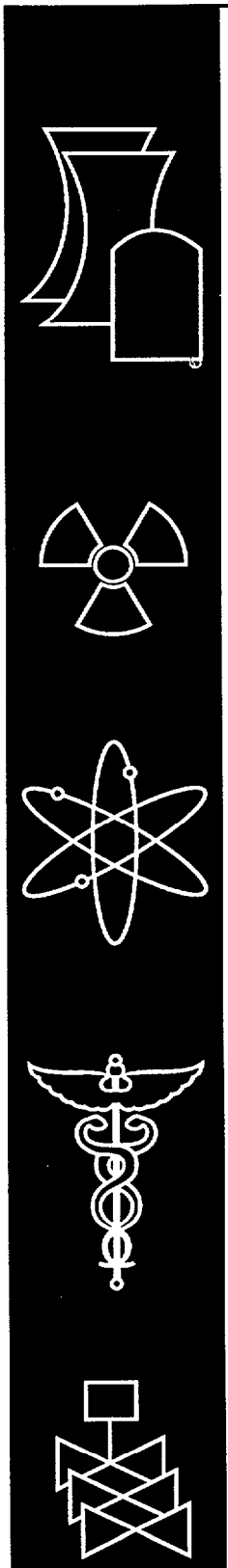

Safety Evaluation Report Related to the License Renewal of the Edwin I. Hatch Nuclear Plant, Units 1 and 2

Docket Nos. 50-321 and 50-366

U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, DC 20555-0001

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NUREG-1803

Safety Evaluation Report
Related to the License Renewal of Edwin I. Hatch Nuclear Plant Units 1 and 2

Docket Nos. 50-321 and 50-366

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Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation
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ABSTRACT

This safety evaluation report (SER) documents the technical review of the Edwin I. Hatch Nuclear Plant (Plant Hatch), Unit Nos. 1 and 2, license renewal application (LRA) by the U.S. Nuclear Regulatory Commission staff (staff). By letter dated February 29, 2000, Southern Nuclear Operating Company, Incorporated (SNC or the applicant) submitted the LRA for Plant Hatch in accordance with Title 10 of the *Code of Federal Regulations* Part 54 (10 CFR Part 54 or the Rule). SNC is requesting renewal of the operating licenses for Unit 1 and Unit 2 (license numbers DPR-57 and NPF-5) for a period of 20 years beyond the current expiration of midnight, August 6, 2014 and midnight, June 13, 2018, respectively.

The Plant Hatch site is located in Appling County, Georgia. Construction began on Unit 1 in 1969 and its operating license was issued in 1974. Construction began on Unit 2 in 1972 and its operating license was issued in 1978. Each unit consists of a General Electric (GE) boiling-water reactor (BWR) nuclear steam supply system designed to generate 2763 MW-thermal, or approximately 900 MW-electric.

This SER was issued on October 5, 2001 and presented the status of the staff's review of information submitted to the NRC through October 5, 2001. The staff identified open items that had to be resolved before it could make a determination on the application. These items and their resolutions are summarized in Section 1.4 of this report. The staffs final conclusion on the review on the Plant Hatch LRA can be found in Section 6 of this SER.

Since its issuance, the SER has been revised to provide several clarifications. These revisions are identified by status bars in the right margins.

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1 INTRODUCTION AND GENERAL DISCUSSION

1.1 Introduction

This document is an SER on the application for license renewal for the Edwin I. Hatch Nuclear Power Plant Unit Nos. 1 and 2 (Plant Hatch), as filed by Southern Nuclear Operating Company (SNC or the applicant). By a letter dated February 29, 2000, SNC submitted its application to the United States Nuclear Regulatory Commission (NRC) for renewal of the Plant Hatch operating licenses for an additional 20 years. The NRC staff (the staff) prepared this report and summarizes the results of its safety review of the renewal application for compliance with the requirements of 10 CFR Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants." The NRC license renewal project manager for the Plant Hatch license renewal review is William F. Burton. Mr. Burton may be contacted by calling 301-415-2853, or by writing to the License Renewal and Standardization Branch, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001.

In its February 29, 2000 submittal letter, the applicant requested renewal of the operating licenses issued under Section 104 and Section 103 of the Atomic Energy Act of 1954, as amended, for Unit 1 (license number DPR-57) and Unit 2 (license number NPF-5), respectively, for a period of 20 years beyond the current license expirations of midnight, August 6, 2014 for Unit 1 and midnight, June 13, 2018 for Unit 2. Plant Hatch is located in Appling County, Georgia. Construction began on Unit 1 in 1969 and its operating license was issued in 1974. Construction began on Unit 2 in 1972 and its operating license was issued in 1978. Each unit consists of a General Electric (GE) boiling-water reactor (BWR) nuclear steam supply system designed to generate 2763 MW-thermal, or approximately 900 MW-electric. Details concerning the plant and the site are found in the Updated Final Safety Analysis Reports (UFSAR) for the units.

The license renewal process proceeds along two tracks: a technical review of safety issues and an environmental review. The requirements for these reviews are stated in NRC regulations 10 CFR Parts 54 and 51, respectively. The safety review for the Plant Hatch license renewal is based on the applicant's license renewal application (LRA) and on the answers to requests for additional information (RAIs) from the staff. In meetings and docketed correspondence, the applicant has also supplemented its answers to the RAIs. Unless otherwise noted, the staff reviewed and considered information submitted through October 5, 2001. Information received after that date was reviewed on a case-by-case basis, depending on the stage of the safety review. The LRA and all pertinent information and materials, including the UFSAR mentioned above, are available to the public for review at the NRC Public Document Room, 11555 Rockville Pike, Room 1-F21, Rockville, MD, 20852-2738 (301-415-4737/800-3974209), and at the Appling County Library, 242 East Parker St., Baxley, Georgia 31513. Material related to the LRA is also available through the NRC's website, at http://www.nrc.gov/NRC/REACTOR/LR/index.html.

This SER summarizes the results of the staff's safety review of the Plant hatch LRA and delineates the scope of the technical details considered in evaluating the safety aspects of its proposed operation for an additional 20 years beyond the term of the current operating license. The LRA was reviewed in accordance with the NRC regulations and the guidance provided in

the NRC draft "Standard Review Plan for the Review of License Renewal Applications for Nuclear Power Plants, " dated September 1997 (SRP-LR).

Sections 2 through 4 of the SER address the staff's review and evaluation of license renewal issues that have been considered during the review of the application. Section 5 is reserved for the report of the Advisory Committee on Reactor Safeguards (ACRS). The conclusions of this report are in Section 6.

Appendix A of this SER is a chronology of NRC's and the applicant's principal correspondence related to the review of the application. Appendix B of this SER is a bibliography of the references used during the course of the review. Appendix C of this SER is a list of abbreviations used throughout the report. The staff's principal reviewers for this project are listed in Appendix D of this SER. Appendix E of this SER presents an index of the staff's RAIs and the applicant's responses.

Since its issuance on October 5, 2001, the SER has been revised to provide several clarifications. These revisions are identified by status bars in the right margins.

In accordance with 10 CFR Part 51, the staff prepared final plant-specific supplement to the generic environmental impact statement (GEIS) that discusses the environmental considerations related to renewing the licenses for Plant Hatch. The plant-specific supplement to the GEIS will be issued separate from this report.

1.2 License Renewal Background

Pursuant to the Atomic Energy Act of 1954, as amended, and NRC regulations, licenses for commercial power reactors to operate are issued for 40 years. These licenses can be renewed for up to 20 additional years. The original 40-year license term was selected on the basis of economic and antitrust considerations -- not by technical limitations. However, some individual plant and equipment designs may have been engineered on the basis of an expected 40-year service life.

In 1982, the NRC held a workshop on nuclear power plant aging, in anticipation of the interest in license renewal. That led the NRC to establish a comprehensive program plan for nuclear plant aging research (NPAR). On the basis of the results of that research, a technical review group concluded that many aging phenomena are readily manageable and do not pose technical issues that would preclude life extension for nuclear power plants. In 1986, the NRC published a request for comment on a policy statement that would address major policy, technical, and procedural issues related to life extension for nuclear power plants.

In 1991, the NRC published the license renewal rule in 10 CFR Part 54. The NRC participated in, and industry sponsored, demonstration programs to apply the rule to pilot plants and develop experience to establish implementation guidance. To establish a scope of review for license renewal, the rule defined age-related degradation unique to license renewal. However, during the demonstration program, the NRC found that many aging mechanisms occur and are managed during the period of initial license. In addition, the NRC found that the scope of the review did not allow sufficient credit for existing programs, particularly the implementation of the maintenance rule, which also manages plant aging phenomena. As a result, in 1995 the NRC amended the license renewal rule. The amended 10 CFR Part 54 established a regulatory

process that is expected to be simpler, more stable, and more predictable than the previous license renewal rule. In particular, 10 CFR Part 54 was clarified to focus on managing the adverse effects of aging rather than on identification of all aging mechanisms. The rule changes were intended to ensure that important systems, structures, and components (SSCs) will continue to perform their intended function in the period of extended operation. In addition, the integrated plant assessment (IPA) process was clarified and simplified to be consistent with the revised focus on passive, long-lived structures and components (SCs).

In parallel with these efforts, the NRC pursued a separate rulemaking effort, 10 CFR Part 51, to focus the scope of the review of environmental impacts of license renewal, in fulfilling NRC's responsibilities under the National Environmental Policy Act of 1969 (NEPA).

1.2.1 Safety Reviews

License renewal requirements for power reactors are based in two key principals:

(1) The regulatory process is adequate to ensure that the licensing bases of all currently operating plants provide and maintain an acceptable level of safety, with the possible exception of the detrimental effects of aging on the functionality of certain plant SSCs in the period of extended operation, and possibly a few other issues related to safety during the period of extended operation.

(2) The plant-specific licensing basis must be maintained during the renewal term in the same manner and to the same extent as during the original licensing term.

