21(a)(1).

2.3.3.30.3 Conclusions

On the basis of its review of the information contained in LRA Section 2.3.3.30, the supporting information in the P&IDs, and the McGuire and Catawba UFSARs, as described above, the staff did not identify any omissions by the applicant. Therefore, the staff finds that there is reasonable assurance that the applicant adequately identified those portions of the solid waste disposal system that are within the scope of license renewal and the associated SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 54.21(a)(1), respectively.

2.3.3.31 Reactor Coolant Pump Motor Oil Collection Subsystem

LRA Section 2.3.3.31, "Reactor Coolant Pump Motor Oil Collection Subsystem," identified that structures, systems, and components (SSCs) relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with 10 CFR 50.48, the fire protection (FP) rule, are within the scope of license renewal. In LRA Section 2.3.3.31, the applicant identified the FP flow diagrams that had been marked to show the license renewal evaluation boundary for the reactor coolant pump (RCP) motor oil collection subsystem for McGuire and Catawba. The applicant also identified the SSCs for the RCP motor oil collection subsystem that are subject to an AMR for McGuire and Catawba in LRA Table 3.3-40. In a letter to the applicant dated January 28, 2002, the NRC requested additional information regarding the RCP motor oil collection subsystem. In a letter to the NRC dated April 15, 2002, the applicant provided additional information in response to the staff's RAIs.

2.3.3.31.1 Technical Information in the Application

In accordance with 10 CFR 54.4(a)(3), SSCs that are relied on in safety analyses or plant evaluation to demonstrate compliance with 10 CFR 50.48 are within the scope of license renewal. The RCP motor oil collection subsystem is relied upon to meet the requirements of 10 CFR Part 50, Appendix R, Section III.O, "Oil Collection System for Reactor Coolant Pump."

In accordance with 10 CFR 50.48, the applicant is required to implement and maintain an FP program. As stated in LRA Section 2.1.1.3.1, the licensing basis with regard to fire protection differs at McGuire and Catawba. McGuire and Catawba are both licensed to 10 CFR 50.48(b) as specifically stated in the plants' SERs and the facility operating licenses. License Conditions 2.C.(4) and 2.C.(7) apply for McGuire and license conditions 2.C(8) and 2.C.(6) apply for Catawba. The NRC SER, NUREG-0422, provides the staff evaluation which documents the McGuire compliance with Appendix A of BTP APCSB 9.5-1, "FP for Nuclear Power Plants." The NRC SER, NUREG-0954, provides the staff evaluation which documents the Catawba compliance with Appendix A to BTP APCSB 9.5-1.

McGuire and Catawba are both committed to provide an RCP oil collection system in accordance with the requirements of Appendix R. The RCP lube oil is a significant fire hazard and the underlying purpose of the lube oil collection system is to ensure that leaking oil will not lead to a fire that could damage safety-related equipment during normal conditions or design basis conditions. Appendix R, Section III.O, states the following:

> Such collection systems shall be capable of collecting lube oil from all potential pressurized and unpressurized leakage sites in the reactor coolant pump lube oil systems. Leakage shall be collected and drained to a vented closed container that can hold the entire lube oil system inventory. A flame arrester is required in the vent if the flash point characteristics of the oil present the hazard of fire flashback. Leakage points to be protected shall include lift pump and piping, overflow lines, lube oil cooler, oil fill and drain lines and plugs, flanged connections on oil lines, and lube oil reservoirs where such features exist on the reactor coolant pumps. The drain line shall be large enough to accommodate the largest potential oil leak.

As described in the LRA, the applicant listed the mechanical components subject to an AMR for this system and their intended functions in LRA Table 3.3-40. On the basis of the methodology described above, the applicant identified that the highlighted components, shown on the flow diagrams listed in LRA Section 2.3.3.31, are included within the scope of license renewal. The intended functions of the RCP motor oil collection subsystem are to maintain the mechanical pressure boundary integrity so that sufficient flow and/or sufficient pressure are delivered, effect containment isolation for fission product retention, and prevent physical interaction with safety-related equipment.

On the basis of the methodology described above, the applicant included the components, highlighted on the flow diagrams listed in LRA Section 2.3.3.31, within the scope of license renewal.

2.3.3.31.2 Staff Evaluation

The Commission's regulations in 10 CFR 54.21(a)(1) state that for those SSCs that are within the scope of Part 54, as delineated in 10 CFR 54.4, the applicant must identify and list those SCs that are subject to an AMR. The staff reviewed Section 2.3.3.31 of the LRA, as supplemented by a letter to the NRC dated January 28, 2002, to determine whether there was reasonable assurance that the applicant has appropriately identified the SSCs that serve RCP

oil collection system intended functions that are within the scope of license renewal in accordance with 10 CFR 54.4, and are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The applicant is required to meet the requirements of Appendix R, Section III.O to 10 CFR Part 50. Therefore, SSCs relied on in safety analyses or plant evaluations to demonstrate compliance with 10 CFR 50.48 are included in scope of license renewal. LRA Section 2.3.3.31 states that each RCP for McGuire and Catawba is equipped with an oil collection system that meets the requirements of Appendix R, Section III.O.

The staff reviewed portions of the flow diagrams listed in LRA Section 2.3.3.31 for McGuire and Catawba to identify any additional RCP oil collection subsystem functions that met the scoping requirements of 10 CFR 54.4 but that were not identified as intended functions in the LRA. The staff also reviewed the SERs (NUREG- 0422 for McGuire and NUREG -0954 for Catawba) which summarize the FP programs.

The staff then compared the RCP oil collection subsystem components identified in the flow diagrams to verify that the required components were highlighted as being within the evaluation boundaries on the flow diagram, and were not excluded from the scope of license renewal. As part of the evaluation, the staff also sampled portions of the same flow diagrams for the RCP oil collection subsystem to determine if there were any additional portions of the system piping or components located outside of the evaluation boundary that should have been identified as within the scope of license renewal.

The staff was concerned that the applicant had excluded a portion of the RCP oil collection subsystem piping from within the scope of license renewal. By letter dated January 28, 2002, the staff asked, in RAI 2.3.3.31-1, the applicant to discuss why the portion of the RCP motor oil collection subsystem within the dashed lines on flow diagrams CN-1553-1.3 and MCFD-1553-04.00, is excluded from the scope of license renewal and to verify that this portion of the system is not required for compliance with Appendix R, Section III.O. In its response dated April 15, 2002, the applicant stated that the portion of the RCP motor oil collection subsystem within the dashed lines on flow diagrams CN-1553-1.3 and MCFD-1553-04.00 is not required for compliance with Appendix R, Section III.O. This excluded portion of the system is a portable skid that is connected to the system only when needed to refill the motor with oil. Because the portable skid is used for maintenance purposes and is not relied upon to mitigate a fire, the staff was satisfied with the applicant's response.

After determining which components were within the scope of license renewal, the staff reviewed the components the applicant identified as being subject to an AMR. The staff reviewed selected components that the applicant identified as within the scope of license renewal to verify that the applicant determined those SCs that performed their intended functions without moving parts or without a change in configuration or properties, and that are not subject to replacement based on qualified life or specified time period were subject to an AMR.

The staff also reviewed mechanical components from the flow diagrams identified in LRA Section 2.3.3.31, and compared them to the list of components and corresponding intended function(s) in Table 3.3-40 of the LRA. On the basis of this review, the staff did not identify any omissions in the SCs identified by the applicant as being subject to an AMR.

2.3.3.31.3 Conclusions

On the basis of the review described above, the staff finds that there is reasonable assurance that the applicant has adequately identified those portions of the RCP motor oil collection subsystem that are included within the scope of license renewal, and the associated SSCs that are subject to an AMR, in accordance with 10 CFR 54.4(a) and 54.21(a)(1), respectively.

2.3.3.32 Reactor Coolant System (Non-Class 1 Components)

In LRA Section 2.3.3.32, "Reactor Coolant System (Non-Class 1 Components)," the applicant described the non-Class 1 components of the reactor coolant system that are within the scope of license renewal and subject to an AMR.

2.3.3.32.1 Technical Information in the Application

The non-Class 1 portions of the reactor coolant system (excluding the reactor coolant pump motor oil collection subsystem) are relied upon to provide and maintain containment isolation and closure and maintain system pressure boundary integrity. The reactor vessel leak off line is included within this set of components and is relied upon only in the event the reactor vessel flange inner seal leaks.

The component types, component functions, materials of construction, environments, aging effects, and aging management programs/activities for the McGuire and Catawba reactor coolant system (non-Class 1 components) are listed in Table 3.3-41 of the LRA. The following component types are listed: orifices, pipe, tubing, and valve bodies.

2.3.3.32.2 Staff Evaluation

The staff reviewed this section of the LRA to determine whether there is reasonable assurance that the reactor coolant system (non-Class 1 components) and associated pressure boundary components and supporting structures within the scope of license renewal and subject to AMR have been identified in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1). 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 UFSARs for McGuire and Catawba for the reactor coolant system (non-Class 1 components) and associated pressure boundary components and compared the information in the UFSAR with the information in the LRA to identify those portions that the LRA did not identify as 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). For those structures and components that have a applicable intended functions, the staff sought to verify that they either perform these functions 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 UFSAR 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 extended period of operation.

This staff did not identify any omissions.

2.3.3.32.3 Conclusions

On the basis of its review of the information presented in Section 2.3.3.32 of the LRA, and the supporting information in the McGuire and Catawba UFSARs, the staff did not find any omissions by the applicant and, therefore, concludes that there is reasonable assurance that the applicant adequately identified those portions of the reactor coolant system (non-Class 1 components) and the associated supporting structures and components that fall within the scope of license renewal and are subject to an AMR, in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1).

2.3.3.33 Recirculated Cooling Water System

In LRA Section 2.3.3.33, "Recirculated Cooling Water," the applicant described the components of the Catawba recirculated cooling water system that are within the scope of license renewal and subject to an AMR. The LRA notes that no portion of the McGuire recirculated cooling water system is within the scope of license renewal. The staff reviewed the LRA for McGuire and Catawba to determine whether the applicant has adequately demonstrated that the requirements of 10 CFR Part 54 have been met.

2.3.3.33.1 Technical Information in the Application

The Catawba Nuclear Station recirculated cooling water system is a closed cooling system that delivers clean, rust-inhibiting cooling water of a regulated temperature to various components in the turbine buildings, auxiliary building, and service building.

The applicant described the process for identifying the SSCs within the scope of license renewal in LRA Section 2.1.1, "Scoping Methodology," and its process for identifying the SSCs subject to an AMR in LRA Section 2.1.2, "Screening Methodology." Using the methodology described in LRA Section 2.1.1, the applicant listed the systems and structures that are within the scope of license renewal in LRA Tables 2.2-1 and 2.2-2 for McGuire and Catawba, respectively. The Catawba recirculated cooling water system is listed on page 2.2-7 in Table 2.2-2 of the LRA.

The LRA notes that the only portions of the recirculated cooling water system subject to AMR are the Duke Class F portions of the recirculated cooling water system that are in scope at Catawba. McGuire has no Class F components in the recirculated cooling water system. Using the methodology described in Section 2.1.2 of the LRA, the applicant listed the Catawba mechanical components that are subject to an AMR in Table 3.3-42, "Aging Management Results - Recirculated Cooling Water System." This table also lists the intended function of each component and the materials of construction. The applicant identified the following components of the recirculated cooling water system that are subject to an AMR: pipe and valve bodies. The applicant identified maintaining pressure boundary integrity as the only intended function of the SCs subject to an AMR.

2.3.3.33.2 Staff Evaluation

The staff reviewed Section 2.3.3.33 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the recirculated cooling water system that are within the scope of license renewal in accordance with 10 CFR 54.4, and to verify that the applicant appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information presented in Section 2.3.3.33 of the LRA and the applicable piping and instrument drawing referenced therein to determine if the applicant adequately identified the portions of the recirculated cooling water system that are within the scope of license renewal. The Catawba recirculated cooling water system is a non-safety system whose postulated failure could prevent satisfactory accomplishment of certain safety-related functions. To preclude these postulated failures, portions of this system are seismically designed (i.e., Duke Class F). The applicant included all components within the seismically designed piping boundaries of this system within the scope of license renewal per 10 CFR 54.4(a)(2). The staff verified that those portions of the recirculated cooling water system that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were so identified by the applicant in Section 2.3.3.33 of the LRA. To verify that the applicant did include the applicable portions of the recirculated cooling water system as within the scope of license renewal, the staff focused its review on those portions of the recirculated cooling water system that were not identified as within the scope of license renewal to verify that they did not meet the scoping criteria of 10 CFR 54.4. The staff did not identify any omissions in the applicant's scoping review.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR in those portions of the recirculated cooling water system that are identified as within the scope of license renewal. The applicant listed the SCs subject to AMR for the recirculated cooling water system in Table 3.3-42 of the LRA using the screening methodology described in Section 2.1 of the LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER.

The applicant identified the portions of the recirculated cooling water system that are within the scope of license renewal by a highlighted Catawba drawing referenced in LRA Section 2.3.3.33. In addition, the applicant lists the pipe and valve body mechanical component commodity groups that are subject to AMR and their intended functions in Table 3.3-42 of the LRA.

The piping and instrumentation drawing was highlighted by the applicant to identify those portions of the recirculated cooling water system meet at least one of the scoping criteria of 10 CFR 54.4. The staff performed its review by sampling the SCs that the applicant determines as to be within the scope of license renewal but not subject to AMR to verify that no structure or component that performs its intended functions without moving parts or without a change in configuration or properties and that is not subject to replacement on the basis of qualified life or specified time period was excluded from an AMR. The staff did not identify any omissions.

2.3.3.33.3 Conclusions

On the basis of its review of the information contained in Section 2.3.3.33 of the LRA and the supporting information in the LRA drawing, the staff did not identify any omissions in the scoping of the recirculated cooling water system by the applicant. The staff concludes that there is reasonable assurance that the applicant has identified those portions of the Catawba recirculated cooling water system that are within the scope of license renewal, and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.34 Spent Fuel Cooling System

In Section 2.3.3.34 "Spent Fuel Cooling System," of the LRA, the applicant described the components of the spent fuel cooling system that are within the scope of license renewal and subject to an AMR. Section 9.1.3 of the Catawba and McGuire UFSARs provides additional information concerning their respective spent fuel cooling systems.

2.3.3.34.1 Technical Information in the Application

For the purposes of license renewal, the Catawba and McGuire spent fuel cooling systems are essentially the same and perform the same functions. The Catawba spent fuel cooling system, in conjunction with the component cooling water system and nuclear service water system, is designed to remove heat from the spent fuel pool and maintain purity and optical clarity of the pool water during fuel handling operations. The purification loop provides an alternate means for removing impurities from the refueling cavity/transfer canal water during refueling and from the refueling water storage tank water following refueling.

The McGuire spent fuel cooling system removes heat from the spent fuel pool and maintains the purity and optical clarity of the pool water for fuel handling operations. The purification loop provides an alternate means for removing impurities from the refueling canal/transfer canal water during refueling and from the refueling water storage tank water following refueling. The fuel pool water also serves as a source of makeup water to the reactor coolant system during an event that is mitigated by the standby shutdown system.

Using the methodology described in Section 2.1.2, "Screening Methodology," of the LRA, the applicant compiled a list of mechanical component commodity groupings within the license renewal boundaries that are subject to an AMR and identified their intended functions. The mechanical components subject to an AMR, their intended functions, and their materials of construction for the spent fuel cooling system are listed in Table 3.3-43. In LRA Table 3.3-43, the applicant lists the following 10 component commodity groups as subject to an AMR: heat exchangers (channel head), heat exchangers (shell), heat exchangers (tube sheet), heat exchangers (tubes), orifices, pipe, pump casings, spacers, tubing, and valve bodies. Table 3.3-43 also lists eductors as a component commodity group that is subject to an AMR for the McGuire spent fuel cooling system. The applicant states that maintaining pressure boundary integrity is the intended function of the SCs subject to an AMR. The orifices also perform a throttling function. The heat exchangers (tubes) also provide a heat transfer function (to maintain system and/or component operating temperature).

2.3.3.34.2 Staff Evaluation

The staff reviewed Section 2.3.3.34 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the spent fuel cooling system SCs that are within the scope of license renewal in accordance with 10 CFR 54.4 and subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the text and diagrams submitted by the applicant in Section 2.3.3.34 of the LRA and the Catawba and McGuire UFSARs to determine if the applicant adequately identified the SSCs of the spent fuel cooling system that are in the scope of license renewal. The staff verified that those portions of the spent fuel cooling system that meet the scoping requirements of 10 CFR 54.4 are included within the scope of license renewal and are identified by the applicant in Section 2.3.3.34 of the LRA. The staff then focused its review on those portions of the spent fuel cooling system that were not identified as within the scope of license renewal to verify that they do not meet the scoping requirements of 10 CFR 54.4. The staff also reviewed the UFSAR to determine if there were any additional system functions were not identified in the LRA, and verified that no additional functions met the scoping requirements of 10 CFR 54.4. The staff found no omissions by the applicant; therefore, there is reasonable assurance that the applicant adequately identified all portions of the spent fuel cooling system that should be included within the scope of license renewal in accordance with 10 CFR 54.4.

The staff then determined whether the applicant had properly identified the SCs that are subject to an AMR from among those portions of the spent fuel cooling system that are identified as within the scope of license renewal. The applicant identifies and lists the SCs subject to AMR for the spent fuel cooling systems in Table 3.3-43 of the LRA using the screening methodology described in Section 2.1 of the LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER. The staff performed its review by sampling the SCs that the applicant determines to be within the scope of license renewal but not subject to AMR to verify that these SCs performed their intended functions with moving parts or with a change in configuration or properties and were subject to replacement based on qualified life or specified time period.

The applicant identified the portions of the spent fuel cooling system that are within the scope of license renewal in the drawings referenced in the LRA. The detailed flow diagrams were highlighted to identify those portions of the system that are within the scope of license renewal. The applicant highlighted those components which it believes perform at least one of the scoping requirements of 10 CFR 54.4. The staff compared the LRA flow diagrams to the system drawings and the descriptions in the UFSARs to ensure the diagrams were representative of the spent fuel cooling system. The staff sampled components in the flow diagram that were not highlighted to verify that these components did not meet any of the scoping criteria in 10 CFR 54.4. The staff did not identify any omissions.

2.3.3.34.3 Conclusions

On the basis of its review of the information in Section 2.3.3.34 of the LRA and the supporting information in the Catawba and McGuire UFSARs, as described above, no omissions by the applicant were identified. The staff concludes that there is reasonable assurance that the applicant adequately identified those portions of the spent fuel cooling system that are within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.35 Standby Shutdown Diesel

In LRA Section 2.3.3.35, "Standby Shutdown Diesel," the applicant described the components of the standby shutdown diesel that are within the scope of the license renewal and subject to an AMR. The staff reviewed the LRA to determine whether the applicant has adequately demonstrated that the requirements of 10 CFR Part 54 have been met.

2.3.3.35.1 Technical Information in the Application

The standby shutdown diesel provides an alternate and independent means of achieving and maintaining a hot standby condition for one or both units following a postulated fire event. The standby shutdown diesel provides power to the standby shutdown facility required components, instrumentation, and controls for a period of up to 72 hours.

The applicant described the process for identifying the SSCs within the scope of license renewal in Section 2.1.1 of the LRA. Using that scoping methodology, the applicant determined that the standby shutdown diesel was within the scope of license renewal and listed it on page 2.2-3 in Table 2.2-1 for McGuire and on page 2.2-8 in Table 2.2-2 for Catawba. The LRA included system drawings that were highlighted to indicate the license renewal evaluation boundary.

The applicant described the process for identifying the SCs subject to an AMR in Section 2.1.2 of the LRA. Using that screening methodology, the applicant listed the mechanical components of the standby shutdown diesel subsystems that are subject to an AMR in Table 3.3-44 for both McGuire and Catawba. In Table 3.3-44, the applicant grouped the components for the standby shutdown diesel in four subsystems: the cooling water and jacket water heating subsystem, the exhaust subsystem, the fuel oil subsystem, and the lubrication oil subsystem. For the cooling water and jacket water heating subsystem, the applicant identified the following components as subject to an AMR: (1) filter, cooling water mounting head, (2) heat exchanger, engine radiator tubes, channel head, leak off connector, and cap flange, (3) tubing, (4) valves bodies, jacket water heater, and (5) water heater, jacket shell. For the exhaust subsystem, the applicant identified the following components as subject to an AMR: (1) bellows, (2) pipes, and (3) silencer. For the fuel oil subsystem, the applicant identified the following components as subject to an AMR: (1) filter, duplex (mounting head), (2) flame arrestor, (3) level glasses, (4) pipes for fuel oil, day tank vents, day tank drain, storage tank vents, and storage tank suctions, (5) pump casings, fuel oil transfer and engine fuel oil, (6) tanks, fuel oil storage, fuel oil storage manway, and fuel oil day, (7) tubing, fuel oil day tank, and fuel oil storage manway, and (8) valve bodies. For the lubrication oil subsystem, the applicant identified the filters for lube oil bypass and the lube oil mounting head as subject to an AMR. The applicant stated that the intended functions of the components are to maintain mechanical pressure boundary integrity to ensure that sufficient flow and pressure are delivered; to effect containment isolation for fission product retention; and to prevent physical interaction with safety-related equipment.