In implementing these two principles, the rule in 10 CFR 54.4 defines the scope of license renewal as those SSCs (a) that are safety-related; (b) whose failure could affect safety-related functions; and (c) that are relied on to demonstrate compliance with the NRC's regulations for fire protection, environmental qualification, pressurized thermal shock, anticipated transients without scram, and station blackout.

Pursuant to 10 CFR 54.21(a), the applicant must review all SSCs within the scope of the rule to identify SCs subject to an AMR. SCs subject to an AMR are those that perform an intended function 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. As required by 10 CFR 54.21(a), it must be demonstrated that the effects of aging will be managed in such a way that the intended function or functions of those SCs will be maintained, consistent with the current licensing basis, for the period of extended operation. Active equipment, however, is considered to be adequately monitored and maintained by existing programs. In other words, the detrimental aging effects that may occur for active equipment are more readily detectable and will be identified and corrected through routine surveillance, performance indicators, and maintenance. The surveillance and maintenance programs for active equipment, as well as other aspects of maintaining the plant design and licensing basis, are required throughout the period of extended operation. Section 54.21(d) requires that a supplement to the UFSAR contain a summary description of the programs and activities for managing the effects of aging.

Another requirement for license renewal is the identification and updating of time-limited aging analyses (TLAAs). During the design phase for a plant, certain assumptions are made about the length of time the plant will be operated and these assumptions are incorporated into desgin

calculations for several of the plant's SSCs. Under 10 CFR 54.21(c)(1), these calculations must be shown to be valid for the period of extended operation or must be projected to the end of the period of extended operation, or the applicant must demonstrate that the effects of aging on these SSCs will be adequately managed for the period of extended operation.

In 1996, the NRC developed and issued draft regulatory guide DG-1047, "Standard Format and Content for Applications to Renew Nuclear Power Plant Operating License." This guide proposes to endorse an implementation guideline prepared by the Nuclear Energy Institute (NEI) as an acceptable method of implementing the license renewal rule. The NEI guideline is NEI 95-10, "Industry Guideline for Implementing the Requirements of 10 CFR Part 54 - The License Renewal Rule," which was issued in March 1996. The NRC prepared a draft standard review plan for the safety review which was made available in the Public Document Room in September 1997. The draft regulatory guide will be used, along with the draft standard review plan, to review applications and to assess technical issue reports involved in license renewal as submitted by industry groups. As experience is gained, NRC will improve the standard review plan and clarify regulatory guidance.

1.2.2 Environmental Reviews

The environmental protection regulations, 10 CFR Part 51, were revised in December 1996 to facilitate the environmental review for license renewal. The staff prepared a GEIS, in which the staff examined the possible environmental impacts associated with renewing licenses of nuclear power plants. For certain types of environmental impacts the GEIS establishes generic findings that are applicable to all nuclear power plants. These generic findings are identified as Category 1 issues in 10 CFR Part 51, Subpart A, Appendix B. Pursuant to 10 CFR 51.53(c)(3)(i), an applicant for license renewal may incorporate these generic findings in its environmental report. Analyses of those environmental impacts that must be evaluated on a plant-specific basis, Category 2 issues, must be included in the environmental report in accordance with 10 CFR 51.53(c)(3)(ii).

In accordance with NEPA and the requirements of 10 CFR Part 51, the staff performed a plant-specific review of the environmental impacts of license renewal, including whether there was new and significant information not considered in the GEIS. A public meeting was held on May 10, 2000, in Vidalia, Georgia, as part of the NRC scoping process, to identify environmental issues specific to the plant. Results of the environmental review and a preliminary recommendation with respect to the license renewal action were documented in NRC's draft plant-specific supplement to the GEIS, which was issued by the NRC on November 3, 2000, and which was discussed at a separate public meeting held on December 12, 2000 in Vidalia, GA. After consideration of comments on the draft, NRC prepared a final plant-specific supplement to the GEIS, which was published by the NRC on May 31, 2001. These documents are published separate from this report.

1.3 Summary of Principal Review Matters

The requirements for renewing operating licenses for nuclear power plants are described in 10 CFR Part 54. The staff performed its technical review of the Plant Hatch LRA in accordance with Commission guidance and the requirements of 10 CFR 54.19, 54.21, 54.22, 54.23, and 54.25. The standards for renewing a license are contained in 10 CFR 54.29. This SER describes the results of the staff's safety review.

In 10 CFR 54.19(a), the Commission requires a license renewal applicant to submit general information. The applicant provided this general information in Section 1 of its LRA for Plant Hatch, submitted by letter dated February 29, 2000. The staff finds that the applicant has submitted the information required by 10 CFR 54.19(a) in Section 1 of the LRA.

In 10 CFR 54.19(b), the Commission requires that license renewal applications include "conforming changes to the standard indemnity agreement, 10 CFR 140.92, Appendix B, to account for the expiration term of the proposed renewed license." The applicant states the following in its LRA regarding this issue:

> "...Article VII of the original Indemnity Agreement, which was issued on August 2, 1973, along with the HNP [Plant Hatch] Materials License, provides that the Agreement will terminate at the expiration of the license identified in Item 3 of the Attachment (SNM-1378). Since August 2, 1973, the Indemnity Agreement has been amended from time to time. Two of these amendments added license numbers DPR-57 and NPF-5 to Item 3 of the Attachment. As a consequence of these amendments, the existing Indemnity Agreement is presently due to terminate at midnight, June 13, 2018, as the last of these two licenses expires. SNC requests that conforming changes be made to Item 3 of the Attachment to the Indemnity Agreement (and any other provision of the Attachment or Indemnity Agreement) to make clear that the Indemnity Agreement is extended until the expiration date of the renewed HNP operating licenses issued by the Commission in response to this application."

The staff intends to maintain the license numbers on issuance of the renewed license. Therefore, there is no need to make conforming changes to the indemnity agreement, and the requirements of 10 CFR 54.19(b) have been met.

In 10 CFR 54.21, the Commission requires that each application for a renewal license for a nuclear facility must contain the following information: (a) an IPA, (b) current licensing basis (CLB) changes during Staff review of the application, (c) an evaluation of TLAAs, and (d) an FSAR supplement. Sections 3 and 4, and Sections A and B of the LRA, address the license renewal requirements of 10 CFR 54.21(a), (c), and (d), respectively.

In 10 CFR 54.22, the Commission states requirements regarding technical specifications. The applicant addresses the requirements of 10 CFR 54.22 in Appendix E of the LRA.

The staff evaluated the technical information required by 10 CFR 54.21 and 10 CFR 54.22 in accordance with the NRC's regulations and the guidance provided by the draft SRP. The staff's evaluation of the LRA in accordance with 10 CFR 54.21 and 54.22 is contained in Sections 2, 3, and 4 of this report.

The staff's evaluation of the environmental information required by 10 CFR 54.23 will be found in the draft and final plant-specific supplements to the GEIS that state the considerations related to renewing the license for Plant Hatch. These documents will be prepared by the staff separate from this report. When the report of the Advisory Committee on Reactor Safeguards (ACRS), required by 10 CFR 54.25, is issued, it will be incorporated into Section 5 of this SER. The findings required by 10 CFR 54.29 will be placed in Section 6 of this report.

Boiling Water Reactor Vessel Internals Project (BWRVIP) Topical Reports

In accordance with 10 CFR 54.17(e), the applicant also incorporated by reference several BWRVIP topical reports into the Plant Hatch LRA. The purpose of the topical reports is to generically demonstrate that the aging effects for reactor coolant system components are adequately managed for the period of extended operation under a renewed license. Specifically, the applicant incorporated the following BWRVIP topical reports into its application:

- BWRVIP-18, "Core Spray Internals Inspection and Flaw Evaluation Guidelines," July 1996
- BWRVIP-26, "Top Guide Inspection and Flaw Evaluation Guidelines," December 1996
- BWRVIP-27, "Standby Liquid Control System/Core Plate ΔP Inspection and Flaw Evaluation Guidelines," April 1997
- BWRVIP-38, "Shroud Support Inspection and Flaw Evaluation Guidelines," September 1997
- BWRVIP-41, "BWR Jet Pump Assembly Inspection and Flaw Evaluation Guidelines," October 1997
- BWRVIP-47, "BWR Lower Plenum Inspection and Flaw Evaluation Guidelines," December 1997
- BWRVIP-48, "Vessel ID Attachment Weld Inspection and Flaw Evaluation Guidelines," March 1998
- BWRVIP-74, "BWR Reactor Pressure Vessel Inspection and Flaw Evaluation Guidelines," September 1999.
- BWRVIP-75, "Technical Basis for Revisions to Generic Letter 88-01 Inspection Schedules (NUREG-0313)," October 1999
- BWRVIP-76, "BWR Core Shroud Inspection and Flaw Evaluation Guidelines," December 1999

All the BWRVIP reports listed above have been approved by the staff, with the following exceptions:

- BWRVIP-74: The staff is finalizing its safety evaluation.
- BWRVIP-76: This BWRVIP report incorporates BWRVIP-01, -07 and -63. The staff's review of the BWRVIP-07 report is complete. The staff has issued a safety evaluation with open items for BWRVIP-63 and is presently reviewing the BWRVIP's response to these open items.

The licensee has committed to follow the BWRVIP reports as approved by the staff. The staff finds this commitment to be acceptable for aging management of the systems and components addressed in the subject BWRVIP reports.

1.4 Summary of Open Items

As a result of its review of the LRA for Plant Hatch, including additional information submitted to the NRC through January 31, 2001, the staff identified the following issues that remained open at the time this report was prepared. An issue was open if the applicant had not presented a sufficient basis for resolution. Each open item has been assigned a unique identifying number.

Item	Description
2.1.3.1-1	Non-Safety-Related Piping Systems (Seismic II-over-I)

Section 54.29 of 10 CFR Part 54 (the Rule) states that a renewed license may be issued by the Commission if the Commission finds that actions have been or will be taken with respect to the matters identified in paragraphs (a)(1) and (a)(2) of this section such that there is reasonable assurance that the activities authorized by the renewed license will continue to be conducted in accordance with the CLB, and that any changes made to the CLB in order to comply with this paragraph are in accord with the Act and the Commission's regulations. These matters include managing the effects of aging during the period of extended operation to assure the functionality of structures and components that have been identified to require review under Section 54.21(a)(1).

The Statements of Consideration (SOC) for the Rule states that the objective of a license renewal review is to determine whether the detrimental effects of aging, which could adversely affect the functionality of systems, structures, and components (SSCs) that the Commission determines require review for the period of extended operation, are adequately managed.

The SOC articulates the underlying philosophy of the Rule that during the extended period of operation, safety-related functions should be maintained in the same manner and to the same extent as during the current licensing term. Aging effects that could adversely impact on the ability of SSCs to maintain these safety-related functions during the extended period of operation should be evaluated.

Section 54.4(a)(2) of the Rule states that all non-safety-related systems, structures, and components whose failure could prevent satisfactory accomplishment of any of the functions identified in Section 54.4(a)(1) should be included within the scope of the Rule. The SOC provides additional guidance related to this scoping criterion. Specifically, the SOC states that "To limit this possibility for the scoping category relating to nonsafety-related systems, structures, and components... An applicant for license renewal should rely on the plant's CLB, actual plant-specific experience, industry-wide operating experience, as appropriate, and existing engineering evaluations to determine those nonsafety-related systems, structures, and components that are the initial

focus of the license renewal review. Consideration of hypothetical failures that could result from system interdependencies that are not part of the CLB and that have not been previously experienced is not required." (Federal Register, Volume 60, No. 88, 22467).

An applicant for license renewal should consider two configurations of non-safety-related piping systems that could potentially meet the 54.4(a)(2) scoping criterion. The first configuration includes non-safety- related piping systems (including piping segments and supports) which are connected to safety-related piping. These non-safety-related piping systems should be included within the scope of license renewal up to and including the first seismic support past the safety-related/non-safety-related interface. The second configuration involves non-safety-related piping systems which are not connected to safety-related piping, but have a spatial relationship such that their failure could adversely impact on the performance of an intended safety function. For this type of piping system, the applicant has two options when performing its scoping evaluation: a mitigative option or a preventive option. With the mitigative option, the applicant must demonstrate that plant mitigative features (e.g., pipe whip restraints, jet impingement shields, spray and drip shields, seismic supports, flood barriers, etc.) are provided which protect safety-related SSCs from failures of non-safety-related piping segments. When evaluating the failure modes of non-safety-related piping segments and the associated consequences, age-related degradation must be considered. The staff notes that pipe failure evaluations typically do not consider age-related degradation when determining pipe failure locations. Rather, pipe failure locations are normally postulated based on high stress. Industry operating experience has shown that age-related pipe failures can, and do, occur at locations other than the high-stress locations postulated in most pipe failure analyses. Therefore, to utilize the mitigative option, an applicant should demonstrate that the mitigating devices are adequate to protect safety-related SSCs from failures of non-safety-related piping segments at any location where age-related degradation is plausible. If this level of protection can be demonstrated, then only the mitigative features need to be included within the scope of license renewal, and the piping segments need not be included within the scope. However, if an applicant cannot demonstrate that the mitigative features are adequate to protect safety-related SSCs from the consequences of non-safety-related pipe failures, then the applicant should utilize the preventive option, which requires that the entire non-safety-related piping system be brought into the scope of license renewal and an AMR be performed on the components within the piping system. Finally, an applicant may determine that in order to ensure adequate protection of the safety-related SSC, a combination of mitigative features and non-safety-related SSCs must be brought within scope. Again, it is incumbent upon the applicant to provide adequate justification for the approach taken with respect to scoping of non-safety-related SSCs in accordance with the Rule.

A subset of non-safety-related piping systems that meet the 54.4(a)(2) criterion is seismic II over I (seismic II/I) piping. Seismic II/ I denotes non-seismic Category I SSCs interacting with seismic Category I SSCs as described in Position C.2 of Regulatory Guide 1.29, "Seismic Design Classification." The

SOC specifically includes seismic II/I as a subset of the 54.4(a)(2) scoping requirement. In addition, Section 2.1.III.B of the Standard Review Plan for License Renewal (September, 1997) states that "The reviewer verifies that the so-called 'seismic II over I' systems, structures, and components consistent with the plant's CLB are identified by the applicant's proposed screening methodology."

By letter dated July 28, 2000, the staff issued two requests for additional information related to seismic II/I SSCs. RAI 3.4-11 asked the applicant to clarify whether the scope of the auxiliary systems discussed in Section 3.2.4 of the LRA includes any spatially-related components and piping segments within the category of seismic II/I, and how the aging management programs discussed in Table 3.2.4 of the application also apply to seismic II/I piping components. RAI 3.6-51 stated that it was not clear to the staff whether the scope of the primary containment system discussed in Table 3.3.1-3 of the LRA includes spatially-related components and piping systems within the category of seismic II/I, and asked the applicant to clarify the scope and whether the same aging management programs discussed in LRA Table 3.3.1-3 also applied to seismic II/I piping components.

By letter dated October 10, 2000, the applicant responded to these RAIs. In response to RAI 3.4-11 the applicant stated that intended function L35-01, "Pipe Supports," captures all safety-related and non-safety-related supports for components in configurations that could potentially result in loss of function for seismic Category I components based on spatial relationships. The applicant further stated that the key to managing both seismic Category I and non-seismic Category I systems so that no impact on safety-related functions occurs, is to assure that aging effects for the supports encompassed by L35-01 are appropriately managed, and that, based on empirical evidence related to piping and pipe supports under seismic loadings, managing the aging effects associated with the pipe supports for systems not otherwise in scope is adequate to assure no loss of safety-related functions. On this basis, the applicant concluded that no AMPs are applied to piping segments that are not in scope, but are supported by seismic II/I piping supports.

In response to RAI 3.6-51, the applicant stated that LRA Table 3.3.1-3 addresses components supporting the primary containment integrity function, including safety-related and non-safety-related components inside containment, but the piping supports are included in LRA Table 3.3.1-1, "Piping Specialties."

During subsequent discussions with the staff, the applicant clarified that for the protection of safety-related SSCs, seismic II/I piping segments are seismically supported. These seismic supports are within the scope of license renewal. The applicant further clarified that design features (e.g., jet impingement shielding and pipe whip restraints) credited for mitigating the consequences of seismic II/I piping failures are also included within the scope of license renewal. However, the applicant also stated that it does not consider the seismically-supported seismic II/I piping segments to be within the scope of license renewal and no aging management programs are applied to those seismic II/I piping segments.

The applicant believes that since the seismic II/I piping is seismically supported, consideration of its failure is hypothetical.

The staff did not agree with the applicant's scoping criteria for non-safety-related piping systems. The staff's concern is that seismic II/I piping, though seismically supported, would be subjected to the same plausible aging effects as safety-related piping. For example, depending on piping material, geometrical configuration, operating conditions such as water chemistry, temperature, flow velocity, and external environment, erosion and corrosion may be plausible aging effects for some seismic II/I piping. Those effects, if not properly managed, could result in age-related failures and adversely impact the safety functions of safety-related SSCs.

The staff reviewed the UFSAR and found that the information described in the UFSAR is not adequate to support the applicant's assertions that design features would protect safety-related SSCs from the impact associated with the potential aging-related failures of seismic II/I piping such that seismic II/I piping need not be included within the scope of license renewal. As a result, the staff requested that the applicant provide additional information to address the staff's concern. This was identified as Open Item 2.1.3.1-1.

By e-mail dated 6/19/01, the applicant provided the requested information. On the basis of the information provided in the e-mail, the staff found that the Plant Hatch CLB pipe break/crack analyses mainly postulated pipe failures at specific locations (e.g., at terminal ends and high stress points). Further, the mitigative features (e.g., jet impingement shielding and pipe whip restraints), which the applicant wanted to credit as the basis for excluding seismic II/I piping from scope, assume pipe failures in locations based on the CLB pipe break/crack analyses. As described above, the primary concern for license renewal is aging-related failures. Since aging-related degradation of piping depends on piping material, geometrical configuration, water chemistry, temperature, flow velocity, and external environment, the resulting pipe failure mechanism and failure location may be different from those postulated in the Plant Hatch CLB pipe break/crack analyses, which were based on stress criteria. Therefore, the staff concluded that the applicant had not demonstrated that safety-related SSCs at Plant Hatch are adequately protected from the consequences of seismic II/I pipe failures due to potential aging-related degradation. Thus, the staff's position was that seismic II/I piping systems, including piping segments and their supports, should be included within the scope of license renewal. For these seismic II/I piping systems, the applicant should perform an aging management review to determine if there are any plausible aging effects, and identify appropriate aging management programs.

By letter dated September 5, 2001, the applicant brought all seismic II/I piping systems into the scope of license renewal, provided the results of the associated AMRs, and provided a summary of the programs and activities that will be used to manage aging in these piping systems. The staff's review of the applicant's aging management of components in these piping systems is provided in Section 3.1 of this SER. On the basis of the additional information provided by

the applicant, the staff concludes that the applicant has provided sufficient information to demonstrate that all SSCs that meet the 54.4(a)(2) scoping criterion, have been identified as being within the scope of license renewal. Open Item 2.1.3.1-1 is closed.

2.3.3.2-1 (a) In RAI-2.3.3-HR-1 and RAI-2.3.3-HR-4, the staff asked the applicant to justify its exclusion of various components (highlighted in HL-26068) from an AMR. Specifically, these components included the water separator, water spray cooler, reaction chamber, blower (C0001A), heater (B001A), and instrument tubing. The applicant responded that these components are a part of skid-mounted hydrogen recombiners, which are active components, and thus not subject to an AMR. Therefore, the applicant determined that the components are also not subject to an AMR.