2.3.3.35.2 Staff Evaluation

The staff reviewed Section 2.3.3.35 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the standby shutdown diesel that are within the scope of license renewal in accordance with 10 CFR 54.4 and that the applicant appropriately identified the mechanical components that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the text and applicable drawings submitted by the applicant in Section 2.3.3.35 of the LRA to verify that the applicant adequately identified the portions of the standby shutdown diesel that meet the scoping requirements of 10 CFR 54.4 and that these portions were included within the scope of license renewal in Section 2.3.3.35 of the LRA. The staff focused its review on those portions of the standby shutdown diesel that were not identified as within the scope of license renewal to verify that they did not meet the scoping requirements of 10 CFR 54.4.

The staff reviewed Table 3.3-44 of the LRA, which lists the mechanical components subject to an AMR for the standby shutdown diesel for McGuire and Catawba. The staff verified that the applicant properly identified the mechanical components that were subject to an AMR from among those portions of the standby shutdown diesel that were identified as within the scope of license renewal. The staff sampled the components that the applicant determined to be within the scope of license renewal but not subject to AMR to verify that no component that performs its intended functions without moving parts or without a change in configuration or properties and that is not subject to replacement based on qualified life or specified time period was excluded from Table 3.3-44.

During its review of Section 2.3.3.35, the determined that additional information was needed to complete its review. The standby shutdown diesel radiator is listed in Table 3.3.44 as a component subject to an AMR, which implies that the radiator is within the scope of license renewal. McGuire drawing MC-1614-4 shows that the standby shutdown diesel engine radiator is air-cooled by an engine-driven fan. The standby shutdown diesel and its supporting subsystems are relied on to perform a function that demonstrates compliance with the Commission's regulation for station blackout. Therefore, they meet the scoping requirement of 10 CFR 54.4(a)(3). As a subsystem of the standby shutdown diesel, the fan identified on MC-1614-4 should be within the scope of the license renewal and listed in Table 2.3.3-44 as subject to an AMR. By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.35-1, that the applicant provide the basis for not listing the engine-driven fan in Table 3.3.44. The staff also requested that the applicant confirm the existence of an air cooling system for the standby shutdown diesel engine radiator at Catawba and address its inclusion in the scope of license renewal. It should be noted here that, in RAI 2.3.3.35-1, the staff mistakenly referred to Table 3.3.34 instead of referring to Table 3.3.44, in its response dated April 15, 2002, the applicant stated that the engine-driven fan was not excluded from the scope of license renewal and that it was within the license renewal boundary highlighted on MC-1614-4. The applicant also stated that the air cooling system for the standby shutdown diesel radiator at McGuire was subject to an AMR and was listed in Table 3.3-46, "Turbine Building Ventilation System," rather than in Table 3.3.44, because the turbine building ventilation system performs the HVAC for the standby shutdown facility. In response to the staff's question regarding the existence of a cooling system for the standby shutdown diesel radiator at Catawba, the applicant responded that the McGuire and Catawba shutdown diesels are of the same design. The applicant indicated that the AMR results for the Catawba standby shutdown diesel radiator were listed in Table 3.3-33 of the LRA, "Miscellaneous Structures Ventilation System," rather than in Table 3.3.44, because the miscellaneous structures ventilation system performs the HVAC function for the standby shutdown facility. The applicant also stated that the only long-lived passive component associated with the standby shutdown diesel engine radiator is the plenum (the AMR results of which the staff verified are provided in Tables 3.3.33 and 3.3.46). Other components, such as the fans, are within the scope of license renewal, but are not subject to an AMR. Cooling fans, without sub-component exceptions, are explicitly excluded from an AMR by

10 CFR 54.21(a)(1)(i). The staff finds the applicant's response acceptable because the air cooling systems for the McGuire and Catawba standby shutdown diesel radiator were identified by the applicant as within the scope of license renewal.

Table 3.3-44 lists the standby shutdown diesel components subject to an AMR. The list includes the pump casing for the fuel oil transfer pump. McGuire drawing MCFD-1560-01.00 and Catawba drawing CN-1560-1.0 do not show a pump by that name. By letter dated January 28, 2002, the staff asked, in RAI 2.3.3.35-2, the applicant if the fuel oil transfer pump in Table 3.3.44 is the same component as the fuel oil day tank pump on drawings MCFD-1560-01.00 and CN-1560-1.0. In its response dated April 15, 2002, the applicant confirmed that the fuel oil transfer pump listed in Table 3.3.44 refers to the component listed as standby shutdown fuel oil day tank pump at coordinates F2 on drawings MCFD-1560-01.00 and CN-1560-1.0. The applicant's clarification of this information assisted the staff in completing its review.

On drawings MCFD-1560-01.00, MCFD-1560-02-00, CN-1560-1.0, and CN-1560-2.0, the flexible hose connections on the fuel oil subsystem on either side of the engine are shown to be within the scope of license renewal. Although these components appear to have a pressure boundary intended function, they are not listed in Table 3.3-44 as subject to an AMR. By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.35-3, that the applicant provide the basis for excluding these flexible hose connections from the lists of components subject to an AMR. In its response dated April 15, 2002, the applicant stated that these flexible hose connections are replaced during periodic maintenance on the diesel engine and, in accordance with 10 CFR 54.21(a)(1)(ii), are not subject to an AMR. The applicant specified that drawings MCFD-1560-02-00 and CN-1560-2.0 show no fuel oil component. Because the applicant did not provide information about the replacement of these flexible connectors (whether they are replaced on condition based on specific performance parameters or based on a qualified life), the staff is unable to evaluate the acceptability of this response. Pending the staff's receipt of this information, this issue is characterized as open item 2.3.3.35.2-1.

Drawings MCFD-1560-01.00, MCFD-1560-02-00, CN-1560-1.0, and CN-1560-2.0 depict the portions of the standby shutdown diesel subsystems that are within the scope of license renewal. It is not apparent from these drawings how the standby shutdown diesel lube oil subsystem accomplishes its function of lubricating the diesel engine, and the UFSARs for McGuire and Catawba do not provide any written description of these subsystems. As a result, the staff was not able to determine, during its review of the LRA, if all the passive and long-lived subsystems components that are within the scope of license renewal, were included in Table 3.3.44 to indicate that they were subject to an AMR. By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.35-4, that the applicant provide a system description and an explanation of how this subsystem performs its intended function. In its response dated April 15, 2002, the applicant stated that the standby shutdown diesel engine is a small, 16-cylinder diesel engine and that the entire lubrication system is contained inside the diesel engine. The only external components are the lube oil filters and they are listed in Table 3.3.44. The components internal to the engine, such as the pump and the lube oil cooler, are considered part of the diesel engine and are excluded from an AMR by 10 CFR 54.21(a)(1)(i). The applicant further specified that only the components associated with the filter (mounting head and bypass) are listed in Table 3.3.44. The filter itself is replaced during periodic maintenance and is not subject to an AMR. The staff finds the applicant's response acceptable because, even though portions of the pump and of the lube oil cooler may be passive, the pump and the lube oil cooler are parts of the standby shutdown diesel generator and, therefore, are not subject to an AMR in accordance

with 10 CFR 54.21(a)(1)(i). The staff's evaluation of the applicant's treatment of filters is documented in Section 2.1.3.2.1 of this SER.

Table 3.3.44 lists the McGuire and Catawba components that are subject to an AMR for the cooling water and jacket water heating subsystem for the standby shutdown diesel. The table does not list piping or pump casings. By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.35-5, that the applicant provide the basis for excluding the piping and pump casings from Table 3.3.44 as subject to an AMR. In its response dated April 15, 2002, the applicant stated that the component called "tubing" listed in Table 3.3.44 for the cooling water and jacket water heating subsystem reflects the terminology used by the vendor for piping. The applicant added that a visual inspection of the diesel confirmed that this tubing, as it is referred to in the vendor manuals, is actually carbon steel pipe. As a result, the applicant supplemented Table 3.3.44 to read as follows:

Component Type	Component Function	Material	Internal Environment / External Environment	Aging Effects	Aging Management Programs and Activity
Pipe	PB	CS	Treated Water	Cracking (Note 3)	Chemistry Control Program
				Loss of Material	Chemistry Control Program
			Sheltered	Loss of Material	Inspection Program for Civil Engineering Structures and Components

In its response to RAI 2.3.3.35-5, the applicant stated that the pump casing for the diesel generator cooling water and jacket water heating subsystem had been inadvertently omitted from Table 3.3-44 of the LRA and provided the following supplemental information.

Component Type	Component Function	Material	Internal Environment / External Environment	Aging Effects	Aging Management Programs and Activity
Pump Casing (cooling water)	PB	CS	Treated Water	Cracking (Note 3)	Chemistry Control Program
				Loss of Material	Chemistry Control Program
			Sheltered	Loss of Material	Inspection Program for Civil Engineering Structures and Components

Since the applicant provided the AMR results for the pump casing and clarified that tubing was specified for the piping in question, the staff finds its response acceptable. The supplemental information for Table 3.3-44 to reflect the vendor's characterization of the tubing as piping is a further clarification that is helpful because it accurately reflects the vendor's documentation. The staff's evaluation of the AMR results for the carbon steel pipe and pump casings is documented in Section 3.3.35.2 of this SER.

2.3.3.35.3 Conclusion

The staff reviewed the information contained in Section 2.3.3.35 of the LRA, the applicable LRA drawings, and the April 15, 2002, response to RAIs. With the exception of open item 2.3.3.35.2-1, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the standby shutdown diesel that are within the scope of license renewal and subject to an AMR, in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.36 Turbine Building Sump Pump System

In LRA Section 2.3.3.36, "Turbine Building Sump Pump System," the applicant described the components of the Catawba turbine building sump pump system that are within the scope of license renewal and subject to an AMR. McGuire has no Class F components in the turbine building sump pump system; therefore, no portion of the McGuire turbine building sump pump system is within the scope of license renewal. As a result, the following staff evaluation only applies to Catawba. The Catawba turbine building sump pump system is not described in the UFSAR.

2.3.3.36.1 Technical Information in the Application

The turbine building sump pump system serves as a collection point for the contents of liquid radwaste system sumps when the sumps contain less than predetermined levels of radiation, as sensed by radiation monitors in the discharge lines. The turbine building sump pump system is a non-safety system whose postulated failure could prevent satisfactory accomplishment of certain safety-related functions. To preclude these postulated failures, portions of this system are seismically designed (i.e., Duke Class F). All components within the seismically designed piping boundaries of this systems are within the scope of license renewal per §54.4(a)(2). Using the methodology described in Section 2.1.2, "Screening Methodology," of the LRA, the applicant compiled a list of mechanical component commodity groupings within the license renewal boundaries that are subject to an AMR and identified their intended functions. The mechanical components subject to an AMR and their intended functions and materials of construction for the Catawba turbine building sump pump system are listed in Table 3.3-45. In the LRA, Table 3.3-45, the applicant lists the following component commodity group as subject to an AMR: pipe. The applicant states that maintaining pressure boundary integrity is the intended function of the SCs subject to an AMR.

2.3.3.36.2 Staff Evaluation

The staff reviewed Section 2.3.3.36 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the turbine building sump pump system SCs that are within the scope of license renewal in accordance with 10 CFR 54.4 and subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the text and diagrams submitted by the applicant in Section 2.3.3.36 of the LRA to determine if the applicant adequately identified the SSCs of the turbine building sump pump system that are in the scope of license renewal. The staff verified that those portions of the turbine building sump pump system that meet the scoping requirements of 10 CFR 54.4 are included within the scope of license renewal, and are identified as such by the applicant in

Section 2.3.3.36 of the LRA. The staff then focused its review on those portions of the turbine building sump pump system that were not identified as within the scope of license renewal to verify that they do not meet the scoping requirements of 10 CFR 54.4. The staff found no omissions by the applicant, therefore, there is reasonable assurance that the applicant adequately identified all portions of the turbine building sump pump system that should be included within the scope of license renewal in accordance with 10 CFR Part 54.4.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the turbine building sump pump system that are identified as within the scope of license renewal. The applicant identifies and lists the SCs subject to AMR for the turbine building sump pump systems in Table 3.3-45 of the LRA using the screening methodology described in Section 2.1 of the LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER. The staff performed its review by sampling the SCs that the applicant determines as within the scope of license renewal but not subject to AMR to verify that these SCs performed their intended functions with moving parts or with a change in configuration or properties or were subject to replacement based on qualified life or specified time period.

The applicant identified the portions of the turbine building sump pump system that are within the scope of license renewal in the drawings referenced in the LRA. The detailed flow diagrams were highlighted to identify those portions of the system that are within the scope of license renewal. The applicant highlighted those components which they believe perform at least one of the scoping requirements of 10 CFR 54.4. The staff sampled portions of the flow diagram that were not highlighted to verify that these components did not meet any the scoping criteria in 10 CFR 54.4.

2.3.3.36.3 Conclusions

On the basis of its review of the information contained in Section 2.3.3.36 of the LRA, as described above, no omissions by the applicant were identified. The staff concludes that there is reasonable assurance that the applicant adequately identified those portions of the turbine building sump pump system that are within the scope of license renewal, and subject to an AMR in accordance with 10 CFR 54.4(a), and 10 CFR 54.21(a)(1), respectively.

2.3.3.37 Turbine Building Ventilation (VO) System - McGuire Only

The McGuire VO system includes the standby shutdown facility (SSF) heating, ventilation, and air-conditioning subsystems. The standby shutdown facility heating, ventilation, and air-conditioning portion of the VO system provide the environmental control requirements for the standby shutdown facility.

The applicant evaluated component supports for the VO system ductwork within Table 3.5-3 of the LRA. The applicant evaluated electrical components that support the operation of the system in Section 2.1.2.3 of the LRA. The staff's scoping evaluation of structures and component supports is provided in Section 2.4 of this SER. The staff's evaluation of electrical components and instrumentation and controls in the VO system is documented in Section 2.5 of this SER.

2.3.3.37.1 Technical Information in the Application

The SSF heating ventilation, and air-conditioning subsystems are part of the McGuire VO system. The SSF control room is air-conditioned while the standby shutdown facility electrical equipment room and SSF diesel room are provided with ventilation, fans, and electric heaters.

In Section 2.3.3.37 of the LRA the applicant identified the following McGuire VO system intended function based on 10 CFR 54.4(a)(1) and 10 CFR 54.4(a)(2):

Section 2.3.3.37 of the LRA:

- To provide the environmental conditioning requirements for the standby shutdown facility

Section 9.4.4 of the McGuire UFSAR-

- To provide a suitable environment for the operation of equipment and personnel access as required for inspection, testing and maintenance.
- To maintain the ambient temperature limit within the turbine building.
- To provide air-conditioning for the SSF control room and battery rooms.
- To provide ventilation and heat for the SSF electrical equipment room and SSF diesel rooms.

On the basis of the intended functions identified above for the McGuire SSF heating ventilation and air-conditioning subsystems, the portions of this system that were identified by the applicant as within the scope of license renewal included components highlighted on the referenced flow diagram in Section 2.3.3.37 of the LRA. The applicant described their methodology for identifying the mechanical components subject to an AMR in Section 2.1 of the LRA. On the basis of this methodology, the applicant identified the portions of the SSF heating ventilation and air-conditioning subsystems that are within the scope of license renewal. Using the methodology described in Section 2.2.1 of the LRA, the applicant compiled a list of the mechanical components and component types subject to an AMR that are within the evaluation boundaries highlighted on the flow diagrams and identified their intended functions. The applicant provided this list in Table 3.3-46 of the LRA.

The following component types are identified as within the scope of license renewal and subject to an AMR within Table 3.3-46 of the LRA: Air handling unit, ductwork, flexible connectors, and plenum section. The applicant indicated in Table 3.3-46 of the LRA for the McGuire SSF heating, ventilation, and air-conditioning portion of the VO system that the pressure boundary function is the only applicable intended function.

2.3.3.37.2 Staff Evaluation

To verify that the applicant identified the components of the VO system that are within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1), the staff reviewed the flow diagram listed in Section 2.3.3.37 showing the evaluation boundaries for the highlighted portion of the VO system that are within the scope of license renewal. The staff also reviewed Table 3.3-46 of the LRA, which lists the mechanical components and the applicable intended functions that are subject to an AMR. The staff also reviewed Section 9.4.4 of the McGuire UFSAR to determine if there were any portions of the VO system that met the scoping criteria in 10 CFR 54.4(a) that were not identified as within the scope of license renewal. The staff also reviewed the McGuire and Catawba UFSARs to

determine if any safety-related system functions were not identified as intended functions in the LRA, and to determine if any structures or components that have intended functions were omitted from the scope of structures or components that require an AMR. The staff compared the functions described in the UFSARs to those identified in the LRA.

The applicant identified the structures and components subject to an AMR for the VO system using the screening methodology described in Section 2.1 of the LRA and listed them in Table 3.3-46 of the LRA. The staff sampled the structures and components from Table 3.3-46 of the LRA to verify that the applicant did identify the structures and components subject to an AMR. The staff also sampled the structures and components that were within the scope of license renewal but not subject to an AMR to verify that the structures and components perform their intended functions without moving parts or without a change in configuration or properties and are not subject to replacement on the basis of a qualified life or specified time period.

To ensure that those portions of the VO system excluded from scope do not perform any intended functions, the staff requested additional information based on a review of the McGuire UFSAR and LRA descriptions. The staff noted that Section 2.3.3.37 of the LRA provides a summary description of the system functions and a listed flow diagram. The flow diagram highlights the evaluation boundaries, and Table 3.3-46 of the LRA tabulates the components within the scope and subject to an AMR for the VO system. The corresponding drawings and UFSAR, however, show additional components that were not listed in Table 3.3-46 of the LRA.

The staff noted that the applicant did not identify housings for active components that require an AMR. The determination should consider whether failure of the housing would result in a failure of the associated active component to perform its intended function and whether the housing meets the long-lived and passive criteria as defined in the rule.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-1, specific information concerning the exclusion of fan housings from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant stated that cooling fans are not included in the AMR results tables in the LRA. The applicant also stated that cooling fans, without sub-component exceptions, are explicitly excluded from an AMR by 10 CFR 54.21. The staff reviewed this response and determined that the applicant's basis for excluding fan housings is not consistent with the license renewal rule because the housings are relied upon to maintain pressure boundary integrity (as are valve bodies and pump casings) and are within scope. Furthermore, because the fan housings are passive long-lived components, they are subject to an AMR. The staff finds this response unacceptable and characterizes this issue as open item 2.3-1.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-2, specific information concerning the exclusion of damper housings from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant stated that dampers are not included in the AMR result tables in the LRA. The applicant goes on to state that ventilation dampers, without sub-component exceptions, are explicitly excluded from an AMR by 10 CFR 54.21. The staff reviewed this response and has determined that the applicant's basis for excluding damper housings is not consistent with the license renewal rule because the housings are relied upon to maintain pressure boundary integrity (as are valve bodies and pump casings) and are within scope. Furthermore, because the damper housings are passive long-lived components, they

are subject to an AMR. The staff finds this response unacceptable and characterizes this issue as open item 2.3-2.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-7(6), specific information concerning the exclusion of McGuire duct heater housings from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant stated that duct heater housings should have been highlighted on flow diagrams to indicated they are within the scope of license renewal. The applicant further states the duct heaters consist of electric heating elements that are mounted inside the ductwork and do not have a pressure boundary function or any other component intended function for license renewal and are not subject to an AMR. Because the duct hearer housings do not perform any intended function as describe in 10 CFR 54.5, the staff finds the applicant's responses acceptable.

By letter dated January 23, 2002, the staff requested, in RAI 2.3-7(7), specific information concerning the exclusion of pre-filter housings from the scope of license renewal and/or an AMR. In its response dated April 15, 2002, the applicant stated that the pre-filter housings are removable components within the air handling units. The applicant further explained that the filters are removable components within the air handling units (AHUs), and that the AHUs are listed in Table 3.3-46 of the LRA. The staff verified that the AHUs are listed in Table 3.3-46. Since the housings (AHUs) for these filters (which are removable) are in scope, and since the applicant performed an AMR on the AHU, the staff finds the applicant's response acceptable.

Some components that are common to many systems, including the VO system, have been evaluated separately by the applicant in Section 2.1.2.1.2 of the LRA as "replace on condition" commodities. The staff's evaluation of applicant's treatment of these consumables is documented in Section 2.1.3.2.1 of this SER.

SER Section 2.4.3 documents the staff's evaluation of component supports for piping, cables, and equipment, that support the design and operation of the VO system. SER Section 2.5, "Scoping and Screening Results: Electrical and Instrumentation and Controls," documents the staff's evaluation of electrical and instrument components that support the VO system.

The staff reviewed the LRA, supporting information in the UFSARs, and the applicant's responses to RAIs. In addition, the staff sampled several components from the VO system flow diagram, as identified in Section 2.3.3.37 of the LRA to determine whether the applicant properly identified the components within scope and subject to an AMR. No omissions were identified, except as identified in the RAIs.

2.3.3.37.3 Conclusions

On the basis of its review, with the exception of open items identified in this SER section, the Staff has reasonable assurance that the applicant has adequately identified the VO system structures and components that are within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4 and 10 CFR 54.21, respectively.

2.3.3.38 Waste Gas System

In LRA Section 2.3.3.38, “Waste Gas System,” the applicant described the components of the waste gas system that are within the scope of license renewal and subject to an AMR. The system is described in Section 11.3 of the McGuire and Catawba UFSARs.

2.3.3.38.1 Technical Information in the Application

The waste gas system removes fission product gases from radioactive fluids and contains these gases for a time sufficient to allow ample decay of the nuclides prior to release in accordance with applicable NRC regulations. The system is designed to control and minimize releases of radioactive effluent to the environment by reducing the fission product gas concentration in the reactor coolant which may escape during maintenance operations or from equipment leaks.

The applicant described the process for identifying the mechanical components that are within the scope of license renewal in LRA Section 2.1.1, “Scoping Methodology.” As described in the scoping methodology, the applicant identified the portions of the waste gas system that are within the scope of license renewal on the piping and instrumentation diagrams (P&IDs) that are listed in LRA Section 2.3.3.38. Consistent with the method described in LRA Section 2.1.2, “Screening Methodology,” the applicant listed the waste gas system mechanical components that are subject to an AMR in LRA Table 3.3-47. This table also lists the component functions. Specifically, the applicant identified the following components as subject to an AMR: valve bodies, piping, flow meters, hydrogen recombiners, hydrogen recombiner heat exchangers , hydrogen recombiner heaters, hydrogen recombiner phase separators, hydrogen recombiner safety disc, orifices, strainers (for Catawba only), tubing, waste gas compressor heat exchangers (for Catawba only), and waste gas decay tanks. All these components have the intended component function of PB, which is defined by the applicant as maintaining pressure boundary, affecting containment isolation, or preventing interaction with safety-related equipment. In addition to the PB function, hydrogen recombiner heat exchangers have TH (heat transfer) function. Hydrogen recombiner phase separators have WR (water removal) function in maintaining moisture levels.

2.3.3.38.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.38 to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the waste gas system that are within the scope of license renewal in accordance with 10 CFR 54.4(a) and that the applicant appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in LRA Section 2.3.3.38, the applicable P&IDs referenced therein, and the McGuire and Catawba UFSARs to determine if the applicant adequately identified the portions of the waste gas system that are within the scope of license renewal. The staff verified that those portions of the waste gas system that meet the scoping requirements of 10 CFR 54.4(a) were included within the scope of license renewal and were identified as such by the applicant in Section 2.3.3.38 of the LRA.

In LRA Section 2.3.3.38, the applicant listed applicable P&IDs for the waste gas system. The detailed diagrams are highlighted to identify those portions of the system that are within the scope of license renewal. The staff compared the LRA diagrams to the system drawings and descriptions in the UFSARs to ensure that they were representative of the waste gas system.

To verify that the applicant included the applicable portions of the waste gas system within the scope of license renewal, the staff focused its review on those portions of the waste gas system that were not identified as within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4(a). In addition, the staff reviewed the UFSARs for each facility to identify any additional system functions that were not identified in the LRA, and verified that the additional functions did not meet the scoping requirements of 10 CFR 54.4(a).

During a September 12, 2001, conference call (summarized by memorandum dated October 10, 2001), the staff asked the applicant to clarify whether the hydrogen recombining function for the combustible gas control is one of the intended system functions for the waste gas system. The hydrogen recombiner is listed in LRA Table 3.3-47 for an AMR, but the recombining function is not discussed in the system description of LRA Section 2.3.3.38 for waste gas system. The applicant responded that the system description in the LRA discussed the general function of the waste gas system, and not all of the intended system functions that met license renewal scoping criteria. The applicant indicated that the safety-related hydrogen recombiners are part of the Containment Air Return Exchange and Hydrogen Skimmer (VX) System at Catawba and McGuire and that they can be located on piping and instrumentation drawings associated with the VX systems. The applicant further indicated that the WG hydrogen recombiners are within the scope of license renewal because they provide a pressure boundary function to retain radioactive gases. The applicant indicated that the safety-related hydrogen recombiners in the VX system are within the scope of license renewal but the electrical portions are not subject to an AMR because they are heaters, which are classified as active components. The electrical components are located in enclosures that are considered component supports. The enclosures are seismically qualified and are included in LRA Table 3.5-3, page 3.5-19, Electrical & Instrument Panels & Enclosures. No aging effects or AMPs were identified for the VX hydrogen recombiner enclosures. The staff finds this clarification reasonable and provides its evaluation of the applicant's scoping and screening review for the VX system in Section 2.3.2.3.2 of this SER.

By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.38-2, the applicant to identify the intended system functions of the waste gas system that the applicant used for the scoping determination. In its response dated April 15, 2001, the applicant stated that the system intended functions were not used to determine whether the waste gas system is within the scope of license renewal. Instead, the applicant determined the portions of the waste gas system within the scope of license renewal according to the following scoping criteria: (1) portions of the systems that are safety-related (Duke Class A, B, or C), (2) portions of the systems that are designated as non-safety-related Class F piping, (3) portions of the systems that are required to remain functional for fire protection. The staff finds the applicant's scoping criteria acceptable for the same reason provided in the staff's .evaluation of radioactive waste management systems, which is documented in SER Section 2.3.3.24.2 pertaining to the liquid waste system.

LRA Table 3.3-47 identifies all the components subject to an AMR, but the following components are identified as for Catawba only: Orifices for compressor seal and compressor make-up, waste gas compressor heat exchangers, valve bodies and strainers. Both Catawba and McGuire have the waste gas compressor. The staff reviewed Catawba drawing CN-1567-1.0 and found that the waste gas compressor and associated components (such as orifices, heat exchangers, piping, valves, and strainers) are designed to either Duke Class C or Class F components; therefore, those Catawba components are within the scope of license renewal.

On the other hand, McGuire Drawing No. MCFD-1567-01.00 indicates that the waste gas compressor and associated components are designated as Duke Class E; therefore, those McGuire components are out of the scope according to LRA Section 2.1. The staff's evaluation of different Duke Classes is in SER Section 2.1. The staff noted that the differences in scoping the above components resulted from the differences in the current design basis, and both are acceptable according to 10 CFR 54.4(a).

On the basis of the above review, the staff did not identify any omissions by the applicant in the scoping of mechanical components according to 10 CFR 54.4(a).

The staff then determined whether the applicant had properly identified the SCs that are subject to an AMR from among those portions of the waste gas system that were identified as within the scope of license renewal. The applicant used the screening methodology described in LRA Section 2.1.2 to identify the SCs subject to an AMR. The staff evaluation of the scoping and screening methodology is documented in Section 2.1 of this SER. In the LRA, the applicant identified the portions of the waste gas system that are within the scope of license renewal in the P&IDs and listed the mechanical components that are subject to an AMR and their intended component functions in LRA Table 3.3-47. The staff performed its review by sampling the SCs that the applicant determined to be within the scope of license renewal but not subject to AMR to verify that no structure or component, that performs its intended function without moving parts or without a change in configuration or properties and that is not subject to replacement based on qualified life or specified time period was excluded from an AMR.

During the staff's review of Table 3.3.47, the staff noted that the waste gas separators were not listed. By letter dated January 28, 2002, the staff requested, in RAI 2.3.3.38-1, the applicant to explain why the waste gas separators, which appeared to be passive, long-lived components, were highlighted in Catawba drawing CN-1567-1.0 but not listed in LRA Table 3.3-47. In its response dated April 15, 2002, the applicant stated that the waste gas separators are within the scope of license renewal and subject to an AMR. The applicant provided the AMR results for the waste gas separators as a supplement to Table 3.3-47. Since the applicant provided the AMR results for the waste gas separators, the staff finds this response acceptable. The staff's evaluation of the AMR results is documented in Section 3.3.38.2 of this SER. The staff did not identify any other omissions by the applicant in screening the components that are subject to an AMR in accordance with the requirement of 10 CFR 54.21(a)(1).

2.3.3.38.3 Conclusions

On the basis of its review of the information contained in LRA Section 2.3.3.38, the supporting information in the P&IDs, and the McGuire and Catawba UFSARs, as described above, the staff did not identify any other omissions by the applicant. Therefore, the staff finds that there is reasonable assurance that the applicant adequately identified those portions of the waste gas system that are within the scope of license renewal and the associated SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 54.21(a)(1), respectively.

2.3.4 System Scoping and Screening Results: Steam and Power Conversion Systems

2.3.4.1 Auxiliary Feedwater System

In LRA Section 2.3.4.1 “Auxiliary Feedwater System,” the applicant described the components of the auxiliary feedwater system that are within the scope of license renewal and subject to an AMR. These systems are identical for purposes of license renewal for both facilities without any notable differences in system design. Section 10, Auxiliary Feedwater System, of the Catawba and McGuire UFSARs provides additional information concerning their respective auxiliary feedwater systems.

2.3.4.1.1 Technical Information in the Application

For both Catawba and McGuire, the auxiliary feedwater system is a nuclear safety-related system which serves as a backup to the feedwater system to ensure the safety of the plant and protection of equipment. The auxiliary feedwater system is essential to prevent an unacceptable decrease in the SG water levels, to reverse the rise in reactor coolant temperature, to prevent the pressurizer from filling to a water solid condition, and to establish stable hot standby conditions. The auxiliary feedwater system can be used during an emergency as well as during normal startup and shutdown operations. Using the methodology described in Section 2.1.2, “Screening Methodology,” of the LRA, the applicant compiled a list of mechanical component commodity groupings within the license renewal boundaries that are subject to an AMR and identified their intended functions. The mechanical components subject to an AMR, their intended functions, and materials of construction for the Catawba and McGuire auxiliary feedwater systems are listed in Table 3.4-1 of the LRA. In Table 3.4-1, the applicant lists the following ten component commodity groups as subject to an AMR: motor-driven auxiliary feedwater pump casings, orifices, pipe, tubing, turbine-driven auxiliary feedwater pump casings, turbine-driven auxiliary feedwater pump bearing oil cooler (tubes), turbine-driven auxiliary feedwater pump bearing oil cooler (tube sheet), turbine-driven auxiliary feedwater pump bearing oil cooler (channel heads), turbine-driven auxiliary feedwater pump bearing oil cooler (shell), and valve bodies. Table 3.4-1 also lists eductors as a component commodity group that is subject to an AMR for the Catawba auxiliary feedwater system. The applicant states that maintaining pressure boundary integrity is the intended function of the SCs subject to an AMR. The orifices also perform a throttling function.

2.3.4.1.2 Staff Evaluation

The staff reviewed Section 2.3.4.1 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the auxiliary feedwater system SCs that are within the scope of license renewal in accordance with 10 CFR 54.4 and subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the text and diagrams submitted by the applicant in Section 2.3.4.1 of the LRA and the Catawba and McGuire UFSARs to determine if the applicant adequately identified the SSCs of the auxiliary feedwater system that are in the scope of license renewal. The staff verified that those portions of the auxiliary feedwater system that meet the scoping requirements of 10 CFR 54.4 are included within the scope of license renewal, and are identified as such by the applicant in Section 2.3.4.1 of the LRA. The staff then focused its review on those portions of the auxiliary feedwater system that were not identified as within the

scope of license renewal to verify that they do not meet the scoping requirements of 10 CFR 54.4. The staff also reviewed the UFSAR to determine if there were any additional system functions that were not identified in the LRA, and verified that those additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff found no omissions by the applicant, therefore, there is reasonable assurance that the applicant adequately identified all portions of the auxiliary feedwater system that should be included within the scope of license renewal in accordance with 10 CFR Part 54.4.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the auxiliary feedwater system that are identified as within the scope of license renewal. The applicant identifies and lists the SCs subject to AMR for the auxiliary feedwater systems in Table 3.4-1 of the LRA using the screening methodology described in Section 2.1 of the LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER. The staff performed its review by sampling the SCs that the applicant determines as within the scope of license renewal but not subject to AMR to verify that these SCs performed its intended functions with moving parts or with a change in configuration or properties or were subject to replacement based on qualified life or specified time period.

The applicant identified the portions of the auxiliary feedwater system that are within the scope of license renewal in the drawings referenced in the LRA. The license renewal drawings were highlighted by the applicant to identify those portions of the auxiliary feedwater systems meet at least one of the scoping criteria of 10 CFR 54.4. The staff compared the LRA drawings to the system drawings and the descriptions in the Catawba and McGuire UFSARs to ensure they were representative of the auxiliary feedwater systems. The staff performed its review by sampling the SCs that the applicant determines as within the scope of license renewal but not subject to AMR to verify that no structure or component that performs its intended functions without moving parts or without a change in configuration or properties and, that are not subject to replacement based on qualified life or specified time period was excluded from an AMR. The staff did not identify any omissions.

2.3.4.1.3 Conclusions

On the basis of its review of the information contained in Section 2.3.4.1 of the LRA and the supporting information in the Catawba and McGuire UFSARs, as described above, no omissions by the applicant were identified. The staff concludes that there is reasonable assurance that the applicant adequately identified those portions of the Catawba and McGuire auxiliary feedwater systems that are within the scope of license renewal, and subject to an AMR in accordance with 10 CFR 54.4(a), and 10 CFR 54.21(a)(1), respectively.

2.3.4.2 Auxiliary Steam System

In the Catawba and McGuire LRA's, Section 2.3.4.2 "Auxiliary Steam System," the applicant described the components of the auxiliary steam system that are within the scope of license renewal and subject to an AMR. These systems are identical for purposes of license renewal for both facilities without any notable differences in system design.

2.3.4.2.1 Technical Information in the Application

The auxiliary steam system provides steam to various plant equipment as required during all modes of plant operation, including condensate cleanup, startup, normal operation, and shutdown. The auxiliary steam system is a non-safety system whose postulated failure could prevent satisfactory accomplishment of certain safety-related functions. To preclude these postulated failures, portions of this system are seismically designed (i.e., Duke Class F). All components within the seismically designed piping boundaries of this system are within the scope of license renewal per §54.4(a)(2). Using the methodology described in Section 2.1.2, "Screening Methodology," of the LRA, the applicant compiled a list of mechanical component commodity groupings within the license renewal boundaries that are subject to an AMR and identified their intended functions. The mechanical components subject to an AMR, their intended functions, and materials of construction for the Catawba and McGuire auxiliary steam systems are listed in Table 3.4-2. In the LRA, Table 3.4-2, the applicant lists the following three component commodity groups as subject to an AMR: pipe, tubing, and valve bodies The applicant states that maintaining pressure boundary integrity is the intended function of the SCs subject to an AMR.

2.3.4.2.2 Staff Evaluation

The staff reviewed Section 2.3.4.2 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the auxiliary steam system SCs that are within the scope of license renewal in accordance with 10 CFR 54.4 and subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the text and diagrams submitted by the applicant in Section 2.3.4.2 of the LRA to determine if the applicant adequately identified the SSCs of the auxiliary steam system that are in the scope of license renewal. The staff verified that those portions of the auxiliary steam system that meet the scoping requirements of 10 CFR 54.4 are included within the scope of license renewal, and are identified as such by the applicant in Section 2.3.4.2 of the LRA. The staff then focused its review on those portions of the auxiliary steam system that were not identified as within the scope of license renewal to verify that they do not meet the scoping requirements of 10 CFR 54.4. The staff found no omissions by the applicant, therefore, there is reasonable assurance that the applicant adequately identified all portions of the auxiliary steam system that should be included within the scope of license renewal in accordance with 10 CFR Part 54.4.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the auxiliary steam system that are identified as within the scope of license renewal. The applicant identifies and lists the SCs subject to AMR for the auxiliary steam systems in Table 3.4-2 of the LRA using the screening methodology described in Section 2.1 of the LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER. The staff performed its review by sampling the SCs that the applicant determines as within the scope of license renewal but not subject to AMR to verify that these SCs performed their intended functions with moving parts or with a change in configuration or properties or were subject to replacement based on qualified life or specified time period.

The applicant identified the portions of the auxiliary steam system that are within the scope of license renewal in the drawings referenced in the LRA. The detailed flow diagrams were highlighted to identify those portions of the system that are within the scope of license renewal.

The applicant highlighted those components which they believe perform at least one of the scoping requirements of 10 CFR 54.4. The staff sampled portions of the flow diagram that were not highlighted to verify that these components did not meet any the scoping criteria in 10 CFR 54.4. The staff did not identify any omissions.

2.3.4.2.3 Conclusions

On the basis of its review of the information contained in Section 2.3.4.2 of the LRA, as described above, no omissions by the applicant were identified. The staff concludes that there is reasonable assurance that the applicant adequately identified those portions of the Catawba and McGuire auxiliary steam systems that are within the scope of license renewal, and subject to an AMR in accordance with 10 CFR 54.4(a), and 10 CFR 54.21(a)(1), respectively.

2.3.4.3 Condensate System

In LRA Section 2.3.4.3 "Condensate System," the applicant described the components of the condensate system that are within the scope of license renewal and subject to an AMR. The Catawba UFSAR Section 10.4.7, Condensate and Feedwater System, provides additional information concerning the Catawba condensate system. McGuire has no Class F components in the Condensate System, therefore, no portion of the McGuire Condensate System is within the scope of license renewal. As a result, the following staff evaluation applies to Catawba only.

2.3.4.3.1 Technical Information in the Application

The condensate system provides water to various plant equipment as required during all modes of plant operation, including condensate cleanup, startup, normal operation, and shutdown. The condensate system is a non-safety system whose postulated failure could prevent satisfactory accomplishment of certain safety-related functions. To preclude these postulated failures, portions of this system are seismically designed (i.e., Duke Class F). All components within the seismically designed piping boundaries of this system are within the scope of license renewal per §54.4(a)(2). Using the methodology described in Section 2.1.2, "Screening Methodology," of the LRA, the applicant compiled a list of mechanical component commodity groupings within the license renewal boundaries that are subject to an AMR and identified their intended functions. The mechanical components subject to an AMR, their intended functions, and materials of construction for the Catawba condensate system are listed in Table 3.4-3. In the LRA, Table 3.4-3, the applicant lists the following two component commodity groups as subject to an AMR: pipe and valve bodies. The applicant states that maintaining pressure boundary integrity is the intended function of the SCs subject to an AMR.

2.3.4.3.2 Staff Evaluation

The staff reviewed Section 2.3.4.3 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the condensate system SCs that are within the scope of license renewal in accordance with 10 CFR 54.4 and subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the text and diagrams submitted by the applicant in Section 2.3.4.3 of the LRA and the Catawba UFSAR to determine if the applicant adequately identified the SSCs of the condensate system that are in the scope of license renewal. The staff verified that those

portions of the condensate system that meet the scoping requirements of 10 CFR 54.4 are included within the scope of license renewal, and are identified as such by the applicant in Section 2.3.4.3 of the LRA. The staff then focused its review on those portions of the condensate system that were not identified as within the scope of license renewal to verify that they do not meet the scoping requirements of 10 CFR 54.4. The staff also reviewed the UFSAR to determine if there were any additional system functions that were not identified in the LRA, and verified that those additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff found no omissions by the applicant, therefore, there is reasonable assurance that the applicant adequately identified all portions of the condensate system that should be included within the scope of license renewal in accordance with 10 CFR Part 54.4.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the condensate system that are identified as within the scope of license renewal. The applicant identifies and lists the SCs subject to AMR for the condensate systems in Table 3.4-3 of the LRA using the screening methodology described in Section 2.1 of the LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER. The staff performed its review by sampling the SCs that the applicant determines as within the scope of license renewal but not subject to AMR to verify that these SCs performed their intended functions with moving parts or with a change in configuration or properties or were subject to replacement based on qualified life or specified time period.

The applicant identified the portions of the condensate system that are within the scope of license renewal in the drawings referenced in the LRA. The detailed flow diagrams were highlighted to identify those portions of the system that are within the scope of license renewal. The applicant highlighted those components which they believe perform at least one of the scoping requirements of 10 CFR 54.4. The staff compared the LRA flow diagrams to the system drawings and the descriptions in the UFSAR to ensure they were representative of the condensate system. The staff sampled portions of the flow diagram that were not highlighted to verify that these components did not meet any the scoping criteria in 10 CFR 54.4. The staff did not identify any omissions.

2.3.4.3.3 Conclusions

On the basis of its review of the information contained in Section 2.3.4.3 of the LRA and the supporting information in the Catawba UFSAR, as described above, no omissions by the applicant were identified. The staff concludes that there is reasonable assurance that the applicant adequately identified those portions of the condensate system that are within the scope of license renewal, and subject to an AMR in accordance with 10 CFR 54.4(a), and 10 CFR 54.21(a)(1), respectively.

2.3.4.4 Condensate Storage System

In LRA Section 2.3.4.4 “Condensate Storage System,” the applicant described the components of the condensate storage system that are within the scope of license renewal and subject to an AMR. McGuire has no Class F components in the Condensate
Storage System, therefore, no portion of the McGuire Condensate Storage System is within the scope of license renewal. As a result, the following staff evaluation only applies to Catawba.

2.3.4.4.1 Technical Information in the Application

The condensate storage system provides a source of water for various plant equipment as required during all modes of plant operation, including condensate cleanup, startup, normal operation, and shutdown. The condensate storage system is a non-safety system whose postulated failure could prevent satisfactory accomplishment of certain safety-related functions. To preclude these postulated failures, portions of this system are seismically designed (i.e., Duke Class F). All components within the seismically designed piping boundaries of this system are within the scope of license renewal per §54.4(a)(2). Using the methodology described in Section 2.1.2, "Screening Methodology," of the LRA, the applicant compiled a list of mechanical component commodity groupings within the license renewal boundaries that are subject to an AMR and identified their intended functions. The mechanical components subject to AMR, their intended functions, and materials of construction for the Catawba condensate storage system are listed in Table 3.4-4. In the LRA, Table 3.4-4, the applicant lists the following two component commodity groups as subject to an AMR: pipe and valve bodies. The applicant states that maintaining pressure boundary integrity is the intended function of the SCs subject to an AMR.