In a telephone conference on September 13, 2000, the staff expressed its disagreement with the applicant's determination to exclude these components from an AMR simply because they are skid-mounted. The staff requested that the applicant provide additional justification for its position. In response, the applicant provided a paper, entitled "Active Assemblies Used in License Renewal," via an email, dated November 6, 2000.

The staff has reviewed this paper, and finds that the applicant's basis for excluding hydrogen recombiner components, as discussed in the paper, is not consistent with the License Renewal Rule. The basis for the staff's conclusion is summarized below and is described in more detail in Section 2.3.4.2 of this report discussing the emergency diesel generators.

Components are subject to an AMR if they perform a passive function and are long-lived. A passive function is one performed without moving parts or a change in configuration or properties. A function performed with moving parts or a change in configuration or properties is considered an active function. Components that perform a passive function and are also long-lived must be subject to an AMR, whether they are skid-mounted or not. The staff believes that the water separator, water spray cooler, and reaction chamber are long-lived components with a passive function, and therefore are subject to an AMR. On this basis, the staff requested that the applicant identify any applicable aging effects associated with these components, and any other long-lived components performing a passive function associated with the hydrogen recombiners, and identify AMPs credited with managing the aging effects. This was identified as part of Open Item 2.3.3.2-1 (2.3.3.2-1(a)).

By letter dated June 5, 2001, the applicant responded to this open item by identifying the following skid-mounted components that are subject to an AMR and listing these components in Table 2.3.3-8 of the LRA: blower casing, instrument, piping, reaction chamber, water separator, and water spray cooler. Further clarification was provided by letter dated

September 5, 2001, where the applicant clarified that the hydrogen recombiner heater is electric and does not form a part of the pressure boundary. Therefore, the heater is an active component and not subject to an AMR. The staff reviewed the additional information and finds that the inclusion of these components in Table 2.3.3-8 of the LRA is acceptable. In addition, the staff agrees that the recombiner heater is not subject to an AMR. Open Item 2.3.3.2-1(a) is closed. The staff's review of the applicant's management of the aging effects associated with these components can be found in Section 3.3.3 of this SER.

(b) In reviewing drawings HL-21074, HL-11631, HL-11638, the staff found that some of the pumps were highlighted as within the scope of license renewal, but there are no pumps listed in Table 2.3.4-12 as subject to an AMR. The staff requested the applicant to explain this discrepancy. The applicant explained that on drawings HL-11638 (sheets 1 and 2) and HL-11631 (sheets 1 and 2), all of the pumps are part of the diesel generator skid. The applicant further stated that the diesel generator is an active component and, thus, not subject to an AMR. Therefore, the applicant determined that these pumps, which are part of the diesel generator skid, are also not subject to an AMR. However, the pumps that are not part of the diesel generator skid (on drawing HL-21074) are subject to an AMR and appear in Table 2.3.4-19 of the LRA for the fuel oil system. The staff did not agree that pumps can be excluded from an AMR because they are part of the diesel generator skid that constitutes part of a complex assembly.

In a telephone conference on September 13, 2000, the staff expressed its disagreement with the applicant's decision to exclude these components from an AMR simply because these components are skid-mounted. The staff requested that the applicant provide additional justification for its position. In response, the applicant provided a paper, via e-mail, entitled "Active Assemblies Used in License Renewal," dated November 6, 2000.

The staff reviewed this paper and did not agree with the applicant's basis for excluding skid-mounted components that are part of a complex assembly from an AMR.

Regarding complex assemblies, NEI 95-10, Revision 0, stated:

> "There are structures and components that, when combined, are considered a complex assembly (e.g., diesel generator starting air skids or heating, ventilating, and air conditioning refrigerant units). The Rule and associated SOC do not specifically discuss such assemblies. For purposes of performing an aging management review, it is important to clearly establish the boundaries for review. An applicant should establish the boundaries for such assemblies by identifying each structure or component that makes up the complex assembly and determining whether or not each

structure and component is subject to an aging management review. (See example 5 in Appendix C.)"

Example 5 in Appendix C of NEI 95-10, Revision 0, provided an example of a control room chiller complex assembly and guidance on how to establish the boundaries for such an assembly. It notes that once the boundary is determined, long-lived components with a passive function would be appropriately subjected to an AMR.

Components are subject to an AMR if they perform a passive function and are long-lived. A passive function is one performed without moving parts or a change in configuration or properties. A function performed with moving parts or a change in configuration or properties is considered an active function. Components that perform a passive function and are also long-lived must be subject to an AMR, whether they are skid-mounted or not. The staff believes that some of the skid-mounted components are long-lived components with a passive function, and therefore are subject to an AMR.

In the staff's evaluation of the Oconee LRA, the staff reached a similar conclusion regarding the treatment of the vendor-supplied diesel generator skid-mounted equipment. Duke had drawn a boundary around the diesel generator skid and determined that everything within the boundary was active and therefore not subject to an AMR. The staff disagreed and noted that the assembly included some long-lived components with a passive function which were subject to an AMR. Duke subsequently redefined the evaluation boundaries to ensure that long-lived components with a passive function on the diesel generator skid were subject to an AMR.

On this basis, the staff requested that the applicant identify any applicable aging effects associated with these components, and any other long-lived components with a passive function associated with the emergency diesel generators, and identify AMPs credited with managing the aging effects. This was identified as part of Open Item 2.3.3.2-1 (2.3.3.2-1(b)).

By letter dated June 5, 2001, the applicant provided additional information. The EDGs include three subsystems that contain components that are passive and long-lived, and that perform a component function that supports the system intended function of standby ac power supply (R43-01). The subsystems are the diesel jacket water cooling subsystem, the diesel lubricating oil subsystem, and the scavenging air subsystem. The evaluation boundary for the extended set of skid-mounted components ends at the engine block and does not include the active portion of the diesel. On the basis of the above information, the applicant identified the following skid-mounted components that are subject to an AMR and listed in Table 2.3.4-12 of the LRA: bolting, heater housing, heat exchanger shell, heat exchanger

tubes (piping), piping/tubing, pump casing, restricting orifice, strainer casing, strainer element, and valve bodies. The applicant also stated that aging management of these components would be accomplished with the torque activities, protective coatings, and diesel generator maintenance activities AMPs. The staff's review of the AMPs can be found in Section 3.1 of this SER. Staff evaluation of the applicants aging management activities for these components can be found in Section 3.4.3 of this SER. The staff finds this response acceptable, and considers Open Item 2.3.3.2-1(b) closed.

2.3.3.2-2 (a) In its responses to RAI 2.3.3-SGTS-1 and RAI 2.3.3-SGTS-2, the applicant stated that differential pressure indicators, guillotine damper housings, and fan housings in the SGTS are not subject to an AMR on the basis of the guidance provided in NEI 95-10, Appendix B. The staff agrees that differential pressure indicators are considered components with an active function and, therefore, are not subject to an AMR. However, the staff questioned whether it was appropriate for the applicant to exclude guillotine damper housings and fan housings from an AMR. During a telephone conference on October 31, 2000, the staff asked the applicant to provide justification for why the housings for the guillotine dampers and fans should be excluded from an AMR.

In response to the staff's concerns regarding the exclusion from an AMR of the housings for components such as fans, dampers, and heating and cooling coils, the applicant provided, by an e-mail dated November 6, 2000, a paper titled "Active Assemblies Used in License Renewal."

The staff reviewed this paper and found that the applicant's basis for excluding fan, damper, and heating and cooling coil housings is not consistent with the license renewal rule, the Statements of Consideration (SOC) accompanying the Rule, or the staff's review guidance.

10 CFR 54.21(a)(1) provides that those components that perform their intended functions without moving parts and without a change in configuration or properties (10 CFR 54.21(a)(1)(i)) and that are not subject to replacement based on qualified life or specified time period (10 CFR 54.21(a)(1)(ii)) are subject to an AMR. Such components are commonly considered as "long-lived" and as performing a passive function. 10 CFR 54.21(a)(1)(i) states that "structures and components [with passive functions] include, but are not limited to,... pump casings, valve bodies ... " and lists other components that perform passive functions. The examples cited in the license renewal rule illustrate components with significant passive functions.

Section III.f.i(a) of the SOC further explains that major components may have active functions, passive functions, or both, and cites pumps and valves as examples. Pumps and valves have moving parts, but the Commission concluded that the pressure-retaining function performed by the pump casing and the valve body were important enough to warrant

an AMR. The SOC further explains that the Commission does not limit the consideration of pressure boundaries to reactor coolant pressure boundary. The exclusion regarding components is focused on active functions rather than on the exclusion of the entire component, while the AMR applies to the passive function of the component. On this basis, the staff concludes that fans, dampers, and heating and cooling coils may include significant passive pressure-retaining and structural support functions.

Section 2.2.III.A of the draft SRP-LR, September 1997, states that "...some functions of "active" components may meet the criteria of the "passive" description. For example, although a pump or a valve has some moving parts, a pump casing or valve body performs a pressure retaining function without moving parts. A pump casing or a valve body meets this description and would therefore be considered for an aging management review." It is clear by this passage, and by the examples provided of pumps and valves, that the passive functions of components are subject to an AMR.

In Section 2.1.1 of the LRA, the applicant states that the specific method used to identify in-scope functions and to screen the SSCs required to perform the in-scope functions was developed considering the guidance provided by NEI 95-10, Revision 0, "Industry Guideline on Implementing the Requirements of 10 CFR Part 54 - The License Renewal Rule," among other regulatory and guidance documents. Appendix B of NEI 95-10 provides a list of components and their active/passive functions. Item numbers 155 and 163 identify dampers and ventilation fans, respectively. Each of these components is identified in the appendix as performing an active function. The staff notes that the appendix, though it specifically identifies the dampers and ventilation fans, does not address housings for these components.