2.3.4.4.2 Staff Evaluation

The staff reviewed Section 2.3.4.4 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the condensate storage system SCs that are within the scope of license renewal in accordance with 10 CFR 54.4 and subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the text and diagrams submitted by the applicant in Section 2.3.4.4 of the LRA to determine if the applicant adequately identified the SSCs of the condensate storage system that are in the scope of license renewal. The staff verified that those portions of the condensate storage system that meet the scoping requirements of 10 CFR 54.4 are included within the scope of license renewal, and are identified as such by the applicant in Section 2.3.4.4 of the LRA. The staff then focused its review on those portions of the condensate storage system that were not identified as within the scope of license renewal to verify that they do not meet the scoping requirements of 10 CFR 54.4. The staff also reviewed the UFSAR to determine if there were any additional system functions that were not identified in the LRA, and verified that those additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff found no omissions by the applicant, therefore, there is reasonable assurance that the applicant adequately identified all portions of the condensate storage system that should be included within the scope of license renewal in accordance with 10 CFR Part 54.4.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the condensate storage system that are identified as within the scope of license renewal. The applicant identifies and lists the SCs subject to AMR for the condensate storage systems in Table 3.4-4 of the LRA using the screening methodology described in Section 2.1 of the LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER. The staff performed its review by sampling the SCs that the applicant determines as within the scope of license renewal but not subject to AMR to verify that these SCs performed their intended functions with moving parts or with a change in configuration or properties or were subject to replacement based on qualified life or specified time period.

The applicant identified the portions of the condensate storage system that are within the scope of license renewal in the drawings referenced in the LRA. The detailed flow diagrams were highlighted to identify those portions of the system that are within the scope of license renewal. The applicant highlighted those components which they believe perform at least one of the scoping requirements of 10 CFR 54.4. The staff sampled portions of the flow diagram that were not highlighted to verify that these components did not meet any the scoping criteria in 10 CFR 54.4. The staff did not identify any omissions.

2.3.4.4.3 Conclusions

On the basis of its review of the information contained in Section 2.3.4.4 of the LRA, as described above, no omissions by the applicant were identified. The staff concludes that there is reasonable assurance that the applicant adequately identified those portions of the condensate storage system that are within the scope of license renewal, and subject to an AMR in accordance with 10 CFR 54.4(a), and 10 CFR 54.21(a)(1), respectively.

2.3.4.5 Feedwater System

In LRA Section 2.3.4.5, “Feedwater System,” the applicant described the components of the feedwater system that are within the scope of license renewal and subject to an AMR. Section 10.4.7, Condensate and Feedwater System, of the Catawba and McGuire UFSARs, provides additional information concerning their respective feedwater systems. These systems are identical for purposes of license renewal for both facilities without any notable differences in system design.

2.3.4.5.1 Technical Information in the Application

The feedwater system takes treated condensate system water, heats it further to improve the plant's thermal cycle efficiency, and delivers it at the required flow rate, pressure and temperature to the SGs. The feedwater system is designed to maintain proper vessel water levels with respect to reactor power output and turbine steam requirements. Using the methodology described in Section 2.1.2, “Screening Methodology,” of the Catawba and McGuire LRA, the applicant compiled a list of mechanical component commodity groupings within the license renewal boundaries that are subject to an AMR and identified their intended functions. The mechanical components subject to AMR, their intended functions, and materials of construction for the Catawba and McGuire feedwater systems are listed in Table 3.4-5. In the LRA, Table 3.4-5, the applicant lists the following five component commodity groups as subject to an AMR: orifices, pipe, reservoirs, tubing, and valve bodies. Table 3.4-5 also lists cavitating venturies as a component commodity group that is subject to an AMR for the Catawba feedwater system. Table 3.4-5 lists flow nozzles as a component commodity group that is subject to an AMR for the McGuire feedwater system. The applicant states that maintaining pressure boundary integrity is the intended function of the SCs subject to an AMR.

2.3.4.5.2 Staff Evaluation

The staff reviewed Section 2.3.4.5 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the feedwater system SCs that are within the scope of license renewal in accordance with 10 CFR 54.4 and subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the text and diagrams submitted by the applicant in Section 2.3.4.5 of the LRA and the Catawba and McGuire UFSARs to determine if the applicant adequately identified the SSCs of the feedwater systems that are in the scope of license renewal. The staff verified that those portions of the feedwater system that meet the scoping requirements of 10 CFR 54.4 are included within the scope of license renewal, and are identified as such by the applicant in Section 2.3.4.5 of the LRA. The staff then focused its review on those portions of the feedwater system that were not identified as within the scope of license renewal to verify that they do not meet the scoping requirements of 10 CFR 54.4. The staff also reviewed the UFSAR to determine if there were any additional system functions that were not identified in the LRA, and verified that those additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff found no omissions by the applicant, therefore, there is reasonable assurance that the applicant adequately identified all portions of the feedwater system that should be included within the scope of license renewal in accordance with 10 CFR Part 54.4.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the feedwater system that are identified as within the scope of license renewal. The applicant identifies and lists the SCs subject to AMR for the feedwater systems in Table 3.4-5 of the LRA using the screening methodology described in Section 2.1 of the LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER. The staff performed its review by sampling the SCs that the applicant determines as within the scope of license renewal but not subject to AMR to verify that these SCs performed their intended functions with moving parts or with a change in configuration or properties or were subject to replacement based on qualified life or specified time period.

The applicant identified the portions of the feedwater system that are within the scope of license renewal in the drawings referenced in the LRA. The detailed flow diagrams were highlighted to identify those portions of the system that are within the scope of license renewal. The applicant highlighted those components which they believe perform at least one of the scoping requirements of 10 CFR 54.4. The staff compared the LRA flow diagrams to the system drawings and the descriptions in the UFSAR to ensure they were representative of the feedwater system. The staff sampled portions of the flow diagram that were not highlighted to verify that these components did not meet any the scoping criteria in 10 CFR 54.4. The staff did not identify any omissions.

2.3.4.5.3 Conclusions

On the basis of its review of the information contained in Section 2.3.4.5 of the LRA and the supporting information in the Catawba and McGuire UFSARs, as described above, no omissions by the applicant were identified. The staff concludes that there is reasonable assurance that the applicant adequately identified those portions of the feedwater system that are within the scope of license renewal, and subject to an AMR in accordance with 10 CFR 54.4(a), and 10 CFR 54.21(a)(1), respectively.

2.3.4.6 Feedwater Pump Turbine Exhaust System

In Section 2.3.4.6, “Feedwater Pump Turbine Exhaust System,” of the LRA, the applicant described the components of the feedwater pump turbine exhaust system that are within the scope of license renewal and subject to an AMR. Catawba UFSAR Section 10.3, Main Steam

System, provides additional information concerning the design and operation of the Catawba feedwater pump turbine exhaust system. The McGuire feedwater pump turbine exhaust system is not described in the McGuire UFSAR.

2.3.4.6.1 Technical Information in the Application

The feedwater pump turbine exhaust system is essentially the same and performs the same function at Catawba and McGuire. The system provides a flowpath for the exhaust steam from the turbine-driven auxiliary feedwater pump turbine. The steam to the turbine-driven auxiliary feedwater pump turbine is provided by the main steam system. Using the methodology described in Section 2.1.2, "Screening Methodology," of the LRA, the applicant compiled a list of mechanical component commodity groupings within the license renewal boundaries that are subject to an AMR and identified their intended functions. The mechanical components subject to AMR, their intended functions, and materials of construction for the Catawba and McGuire feedwater pump turbine exhaust systems are listed in Table 3.4-6. In the LRA, Table 3.4-6, the applicant lists the following two component commodity groups as subject to an AMR: pipe and tubing. Table 3.4-6, also lists expansion joint, expansion joint (bellows), orifices, and valve bodies as component commodity groups for Catawba that are subject to an AMR. The applicant states that maintaining pressure boundary integrity is the intended function of the SCs subject to an AMR. The orifices also provide a throttling function.

2.3.4.6.2 Staff Evaluation

The staff reviewed Section 2.3.4.6 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the feedwater pump turbine exhaust system SCs that are within the scope of license renewal in accordance with 10 CFR 54.4 and subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the text and diagrams submitted by the applicant in Section 2.3.4.6 of the LRA and the Catawba UFSAR to determine if the applicant adequately identified the SSCs of the feedwater pump turbine exhaust system that are in the scope of license renewal. The staff verified that those portions of the feedwater pump turbine exhaust system that meet the scoping requirements of 10 CFR 54.4 are included within the scope of license renewal, and are identified as such by the applicant in Section 2.3.4.6 of the LRA. The staff then focused its review on those portions of the feedwater pump turbine exhaust system that were not identified as within the scope of license renewal to verify that they do not meet the scoping requirements of 10 CFR 54.4. The staff also reviewed the Catawba UFSAR to determine if there were any additional system functions that were not identified in the LRA, and verified that those additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff found no omissions by the applicant, therefore, there is reasonable assurance that the applicant adequately identified all portions of the feedwater pump turbine exhaust system that should be included within the scope of license renewal in accordance with 10 CFR Part 54.4.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the feedwater pump turbine exhaust system that are identified as within the scope of license renewal. The applicant identifies and lists the SCs subject to AMR for the feedwater pump turbine exhaust systems in Table 3.4-6 of the LRA using the screening methodology described in Section 2.1 of the LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER.

The staff performed its review by sampling the SCs that the applicant determines as within the scope of license renewal but not subject to AMR to verify that these SCs performed their intended functions with moving parts or with a change in configuration or properties or were subject to replacement based on qualified life or specified time period.

The applicant identified the portions of the feedwater pump turbine exhaust system that are within the scope of license renewal in the drawings referenced in the LRA. The detailed flow diagrams were highlighted to identify those portions of the system that are within the scope of license renewal. The applicant highlighted those components which they believe perform at least one of the scoping requirements of 10 CFR 54.4. The staff compared the Catawba and McGuire LRA flow diagrams to the system drawings and, for Catawba, the descriptions in the Catawba UFSAR to ensure they were representative of the feedwater pump turbine exhaust system. The staff sampled portions of the flow diagram that were not highlighted to verify that these components did not meet any of the scoping criteria in 10 CFR 54.4. The staff did not identify any omissions.

2.3.4.6.3 Conclusions

On the basis of its review of the information contained in Section 2.3.4.6 of the LRA and the supporting information in the Catawba UFSAR, as described above, no omissions by the applicant were identified. The staff concludes that there is reasonable assurance that the applicant adequately identified those portions of the Catawba and McGuire feedwater pump turbine exhaust systems that are within the scope of license renewal, and subject to an AMR in accordance with 10 CFR 54.4(a), and 10 CFR 54.21(a)(1), respectively.

2.3.4.7 Feedwater Pump Turbine Hydraulic Oil System

In Section 2.3.4.7 “Feedwater Pump Turbine Hydraulic Oil System,” of the LRA, the applicant described the components of the feedwater pump turbine hydraulic oil systems that are within the scope of license renewal and subject to an AMR.

2.3.4.7.1 Technical Information in the Application

The feedwater pump turbine hydraulic oil system is essentially the same and performs the same function at Catawba and McGuire. The system provides emergency trip to the feedwater pump turbine steam valves and overspeed exercisers for ATWS mitigation. The turbine trip signal causes pressure to be bled off the hydraulic system causing the stop and governor valves to close. The components required to meet these functions are either active components or are passive components whose failure will not prevent the desired action from occurring. Failure of the pressure boundary of the valve bodies or piping will create a loss of hydraulic pressure causing the stop and governor valves to close which is the safety function. Therefore, the components are in scope, but no AMR is required.

2.3.4.7.2 Staff Evaluation

The staff reviewed Section 2.3.4.7 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the feedwater pump turbine hydraulic oil system SCs that are within the scope of license renewal in accordance with 10 CFR 54.4 and subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the text and diagrams submitted by the applicant in Section 2.3.4.7 of the LRA to determine if the applicant adequately identified the SSCs of the feedwater pump turbine hydraulic oil system that are in the scope of license renewal. The staff verified that those portions of the feedwater pump turbine hydraulic oil system that meet the scoping requirements of 10 CFR 54.4 are included within the scope of license renewal, and are identified as such by the applicant in Section 2.3.4.7 of the LRA. The staff then focused its review on those portions of the feedwater pump turbine hydraulic oil system that were not identified as within the scope of license renewal to verify that they do not meet the scoping requirements of 10 CFR 54.4. The staff found no omissions by the applicant, therefore, there is reasonable assurance that the applicant adequately identified all portions of the feedwater pump turbine hydraulic oil system that should be included within the scope of license renewal in accordance with 10 CFR Part 54.4.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the feedwater pump hydraulic oil system that are identified as within the scope of license renewal. The applicant identified that no AMR is required using the screening methodology described in Section 2.1 of the LRA. This is due to the components required to meet the ATWS mitigation functions are either active components or are passive components whose failure will not prevent the desired action from occurring. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER. The staff performed its review by sampling the SCs that the applicant determines as within the scope of license renewal but not subject to AMR to verify that these SCs performed their intended functions with moving parts or with a change in configuration or properties or were subject to replacement based on qualified life or specified time period.

The applicant identified the portions of the feedwater pump turbine hydraulic oil system that are within the scope of license renewal in the drawings referenced in the LRA. The detailed flow diagrams were highlighted to identify those portions of the system that are within the scope of license renewal. The applicant highlighted those components which they believe perform at least one of the scoping requirements of 10 CFR 54.4. The staff sampled portions of the flow diagram that were not highlighted to verify that these components did not meet any the scoping criteria in 10 CFR 54.4. The staff did not identify any omissions.

2.3.4.7.3 Conclusions

On the basis of its review of the information contained in Section 2.3.4.7 of the LRA, as described above, no omissions by the applicant were identified. The staff concludes that there is reasonable assurance that the applicant adequately identified those portions of the Catawba and McGuire feedwater pump turbine hydraulic oil systems that are within the scope of license renewal, and subject to an AMR in accordance with 10 CFR 54.4(a), and 10 CFR 54.21(a)(1), respectively.

2.3.4.8 Main Steam System

In Section 2.3.4.8 “Main Steam System,” of the LRA, the applicant described the components of the main steam system that are within the scope of license renewal and subject to an AMR. In both the Catawba and McGuire UFSARs, Section 10.3, Main Steam Supply System, provides additional information concerning the main steam system.

2.3.4.8.1 Technical Information in the Application

The main steam system is essentially the same and performs the same function at Catawba and McGuire. The main steam system dissipates heat from the reactor coolant system, provides main steam overpressure protection, minimizes positive reactivity effects associated with a main steam line rupture, minimizes the containment temperature increase associated with a main steam line rupture within containment, and provides steam to the turbine driven auxiliary feedwater pump, as needed. Using the methodology described in Section 2.1.2, "Screening Methodology," of the LRA, the applicant compiled a list of mechanical component commodity groupings within the license renewal boundaries that are subject to an AMR and identified their intended functions. The mechanical components subject to AMR, their intended functions, and materials of construction for the main steam system are listed in Table 3.4-7. In the LRA, Table 3.4-7, the applicant lists the following four component commodity groups as subject to an AMR: orifices, pipe, tubing, and valve bodies. The applicant states that maintaining pressure boundary integrity is the intended function of the SCs subject to an AMR. Some of the orifices also perform a throttling function.

2.3.4.8.2 Staff Evaluation

The staff reviewed Section 2.3.4.8 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the main steam system SCs that are within the scope of license renewal in accordance with 10 CFR 54.4 and subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the text and diagrams submitted by the applicant in Section 2.3.4.8 of the LRA and the Catawba and McGuire UFSARs to determine if the applicant adequately identified the SSCs of the main steam system that are in the scope of license renewal. The staff verified that those portions of the main steam system that meet the scoping requirements of 10 CFR 54.4 are included within the scope of license renewal, and are identified as such by the applicant in Section 2.3.4.8 of the LRA. The staff then focused its review on those portions of the main steam system that were not identified as within the scope of license renewal to verify that they do not meet the scoping requirements of 10 CFR 54.4. The staff also reviewed the UFSAR to determine if there were any additional system functions that were not identified in the LRA, and verified that those additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff found no omissions by the applicant, therefore, there is reasonable assurance that the applicant adequately identified all portions of the main steam system that should be included within the scope of license renewal in accordance with 10 CFR Part 54.4.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the main steam system that are identified as within the scope of license renewal. The applicant identifies and lists the SCs subject to AMR for the main steam systems in Table 3.4-7 of the LRA using the screening methodology described in Section 2.1 of the LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER. The staff performed its review by sampling the SCs that the applicant determines as within the scope of license renewal but not subject to AMR to verify that these SCs performed their functions with moving parts or with a change in configuration or properties or were subject to replacement based on qualified life or specified time period.

The applicant identified the portions of the main steam system that are within the scope of license renewal in the drawings referenced in the LRA. The detailed flow diagrams were highlighted to identify those portions of the system that are within the scope of license renewal. The applicant highlighted those components which they believe perform at least one of the scoping requirements of 10 CFR 54.4. The staff compared the LRA flow diagrams to the system drawings and the descriptions in the UFSAR to ensure they were representative of the main steam system. The staff sampled portions of the flow diagram that were not highlighted to verify that these components did not meet any the scoping criteria in 10 CFR 54.4. The staff did not identify any omissions.

2.3.4.8.3 Conclusions

On the basis of its review of the information contained in Section 2.3.4.8 of the LRA and the supporting information in the Catawba and McGuire UFSARs, as described above, no omissions by the applicant were identified. The staff concludes that there is reasonable assurance that the applicant adequately identified those portions of the main steam system that are within the scope of license renewal, and subject to an AMR in accordance with 10 CFR 54.4(a), and 10 CFR 54.21(a)(1), respectively.

2.3.4.9 Main Steam Supply to Auxiliary Equipment

In Section 2.3.4.9 “Main Steam Auxiliary Equipment System,” of the LRA, the applicant described the components of the main steam auxiliary equipment system that are within the scope of license renewal and subject to an AMR. In both the Catawba and McGuire UFSARs, Section 10.3, Main Steam Supply System, provides additional information concerning the main steam to auxiliary equipment system.

2.3.4.9.1 Technical Information in the Application

The main steam to auxiliary equipment system is essentially the same and performs the same function at Catawba and McGuire. The system transfers steam to the turbine driven auxiliary feedwater pump turbine, so that the design bases of the Auxiliary Feedwater System can be met. Using the methodology described in Section 2.1.2, “Screening Methodology,” of the LRA, the applicant compiled a list of mechanical component commodity groupings within the license renewal boundaries that are subject to an AMR and identified their intended functions. The mechanical components subject to AMR, their intended functions, and materials of construction for the Catawba and McGuire main steam auxiliary equipment systems are listed in Table 3.4-8. In the LRA, Table 3.4-8, the applicant lists the following five component commodity groups as subject to an AMR: auxiliary feedwater pump turbine casing, orifices, pipe, tubing, and valve bodies. Table 3.4-8 also lists strainers as a component commodity groups that are subject to an AMR for McGuire. The applicant states that maintaining pressure boundary integrity is the intended function of the SCs subject to an AMR. Some of the orifices also perform a throttling function and the strainers perform a filtration function.

2.3.4.9.2 Staff Evaluation

The staff reviewed Section 2.3.4.9 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the main steam auxiliary equipment system

SCs that are within the scope of license renewal in accordance with 10 CFR 54.4 and subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the text and diagrams submitted by the applicant in Section 2.3.4.9 of the LRA and the Catawba and McGuire UFSARs to determine if the applicant adequately identified the SSCs of the main steam auxiliary equipment system that are in the scope of license renewal. The staff verified that those portions of the main steam auxiliary equipment system that meet the scoping requirements of 10 CFR 54.4 are included within the scope of license renewal, and are identified as such by the applicant in Section 2.3.4.9 of the LRA. The staff then focused its review on those portions of the main steam auxiliary equipment system that were not identified as within the scope of license renewal to verify that they do not meet the scoping requirements of 10 CFR 54.4. The staff also reviewed the UFSAR to determine if there were any additional supply to auxiliary equipment functions that were not identified in the LRA, and verified that those additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff found no omissions by the applicant, therefore, there is reasonable assurance that the applicant adequately identified all portions of the main steam auxiliary equipment system that should be included within the scope of license renewal in accordance with 10 CFR Part 54.4.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the main steam auxiliary equipment system that are identified as within the scope of license renewal. The applicant identifies and lists the SCs subject to AMR for the main steam auxiliary equipment systems in Table 3.4-8 of the LRA using the screening methodology described in Section 2.1 of the LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER. The staff performed its review by sampling the SCs that the applicant determines as within the scope of license renewal but not subject to AMR to verify that these SCs performed their intended functions with moving parts or with a change in configuration or properties or were subject to replacement based on qualified life or specified time period.

The applicant identified the portions of the main steam auxiliary equipment system that are within the scope of license renewal in the drawings referenced in the LRA. The detailed flow diagrams were highlighted to identify those portions of the supply to auxiliary equipment that are within the scope of license renewal. The applicant highlighted those components which they believe perform at least one of the scoping requirements of 10 CFR 54.4. The staff compared the LRA flow diagrams to the supply to auxiliary equipment drawings and the descriptions in the UFSAR to ensure they were representative of the main steam auxiliary equipment system. The staff sampled portions of the flow diagram that were not highlighted to verify that these components did not meet any the scoping criteria in 10 CFR 54.4. The staff did not identify any omissions.

2.3.4.9.3 Conclusions

On the basis of its review of the information contained in Section 2.3.4.9 of LRA and the supporting information in the Catawba and McGuire UFSARs, as described above, no omissions by the applicant were identified. The staff concludes that there is reasonable assurance that the applicant adequately identified those portions of the main steam auxiliary equipment system that are within the scope of license renewal, and subject to an AMR in accordance with 10 CFR 54.4(a), and 10 CFR 54.21(a)(1), respectively.

2.3.4.10 Main Steam Vent to Atmosphere System

In Section 2.3.4.10 “Main Steam Vent to Atmosphere System,” of the LRA, the applicant described the components of the main steam vent to atmosphere system that are within the scope of license renewal and subject to an AMR. In both the Catawba and McGuire UFSARs, Section 10.3, Main Steam Supply System, provides additional information concerning the main steam vent to atmosphere system.

2.3.4.10.1 Technical Information in the Application

The main steam vent to atmosphere system is essentially the same and performs the same function at Catawba and McGuire. The system dissipates heat from the reactor coolant system, provides main steam overpressure protection, minimizes positive reactivity effects associated with a main steam line rupture, and minimizes the containment temperature increase associated with a main steam line rupture within containment. Using the methodology described in Section 2.1.2, “Screening Methodology,” of the LRA, the applicant compiled a list of mechanical component commodity groupings within the license renewal boundaries that are subject to an AMR and identified their intended functions. The mechanical components subject to AMR, their intended functions, and materials of construction for the Catawba main steam vent to atmosphere system are listed in Table 3.4-9. In the LRA, Table 3.4-9, the applicant lists the following three component commodity groups as subject to an AMR: pipe, tubing, and valve bodies. The applicant states that maintaining pressure boundary integrity is the intended function of the SCs subject to an AMR.

2.3.4.10.2 Staff Evaluation

The staff reviewed Section 2.3.4.10 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the main steam vent to atmosphere system SCs that are within the scope of license renewal in accordance with 10 CFR 54.4 and subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the text and diagrams submitted by the applicant in Section 2.3.4.10 of the LRA and the Catawba and McGuire UFSARs to determine if the applicant adequately identified the SSCs of the main steam vent to atmosphere system that are in the scope of license renewal. The staff verified that those portions of the main steam vent to atmosphere system that meet the scoping requirements of 10 CFR 54.4 are included within the scope of license renewal, and are identified as such by the applicant in Section 2.3.4.10 of the LRA. The staff then focused its review on those portions of the main steam vent to atmosphere system that were not identified as within the scope of license renewal to verify that they do not meet the scoping requirements of 10 CFR 54.4. The staff also reviewed the UFSAR to determine if there were any additional supply to auxiliary equipment functions that were not identified in the LRA, and verified that those additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff found no omissions by the applicant, therefore, there is reasonable assurance that the applicant adequately identified all portions of the main steam vent to atmosphere system that should be included within the scope of license renewal in accordance with 10 CFR Part 54.4.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the main steam vent to atmosphere system that are

identified as within the scope of license renewal. The applicant identifies and lists the SCs subject to AMR for the main steam vent to atmosphere systems in Table 3.4-9 of the LRA using the screening methodology described in Section 2.1 of the LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER. The staff performed its review by sampling the SCs that the applicant determines as within the scope of license renewal but not subject to AMR to verify that these SCs performed their intended functions with moving parts or with a change in configuration or properties or were subject to replacement based on qualified life or specified time period.

The applicant identified the portions of the main steam vent to atmosphere system that are within the scope of license renewal in the drawings referenced in the LRA. The detailed flow diagrams were highlighted to identify those portions of the supply to auxiliary equipment that are within the scope of license renewal. The applicant highlighted those components which they believe perform at least one of the scoping requirements of 10 CFR 54.4. The staff compared the LRA flow diagrams to the main steam vent to atmosphere system equipment drawings and the descriptions in the UFSAR to ensure they were representative of the main steam vent to atmosphere system. The staff sampled portions of the flow diagram that were not highlighted to verify that these components did not meet any the scoping criteria in 10 CFR 54.4. The staff did not identify any omissions.

2.3.4.10.3 Conclusions

On the basis of its review of the information contained in Section 2.3.4.10 of the LRA and the supporting information in the Catawba and McGuire UFSARs, as described above, no omissions by the applicant were identified. The staff concludes that there is reasonable assurance that the applicant adequately identified those portions of the main steam vent to atmosphere system that are within the scope of license renewal, and subject to an AMR in accordance with 10 CFR 54.4(a), and 10 CFR 54.21(a)(1), respectively.

2.3.4.11 Main Turbine Hydraulic Oil System

In Section 2.3.4.7 “Main Turbine Hydraulic Oil System,” of the LRA, the applicant described the components of the main turbine hydraulic oil system that are within the scope of license renewal and subject to an AMR. The Catawba and the McGuire main turbine hydraulic oil systems are not described in their respective UFSARs.

2.3.4.11.1 Technical Information in the Application

The main turbine hydraulic oil system is essentially the same and performs the same function at Catawba and McGuire. The system provides a means to trip the main turbine to mitigate the plant response to an ATWS event. The components in the main turbine hydraulic oil system are required to maintain pressure boundary integrity for normal system operation. However, an operational loss of pressure in the hydraulic oil system, or a failure of the pressure boundary of within scope components, will produce a turbine trip signal. Because a turbine trip signal is the system intended function, there are no component intended functions applicable to the components highlighted on the mechanical system flow diagrams. Therefore, no AMR is required.

2.3.4.11.2 Staff Evaluation

The staff reviewed Section 2.3.4.11 of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the main turbine hydraulic oil system SCs that are within the scope of license renewal in accordance with 10 CFR 54.4 and subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the text and diagrams submitted by the applicant in Section 2.3.4.11 of the LRA to determine if the applicant adequately identified the SSCs of the main turbine hydraulic oil system that are in the scope of license renewal. The staff verified that those portions of the main turbine hydraulic oil system that meet the scoping requirements of 10 CFR 54.4 are included within the scope of license renewal, and are identified as such by the applicant in Section 2.3.4.11 of the LRA. The staff then focused its review on those portions of the main turbine hydraulic oil system that were not identified as within the scope of license renewal to verify that they do not meet the scoping requirements of 10 CFR 54.4. The staff also reviewed the UFSAR to determine if there were any additional system functions that were not identified in the LRA, and verified that those additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff found no omissions by the applicant, therefore, there is reasonable assurance that the applicant adequately identified all portions of the main turbine hydraulic oil system that should be included within the scope of license renewal in accordance with 10 CFR Part 54.4.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the feedwater pump hydraulic oil system that are identified as within the scope of license renewal. The applicant identified that no AMR is required using the screening methodology described in Section 2.1 of the LRA. This is a result of system design where an operational loss of pressure in the hydraulic oil system or a failure of the pressure boundary of within scope components will produce a turbine trip signal which is the intended function of the system. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER. The staff performed its review by sampling the SCs that the applicant determines as within the scope of license renewal but not subject to AMR to verify that these SCs performed its intended functions with moving parts or with a change in configuration or properties or were subject to replacement based on qualified life or specified time period.

The applicant identified the portions of the main turbine hydraulic oil system that are within the scope of license renewal in the drawings referenced in the LRA. The detailed flow diagrams were highlighted to identify those portions of the system that are within the scope of license renewal. The applicant highlighted those components which they believe perform at least one of the scoping requirements of 10 CFR 54.4. The staff sampled portions of the flow diagram that were not highlighted to verify that these components did not meet any the scoping criteria in 10 CFR 54.4. The staff did not identify any omissions.

2.3.4.11.3 Conclusions

On the basis of its review of the information contained in Section 2.3.4.11 of the LRA, as described above, no omissions by the applicant were identified. The staff concludes that there is reasonable assurance that the applicant adequately identified those portions of the main turbine hydraulic oil system that are within the scope of license renewal, and subject to an AMR in accordance with 10 CFR 54.4(a), and 10 CFR 54.21(a)(1), respectively.

2.3.4.12 Main Turbine Lube Oil and Purification System

In Section 2.3.4.12, “Main Turbine Lube Oil and Purification System,” of the LRA, the applicant described the components of the main turbine hydraulic oil system that are within the scope of license renewal and subject to an AMR. The Catawba and the McGuire main turbine lube oil and purification systems are not described in their respective UFSARs.

2.3.4.12.1 Technical Information in the Application

The main turbine lube oil and purification system is essentially the same and performs the same function at Catawba and McGuire. The system provides a means to trip the main turbine to mitigate the plant response to an ATWS event. The components in the main turbine lube oil and purification system are required to maintain pressure boundary integrity for normal system operation. However, an operational loss of pressure in the hydraulic oil system, or a failure of the pressure boundary of the within scope components, will produce a turbine trip signal. Because a turbine trip signal is the system intended function, there are no component intended functions applicable to the components highlighted on the mechanical system flow diagrams. Therefore, no AMR is required.

2.3.4.12.2 Staff Evaluation

The staff reviewed Section of the LRA to determine whether there is reasonable assurance that the applicant appropriately identified the main turbine lube oil and purification system SCs that are within the scope of license renewal in accordance with 10 CFR 54.4 and subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the text and diagrams submitted by the applicant in Section 2.3.4.12 of the LRA to determine if the applicant adequately identified the SSCs of the main turbine lube oil and purification system that are in the scope of license renewal. The staff verified that those portions of the main turbine lube oil and purification system that meet the scoping requirements of 10 CFR 54.4 are included within the scope of license renewal, and are identified as such by the applicant in Section 2.3.4.12 of the LRA. The staff then focused its review on those portions of the main turbine lube oil and purification system that were not identified as within the scope of license renewal to verify that they do not meet the scoping requirements of 10 CFR 54.4. The staff also reviewed the UFSAR to determine if there were any additional system functions that were not identified in the LRA, and verified that those additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff found no omissions by the applicant, therefore, there is reasonable assurance that the applicant adequately identified all portions of the main turbine lube oil and purification system that should be included within the scope of license renewal in accordance with 10 CFR Part 54.4.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the feedwater pump hydraulic oil system that are identified as within the scope of license renewal. The applicant identified that no AMR is required using the screening methodology described in Section 2.1 of the LRA. This is a result of system design where an operational loss of pressure in the hydraulic oil system or a failure of the pressure boundary of within scope components will produce a turbine trip signal which is the intended function of the system. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER. The staff performed its review by

sampling the SCs that the applicant determines as within the scope of license renewal but not subject to AMR to verify that these SCs performed its intended functions with moving parts or with a change in configuration or properties or were subject to replacement based on qualified life or specified time period.

The applicant identified the portions of the main turbine lube oil and purification system that are within the scope of license renewal in the drawings referenced in the LRA. The detailed flow diagrams were highlighted to identify those portions of the system that are within the scope of license renewal. The applicant highlighted those components which they believe perform at least one of the scoping requirements of 10 CFR 54.4. The staff sampled portions of the flow diagram that were not highlighted to verify that these components did not meet any the scoping criteria in 10 CFR 54.4. The staff did not identify any omissions.

2.3.4.12.3 Conclusions

On the basis of its review of the information contained in Section 2.3.4.12 of the LRA, as described above, no omissions by the applicant were identified. The staff concludes that there is reasonable assurance that the applicant adequately identified those portions of the main turbine lube oil and purification system that are within the scope of license renewal, and subject to an AMR in accordance with 10 CFR 54.4(a), and 10 CFR 54.21(a)(1), respectively.

2.4 Scoping and Screening Results: Structures

2.4.1 Reactor Buildings

The reactor buildings include the concrete shield building, steel containment, and reactor building internal structures. The descriptions provided in the LRA are generically applicable to both McGuire and Catawba, except where differences are stated.

2.4.1.1 Concrete Shield Building

In the LRA, the applicant described the components of the concrete shield building for Catawba and McGuire that are within the scope of license renewal and subject to an AMR. The concrete shield building is further described in Section 3.8.1 of both the Catawba and McGuire UFSARs. The staff reviewed sections of the LRA and UFSARs pertaining to the concrete shield building to determine whether there is reasonable assurance that the applicant has identified and listed the structures and components subject to AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.4.1.1.1 Technical Information in the Application

The applicant described its methodology for identifying structures and components that are within the scope of license renewal in Section 2.0 of the LRA and the applicant states that the methodology is generically applicable to both McGuire and Catawba. Section 2.1.1.1.2, “Safety Related Structures,” specifically describes the applicant’s methods for identifying structures within the scope of license renewal that satisfy criteria in 10 CFR 54.4(a)(1). The applicant list the structures within the scope of license renewal for McGuire in Table 2.2-1 and for Catawba in Table 2.2-2. Structures identified as not within the scope of license renewal are listed in Tables 2.2-3 and Table 2.2-4, for McGuire and Catawba, respectively. Based on the scoping methodology, the applicant, in Table 3.5-1 of the LRA includes the reactor buildings within the scope of license renewal and describes the results of its scoping methodology in Section 2.4.1 in the LRA.

The concrete shield building (“shield building”) at McGuire and Catawba is a reinforced concrete structure composed of a right cylinder with a shallow dome and flat circular foundation. The shield building is part of the containment system that ensures an acceptable upper limit of leakage of radioactive material is not exceeded under design basis events. In addition, it is designed to provide biological shielding as well as missile protection for the steel containment vessel. The annulus space between the shield building and the steel containment vessel provides control of containment external temperatures and pressures.

The applicant identified shield building structural components that require AMRs in Table 3.5-1 in the LRA. This table lists the types of structural components with their passive function(s) identified, including the AMR results with a link to the aging management programs and activities if applicable. The applicant identified the following structural components for the shield building that are subject to an AMR: dome, foundation dowels (McGuire only), foundation mat, and shell wall.

In Table 3.5-1 the applicant lists the structural components of the McGuire and Catawba shield building that are within the scope of license renewal because they fulfill one or more of the

following intended functions: (1) provides structural and/or functional support to safety-related equipment; (2) provides shelter/protection to safety-related equipment; (3) provides rated fire barrier to confine or retard a fire from spreading to or from adjacent areas of the plant; (4)serves as missile (internal or external) barrier; (5) provides structural and/or functional support to non-safety related equipment where failure of this component could directly prevent satisfactory accomplishment of any of the required safety-related functions; and (6) provides structural support and/or shelter to components relied on during certain postulated fire, anticipated transients without scram, and/or station blackout events.

As stated by the applicant, structural components of the shield building are subject to an AMR because they support equipment meeting the scoping criteria from the license renewal rule, 10 CFR Part 54.4(a)(1), (a)(2), and (a)(3), in a passive manner. As a result, they perform their intended function(s) without moving parts or without change in configuration or properties and are not subject to periodic replacement based on a qualified life or specified time limit.

2.4.1.1.2 Staff Evaluation

The NRC staff reviewed Section 2.4.1.1 of the LRA and the supporting information in Section 3.8.1 of the McGuire and Catawba UFSARs to determine whether there is reasonable assurance that the structural components of the shield building were adequately identified within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1), respectively.

The staff reviewed the structural components in Table 3.5-1 for McGuire and Catawba to determine whether any other structures associated with the shield building 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 UFSAR descriptions to ensure that all structural components of the shield buildings had been adequately identified and that they were passive, long-lived and performed their intended functions without moving parts or with a change in configuration or change in properties and were subject to replacement based on qualified life or specified time period. The staff reviewed figures 3-11, 3-12, and 3-13 of Section 3.8.1 of the Catawba UFSAR, which depicts hot, cold, and feedwater penetrations. These penetrations were not identified in Table 3.5-1 of the LRA as within the scope of license renewal.

By letter dated January 28, 2002, the staff requested, in RAIs 2.4.1-1 and 2.4.1-4, additional information relating to the shield building penetrations for Catawba and McGuire. In its response dated March 11, 2002, the applicant provided a supplement to Table 3.5-1 to adding penetrations to the scope of license renewal for the shield building. The penetrations that are being added under the shield building in Table 3.5-1 include sub-components such as anchor rings, penetrations sleeves, pipe, caps and restraint rings. These penetrations perform the following intended functions:

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

The staff finds the addition of the shield building penetrations to be acceptable because these components are passive, long-lived and perform their intended functions without moving parts or without a change in configuration or change in properties and are not subject to replacement based on qualified life or specified time period. The staff's evaluation of the AMR results is documented in Section 3.5.1.2.1 of this SER.

During its review of the UFSAR the staff noted that the shield building included a three foot thick removable concrete cover mounted on a track that covers the equipment hatch during operations. By letter dated January 28, 2002, the staff requested, in RAI 2.4.1-3, the applicant to explain why the concrete covers were not included within the scope of license renewal and subject to an AMR. In its response dated March 11, 2002, the applicant stated that the concrete cover described in the UFSAR is equipment hatch missile shield and that it is within the scope of license renewal and subject to an AMR. The applicant stated that the tracks and other supporting structures also were within scope and subjected to an AMR. The missile shield is listed in Table 3.5-1 under the Reactor Building Interior Structural Components; the tracks and other supporting structures are included with structural steel beams, plates, etc., in Table 3.5-1 under the Reactor Building Interior Structural Components. The staff noted that, since LRA Section 2.4.1.1, Concrete Shield Building, did not provide a reference to Section 2.4.1.3, Reactor Building Interior Structural Components, it was not clear that these exterior components were covered within the LRA. However, the staff reviewed this portion of Table 3.5-1 and verified that the components of concern were included within the scope as indicated within the applicant's RAI response. Since the applicant indicated that the structures of concern were within scope and listed in the AMR results tables, the staff finds the applicant's clarification concerning the concrete cover, rails, and associated supports to be acceptable.

The NRC staff reviewed the LRA, supporting information in the UFSARs, and the applicant's response to the staff's RAI. In addition, the staff sampled several components from Table 3.5-1, Table 2.2-3 and Table 2.2-4 to determine whether the applicant properly identified the components that are within the scope of license renewal and subject to an AMR. No omissions were identified.

2.4.1.1.3 Conclusions

On the basis of this review, the staff finds that there is reasonable assurance that the applicant has adequately identified SCs of the concrete shield building that are within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4(a) and 54.21(a)(1), respectively.

2.4.1.2 Steel Containment

In LRA Section 2.4.1.2, "Steel Containment," the applicant described the structures and components of the steel containment that serves as the primary containment and surrounds the reactor coolant system. The steel containment is further described in section 3.8.2, "Steel Containment," within both the Catawba and McGuire UFSARs. The staff reviewed sections of the LRA and UFSARs pertaining to the steel containment to determine whether there is reasonable assurance that the applicant has identified and listed the structures and components subject to AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.4.1.2.1 Technical Information in the Application

The applicant described its methodology for identifying structures and components that are within the scope of license renewal in Section 2.0 of the LRA and the applicant states that the methodology is generically applicable to both McGuire and Catawba. Section 2.1.1.1.2, "Safety Related Structures," specifically describes the applicant's methods for identifying structures within the scope of license renewal that satisfy criteria in 10 CFR 54.4(a)(1). The applicant list the structures within the scope of license renewal for McGuire in Table 2.2-1 and for Catawba in Table 2.2-2. Structures identified as not within the scope of license renewal are listed in Tables 2.2-3 and Table 2.2-4, for McGuire and Catawba, respectively. Based on the scoping methodology, the applicant, in Table 3.5-1 of the LRA identifies the steel containment as within the scope of license renewal and lists the results of its scoping methodology in Table 3.5-1 of the LRA.

The steel containment at Catawba and McGuire is a freestanding welded seismic Category I structure with a vertical cylinder, hemispherical dome, and flat base. The primary containment is anchored to the shield building foundation by means of anchor bolts around the circumference of the cylinder base. The base of the steel containment is a liner plate encased in and anchored to the shield building foundation. The base liner plate functions as a leak-tight membrane and does not provide structural support to the steel containment. The applicant lists the structures and components of the steel containment in Table 3.5-1 that are within the scope of license renewal because they provide pressure boundary and/or fission product barrier.

In Table 3.5-1 of the LRA, the applicant identifies the component types for the steel containment that require an AMR. This table lists the structural components with their passive function identified and its AMR results. The applicant has identified the following structural components for the steel containment that are subject to an AMR: bellows (penetrations), electrical penetrations, equipment hatch, fuel transfer tube penetration, mechanical penetrations, personnel air locks, and the steel containment vessel.

On the basis of the above-described methodology, the applicant identified the structures and components that are part of the steel containment and identified the intended functions of the SCs that are subject to an AMR in Table 3.5-1 of the LRA. As stated by the applicant, SCs of the steel containment are subject to AMR because the steel containment is a Seismic Category I structure. All Category I structures are within the scope of license renewal because they ensure the health and safety of the public and supports or protects safety related equipment in a passive manner. As a result, they perform their intended function without moving parts or without change in configuration or properties, and are not subject to periodic replacement based on a qualified life or specified time limit.

2.4.1.2.2 Staff Evaluation

The NRC staff reviewed Section 2.4.1.2 of the LRA and the supporting documentation in Section 3.8.2 of the McGuire and Catawba UFSARs to determine whether there is reasonable assurance that the SCs of the steel containment were adequately identified within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1), respectively.

The staff reviewed the structural components in Table 3.5-1 for McGuire and Catawba to determine whether any other structures associated with the steel containment 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 UFSAR descriptions to ensure that all SCs of the steel containment had been adequately identified and that they were passive, long-lived and performed their intended functions without moving parts or with a change in configuration or change in properties and were not subject to replacement based on qualified life or specified time period. The staff reviewed Section 3.8.2.1 of the McGuire and Catawba UFSARs, which lists the containment penetrations. The staff found that SCs such as seals on personnel locks, penetration sleeves, the purge penetration, double compressible seals, and bolted flanges were not included in Section 2.4.1.2 nor Table 3.5-1 as within the scope of license renewal. By letter dated January 28, 2002, the staff requested, in RAI2.4.1-5, additional information relating to the above mentioned steel containment SCs for Catawba and McGuire. In its response dated March 11, 2002, the applicant indicated that the SCs in question were sub-components of other structures and components or included within the component type listed in Table 3.5-1. The SCs were part of items such as personnel air locks, steel containment penetrations, equipment hatch, fuel transfer penetration, and the purge penetration was included within the component type of mechanical penetrations listed in Table 3.5-1. The applicant indicated that these SCs, being sub-components of SCs within the scope of license renewal, and their aging effects, were managed in accordance with the Containment Leak Rate Testing Program identified in Appendix B of the LRA. The staff finds the applicants response to be acceptable, since the sub-components are within the scope and subject to an AMR in accordance with 10 CFR 54.21(a)(1).