On the basis of the information in the Rule, the SOC, and guidance provided in the SRP-LR, the staff concludes that the housings for fans, dampers, and heating and cooling coils contribute to the performance of the intended function of fans, dampers, and heating and cooling coils without moving parts and without a change in configuration or properties, and thus are subject to an AMR. This issue also affects the scope of components with passive functions for the control building HVAC, outside structures HVAC, and reactor building HVAC systems, which are discussed in Section 2.3.4.2 of this SER.

Therefore, on the basis of the above staff positions, the staff requested that the applicant identify the passive functions for those fans, dampers, and heating and cooling coils that are within the scope of license renewal. For those passive functions, the applicant should identify any aging effects associated with the components and provide an AMP to manage the aging. This was identified as part of Open Item 2.3.3.2-2 [2.3.3.2-2(a)].

By letter dated June 5, 2001, the applicant provided information regarding the disposition of fans, dampers, and heating and cooling coils within the scope of license renewal. Consistent with the staff's guidance regarding evaluation of active components, the applicant identified the passive functions of damper frames and fan housings in the SGTS and added these components to the list of components in the LRA that are subject to an AMR. The applicant also identified any aging effects associated with the damper frames and fan housings and provided an AMP to manage the aging. The applicant added these components to those listed in Tables 2.3.3-6 and 3.2.3-6 in the LRA. The staff's review of the aging effects and AMPs for the SGTS can be found in Section 3.3.3 of this SER. On the basis of the additional information provided by the applicant, the staff agrees that the damper frames and fan housings are included in the scope of license renewal and subject to an AMR. Further, the staff concludes that the inclusion of these components in Tables 2.3.3-6 and 3.2.3-6 of the LRA is acceptable. On the basis of the additional information provided by the applicant, this part of Open Item 2.3.3.2-2, as it relates to SGTS components, is closed.

The applicant also agreed to clarify the function of the guillotine damper regarding, including whether this damper is safety-related and included within the scope of license renewal and subject to an AMR. This was also identified as part of Open Item 2.3.3.2-2 [2.3.3.2-2(a)].

By letter dated June 5, 2001, the applicant clarified the function of the guillotine damper utilized in the SGTS. The dampers represent a commodity group of dampers associated with SGTS filtration units, 2T46-D001A and 2T46-D001B. During accident and normal operating conditions, the dampers remain open. For filter testing purposes the dampers may be closed as needed. However, the dampers are not safety-related, do not perform an intended function , and can not prevent an intended function. Therefore, the guillotine dampers are not included in the scope of license renewal and are not subject to an AMR. On the basis of the additional information provided by the applicant, the staff agrees that the guillotine dampers are not within the scope of license renewal and not subject to an AMR. On the basis of the previously noted information, this part of Open Item 2.3.3.2-2 [2.3.3.2-2(a)], as relates to SGTS guillotine dampers, is closed.

(b) In its response to RAI 2.3.4-CBHVAC-1, the applicant also stated that, given the guidance on NEI 95-10, Appendix B, no damper housing, fan housing, and air handling units, including the cooling coils, are found within the license renewal portions of the control building HVAC system. The staff disagreed with the applicant's exclusion from an AMR of housings for fans, dampers, and air handling units, including cooling coils. The staff's position with regard to the treatment of the housings for fans, dampers, and heating and cooling coils is discussed in detail in the staff's review of the SGTS in Section 2.3.3 of this SER, which includes treatment of the component passive functions of the control building

HVAC system. Resolution of this issue was part of Open Item 2.3.3.2-2 [2.3.3.2-2(b)].

By letter dated June 5, 2001, the applicant provided information regarding the disposition of fans, dampers, and heating and cooling coils within the scope of license renewal. Consistent with the staff's guidance regarding evaluation of active components, the applicant identified the passive functions of condensing unit shells, damper frames, fan housings, and fan screens in the control building HVAC system and added these components to the list of components in the LRA that are subject to an AMR. The applicant also identified any aging effects associated with the condensing unit shells, damper frames, fan housings, and fan screens and provided an AMP to manage the aging. The applicant added these components to those listed in Tables 2.3.4-20 and 3.2.4-20 in the LRA. The staff's review of the aging effects and AMPs for the control building HVAC system can be found in Section 3.4.3 of this SER. On the basis of the additional information provided by the applicant , the staff agrees that the condensing unit shells, damper frames, fan housings, and fan screens are within the scope of license renewal and subject to an AMR. On the basis of the previously noted information, this part of Open Item 2.3.3.2-2 [2.3.3.2-2(b)], as relates to control building HVAC system components, is closed.

Additionally, in a telephone conference held on October 31, 2000, the applicant clarified that the LPCI inverter room and the Unit 2 vital A/C room coolers are no longer in scope because of a design modification. The applicant committed to provide a description of the design modification that clarifies how the modification impacts the LPCI inverter room and Unit 2 vital A/C room cooler functions. The applicant also committed to address why heating coil housings are not specifically identified in Table 2.3.4-20 of the LRA. The design modification information and the resolution of the issue regarding Table 2.3.4-20 were identified as part of Open Item 2.3.3.2-2(b).

By letter dated June 5, 2001, the applicant provided a description of the design modification that clarified how the modification impacts the LPCI inverter room and Unit 2 vital A/C room cooler functions. Over a period of time, the LPCI inverters became obsolete and plant design change packages retired the Unit 1 and Unit 2 LPCI inverters. To continue to provide a diverse source of power for certain LPCI valves, Unit 2 Class 1E AC power supplies were selected as the normal source of power for the Unit 1 LPCI valves and Unit 1 Class 1E power supplies were selected as the normal source of power for the Unit 2 LPCI valves. The LPCI inverter function (R44-02) was removed from scope when the modifications were performed to remove the inverters, effectively deleting the function; therefore, the LPCI inverter room cooling function was not included in the LRA. By comparison, vital AC is not safety-related, as defined in 10 CFR 54.4(a)(1), its failure does not prevent a safety function, as defined in 10 CFR 54.4(a)(2), and it is not required to operate

during the events defined in 10 CFR 54.4(a)(3). Therefore, as seen in Table 2.2-1 of the LRA, this function does not meet the criteria for inclusion within license renewal scope. Consequently, the vital AC room cooling function is out of scope for license renewal. The applicant also addressed why heating coil housings are not specifically identified in Table 2.3.4-20 of the LRA. Control building heating coils are electric and thus, were considered to be active components. Consequently, the heating coils were screened out and not included in Table 2.3.4-20. The duct heater frame was evaluated in the LRA and included in Table 2.3.4-20. The applicant provided other clarifications and/or editorial changes, as appropriate. On the basis of the additional information provided by the applicant, the staff agrees that the LPCI inverter room and Unit 2 vital A/C room cooler functions and the heating coil housings are not within the scope of license renewal and not subject to an AMR. On the basis of the previously noted information, this part of Open Item 2.3.3.2-2(b), as relates to control building HVAC system components, is closed.

(c) In its response to RAI 2.3.4-OSHVAC-1, the applicant stated that roof-mounted exhaust ventilator housings and wall-mounted unit heater housings are not subject to an AMR, since these housings are part of active components (i.e., fan/damper assembly and heater, respectively). The staff disagreed with the applicant's exclusion of roof-mounted exhaust ventilator and wall-mounted unit heater housings from being subject to an AMR. The staff's position with regard to the treatment of the housings for roof-mounted exhaust ventilators and wall-mounted unit heaters is discussed in detail in the staff's evaluation of the SGTS in Section 2.3.3 of this SER. The staff's position in Section 2.3.3 of this SER also applies to the treatment of the component passive functions of the outside structures HVAC system. Resolution of this issue was identified as part of Open Item 2.3.3.2-2 [2.3.3.2-2(c)].

By letter dated June 5, 2001, the applicant provided information regarding the disposition of fans, dampers, and heating and cooling coils within the scope of license renewal. Consistent with the staff's guidance regarding evaluation of active components, the applicant identified the passive functions of damper frames, fan housings, and unit heater housings in the outside structures HVAC system and added these components to the list of components in the LRA that are subject to an AMR. The applicant also identified any aging effects associated with the damper frames, fan housings, and unit heater housings and provided an AMP to manage the aging. The applicant added these components to Tables 2.3.4-17 and 3.2.4-17 in the LRA. The staff's review of the aging effects and AMPs for the outside structures HVAC system components can be found in Section 3.4.3 of this SER. On the basis of the additional information provided by the applicant, the staff agrees that damper frames, fan housings, and unit heater housings are within the scope of license renewal and subject to an AMR. On the basis of the previously noted information, this part of Open

Item 2.3.3.2-2, as relates to outside structures HVAC system components, is closed.

(d) In its response to RAI 2.3.4-RBHVAC-1, the applicant stated that, given the guidance in NEI 95-10, Appendix B, safeguards equipment room cooler housings are not subject to an AMR. With regard to this RAI, the applicant also did not address the scope of license renewal and an AMR as it relates to air-operated valve bodies, the air-operated damper housings, and associated ductwork. Additionally, in a telephone conference held on October 31, 2000, the applicant agreed to reconsider its response to RAI 2.3.4-RBHVAC-3, concerning whether certain ductwork identified by the staff is within the scope of license renewal and subject to an AMR.

The staff believes that the safeguards equipment room cooler housings may be within the scope of license renewal and subject to an AMR. The staff's position with regard to the treatment of the housings for the safeguards equipment room coolers is discussed in detail in the staff's evaluation of the SGTS in Section 2.3.3 of this SER. The staff's position in Section 2.3.3 of this SER applies to the treatment of the component passive functions of the reactor building HVAC system. Resolution of this issue, including the scoping clarification for the air-operated valve bodies, air-operated damper housing, and associated ductwork, was identified as part of Open Item 2.3.3.2-2 [2.3.3.2-2(d)].

By letter dated June 5, 2001, the applicant provided information regarding the disposition of fans, dampers, and heating and cooling coils within the scope of license renewal. Consistent with the staff's guidance regarding evaluation of active components, the applicant identified the passive functions of damper frames, fan housings, fan inlet housings, and fan inlet screens in the reactor building HVAC system and added these components to the list of components in the LRA that are subject to an AMR. The applicant also identified any aging effects associated with the damper frames, fan housings, fan inlet housings, and fan inlet screens and provided an AMP to manage the aging. The applicant added these components to those listed in Tables 2.3.4-15 and 3.2.4-15 in the LRA. The staff's review of the aging effects and AMPs for the reactor building HVAC system components can be found in Section 3.4.3 of this SER. The applicant provided other clarifications and/or editorial changes, as appropriate. On the basis of the additional information provided by the applicant, the staff agrees that damper frames, fan housings, fan inlet housings, and fan inlet screens are within the scope of license renewal and subject to an AMR. On the basis of the previously noted information, this part of Open Item 2.3.3.2-2 [2.3.3.2-2(d)], as relates to reactor building HVAC system components, is closed.

2.3.4.2-1 With respect to the radwaste building, the staff reviewed the Plant Hatch FHA dated July 22, 1986, and concluded that fire suppression for certain areas in the radwaste building were included in the 1986 FHA. Specifically, Section IV.B.4.d

of the FHA states that "fixed automatic water spray systems are installed in all charcoal filters in the plant." The radwaste building contains charcoal filters that are protected by fixed sprinkler systems. Therefore, the fire suppression piping leading to the charcoal filters, including the nozzles and sprinkler heads, should be included within the scope of license renewal and subject to an AMR.

In addition, Section IV.D of the FHA states that the guidelines for specific plant areas is presented for each specific plant area throughout the FHA. In both the June 1986 and July 1987 revisions to the FHA, the FHA analysis of fire area/zone 2301 (Radwaste Building - All Elevations) states that, "all sections of this area which contain specific fire hazards (charcoal filters) or high concentrations of combustibles (dry waste storage area, Radwaste Control Room) are equipped with detection, suppression, or both." Specifically, the west central portion of fire zone 2301J over the drywaste storage section is equipped with a wet pipe suppression system. To the staff's knowledge, the applicant has not submitted any information to show that the radwaste suppression system has been physically removed or altered so that it can't perform its intended function, and that no plant evaluations through 10 CFR 50.59 have determined that this suppression system is no longer required for compliance with Appendix A to BTP 9.5-1.

It was the staff's view that the radwaste suppression system should be included within the scope of license renewal and subject to an AMR. This issue was identified as Open Item 2.3.4.2-1.

After reviewing the Plant Hatch Fire Hazards Analysis (FHA) dated July 22, 1986, the staff raised a concern with the applicant's exclusion of the radwaste fire suppression system from within the scope of license renewal. The radwaste building contains charcoal filters which are protected by fixed sprinkler systems. Section IV.B.4.d of the FHA states that "fixed automatic water spray systems are installed in all charcoal filters in the plant". In addition, Section IV.D of the FHA states that the guidelines for specific plant areas are presented for each specific plant area throughout the FHA. In both the June, 1986 and July, 1987 revisions to the FHA, the FHA analysis of fire area/zone 2301 (Radwaste Building - All Elevations) states that, "all sections of this area which contain specific fire hazards (charcoal filters) or high concentrations of combustibles (dry waste storage area, Radwaste Control Room) are equipped with detection, suppression, or both." Specifically, the west central portion of fire zone 2301J over the drywaste storage section is equipped with a wet pipe suppression system.

In response to the staff's concern, the applicant responded in a letter dated June 5, 2001, that the radwaste building fixed fire suppression has been included in scope for license renewal and is subject to an AMR. No new component types, component materials, or internal or external environments result from this scope change. In addition, the following evaluation boundary drawings were revised or created to reflect the change in scope:

HL-11034	HL-11901
HL-11304, Sheet 7	HL-11905
HL-11304, Sheet 8	HL-11909
HL-11869	HL-21017
HL-11873	HL-21197
HL-11874	HL-21342
HL-11875	HL-26372

The staff's review of the aging effects associated with these components can be found in Section 3.4.3 of this SER. The staff is satisfied with the applicant's resolution of this issue and Open Item 2.3.4.2-1 is closed.

3.0-1 The staff issued Open Item 3.0-1 to ensure that the applicant's FSAR Supplement contained an adequate description of the programs and activities that have been credited for managing the effects of aging, and the evaluation of time-limited aging analyses (TLAAs) for the period of extended operation as required by 10 CFR 54.21(d). The staff reviewed the aging management program and TLAA descriptions provided by letter dated October 10, 2000, and the associated FSAR Supplement provided by letter dated September 5, 2001, and found that the FSAR Supplement provided by the applicant contains descriptions of these programs and activities adequate to satisfy 10 CFR Part 54 requirements. On the basis of the program descriptions provided by the applicant, the staff concludes that the FSAR Supplement contains sufficient information to adequately describe the content of the associated aging management programs and TLAAs and satisfies the requirements of 10 CFR 54.21(d). A condition will be included in the renewed license requiring the inclusion of the FSAR Supplement in the next UFSAR update, required by 10 CFR 50.71(e). Open Item 3.0-1 is closed.

3.1.1-1 The applicant's reactor water chemistry control program is predicated on the guidance provided in EPRI TR-103515, "BWR Water Chemistry Guidelines." In the staff's RAIs regarding program elements that deviate from the referenced EPRI guidelines, the applicant indicated that this program is currently being updated to meet the guidance of EPRI TR-103515, Revision 2. The staff noted that EPRI TR-103515, Revision 2, has not been reviewed by the staff for generic use. The staff requested that the applicant clarify the differences between Revision 1 and Revision 2 of EPRI TR-103515, so the staff can determine whether the provisions of Revision 2 are acceptable. This was identified as Open Item 3.1.1-1.

By letter dated June 5, 2001, the applicant responded to the open item, stating that, as discussed in its response to RAI 3.1.1-2, Plant Hatch is committed to meeting the chemistry control parameters specified for RCS chemistry contained in EPRI TR-103515. The applicant identified, as a point of information, the applicable revision of the EPRI document which was current at the time the LRA was submitted, and noted that the program was being updated to a later revision of the document. The applicant believes, and the staff agrees, that it is important to maintain the flexibility to modify plant chemistry control procedures based on the best industry guidance developed from the collective operating

experience of similar reactors. Therefore, over time, the applicant expects to revise the plant chemistry procedures to reflect changes in industry guidance as reflected in the EPRI control parameters.

As part of the response to Open Item 3.1.1-1, the applicant also discussed the significant differences between Revision 1 and Revision 2 of EPRI TR-103515. The first relates to the additional consideration of the beneficial effects of operation with hydrogen water chemistry (HWC) or with HWC with noble metal chemistry addition (NMCA). Revision 2 of EPRI TR-103515 provides an additional table (4-5b) which allows relaxation of the power operation Action Level 3 (AL3) values for chlorides and sulfates from 100 ppb to 200 ppb when HWC is in service and measured electrochemical potential (ECP) values are less than -230 mV. Currently, Plant Hatch operates in accordance with Revision 2 of the EPRI guidelines and current sampling and monitoring procedure allows for higher AL3 chloride and sulfate values under HWC. This additional flexibility is warranted based on the increased protection of reactor coolant system and reactor assembly components provided by HWC or HWC with NMCA.

The second significant difference between Revision 1 and Revision 2 of the EPRI guidelines involves the allowance in Revision 2 for monitoring of chlorides and sulfates on less than a daily basis, if appropriate, based on site-specific resource allocation needs. This flexibility in monitoring frequency is acceptable when adequately justified and supported by the conductivity values and/or chemistry trends that assure that Action Level 1 limits will not be exceeded.

On the basis of the information provided by the applicant in response to this open item, the staff concludes that the applicant should be allowed to maintain the flexibility to modify chemistry control procedures in response to new or updated industry information, and that the differences between Revision 1 and Revision 2 of the EPRI guidelines provide this flexibility. Therefore, the staff considers Open Item 3.1.1-1 closed.

3.1.3-1 The diesel fuel oil testing program, like the various chemistry control programs in effect at Plant Hatch, is a mitigative activity which is not intended to directly detect age-related degradation. The implementation of this program does not provide information directly related to the degradation of the structures and components within the scope of this program. The applicant does not take credit for such a system. Also, water in the fuel oil will be in contact with the tank bottom, possibly causing corrosion. The diesel fuel oil testing program will not be able to detect such degradation. Therefore, the staff concludes that a one-time inspection program is warranted for the diesel fuel oil tanks to verify tank bottom thickness. The addition of a one-time inspection program for the tanks would be consistent with the applicant's approach for other chemistry control programs at Plant Hatch. For example, the torus submerged components inspection program complements the applicant's suppression pool chemistry control. Also, the condensate storage tank inspection complements the applicant's demineralized water and condensate storage tank chemistry control program. The staff requested that the applicant provide the specific attributes of an inspection program, consistent with other one-time inspections (e.g.,

inspection scope, inspection technique, acceptance criteria, etc.). This was identified as Open Item 3.1.3-1.

By letter dated June 5, 2001, the applicant provided a response to this open item. The applicant stated that, since the license renewal application was submitted, one of the four buried, 40,000-gallon emergency diesel generator (EDG) fuel oil storage tanks (FOST) has been inspected. When Tank 1A was drained for cleaning during the last outage, the applicant took this opportunity to conduct aging inspections. On the basis of the results obtained through visual examination and ultrasonic testing (UT), the applicant concluded that significant wall thinning has not occurred in the Plant Hatch EDG FOSTs and that no aging management activities are required.

The Plant Hatch EDG FOSTs are constructed of 0.5 inch plate steel. Ultrasonic testing, covering 144 points along the lower portions of the tank, indicated that wall thickness was consistently between 0.500 and 0.524 inches. In no case was a reading taken less than 0.5 inches. The applicant believes that these results are representative of the other four tanks, since they are all the same material and they all have the same internal and external environments.