The NRC reviewed the LRA, supporting information in the UFSARs, and the applicants response to the staff's RAI. The staff examined the structures and components in Table 3.5-1 of the LRA to determine whether they are the only SCs that are subject to an AMR in accordance with 10 CFR 54.21(a)(1). On the basis of the above review, the staff did not find omissions by the applicant.

2.4.1.2.3 Conclusion

On the basis of its review of the information submitted by the applicant in the LRA and supporting information in the Catawba and McGuire UFSAR as described above, the staff did not identify any omissions by the applicant. Therefore, the staff finds that there is reasonable assurance that the applicant has adequately identified the SCs of the steel containment that are within the scope of license renewal and subject to an AMR, in accordance with 10 CFR 54.4(a) and 54.21(a)(1), respectively.

2.4.1.3 Reactor Building Internal Structures

In LRA Section 2.4.1.3, "Reactor Building Internal Structures," the applicant described the structures and components within the steel containment that surrounds the reactor coolant system. The internal structures are further described in section 3.8.3, "Concrete and Structural Steel Internal Structures of the Steel Containment, 6.2.2, "Ice Condenser System," within the McGuire UFSAR, and Section 3.8.3 and 6.7, "Ice Condenser System of the Catawba UFSAR. The staff reviewed sections of the LRA and UFSARs pertaining to these internal structures to determine whether there is reasonable assurance that the applicant has identified and listed the structures and components subject to AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.4.1.3.1 Technical Information in the Application

The applicant described its methodology for identifying the reactor building internal structures that are within the scope of license renewal in Section 2.0 of the LRA and the applicant states that the methodology is generically applicable to both McGuire and Catawba. Section 2.1.1.1.2, "Safety Related Structures," further describes the applicant's methods for identifying structures within the scope of license renewal that satisfy criteria in 10 CFR 54.4(a)(1). The applicant list the structures within the scope of license renewal for McGuire in Table 2.2-1 and for Catawba in Table 2.2-2. Structures identified as not within the scope of license renewal are listed in Tables 2.2-3 and Table 2.2-4, for McGuire and Catawba, respectively. Based on the scoping methodology, the applicant, in Table 3.5-1 of the LRA identifies the reactor building internal structures that are within the scope of license renewal and lists the results of its scoping methodology in the table.

The internal structures are comprised of a variety of reinforced concrete and structural steel structures. The internal structures enclose the reactor coolant system and provide biological shielding and acts as the pressure boundary for the lower, intermediate, and upper volumes of the steel containment interior. These structures also provide structural and/or function support for all major equipment, components, and systems located within the steel containment. The internal structures are supported by the shield building foundation. The applicant lists the internal structures within Table 3.5-1 under Ice Condenser Components and Reactor Building Interior Structural Components that are within the scope of license renewal because they fulfill one or more of the following intended functions:

- provide pressure boundary and/or fission product barrier
- provide structural and/or functional support to safety-related equipment
- provide shelter/protection to safety-related equipment
- provide rated fire barrier to confine or retard a fire from spreading to or from adjacent areas of the plant
- serve as missile (internal or external) barrier
- provide structural and/or functional support to non-safety related equipment where failure of this component could directly prevent satisfactory accomplishment of any of the safety-related functions
- provide a protective barrier for internal/external flood event
- provide heat sink during SBO or design basis accidents
- provide structural support and/or shelter to components relied on during certain postulated fire, anticipated transients without scram, and/or station blackout events

In the LRA, Table 3.5-1, the applicant identifies the component types for the internal structures that require an AMR. This table lists the SCs with their passive function identified and their AMR results. The applicant has identified SCs of the internal structures that are subject to AMR such as ice baskets, lower support structure, wear slab, anchorage, flood curbs, equipment pads, embedments, hatches, missile shields, pressure seals and gaskets, reinforced concrete beams, structural steel beams, sumps, and trusses.

On the basis of the above-described methodology, the applicant identified the structures and components that are part of the reactor building interior structural components and identified the intended functions of the SCs that are subject to an AMR in Table 3.5-1 in the LRA. As indicated by the applicant in Table 3.5-1, SCs of the internal structures are subject to AMR because they provide structural or functional support to safety-related equipment or equipment meeting 10 CFR 54.4(a)(2) or (3) in a passive manner. As a result, they perform their intended

function without moving parts or without change in configuration or properties, and are not subject to periodic replacement based on a qualified life or specified time limit.

2.4.1.3.2 Staff Evaluation

The NRC staff reviewed Section 2.4.1.3 in the LRA and the supporting information in Sections 3.8.3 of the Catawba and McGuire UFSAR, Section 6.2.2 and Section 6.7 of the McGuire and Catawba UFSARs to determine whether there is reasonable assurance that the SCs of the reactor building internal structures were adequately identified within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.21(a)(1).

The staff reviewed the component types in Table 3.5-1 (e.g., sump liner, sump screens, embedment, checkered plate, anchorage, flood curbs, speciality doors, ice baskets, lower support structure, pressure seals and gaskets, fuel transfer canal liner plate, reinforced concrete beams, slabs, walls, and steel beams) to determine whether there were any other components associated with the reactor building internal structures and ice condenser that meet the scoping criteria of 10 CFR 54.4(a), but were not included within the scope of license renewal. The staff reviewed Section 2.4.1.3 of the LRA and the relevant portions of the Catawba and McGuire UFSARs. The staff also examined the component types listed in Table 3.5-1 in the LRA to determine whether they are the only SCs that are subject to an AMR in accordance with 10 CFR 54.21(a)(1). On the basis of the above review, the staff did not find any omissions by the applicant.

2.4.1.3.3 Conclusion

On the basis of its review of the information submitted by the applicant in the LRA and supporting information in the Catawba and McGuire UFSAR as described above, the staff did not identify any omissions by the applicant. Therefore, the staff finds that there is reasonable assurance that the applicant has adequately identified the SCs of the reactor building internal structures, which include the ice condensers, that are within the scope of license renewal and subject to an AMR, in accordance with 10 CFR 54.4(a) and 54.21(a)(1), respectively.

2.4.2 Other Structures

Other structures are a collection of buildings and structures that house equipment necessary for the safe operation of the plant. In Section 2.4.2, “Other Structures,” of the LRA, the applicant identified the following structures as within the scope of license renewal:

- Auxiliary Building
- Condenser Cooling Water Intake Structure
- Nuclear Service Water Structures
- Standby Nuclear Service Water Pond Dam
- Standby Shutdown Facility
- Turbine Building (including Service Building)
- Unit Vent Stack
- Yard Structures

At both McGuire and Catawba, each of the above buildings and structures is similar in design and essentially performs the same function unless noted otherwise.

2.4.2.1 Auxiliary Buildings

In Section 2.4.2.1, “Auxiliary Buildings,“ of the LRA, the applicant described the structures in the boundary of auxiliary building and identified the structures and components that are within the scope of license renewal and subject to an AMR for both McGuire and Catawba. These structures are further described in Section 3.8.4.1 of the McGuire UFSAR and Section 3.8.4 of the Catawba UFSAR.

2.4.2.1.1 Technical Information in the Application

As described in Section 2.4.2.1 of the LRA, each plant has one auxiliary building, which is a seismic Category I reinforced concrete structure. The auxiliary building is shared by both reactor units. It houses the nuclear steam supply system equipment, electrical equipment, control building, fuel pools, and diesel generator related piping and cabling. The auxiliary building is integrally connected with the spent fuel building and main steam doghouse and is linked with the diesel generator building by cable tunnels. In the LRA, the control building, diesel generator building, fuel building, ground water drainage system, main steam doghouse, and the upper head injection (UHI) tank building are within the boundary of the auxiliary building for license renewal because they are either contained within, or attached to, the auxiliary building.

At both McGuire and Catawba, the control building is a part of the auxiliary building that houses the control room, battery room, and cable room. The control building is a seismic Category I reinforced concrete frame structure that is supported by a reinforced concrete mat foundation on rock and/or fill concrete. A frame structure is the structure that is connected by continuous rigid reinforced concrete beams, columns, walls, floor slabs, and roof slab.

The diesel generator buildings are the free-standing seismic Category I reinforced concrete structures. Each plant has two diesel generator buildings, each one houses two diesel generators which is separated by a reinforced concrete partition wall. The diesel generator building is supported by a reinforced concrete mat foundation on rock and/or fill concrete. Major portions of the diesel generator buildings are below grade. There are various equipment trenches, pits, and sumps at the base of the diesel generator buildings.

The fuel buildings are the seismic Category I reinforced concrete structures that provide storage for the new fuel and spent fuel. The spent fuel building houses the spent fuel pool and the cask handling area. A 125-ton bridge crane is provided for the fuel cask handling. Each spent fuel pool has 4-ft thick reinforced concrete walls lined with stainless steel liner plates. The upending canal can be de-watered independent of the main pool. The roof of the spent fuel pool is designed for missile protection. At McGuire, the reinforced concrete structure encloses the spent fuel pool with the north end opens to the cask handling area and new fuel storage vault. At Catawba, the spent fuel building encloses the pool with the east end opens to the new fuel building which is a seismic Category I reinforced concrete structure.

The groundwater drainage system maintains normal groundwater level near the base of the auxiliary building and diesel generator buildings. The groundwater drainage system is an integral part of the building foundation that consists of a grid of collecting trenches below the foundation surround on all sides by concrete, fill concrete, or rock. These groundwater under-drain systems are further described in Section 2.4.13 of both the McGuire UFSAR and the

Catawba UFSAR. Three groundwater sumps are provided along the perimeter of the auxiliary building for collecting groundwater.

The main steam doghouses are seismic Category I reinforced concrete structures that house the high-pressure main steam and feed-water piping. Each reactor unit has one inside doghouse, one outside doghouse, and an UHI tank building. At Catawba, the inside doghouse and outside doghouse are located on the opposite sides of their respective reactor buildings. The inside doghouse is cast integrally with the auxiliary building and is free standing above a certain elevation. The outside doghouse is cast integrally with the UHI tank building, which houses the UPI tank and its components. The outside doghouse and the UHI tank building are separated by a reinforced concrete wall and are supported by a single mat foundation on rock and/or fill concrete. The Catawba UHI tank was originally designed to store the water to be used for removing decay heat from reactor core after a design basis event. This system has been functionally disabled. However, other systems contained within the UHI tank building, such as portions of the hydrogen bulk storage, are within the scope of license renewal. Therefore, the UHI tank building at Catawba is within the scope of license renewal. The LRA does not address the UHI tank building for McGuire.

The applicant identified the buildings and structures within the scope of license renewal in Table 2.2-1 of the LRA for McGuire and in Table 2.2-2 of the LRA for Catawba. The applicant listed structural component types, component intended functions, and their construction materials in Table 3.5-2 of the LRA as the results of AMR for these buildings. These structural components listed in the table meet the intent of 10 CFR 54.4(a) for license renewal because they perform one or more of the intended functions specified in the table. They also meet the criteria of 10 CFR 54.21(a)(1) because they are passive and long-lived components.

2.4.2.1.2 Staff Evaluation

The staff reviewed Section 2.4.2.1 of the LRA and each plant's UFSAR to determine whether the applicant has adequately implemented its methodologies as described in Section 2.1 of the LRA such that there is reasonable assurance that the structural components and commodities within the boundary of the auxiliary building have been properly identified as within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4 and 10 CFR 54.21, respectively. After completing its initial review, the staff determined that additional information was needed to complete its review.

By letter dated January 28, 2002, the staff requested, in RAI 2.4.2-1, general and detailed structural drawings that would depict the structures addressed in Section 2.4.2 of the LRA. The applicant provided general arrangement plot plans to the staff, and the staff found these drawings to be sufficient to support the staff's review. In a February 21, 2002, conference call (summarized by memorandum dated March 6, 2002) the staff recast RAI 2.4.1-1 to refer to general drawings only, since detailed drawings were requested in RAI 2.4.1-12. In its response to RAI 2.4.1-1, dated March 11, 2002, the applicant referenced the drawings it had provided to the staff, specifically:

- CN-1003-10, Catawba Nuclear Station, Plot Plan, General Arrangement
- MC-1003-1, McGuire Nuclear Station, Plot Plan, General Arrangement
- Figure 1 from CNS-1139.00-00-0004, titled "Auxiliary Building Structures Plan of Component Structures"

• Figure 1 from MCS-1154.00-00-0004, titled “Auxiliary Building Structures Plan of Component Structures”

Because the applicant identified these drawings as classified commercial information related to the physical protection of McGuire and Catawba nuclear stations, the drawings were not attached to the applicant’s response and are not accessible by the public. Since the applicant’s drawings were sufficient to support the staff’s review, the she staff found the applicant’s response to RAI 2.4.1-1 acceptable.

Section 2.4.2.1 of the LRA states that the groundwater drainage system is provided for the auxiliary building and diesel generator building to maintain normal groundwater level near the base of these structures. However, the applicant did not address whether the foundation mat and the lower portion of the walls have expansion joints, water-stops or waterproofing membranes (or elastomer components, if any), that can prevent groundwater in-leakage into the concrete construction joints. By letter dated January 28, 2002, the staff requested, in RAI 2.4.2-3, the applicant to provide additional information on structural sealant or elastomer components for the below-grade construction joints. The staff asked whether the water-stops and the components of the under-drain groundwater system should be included in Table 3.5-2 of the LRA for an AMR.

In its response dated March 11, 2002, the applicant stated that water-stops are provided in the below-grade sections of the structures. Water-stops are addressed in Section 2.1.2.2 of the LRA. However, water-stops are not uniquely identified in the LRA. They are the sub-components of foundation or wall and are addressed with the foundation or wall within which the water-stops are located. The foundations and walls are within the scope and subject to an AMR for license renewal, as are the sub-components. The staff finds the applicant’s response acceptable because the components in concern were included in the scope and subject to an AMR for license renewal.

Section 2.4.2.1 of the LRA states that the main steam doghouses and UPI tank building are within the scope of license renewal. However, the applicant did not describe these structures and Table 3.5-2 of the LRA does not define which of the components in the table are applicable to these structures. By letter dated January 28, 2002, the staff requested, in RAI 2.4.2-4, that the applicant provide additional information for the main steam doghouse and UHI tank building.

In its response, the applicant stated that the components listed in Tables 3.5-2 and 3.5-3 of the LRA are applicable to the main steam doghouse and UHI tank building unless noted otherwise. For example, equipment pads identified in the table are the components for all the structures, including the main steam doghouse and UHI tank building. For completeness, the applicant identified the following components and commodities for the main steam doghouse and UHI tank building: equipment pads, fire walls, foundations, hatches, reinforced concrete beams, columns, floor slabs, and walls, roof slabs, anchorage, checkered plate, embedment, expansion anchors, fire doors, structural steel beams, columns, steel plates and trusses, fire barrier penetration seals, cable tray and conduit supports, electrical and instrument panels and enclosures, equipment component supports, HVAC duct supports, instrument line supports, instrument racks and frames, pipe supports, stair, platform, and grating supports. The staff finds the applicant’s response acceptable because the applicant identified the components within the structures (main steam doghouse and UHI tank building), and the staff verified that these components are included in the LRA tables.

Table 2.2-1 of the LRA does not identify a UHI tank building for McGuire. The staff asked the NRC's scoping and screening inspection team to verify why the McGuire UHI tank building was not in scope. As is documented in NRC Inspection Report 50-369/02-05, 50-370/02-05, 50-413/02-05 and 50-414/02-05, issued May 6, 2002 (ML021280003), the applicant provided McGuire design drawings MC-1204-2-A and MC-1204-3-A (general arrangement plan for the auxiliary building) to the inspector for review. These drawings indicated that the UHI tanks are located in the McGuire auxiliary building, not in a separate building. The drawings depicted the UHI tanks as an "accumulator water tank" and an "accumulator gas tank." To demonstrate that these tanks were associated with the UHI system, the applicant furnished an excerpt from the fire hazards analysis pertaining to fire area 21, which linked the accumulator water and gas tanks to the UHI system. Based on the scoping and screening inspection, the staff confirmed that the UHI tank building is in scope only for Catawba because this building does not exist at the McGuire plant site.

The staff has completed its review of the information presented in Section 2.4.2.1 of the LRA, the supporting information in each plant's UFSAR, the applicant's response to RAIs, and the drawings referenced in the SER section. As a result of its review, the staff did not identify any omissions by the applicant related to scoping the structures for license renewal as defined under 10 CFR 54.4(a). The staff also found that all the components and commodities in scope were subject to an AMR because the applicable intended functions are performed 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.

2.4.2.1.3 Conclusions

On the basis of this review, the staff concludes that there is reasonable assurance that the applicant has adequately identified those structures in the boundary of the auxiliary building that are within the scope of license renewal and their associated components and commodities that are subject to an AMR, in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.4.2.2 Condenser Cooling Water Intake Structure

In Section 2.4.2.2, "Condenser Cooling Water Intake Structure," of the LRA, the applicant described the condenser cooling water intake structure and identified the structural components and commodities that are within the scope of license renewal and subject to an AMR.

2.4.2.2.1 Technical Information in the Application

At McGuire, the condenser cooling water intake structure houses three main fire pumps which are relied on during certain postulated fire event in compliance with 10 CFR 50.48 for fire protection. The condenser cooling water intake structure is a seismic Category III structure that is constructed of carbon steel and reinforced concrete. Seismic Category III structure is not designed to withstand design basis seismic loadings. The applicant determined that the fire pump rooms at east and west sides of the condenser cooling water intake structure are the only portions of the intake structure that are within the scope of license renewal, because they have the safety function for fire protection.

At Catawba, the low pressure service water intake structure houses the components of the conventional low pressure service water system and fire pumps. The applicant determined that only the portion of the structure that supports the fire pumps is within the scope of license renewal. The low pressure service water intake structure is included in the yard structures for license renewal.

The structural components, component intended functions, and material of construction listed in Table 3.5-2 of the LRA are applicable to the condenser cooling water intake structure.

2.4.2.2.2 Staff Evaluation

The staff reviewed Section 2.4.2.2 of the LRA and each plant's UFSAR to determine if there is reasonable assurance that the applicant has properly identified the structures and listed the components of the condenser cooling water intake structure for each plant to meet the requirements of 10 CFR 54.21(a)(1). After completing its initial review, the staff determined that additional information was needed to complete its review.

Section 2.4.2.2 of the LRA states that the McGuire condenser cooling water intake structure is a Category III structure and the fire pump rooms are the only parts of the intake structure that are within the scope of license renewal. However, there is insufficient information in the LRA regarding the structural components that house and support the fire pumps. By letter dated January 28, 2002, the staff requested, in RAI 2.4.2-5, the applicant to provide additional information on the components listed in Table 3.5-2 of the LRA that are applicable to the fire pump rooms.

In its response dated March 11, 2002, the applicant stated that the condenser cooling water intake structure provides structural support to the three main fire pumps, which perform a function that is required by the fire protection rule, 10 CFR 50.48. The fire pump rooms are located on the outermost east and west sides of the condenser cooling water intake structure. For completeness, the applicant identified the following components of the fire pump rooms subject to an AMR: foundation, foundation dowels, equipment pads, reinforced concrete beams, columns, floor slabs and walls, roof, anchorage, cable tray and conduit and their supports, electrical and instrument panels and their enclosures, embedment, expansion anchors, and pipe supports. The staff reviewed Tables 3.5-2 and 3.5-3 of the LRA and found that these components were listed therein.

Section 2.4.2.2 of the LRA states that the fire pumps at Catawba are supported by the low-pressure service water intake structure, which is included in the yard structures. Section 2.4.2.8, "yard structures," of the LRA states that the Catawba fire pumps and their support structure are within the scope of license renewal. However, neither LRA section describes the low-pressure service water intake structure. By letter dated January 28, 2002, the staff requested, in RAI 2.4.2-6, the applicant to describe the structure and identify the components that are subject to an AMR.

In its response dated March 11, 2002, the applicant stated that the low-pressure service water intake structure provides structural support for the components of the conventional low-pressure service water system and the fire pumps. The conventional low-pressure service water system is not within the scope of license renewal. The fire pumps are required for fire protection and are within the scope of license renewal. The applicant listed the following

components which protect and support the fire pumps: foundation, equipment pads, reinforced concrete beams, columns, floor slabs and walls, anchorage, cable tray and conduit and their supports, electric and instrument panels and their enclosures, embedment, expansion anchors, and pipe supports. The staff's review found that these components were listed in Tables 3.5-2 and 3.5-3 of the LRA.

The staff has completed its review of the applicant's submittals and did not find any omissions by the applicant related to scoping the structures of the condenser cooling water intake structure that were included in the scope of license renewal as defined in 10 CFR 54.4(a). The staff also found that all the components and commodities of the condenser cooling water intake structure in scope are subject to an AMR because they perform applicable intended function(s) without moving parts or without a change in confirguration or properties, and they are not replaced on a qualified life or specified time period.

2.4.2.2.3 Conclusions

On the basis of this review, the staff concludes that there is reasonable assurance that the applicant has adequately identified those portions of the structures in the boundary of the condenser cooling water intake structures for both McGuire and Catawba that are within the scope of license renewal, and their associated components and commodities that are subject to an AMR, in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.4.2.3 Nuclear Service Water Structures

In Section 2.4.2.3, "Nuclear Service Water Structures," of the LRA, the applicant described the nuclear service water structures and identified the structures and components that are in scope and subject to an AMR for license renewal.