Prior to performing the UT, visual inspections were conducted of the "as-found" conditions. Very little corrosion was noted in the tank airspace. A thin adherent layer of general corrosion was identified in a small area. That small amount of surface corrosion was removed during cleaning. In addition to the EDG FOSTs, the fire pump diesel fuel oil storage tanks are also in scope for license renewal. The internal environment of these smaller tanks is similar to the internal environment of the EDG FOSTs, each tank having a diesel fuel oil volume and an air vapor space. However, the fire pump diesel fuel oil storage tanks are not buried. They are above ground and are painted. Thus, the external environment is at least as benign as the external environment for the buried EDG FOSTs. In summary, the applicant stated that the FOST visual and UT inspection results already obtained are responsive to the issue raised in the open item and substantiate the LRA conclusion that loss of material is not an aging effect requiring management during the renewal term for either the EDG FOSTs or the fire pump diesel fuel oil storage tanks.

On the basis of its review of the additional information provided by the applicant in its letter dated June 5, 2001, the staff concludes that the applicant has performed a one-time inspection of the internal surfaces of one of the FOSTs, has adequately determined that age-related degradation of the tank bottoms has been minimal, and that significant age-related degradation of the FOSTs is unlikely during the period of extended operation. Open Item 3.1.3-1 is closed.

3.1.11-1 The application stated that the plant commodity group in the scope for torque activities is Class 1 pressure boundary bolting and Non-Class 1 pressure boundary bolting. Class 1 pressure boundary bolting is fabricated from low alloy steel. The non-Class 1 pressure boundary bolting is fabricated to the requirements of ASTM A-307 (Grade B), ASME SA-194 (Grade 2H), and ASME SA-193 (Grade B7). Bolting that is heat treated to a high hardness condition and

exposed to a humid environment within containment could be susceptible to SCC. In response to RAI 3.4-1, the applicant did not state if the yield strength for ASME SA-193 (Grade B7) or any other bolts are limited to less than 150 ksi to avoid the possibility of stress corrosion cracking. (See RICSIL No. 055, February 1, 1991, "RPV Head Stud Cracking."). In Open Item 3.1.11-1, the staff requested that the applicant provide this information. By letter dated June 5, 2001, the applicant stated that these bolts were procured with a minimum yield strength of 105 ksi, with no upper limit stated. However, the applicant also stated that it has not experienced problems with these bolts and could not identify any problems during a survey of industry experience. On the basis that the applicant's operating experience has not shown that these bolts have experienced SCC, the staff finds the applicant's response adequate and considers Open Item 3.1.11-1 closed.

3.1.13-1 (a) In Section C.2.4.3 of the LRA, the applicant credits the PSW and RHRSW inspection program with managing the aging effects of RHR and PSW components exposed to a buried environment. The protective coatings program includes provisions for cleaning, priming, coating, and wrapping underground pipelines whenever underground sections of pipe are uncovered. Pipelines are wrapped with coal tar enamel wrapping. However, this aspect of the program is not discussed in Section A.1.13 of the LRA or Section B.1.13 of the applicant's October 10, 2000 submittal. The staff requested that the applicant enhance its description of the PSW and RHRSW inspection program to clearly state that the scope of the program includes this particular aspect for managing aging effects associated with a buried environment, consistent with the discussion in Section C.2.4.3 of the LRA. This was identified as part of Open Item 3.1.13-1 [3.1.13-1(a)].

The applicant responded to this open item by letter dated June 5, 2001. The applicant indicated that the PSW and RHRSW inspection program does not directly include provisions for cleaning, priming, coating and wrapping underground pipelines. The protective coatings program addresses these activities. However, the site procedure for buried pipelines coating maintenance does specifically invoke the program inspection requirements whenever maintenance is performed on the components in those systems. There is, therefore, certain linkage between these two programs and the applicant reflected it in the LRA. In order to clarify this issue, the applicant will modify the LRA. It will remove the PSW and RHRSW inspection program from Section C.2.4.3. In addition, the applicant will modify Section B.3.5 of the LRA by removing information related to the external surfaces of buried components. A special instruction has been placed in the site procedure used to manage excavation activities to assure that buried commodities are examined by protective coatings personnel. The staff finds that with these modifications introduced in the LRA, the scope of the PSW and RHRSW inspection program with regard to inspection of the underground pipelines is well defined. The staff considers Open Item 3.1.13-1(a) closed.

(b) In Table 3.2.3-2 of the LRA, the RHR heat exchanger augmented inspection and testing program is credited with managing, in part, aging effects for various heat exchanger components, including the tubes, tubesheet, and shell. However, the staff noted that the description of the PSW and RHRSW inspection program contained in Section B.1.13 of the applicant's October 10, 2000 submittal included several references to inspections of heat exchanger components. The staff requested that the applicant clarify the scope of the PSW and RHRSW inspection program relative to managing aging effects for the various heat exchanger components listed in Table 3.2.3-2 of the LRA. This was identified as part of Open Item 3.1.13-1 (Open Item 3.1.13-1(b)).

The applicant responded to this open item by letter dated June 5, 2001. The applicant stated that managing aging effects for various heat exchanger components, including the tubes, tubesheet, and shell in the RHR system is performed by the RHR heat exchanger augmented inspection and testing program. As indicated in Section C.2.2.11 of the LRA, the PSW and RHRSW inspection program plays only a subordinate role, limited to visual inspection of the surfaces of the heat exchanger channel and shell sides. The reason that inspection of the heat exchanger components is referenced in Section B.1.13 of the LRA is to show the linkage that exists between these two programs. On the basis of this information, the staff concludes that the applicant has clarified the scope of the PSW and RHRSW inspection program regarding management of aging effects in the RHR heat exchanger. The staff considers Open Item 3.1.13-1(b) closed.

(c) The staff conducted a scoping inspection in the offices of SNC from September 11, 2000 through September 15, 2000. The results of the inspection are documented in Inspection Report 50-321/00-09, 50-366/00-09. During the inspection, the inspectors identified a guard pipe associated with Division I PSW piping in the diesel generator building. This guard pipe had not been considered for scoping and screening in the LRA. In response to this inspection finding, the applicant evaluated the guard pipe and concluded that it did not perform an intended function, and therefore was not within the scope of license renewal. The staff agreed with this conclusion. The staff's review of the applicant's evaluation of the guard pipe can be found in Section 2.3.4 of this SER. The internal surface of the PSW piping is exposed to raw water, and thus the aging effects and AMPs are consistent with other piping sections in this system. However, the length of the PSW piping surrounded by the guard pipe is sealed, that is, a plate is welded to the PSW pipe and to the guard pipe at both ends. Thus, the external surface of this section of PSW piping is not accessible for inspection. The applicant plans to perform a one-time inspection to assess the material condition of the external surfaces of this piping section. The staff requested that the applicant provide appropriate information about this one-time inspection, or a comparable engineering evaluation, prior to the end of the current term. This was identified as part of Open Item 3.1.13-1 (3.1.13-1(c)).

The applicant responded to this open item by letter dated June 5, 2001. The applicant provided additional information related to the one-time inspection of that portion of the PSW piping that is surrounded by a guard pipe. The applicant states that Plant Hatch Engineering Support is responsible for determining the suitable method or methods for conducting an inspection. Plans have been made to inspect the portion of the external surface of the PSW piping that is surrounded by the guard pipe during the 1B EDG outage scheduled for February 2002. Currently, the plan is to cut a window in the guard pipe for a visual, boroscope, or other suitable examination to determine the condition of the external surface of the PSW pipe. The results will be documented and evaluated, with additional actions taken if needed. The staff has reviewed the information discussed in the applicant's open item response and, on the basis of this information, concludes that the approach for determining the current state of the guarded external surface of the PSW piping is appropriate and acceptable. Open Item 3.1.13-1(c) is closed.

3.1.17-1 To evaluate whether the reactor vessel surveillance program will provide sufficient data for monitoring the amount of embrittlement during the license renewal term, the staff evaluates whether the surveillance program satisfies the following attributes:

> "If the ISP is not approved by the staff, and if, instead, a plant-specific surveillance material testing program is implemented, capsules must be removed periodically to determine the rate of embrittlement. Capsules must be removed at neutron fluence levels which provide relevant data for assessing the integrity of the Plant Hatch 1 and 2 RPVs; in particular, for the determination of RPV pressure-temperature limits through the period of extended operation. Capsules must contain material to monitor the impact of irradiation on the Plant Hatch RPVs and must contain dosimetry to monitor neutron fluence. If the applicant is not participating in an ISP and available capsules are not being removed from Plant Hatch during the license renewal period, the applicant must submit for staff review the technical basis for continued operation (including proposed operating restrictions, such as inlet temperature, neutron spectrum, and flux, ex-vessel dosimetry for monitoring neutron fluence, etc.)"

In response to RAI 3.1.17-1, the applicant indicated that it plans to implement the provisions of an integrated surveillance program (ISP) that is documented in BWRVIP-78, "BWR Vessel and Internals Project; BWR Integrated Surveillance Program Plan," and it's companion document, BWRVIP-86, "BWR Vessel and Internals Project, BWR Integrated Surveillance Program Implementation Plan."

In a telephone conference on November 3, 2000, the applicant clarified its commitment to participate in an ISP through the end of Plant Hatch's period of extended operation, or, if necessary, to develop a plant-specific RPV surveillance materials testing program for the period of extended operation. As part of this commitment, the staff noted that if the applicant participates in a NRC

staff-approved ISP or implements a staff-approved plant specific RPV surveillance program, the ISP or plant-specific program should address the requirements of 10 CFR Part 54, including the ten aging management program attributes in the SRP-LR. Further, if the proposed program cannot meet any program attributes, the applicant should provide a technical justification for the discrepancies. This was identified as Open Item 3.1.17-1.

In response to the open item, by letter dated June 5, 2001, the applicant officially committed to implementing a staff-approved ISP for the extended period of operation based on the technical criteria of BWRVIP-78 and BWRVIP-86. The applicant further stated that, if an ISP is not approved by the NRC, or if the staff-approved ISP is not adequate for implementation at Plant Hatch, then the applicant will develop and implement a plant-specific surveillance material testing program for the extended period of operation. The applicant further stated that the plant-specific surveillance material testing program, if one is needed, will be developed in a manner consistent with other aging management programs, will include consideration of the ten program attributes utilized for other aging management programs, and will provide a technical justification for any program attribute not covered by the plant-specific surveillance material testing program.