2.4.2.3.1 Technical Information in the Application

At McGuire, the nuclear service water structures include both the standby nuclear service water pond intake structure and the standby nuclear service water pond discharge structure. The nuclear service water pond intake structure is a completely submerged reinforced concrete structure located at the bottom of the water pond east of the standby nuclear service water pond dam. The intake structure is designed to act as the head-wall of the nuclear service water intake pipes that provides missile protection for the pipes. The service water pond discharge structure is located at the northern portion of the water pond near the water surface. The discharge structure has a concrete head-wall that prevents erosion around the discharge pipes and has soil backfill over the stepped concrete slab that provides missile protection for the discharge pipes.

At Catawba, the nuclear service water structures include the following:

- nuclear service water and standby nuclear service water pump structure
- nuclear service water conduit manholes
- nuclear service water intake structure
- standby nuclear service water discharge structure
- standby nuclear service water intake structure
- standby nuclear service water pond outlet

The Catawba nuclear service water and standby nuclear service water pump structure is a reinforced concrete enclosure founded on solid rock. The exterior and interior walls and reinforced concrete roof are designed for missile protection. The reinforced concrete roof has hatches which are designed with fire barrier and missile barrier. There are pressure doors in the service water pump enclosure that are designed to withstand tornado suction pressure. The interior wall and some of the exterior walls of the pump enclosure are also designed as fire barriers.

The Catawba nuclear service water conduit manholes and the nuclear service water intake structure are the seismic Category I reinforced concrete structures. The nuclear service water intake structure is designed to house the nuclear service water intake pipes and is submerged in the plant intake channel. The conduit manholes are the small reinforced concrete structures that are located underground with access opening at grade level for cable installation and removal. The nuclear service water intake structure acts as an earth/silt retaining wall that provides missile protection for the intake pipe. An intake chamber and screens are provided at the pipe-end to stop fish impingement.

The Catawba standby nuclear service water discharge structures are the seismic Category I reinforced concrete head-walls. Two discharge structures are provided within the pond that provide missile protection for the discharge piping. Each discharge structure houses two standby nuclear service water discharge pipes that acts as an earth retaining wall.

The Catawba standby nuclear service water intake structures are the seismic Category I reinforced concrete box-shaped structures. The intake structure acts as an earth/silt retaining wall that holds the nuclear service water intake pipe and protects the intake pipe from missiles strike. The intake structure has an intake chamber and screens at the pipe-end to stop fish impingement.

The Catawba standby nuclear service water pond outlet is a seismic Category I structure that consists of a steel pipe located at the south abutment of the standby nuclear service water pond dam with a reinforced concrete head-wall on the pond side and a reinforced concrete end-wall on the Lake Wylie side. The head-wall is designed to prevent erosion around the steel pipe and provide support for the missile shield. The pond outlet has a weir with trash rack that are protected from missiles.

The applicant identified all the structures within the scope of license renewal in Table 2.2-1 of the LRA for McGuire and in Table 2.2-2 of the LRA for Catawba. The structural components and commodities listed in Tables 3.5-2 and 3.5-3 of the LRA an AMR are applicable to the nuclear service water structures.

2.4.2.3.2 Staff Evaluation

The staff reviewed Section 2.4.2.3 of the LRA and each plant's UFSAR to determine whether the applicant has adequately identified the structures of the nuclear service water structures for both plants that are within the scope of license renewal in accordance with 10 CFR 54.4(a), and their components and commodities that require an AMR in accordance with the requirements of 10 CFR 54.21(a)(1). After completing its initial review, the staff determined that additional information was needed to complete its review.

Section 2.4.2.3 of the LRA states that the nuclear service water structures at Catawba include several structures. It is not clear that the structures described in this section cover all the nuclear service water structures in scope. By letter dated January 28, 2002, the staff requested, in RAI 2.4.2-7, the applicant to identify all the structures that are within the scope of license renewal and the components in Table 3.5-2 of the LRA that are applicable to the nuclear service water structures.

In its response dated March 11, 2002, the applicant stated that Table 2.2-2 of the LRA lists all of the Catawba structures that are within the scope of license renewal. Table 2.2-4 of the LRA lists all of the Catawba structures that are not within the scope of license renewal. The combination of the two tables contains all the structures of Catawba. The components listed in Tables 3.5-2 and 3.5-3 of the LRA are applicable to the nuclear service water structures unless noted otherwise. For completeness, the applicant listed the following components of the nuclear service water structures subject to an AMR: anchorage, embedment, equipment pads, fire walls, foundations, hatches, manholes and covers, missile shields, reinforced concrete beams, columns, floor slabs, walls, roof slabs, cable trays and conduit supports, expansion anchors, fire doors, flood, pressure and specialty doors, HVAC duct supports, instrument line supports, instrument racks and frames, structural steel beams, columns, plates and trusses, trash rack and screens, fire barrier penetration seals, and roofing.

The staff reviewed Tables 2.2-2 and 2.2-4 of the LRA for Catawba and Tables 2.2-1 and 2.2-3 for McGuire and found that the structures within the nuclear service water structures are all identified in Section 2.4.2.3 of the LRA. Some of the components provided by the applicant are listed in Table 3.5-3 of the LRA as the component supports that will be further reviewed in Section 2.4.3 of this report. As a result of this review, the staff did not find any omissions by the applicant related to scoping the structures. The staff's review also found that all the structural components in scope were identified as being subject to an AMR because they are all passive and long-lived components.

2.4.2.3.3 Conclusions

On the basis of this review, the staff concludes that there is reasonable assurance that the applicant has adequately identified the structures and components associated with the nuclear service water structures that are within the scope of license renewal and subject to an AMR, in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.4.2.4 Standby Nuclear Service Water Pond Dam

In Section 2.4.2.4, "Standby Nuclear Service Water Pond Dam," of the LRA, the applicant described the standby nuclear service water pond dam at each plant site and identified its structures and components that are within the scope of license renewal and subject to an AMR.

2.4.2.4.1 Technical Information in the Application

At both Catawba and McGuire, the standby nuclear service water pond dam performs the same function that provides ultimate heat sink following a postulated loss of coolant accident (LOCA) or loss of Lake Norman or Lake Wylie. The standby nuclear service water pond dam is an earthen embankment that is designed as a seismic Category I structure. At each plant, the

dam impounds water within the standby nuclear service water pond to provide an alternate source of water for the standby nuclear service water system.

2.4.2.4.2 Staff Evaluation

The staff reviewed Section 2.4.2.4 of the LRA to determine if there is reasonable assurance that the components comprising the standby nuclear service water pond dam have been properly identified as within the scope of license renewal and subject to an AMR. After completing its initial review, the staff determined that additional information was needed to complete its review.

In Table 3.5-2 of the LRA, the applicant lists "earthen embankment" as the component subject to an AMR. No other components are listed in the table. By letter dated January 28, 2002, the staff requested, in RAI 2.4.2-8, the applicant to indicate if other components of the service water pond dam that may perform an intended function should be listed in the table, such as drain pipes, observation wells, and piezometers, if any.

In its response dated March 11, 2002, the applicant stated that the earthen embankment is the component of the standby nuclear service water pond dam that performs the intended function to provide ultimate heat sink following a LOCA or loss of Lake Norman or loss of Lake Wylie. Other components, such as drain pipes, observation wells, and piezometers, are not relied upon for the standby nuclear service water pond dam to perform their intended function, but are used as part of the aging management program to verify that the dam is performing the function as designed. Consequently, these components are not included in the scope of license renewal and are not subject to an AMR. However, they are included as an integral part of the standby nuclear service water pond dam inspection program as described in Appendix B.3.30 of the LRA.

The staff reviewed the information presented in Section 2.4.2.4 of the LRA and the additional information provided by the applicant in response to the staff's question. As a result of this review, the staff finds that the applicant's methodology for scoping the standby nuclear service water pond dam is acceptable because the associated components not listed in the table monitor the dam performance but do not support the intended function of the standby nuclear service water pond dam. Therefore, the staff found no omissions of structural components by the applicant that are required to be in scope and subject to an AMR for license renewal.

2.4.2.4.3 Conclusions

On the basis of this review, the staff concludes that inclusion of the structure of the standby nuclear service water pond dam in the scope of license renewal meets the criteria of 10 CFR 54.4(a) and inclusion of the earthen embankment as the component subject to an AMR meets the criteria of 10 CFR54.21(a)(1). Therefore, the staff concludes that the applicant's scoping and screening of the standby nuclear service water pond dam is acceptable.

2.4.2.5 Standby Shutdown Facility

In Section 2.4.2.5, "Standby Shutdown Facility," of the LRA, the applicant described the structure that houses the standby shutdown facility and identifies the structures and components that are within the scope of license renewal and subject to an AMR.

2.4.2.5.1 Technical Information in Application

At both McGuire and Catawba, the standby shutdown facility structure houses a dedicated diesel generator and its supporting equipment and the batteries relied on during certain postulated events. The standby shutdown system in the enclosure is used to maintain safe shutdown conditions from outside of the control room in the event of a postulated fire, sabotage, or flooding events. The standby shutdown facility structure is a steel-frame and masonry building that consists of a diesel generator room, electrical equipment room, battery room, and the shared equipment for both units. The building is a seismic Category III structure that is not designed to withstand design basis seismic loadings.

The structural components, component intended functions, and material of construction listed in Table 3.5-2 of the LRA are applicable to the standby shutdown facility structure.

2.4.2.5.2 Staff Evaluation

The staff reviewed Section 2.4.2.5 of the LRA and each plant's UFSAR to determine whether the applicant has adequately identified the structures of the standby shutdown facility that are within the scope of license renewal in accordance with 10 CFR 54.4(a), and the structural components that are subject to an AMR in accordance with 10 CFR 54.21(a)(1). After completing its initial review, the staff determined that additional information was needed to complete its review.

The standby shutdown facility structure is within the scope of license renewal because it provides shelter/protection to safety-related or non-safety-related equipment where failure of this structure could directly prevent satisfactory accomplishment of any of the safe shutdown functions. Section 2.4.2.5 of the LRA states that the standby shutdown facility structure is a steel-frame and masonry structure. However, Table 3.5-2 of the LRA only specifies "the block walls" as the components of the standby shutdown facility structure. By letter dated January 28, 2002, the staff requested, in RAI 2.4.2-9, the applicant to identify other components in the table that are applicable to the standby shutdown facility structure.

In its response dated March 11, 2002, the applicant stated that the components listed in Tables 3.5-2 and 3.5-3 of the LRA are applicable to the standby shutdown facility structure unless noted otherwise. The components of the standby shutdown facility structure subject to an AMR include anchorage, battery racks, cable tray and conduit and their supports, control boards, electrical and instrument panels and enclosures, embedment, equipment component supports, equipment pads, expansion anchors, foundation, hatches, HVAC duct supports, instrument line supports, instrument racks and frames, masonry block walls, pipe supports, reinforced concrete beams, columns, floor slabs, and roof slabs, stairs, platforms, and grating supports, and structural steel beams, columns, plates and trusses.

The staff reviewed Tables 3.5-2 and 3.5-3 of the LRA and the additional information submitted by the applicant in response to the staff's question. The staff examined the components and commodities of the standby shutdown facility structure provided by the applicant and found that all portions of the structure were identified in the LRA tables as within the scope of license renewal and subject to an AMR by the applicant. Some of the components are within the category of component supports that will be further reviewed in Section 2.4.3 of this report.

As a result of the above review, the staff did not find any omissions by the applicant related to scoping of the standby shutdown facility structure. The staff's review also found that these long-lived and passive structures and components identified as within the scope of license renewal were subject to an AMR.

2.4.2.5.3 Conclusions

On the basis of this review, the staff concludes that there is reasonable assurance that the applicant has adequately identified the standby shutdown facility structures for both McGuire and Catawba that are within the scope of license renewal, and their associated components and commodities that are subject to an AMR, in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.4.2.6 Turbine Buildings (including Service Building)

In Section 2.4.2.6, "Turbine Buildings (including Service Building)," of the LRA, the applicant described the structures of the turbine building and service building and identified the structures and components that are within the scope of license renewal and subject to an AMR.

2.4.2.6.1 Technical Information in the Application

At both McGuire and Catawba, the turbine building and service building are seismic Category III structures that are not designed to withstand design basis seismic loadings. There are two turbine buildings at each plant site (one for each unit) that house the turbine generators, condensers, feed-water heaters, pumps, and associated components and equipment. The turbine building itself is constructed of a steel frame superstructure and a reinforced concrete substructure that are supported by a mat foundation bearing on dense soil, partially weathered rock, and rock. The service building is a two-storey relatively light steel frame structure that is located between the two turbine buildings. At McGuire, the southern portion of the service building and the southwest portion of the McGuire-1 turbine building are underlaid by compacted soil and are supported on the end bearing caissons. The intended function of the turbine building (including service building) is to provide structural support and/or shelter to the components relied on during certain postulated fire, anticipated transients without scram, and/or station blackout events. The applicant determined that the turbine buildings (including service building) at each plant site are within the scope of license renewal.

The applicant listed the structural components in Table 3.5-2 of the LRA for other structures that are applicable to the turbine building and service building. The applicant specified in the table that the foundation caissons are for McGuire turbine building only and the flood, pressure, and specialty doors are applicable to both the turbine building and auxiliary building.

2.4.2.6.2 Staff Evaluation

The staff reviewed Section 2.4.2.6 of the LRA and each plant's UFSAR to determine whether the applicant has adequately identified the structures of the turbine building and service building that are within the scope of license renewal in accordance with 10 CFR 54.4(a), and their structural components that are subject to an AMR in accordance with 10 CFR 54.21(a)(1). After completing its initial review, the staff determined that additional information was needed to complete its review.

Section 2.4.2.6 of the LRA states that the turbine building (including service building) are Category III structures. However, the relationship between the turbine building and the service building is not clearly defined in the LRA. By letter dated January 28, 2002, the staff requested, in RAI 2.4.2-10, the applicant to describe these buildings and identify the components in Table 3.5-2 of the LRA that are applicable to the turbine building and service building (other than the components specified for turbine building only).

In its response dated March 11, 2002, the applicant described these structures and referred the staff to drawing MC-1003-1, which had been provided to the staff previously. Drawing MC-1003-1 shows the general arrangement of these buildings. The applicant indicated that the following components of the turbine building and service building are subject to an AMR: anchorage, cable tray and conduit and their supports, checkered plates, electrical and instrument panels and their enclosures, embedment, equipment component supports, equipment pads, expansion anchors, flood, pressure and specialty doors, flood curbs, foundations, foundation caissons (McGuire only), hatches, instrument line supports, instrument racks and frames, masonry block walls, pipe supports, reinforced concrete beams, columns, floor slabs, walls, and roofing, stair, platform, and grating supports, structural steel beams, columns, plates and trusses. The staff reviewed these structural components and commodities and found that they were listed in Table 3.5-2 and 3.5-3 of the LRA. Some of these components listed in Table 3.5-3 of the LRA are in the category of component supports that will be further reviewed in Section 2.4.3 of this report.

The staff has completed its review of the applicant's submittals and did not find any omissions by the applicant related to scoping the structures. The staff's review also found that all the structural components and commodities in scope were identified as being subject to an AMR, because they are passive and perform the applicable intended functions without moving parts or without a change of configuration or properties, and they are not replaced on a qualified life or specified time period.

2.4.2.6.3 Conclusions

On the basis of this review, the staff concludes that there is reasonable assurance that the applicant has adequately identified the structures and components associated with the turbine building and service building that are within the scope of license renewal and subject to an AMR, in accordance with 10 CFR 54.4(a) and 54.21(a)(1), respectively.

2.4.2.7 Unit Vent Stack

In Section 2.4.2.7, "Unit Vent Stack," of the LRA, the applicant described the unit vent stack and identified the structure and components that are within the scope of license renewal and subject to an AMR.

2.4.2.7.1 Technical Information in the Application

At both McGuire and Catawba, the unit vent stack is a stiffened steel cylindrical shell that is designed as a seismic Category I structure. The cylindrical shell is vertically supported by the roof of the auxiliary building roof and are latterly attached to the outside cylindrical wall of the reactor building. The unit vent stack at each reactor unit is the primary release point of gases effluent from the plant.

2.4.2.7.2 Staff Evaluation

The staff reviewed Section 2.4.2.7 of the LRA to determine if there is reasonable assurance that the applicant has properly identified the structure and components of the unit vent stack that are in scope and subject to an AMR for license renewal. The unit vent stack performs the intended function to release the filtered and unfiltered gaseous discharges. The inclusion of the structure in the scope of license renewal meets the criteria of 10 CFR54.4(a). The applicant listed "unit vent stack" in Table 3.5-2 of the LRA to represent the components subject to an AMR. The components of the unit vent stack, such as the steel cylindrical shell, vertical and lateral supports, restraints, anchorage and embedment, are not individually listed in the table. The staff's review found that the unit vent stack is unique and its components and attachments are the integral parts of the unit vent stack. Therefore, the structure, as a whole, is in scope and subject to an AMR for license renewal. Based on this review, the staff found no omissions by the applicant related to identify the structural components subject to an AMR.

2.4.2.7.3 Conclusions

On the basis of this review, the staff concludes that the applicant has properly identified the structure and components of the unit vent stack that were included within the scope of license renewal and subject to an AMR.

2.4.2.8 Yard Structures

In Section 2.4.2.8, "Yard Structures," of the LRA, the applicant described the yard structures and identified the structures and components that are within the scope of license renewal and subject to an AMR.

2.4.2.8.1 Technical Information in the Application

As described in the LRA, the following yard structures at McGuire are within the scope of license renewal:

- reactor makeup water storage tank foundation
- refueling water storage tank foundation
- refueling water storage tank missile wall
- refueling water storage tank pipe trenches
- standby shutdown facility cable trenches, and
- condenser cooling water intake structure cable trenches.

At McGuire, the refueling water storage tank foundation is a poured-in-place reinforced concrete composite structure. The foundation mat is enclosed by a free-standing reinforced concrete wall which is designed to protect the tank from missile strike. The foundation and missile wall are the seismic Category I structures. Trenches are provided throughout the plant yard to allow underground routing of cables and piping. The trenches within the scope of license renewal are constructed of reinforced concrete. The covers for the trenches are either made of reinforced concrete or steel checkered plates.

At Catawba, the following yard structures are within the scope of license renewal:

- low pressure service water intake structure
- refueling water storage tank foundation
- refueling water storage tank missile shield
- refueling water storage tank pipe trenches, and
- standby shutdown facility cable trenches

The Catawba low pressure service water intake structure is a reinforced concrete structure that provides structural support for the components of the conventional low pressure service water system and the fire pumps. As stated in Section 2.4.2.2 of the LRA, the portion of the low pressure service water intake structure that supports the fire pumps are within the scope of license renewal. The refueling water storage tank foundation and missile wall are seismic Category I structures. The tank foundation is a poured-in-place reinforced concrete mat. The tank is enclosed by a free-standing reinforced concrete wall with a height that is capable to contain all the water spilt from the tank in case of an accident.

Trenches are provided throughout the Catawba plant site to allow underground routing of cables and piping. The cable and pipe trenches are constructed of reinforced concrete and are covered with either reinforced concrete or checkered plate covers. The yard drainage system is designed to protect all safety-related structures from flooding during a local probable maximum precipitation event. The drainage system consists of catch basin inlets that are connected by corrugated metal pipes to form several networks. The catch basin inlets are constructed of angle iron and grating. The yard drainage system is within the scope of license renewal.

The structural components, component intended functions, and materials of construction listed in Table 3.5-2 of the LRA are applicable to the yard structures.

2.4.2.8.2 Staff Evaluation

The staff reviewed Section 2.4.2.8 of the LRA and each plant's UFSAR to determine whether the applicant has adequately implemented its methodologies such that there is reasonable assurance that the structures and components comprising the yard structures at each plant site have been properly identified as within the scope of license renewal and subject to an AMR. After completing its initial review, the staff determined that additional information was needed to complete its review.

Table 2.2-1 of the LRA lists the structures for McGuire and Table 2.2-2 of the LRA lists the structures for Catawba that are within the scope of license renewal. Tables 2.2-3 and 2.2-4 of the LRA list the structures not in scope for the respective plants. The staff reviewed these tables and found that the yard structures, trenches, and drainage systems described in Section 2.4.2.8 of the LRA are included in the scope of license renewal. In Table 3.5-2 of the LRA, the applicant specified that "trenches" and "yard drainage system" and "metal siding" are the components only applicable to the yard structures. By letter dated January 28, 2002, the staff requested, in RAI 2.4.2-11, the applicant to identify other components in the table that are also applicable to the yard structures.

In its response dated March 11, 2002, the applicant stated that components listed in Tables 3.5-2 and 3.5-3 of the LRA are applicable to the yard structures unless noted otherwise. For example, equipment pads identified in Table 3.5-2 are the components for all structures,

including the yard structures. The foundations for the reactor makeup water storage tank and the refueling water storage tank are listed in the table under the component type "foundations." The refueling water storage tank missile wall is listed in the table under the component type "missile shield." The components of the low pressure service water intake structure at Catawba are all listed in the table as foundations, concrete walls, floor slabs, and anchorage. The corresponding structure at McGuire for these components is the condenser cooling water intake structure. The applicant further clarified that the components for the yard structures identified in Table 3.5-3 of the LRA include cable tray and conduit and their supports, electrical and instrument supports, equipment component supports, pipe supports, stair, platform, and grating supports. Some of these components are noted in the table that they are exposed to the external (yard only) environment.

The staff reviewed the information presented in Section 2.4.2.8 of the LRA and additional information submitted by the applicant in response to the staff's questions. The staff compared the LRA descriptions and Tables 3.5-2 and 3.5-3 of the LRA with LRA Tables 2.2-1 through 2.2-4 and available drawings, to verify that the applicant included all the yard structures that meet the scoping criteria of 10 CFR54.4(a), as within the scope of license renewal. As a result of this review, the staff found no omissions by the applicant in scoping the yard structures. The staff also found no omissions for the components and commodities in Tables 3.5-2 and 3.5-3 of the LRA that are applicable to the yard structures for an AMR.

2.4.2.8.3 Conclusions

On the basis of this review, the staff concludes that there is reasonable assurance that the applicant has properly identified the structures and components of the yard structures for both plants that were within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.4.3 Component Supports

In Section 2.4.3, "Component Supports," of the LRA, the applicant described the component supports and identified the structures and components that are within the scope of license renewal and subject to an AMR.

2.4.3.1 Technical Information in the Application

At both McGuire and Catawba, the component supports are those components that provide support or enclosure for the mechanical and electrical equipment. As stated in Section 2.4.3 of the LRA, the component supports within the scope of license renewal include battery racks, cable tray and conduit, cable tray and conduit supports, control boards, crane rails, enclosures, equipment component supports, HVAC duct supports, instrument line supports, instrument racks and frames, lead shielding supports, new fuel storage racks, pipe supports, stairs, platform and grating supports, and spent fuel storage racks. These support structures are constructed of steel or stainless steel that are located in all of the buildings and structures within the scope of license renewal.

The component supports within the scope of license renewal also include Class I nuclear steam supply system (NSSS) supports. The Class I NSSS supports include reactor coolant system piping supports, pressurizer upper and lower lateral supports, reactor vessel support, control

rod drive seismic structure supports, SG vertical, lower lateral, and upper supports, and reactor coolant pump lateral and vertical support assemblies. These Class 1 component supports are further described in Section 5.5.14 of the McGuire UFSAR and Section 5.4.14 of the Catawba UFSAR.

The component types, component intended functions, and material of construction for these component supports are listed in Table 3.5-3 of the LRA. The components listed in the table meet the criteria of 10 CFR 54.21(a)(1) for an AMR, because applicable intended functions are performed 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.

2.4.3.2 Staff Evaluation

The staff reviewed Section 2.4.3 of the LRA and each plant's UFSAR to determine whether the applicant has adequately implemented its methodologies as described in Section 2.1 of the LRA such that there is reasonable assurance that the component supports have been properly identified as within the scope of license renewal and subject to an AMR, in accordance with 10 CFR 54.4 and 10 CFR 54.21, respectively. After completing its initial review, the staff determined that additional information was needed to complete its review.

During the scoping process for the structures within the scope of license renewal, the applicant identified the passive steel structural components in all buildings and structures that are within the scope of license renewal. Since many of the component supports and enclosures are made from similar materials and are located in the environment common to two or more buildings, the applicant decided to group these general structural components together for an AMR instead of addressing each of them separately in the individual structural evaluation. The applicant classified these general structural components that support or protect most plant mechanical or electrical equipment in the group of "component supports" subject to a specified AMR program. These steel structural components provide support for the safety-related and non-safety related systems, components, and equipment. The applicant lists 21 component types with their intended functions in Table 3.5-3 of the LRA that are subject to an AMR. In addition to the components described in Section 2.4.3 of the LRA, the table lists the equipment component supports in the yard and in the nuclear service water structures, electrical instrument panels, and enclosures. The table also includes the component supports and enclosures that are unique, such as spent fuel and new fuel storage racks, battery racks, control room ceiling, control boards, crane rails and girders, and NSSS supports. These components are subject to the specified AMR program.

Section 2.4.3 of the LRA states that the component supports also include Class 1 NSSS supports. Table 3.5-3 of the LRA lists "Class 1 (NSSS) supports" as the components for the Class 1 NSSS supports subject to an AMR. However, the applicant neither describes the components nor defines the boundaries of the supports that are subject to an AMR. The staff is unable to verify their components for which an AMR is required because these NSSS support assemblies are the Class 1 structures and are different in design. By letter dated January 28, 2002, the staff requested, in RAI 2.4.2-12, the applicant to described the components of the NSSS support assemblies as well as their boundaries that are within the specified AMR program.

In its response dated March 11, 2002, the applicant stated that the component types for the pressurizer supports, reactor vessel supports, SG supports, and reactor coolant pump supports are identified in Table 3.5-3 of the LRA as the Class 1 (NSSS) supports. Typically, the boundary of a NSSS component support extends from the attachment to the component through the attachment to the support structure. Lugs that are integrally attached to the component are included with the component, not the component support. The concrete floors and walls to which the component supports are anchored are addressed in Table 3.5-1 of the LRA under the reactor building interior structural components. The applicant provided additional detail on the NSSS component supports. The staff reviewed this information and each plant's UFSAR and available design drawings. The following paragraphs summarize the staff's evaluation.

Reactor coolant system (RCS) pipe supports are generally constructed of a standard support or a structural frame or combination of the two. A standard support is an assembly generally mass-produced and referred to as a catalogue item. The RCS pipe support frames are constructed of structural steel or tube shapes. The staff verified that these pipe supports are within the scope of license renewal and subject to an AMR.

The pressurizer supports consist of an upper lateral support ring and a lower lateral support frame. The upper lateral support ring is a large frame that encircles the pressurizer and is attached to the embedment anchored to the crane wall and the pressurizer enclosure wall. The lower lateral support is a frame attached to the vertical hangers. The lower lateral support frame attaches to the embedded plates that are anchored to the crane wall and the operating floor slab. The support skirt of the pressurizer is attached to a circular steel frame that is connected to the lateral support frame. The staff verified that all these support components are within the scope of license renewal and subject to an AMR.

The reactor vessel supports are the individual rectangular steel box structures. They are located beneath the two opposing cold leg nozzles and two opposing hot leg nozzles. These supports are constructed from steel plate sections and are anchored to the primary shield wall (lower reactor cavity wall). The staff verified that all the components of the reactor vessel supports are in scope and subject to an AMR for license renewal.

The CRDM seismic support is anchored in place by the seismic supports, including turnbuckles, tied rods and other components. The tie rods arrangement provides radial and rotational restraints. The seismic support platform employs numerous spacer plates, most of which fit around individual CRDM shafts. The staff verified that the CRDM seismic supports and components are in scope and subject to an AMR for license renewal.

The SG is supported by four vertical pinned-end columns, each attached to two SG support lugs, i.e., a lower lateral support (including compression bumpers) and an upper lateral restraint (including a ring band with compression snubbers). The SG support columns provide vertical support for the SGs. The support columns are attached with simple supports to the embedment, which project into the foundation mat through both the base slab and the steel containment vessel liner plate. The SG lower lateral support is a large frame structure consists of flanged sections constructed from structural steel plates that encircles the SG. The frame structure is attached to the embedment anchored to either the crane wall or the reactor cavity wall. The SG upper lateral restraint consists of a restraint ring, two snubbers, and two "A-frame" structures. The snubbers are anchored to the SG enclosure wall. The two "A-frames",

that limit movement of the restraint ring, are attached to the embedment located in either the crane wall or the SG compartment wall. The staff verified that all the components of the SG support are in scope and subject to an AMR for license renewal except the snubbers. The staff noted that the snubbers are not in scope because they are active components, but the brackets that attach the snubbers to the ring and to the building are in scope and subject to an AMR for license renewal.

Each of the reactor coolant pump supports consists of three vertical steel columns and a lateral steel frame. The steel columns provide vertical support for the reactor coolant pump (RCP) that are attached to the embedment in the foundation mat. The RCP lateral support frame is a steel rigid frame structure anchored to the crane wall. The staff verified that all the components of the RCP supports are within the scope of license renewal and subject to an AMR.

The staff has reviewed the LRA and the applicant's response to RAI 2.4.2-12 related to the component supports, including the Class 1 NSSS supports. The staff previously reviewed the other structures, including auxiliary building, turbine building, condenser cooling water intake structure, standby shutdown facility, which address the component supports and enclosures. The staff determined that the component supports listed in Table 3.5-3 of the LRA are part of the safety-related or non-safety-related systems and components or are part of the structures in scope that are common to most nuclear power plants. The staff verified that they are all in scope and subject to an AMR for license renewal because they are passive and long-lived and perform intended functions. The staff also determined that the NSSS support boundaries that are in scope include all structural support items between the NSSS components and the containment concrete structure, up to and including integral attachments on the components. All the NSSS support components are subject to an AMR with the exception of snubbers, because they are active and subject to replacement on a qualified life.

Based on its review, the staff did not identify any omissions by the applicant related to scoping and screening of the structures for the component supports (including the Class 1 NSSS supports). The staff also verified that all the structural components within the component supports were identified subject to an AMR with the exception of snubbers, which are active components that are not subject to the AMR in accordance with 10 CFR 54.21(a)(1).

2.4.3.3 Conclusions

On the basis of this review, the staff concludes that there is reasonable assurance that the applicant has adequately identified those portions of the structures and components associated with the component supports (including the Class 1 NSSS supports) for both McGuire and Catawba that are within the scope of license renewal and subject to an AMR, in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.5 Scoping and Screening Results: Electrical, Instrumentation and Control

The applicant identified electrical components (or commodities) subject to an AMR in Section 2.5, “Scoping and Screening Results: Electrical and Instrumentation and Controls,” of the LRA. The staff reviewed this section of the LRA to determine that electrical components [which are subject to an AMR, (AMR) as required by 10 CFR 54.21(a)(3)] have been identified as required by 10 CFR 54.4(a), and that all structures and components subject to an AMR have been identified, as required by 10 CFR Part 54.21(a)(i).

2.5.1 Technical Information in the Application

The applicant performed screening for electrical/I&C components in accordance with NEI 95-10, Appendix B, which identifies the following passive electrical and I&C commodity groupings (i.e., components that perform an intended function without moving parts or without a change in configuration).

- Electrical portions of electrical and I&C penetration assemblies
- High-voltage insulators
- Insulated cables and connections for power, instrumentation, and control applications, (including plug-in connectors, splices and terminal blocks)
- Phase bus (e.g., isolated-phase bus, nonsegregated-phase bus, bus duct)
- Switchyard bus
- Transmission conductors
- Uninsulated ground conductors

Other electrical and I&C commodities are active.

Based on its review, the applicant determined that the electrical components that are subject to an AMR are non-EQ insulated cables and connections for power, instrumentation and control applications (including plug-in connectors, splices and terminal blocks).

2.5.2 Staff Evaluation

Section 2.1.1 of the LRA, “Scoping Methodology,” discussed the scoping methodology as it related to the safety-related criteria in accordance with 10 CFR 54.4(a)(1), non-safety-related criteria in accordance with 10 CFR 54.4(a)(2), and the scoping criteria in accordance with 10 CFR 54.4(a)(3). Following the determination of the SSCs within the scope of license renewal the applicant implemented a process for determining which SCs, among those SSCs that were determined to be within scope of renewal, would be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

For scoping and screening of electrical and I&C systems, the applicant used the plant spaces approach, which provides efficiencies in AMR of electrical equipment located within the same plant space environment. Under this approach the applicant identified all passive long-lived electrical equipment within a specified plant space as subject to an AMR, regardless of whether these components perform any intended functions. In the subsequent AMR, the applicant would evaluate the environment of the space to determine the appropriate aging management activities for the strictures and components.

2.5.2.1 Identification of Passive Components

From the group of components consisting of all electrical components, the applicant identified the following components as passive (components that perform an intended function without moving parts or without a change in configuration):

- Electrical portion of electrical, instrumentation, and control penetration assemblies
- High-voltage insulators
- Insulated cables and connections for power, instrumentation, and control applications, (including plug-in connectors, splices and terminal blocks)
- Phase bus (e.g., isolated-phase bus, nonsegregated-phase bus, bus duct)
- Switchyard bus
- Transmission conductors
- Uninsulated ground conductors

Passive components (for which aging degradation is not readily monitored) are those that perform an intended function without moving parts or without a change in configuration or properties. As examples of passive components, 10 CFR 54.21(a)(1)(i) conveys that electrical components meeting this passive definition as including, but not limited to, electrical penetrations, cables, and connections, and as excluding, but not limited to, motors, diesel generators, pressure transmitters, pressure indicators, water level indicators, switchgears, cooling fans, transistors, batteries, breakers, relays, switches, power inverters, circuit boards, battery chargers, and power supplies.

The staff reviewed the above identified components to verify that the applicant did not omit any passive component and that they meet the above defined passive screening criteria and/or examples conveyed by 10 CFR 54.21(a)(1)(i). The staff concluded that the above identified components are consistent with the examples of passive components conveyed by 10 CFR 54.21(a)(1)(i) and are therefore considered acceptable. In addition, these components were found to be the same as the passive determinations described in NEI-95-10 (Revision 3), Appendix B, for components (or commodities) in the electrical category. The staff has reviewed these NEI determinations and concluded (1) that each component identified performs its intended function without moving parts or without a change in configuration or properties and its aging degradation is not readily monitored and (2) that these components acceptably identify passive components pursuant to 10 CFR 54.21(a)(1)(i). Therefore, the staff agrees that the above identified subgroup of electrical components represents the passive electrical components that would be required to be included in an AMR if they also meet scoping and long-lived screening criteria.

2.5.2.2 Identification of Components Not Within the Scope of License Renewal

From the above identified subgroup of passive EI&C components, the applicant in the LRA initially identified the following components as being outside the scope of license renewal.

- High-voltage insulators,
- Phase bus (e.g., isolated-phase bus, nonsegregated-phase bus, bus duct),
- Switchyard bus,
- Transmission conductors,
- Uninsulated ground conductors.

Switchyard Systems were found not to meet any of the scoping criteria of 10 CFR 54.4(a). Consequently, the passive electrical commodities of switchyard bus, transmission conductors and high-voltage insulators are not within the scope of license renewal.

The Unit Main Power System and Nonsegregated-Phase Bus in the 6.9kV Normal Auxiliary Power System were found not to meet any of the scoping criteria of 10 CFR 54.4(a). Consequently, the passive electrical commodity of phase bus is not within the scope of license renewal.

Uninsulated Ground Conductors

Section 2.5 of the LRA indicates that the passive electrical commodity of uninsulated ground conductors was found not to meet any of the scoping criteria of 10 CFR 54.4(a). Consequently, uninsulated ground conductors were considered outside the scope of license renewal. By letter dated January 17, 2002, the staff requested, in RAI 2.5-3, the applicant to clarify why uninsulated ground conductors that provide safety-related electrical systems with the capability to withstand transient conditions (e.g., electrical faults) do not meet the scoping criteria of 10 CFR 54.4(a)(1) and 10 CFR 54.4(a)(2). In its response dated March 8, 2002, the applicant stated the following:

> The non-safety-related scoping criterion of 10 CFR 54.4(a)(2) is not a function-based criterion but a failure-based criterion. To further understand this scoping criterion and how a non-safety-related system or component could be within scope, the language of this criterion is expanded in Chapter 6 of the License Renewal Electrical Handbook, EPRI 1003057, (page 6-6) as follows:
>
> > License Renewal Electrical Handbook
> > "A non-safety-related system or component is not in scope (per §54.4(a)(2)) unless its failure would:
> > • cause a loss of the integrity of the reactor coolant pressure boundary,
> > • cause a loss of the capability to shut down the reactor or the capability to maintain it in a safe shutdown condition, or cause a loss of the capability to prevent or mitigate the consequences of accidents that could result in the potential offsite exposure specified in §54.(a)(1)(iii)."
>
> This non-safety-related failure is a single failure as discussed in licensing and station design documents. Single failures are considered as part of the current licensing basis for both McGuire and Catawba. McGuire and Catawba are in conformance with licensing commitments concerning single failure as contained in Section 3.1, "Conformance with General Design Criteria" of their respective UFSARs. Criterion 17 - Electrical Power Systems is excerpted below:
>
> > UFSAR Section 3.1, Conformance with General Design Criteria Criterion 17 - Electrical Power Systems
> > "...The onsite eletrical power supplies...and the onsite electric distribution system, shall have sufficient independence, redundancy, and testability to perform their safety functions assuming a single failure...."
>
> Based on conformance with single failure criteria as outlined in both the McGuire and Catawba UFSARs, no uninsulated ground conductor failure would prevent satisfactory accomplishment of any of the safety-related functions identified in 10 CFR 54.4(a)(1)(i), (ii), or (iii). Uninsulated ground conductors do not meet the non-safety-related scoping criterion of 10 CFR 54.4(a)(2).

Because the plant conforms with single failure criteria, and because operability of the ground conductor has not been credited as part of the design basis analysis for ensuring that there is sufficient independence of redundant systems to meet single failure requirements of Criterion

17 of 10 CFR Part 50, Appendix A, the staff agrees that the uninsulated ground conductors are not within scope because a failure of these components would not prevent satisfactory completion of any of the safety-related functions identified in 10 CFR 54.4(a)(1)(i), (ii), or (iii).

Offsite System Scoping

10 CFR 54.4(a)(3) requires that all systems, structures, and components relied on in safety analyses or plant evaluations to perform a function that demonstrates compliance with the Commissions regulations for station blackout (10 CFR 50.63) be included within the scope of license renewal. 10 CFR 50.63 requires that each light-water-cooled power plant licensed to operate be able to withstand and recover from a station blackout of a specified duration. The establishment of this specified duration (or coping) can be based on plant evaluations that follow the guidance in NRC Regulatory Guide 1.155 and NUMARC 87-00. This guidance requires that the plant evaluation consider offsite system characteristics such as the expected frequency of loss of offsite power and the probable time needed to recover offsite power. Offsite systems can be relied on in plant evaluations to perform a function that demonstrates compliance with the Commission regulations for station blackout (10 CFR 50.63). Thus, pursuant to 10 CFR 54.4(a)(3), offsite systems should be included within the scope of license renewal to the extent practical.

The staff pursued offsite system scoping generically and held several public meetings on the subject. By letter dated April 1, 2002, the staff issued its position on the license renewal rule (10 CFR 54.4) as it relates to the station blackout rule (10 CFR 50.63). By letter dated January 17, 2002, the staff requested the applicant to clarify why offsite systems (which include switchyard systems, parts of the Unit Main Power system, and Nonsegregated-Phase bus in the 6.9 kV Normal Auxiliary Power System) are not relied on in safety analyses or plant evaluations to perform a function in the recovery from a station blackout. In addition, the staff requested the applicant to clarify why these offsite system components do not meet the scoping criteria of 10 CFR 54.4(a)(3).

In its response dated March 8, 2002, the applicant indicated that it had re-reviewed plant documents with emphasis on equipment related to the recovery of offsite power. Based on the results of this review, the applicant decided that components that are part of the power path for offsite power from the switchyard are within the scope of license renewal in accordance with the station blackout scoping criterion required by 10 CFR 54.4(a)(3). This power path includes portions of the power path from the unit power circuit breakers (PCBs) in the respective switchyards to the safety-related buses in each plant. The power path includes portions of (1) the switchyard systems, (2) the Unit Main Power System, and (3) the Nonsegregated-Phase bus in the 6.9 kV Normal Auxiliary Power System of each station.

Based on the results of the applicant's more recent review, the staff concludes that passive offsite system components (i.e., components included as part of switchyard, unit main power, and 6.9kV normal auxiliary power systems) have been identified by the applicant to be within the scope of license renewal. A detailed scoping evaluation for the exclusion of specific offsite system components [such as high-voltage insulators, phase bus (e.g., isolated-phase bus, nonsegregated-phase bus, bus duct), switchyard bus, transmission conductors, insulated cables and splices, etc.] was not presented in the LRA or in the applicant's March 8, 2002 response to the staff's January 17, 2002, request for additional information; thus, pursuant with the scoping methodology described in Section 2.1.1 of the LRA, passive, long-lived offsite

system components that perform a function in the recovery from a station blackout are considered within the scope of license renewal and subject to an AMR.

By letter dated June 26, 2002, the applicant submitted to the staff the results of the AMR it had performed for the passive, long-lived offsite system components that perform a function in the recovery from a station blackout and were identified by the applicant as within the scope of license renewal. Pending completion of the staff's review of this information, this issue is characterized as open item 2.5-1.

2.5.2.3 Identification of Components that are Passive but Not Long-lived

From the above identified subgroup of passive EI&C components, the applicant identified the following components as not meeting the long-lived screening criteria.

- Electrical portion of electrical, instrumentation, and control penetration assemblies,
- Insulated cables and connections (power, instrumentation, and control applications; connections include plug-in connectors, splices and terminal blocks) that are included in the McGuire and Catawba 10 CFR 50.49 EQ program.

A component that is not replaced either (i) on a specified interval based on the qualified life of the component or (ii) periodically in accordance with a specified time period, is deemed to be "long-lived," and therefore subject to an AMR.

Components subject to EQ aging requirements pursuant to 10 CFR 50.49(e)(5) are required to be replaced or refurbished at the end of their designated life. These components, pursuant to 10 CFR 50.49(e)(5), are subject to replacement based on a qualified life or specified time period. The applicant in the LRA conveyed that the above identified components are included in their 10 CFR 50.49 EQ program and subject to aging requirements of 10 CFR 50.49(e)(5). The staff, therefore, agrees that the above identified components do not meet long-lived screening criteria and are thus not subject to an AMR.

2.5.3 Conclusion

Based on its review, the staff did not find any omissions (with the exception of detailed scoping evaluation for the exclusion of specific offsite system components credited for recovery from an SBO), and therefore concludes that the applicant has identified those parts of the electrical, instrumentation, and control systems that are (a) within the scope of license renewal pursuant to §54.21(a); and (b) within scope and subject to an AMR pursuant to passive screening criteria [§54.21(a)(1)(i)] and long-lived screening criteria [§54.21(a)(1)(ii)]. Pending completion of the staff's review of the AMR results for the passive, long-lived offsite system components, provided by letter dated June 26, 2002, this issue is characterized as open item 2.5-1.