The staff's review of BWRVIP-78 is continuing; however, all significant issues necessary for approval of BWRVIP-78 have been addressed. The proposed ISP addressed by BWRVIP-78 and BWRVIP-86, only applies to the period of the current operating licenses. The BWRVIP has committed to provide supplemental information to extend the ISP through the period of extended operation, based on the same technical criteria as found in BWRVIP-78 and BWRVIP-86, for the BWR fleet. The staff expects this supplemental information to be submitted in 2002.

Although the BWRVIP-78 and -86 reports apply only to the current term, the staff finds that the provisions in these reports, if implemented during the extended period of operation, constitute sufficient actions to manage the aging effects associated with the reactor vessel during the renewal term.

With regard to the plant-specific surveillance materials testing program, in a telephone conference on October 5, 2001, the applicant clarified its commitment that the plant-specific program, if needed, will include the following actions:

- capsules will be removed periodically to determine the rate of embrittlement
- capsules will be removed at neutron fluence levels which provide relevant data for assessing the integrity of the Plant Hatch RPVs; in particular, for the determination of RPV pressure-temperature limits through the period of extended operation
- capsules will contain material to monitor the impact of irradiation on the Plant Hatch RPVs and will contain dosimetry to monitor neutron fluence

On the basis of these commitments, the staff concludes that the applicant has identified in sufficient detail the actions that will be taken to provide reasonable assurance that aging effects associated with embrittlement of the reactor vessel will be adequately managed for the period of extended operation. On this basis, Open Item 3.1.17-1 is resolved. The renewed license will be conditioned to require that, prior to operation in the renewal term, the applicant will notify the NRC of the its decision to implement the ISP or a plant-specific program, and provide the appropriate revisions to the FSAR Supplement summary descriptions of the vessel surveillance material testing program.

3.1.18-1 (a) Table C.2.3.1-1 of the LRA states that, for water-based fire suppression system components, the fire protection activities prevent or mitigate loss of material by using system flushes to remove undesirable material from the system. However, the operability of the automatic wet-pipe sprinkler systems, which are required for compliance with 10 CFR 50.48, were not discussed. In response to RAI 3.1.18-7, in which the staff notified the applicant of this omission, the applicant stated that, "unobstructed water flow from the header test valve demonstrates that sprinkler heads and piping are not clogged from corrosion product debris." The staff did not agree with this statement since (1) the arrangement of the test header at the most distant point in the sprinkler system is usually located in the fire suppression piping, which is along the path of least water resistance, and (2) the sprinkler heads are located along the smaller branch line piping and, as a result of their orientation, are typically never exposed to the flow of water during the routine testing of the test header. Since there is little or no flow in the branch lines during testing, the water in these lines remains stagnant and sediment from the raw water, which flows to the header test connection, continues to collect in the smaller branch line piping. This may result in blockage and corrosion of the branch line piping and the sprinkler heads at accelerated rates. The staff has addressed this issue in Generic Letter 89-13, "Service Water Problems Affecting Safety-Related Equipment." The staff requested that the applicant discuss the specific considerations for addressing this aging mechanism in the automatic wet-pipe sprinkler systems. This was identified as part of Open Item 3.1.18-1 [3.1.18-1(a)].

The applicant routinely performs sprinkler piping flow tests to check for clogging from corrosion products as part of the fire protection activities. The staff was initially concerned that these tests may not be adequate for demonstrating operability of the sprinkler heads during the extended period of operation. However, as the staff position has evolved, additional flow tests are not required to determine flow blockage in the sprinkler system. This is consistent with the staff position in the generic aging lessons learned (GALL) report with regard to flow blockage in fire protection and other systems, as a result of corrosion, biofouling, or silting. System flow is considered to be an active feature. However, the staff expects the applicant to be sensitive to the potential for flow degradation as a result of accumulation of corrosion products. The staff

has determined that as long as the applicant conducts the wet pipe sprinkler header flow tests as described in the response to RAI 3.1.18-7, flow degradation would be adequately managed. In addition, should flow degradation be discovered, the applicant has a corrective action program, that requires trending to determine the need for future actions. On this basis, the staff concludes that Open Item 3.1.18-1(a) is closed.

(b) With regard to the inspection frequency of fire system components, the applicant lists in Section B.2.1 of the applicant's October 10, 2000 submittal the different inspection intervals for the water-based fire protection systems, fire protection pump diesel fuel oil supply system, compressed gas based fire suppression systems, fire penetration seals, cable tray enclosures, and fire doors. In addition to the systems listed above, the applicant describes a one-time inspection called the "Sprinkler Head Inspections" that will be performed at or before the start of the extended period of operation for closed sprinkler heads within the scope of license renewal. In RAI 3.1.18-9, the staff requested that the applicant provide justification for the absence of enhanced inspection programs for the sprinkler heads, which do not have a design life that covers the period of extended operation. In response the applicant stated that, in general, enhanced inspection programs are deemed unnecessary because the existing programs adequately manage the aging effects of concern, and that the guidelines of the National Fire Protection Act (NFPA) Code 25, "Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection," a one-time sprinkler heads inspection are being followed for in-scope sprinkler heads." The staff does not agree that a one-time inspection is sufficient for the sprinkler heads and recommends that the applicant expand the scope of its inspections to include the 10-year inspection intervals that are recommended in NFPA 25, Section 2.3.3.1, "Sprinklers." Section 2.3.3.1 states that "where sprinklers have been in place for 50 years, they shall be replaced, or representative samples from one or more sample areas shall be submitted to a recognized testing laboratory for field service testing." It also contains guidance to perform this sampling every 10 years after the initial field service testing. In addition, the staff has notified the nuclear industry, through recent information notices, about the potential failures associated with sprinkler heads. These information notices include IN 01-10, "Failure of Central Sprinkler Company Model GB Series Fire Sprinkler Heads," IN 99-28, "Recall of Star Brand Fire Protection Sprinkler Heads;" and IN 97-72, "Potential for Failure of the Omega Series Sprinkler Heads." Problems with seals leaking and sprinkler heads failing to actuate are typically not detectable through the performance of existing visual inspections. Therefore, the staff requested that the applicant expand the scope of its inspections to include the 10-year inspection intervals that are recommended in NFPA 25 or provide additional justification for the applicant's proposed inspection interval. This was identified as part of Open Item 3.1.18-1 [3.1.18-1(b)].

The applicant has previously addressed this issue in its responses to RAIs 2.3.4-FPS-10 and 3.1.18-9. By letter dated June 5, 2001, in response to Open Item 3.1.18-1(b), the applicant supplemented the earlier RAI responses by expanding the scope of the inspections referenced. Thus, the revised commitment is to use the guidance of NFPA-25 to perform an inspection of closed head sprinklers after 50 years of service and at 10-year intervals thereafter. On the basis of the applicant's commitment, the staff finds that the applicant has adequately addressed the staff's concern and Open Item 3.1.18-1(b) is closed.

3.1.28-1 The staff was concerned about cracking in the RHR heat exchangers. The RHR heat exchanger augmented inspection and testing program description was unclear regarding its ability to manage vibration-induced cracking. Therefore, in order to ascertain whether this AMP is adequate to manage vibration-induced cracking, the staff requested that the applicant provide additional information. The requested information is summarized below, and was identified as Open Item 3.1.28-1.

A. The applicant should provide information on the inspection methods, frequencies, acceptance criteria, and associated bases, which are used to detect vibration-induced cracking.

B. The applicant should provide information regarding the leakage identified in 1996, including the analyses conducted that determined the cause of the leakage, the operational changes or component modifications that were instituted in response to the leakage, and additional programs which were developed and credited for managing vibration-induced cracking.

C. The LRA states that measured and recordable values of the inspected or monitored parameters shall not fall below acceptable values for defined inspection locations. The applicant should identify the inspection locations, and the inspection criteria used to determine inspection locations, and their bases.

D. The LRA states that a sample taken from an RHRSW drain valve contained nuclides and as a result, testing was performed on one of the Unit 1 RHR heat exchangers. Dents were found at a number of tube-to-tube support connections and the dents may indicate tube vibration. The applicant should provide the basis for its determination that the dents may have been caused by tube vibration, as opposed to localized corrosion. In addition, the applicant should provide information regarding industry experience related to the bases and criteria of the inspections credited in the RHR heat exchanger augmented inspection and testing program.

By letters dated October 10, 2000 and June 5, 2001, the applicant provided additional information related to the staff's concerns regarding vibration-induced cracking in the RHR heat exchangers. The applicant stated that there is no site or industry operating experience indicating that vibration-induced fatigue

cracking is an active mechanism in the RHR heat exchangers. However, the RHR heat exchanger augmented inspection and testing program provides for inspection activities capable of detecting significant tube damage or throughwall leakage that could result from potential vibration-induced damage. The program includes the following:

- eddy current testing (minimum of 10 percent of the operational tubes) once during each 10 year inspection period to determine the overall condition of the heat exchanger tubes
- leak testing to quantify leaks in the tubes or tubesheets
- general visual inspection of the channel side of the heat exchanger every three operating cycles to include visible portions of the tubesheets and tubes
- general visual inspection of the shell side of the heat exchanger once during the ten year interval to include a representative portion of the tube bundle, tube supports, tube-to-tubesheet interface, and baffles.

The testing frequency is based on a combination of satisfactory results of eddy current tests performed on three heat exchangers and on heat exchanger design margin. Except for one tube in one heat exchanger, the condition of the tubes in all three heat exchangers was found to be free of damage. Also, the heat exchanger transfer surface area is oversized by at least 5 percent to provide sufficient margin if tubes need to be plugged. On the basis of the satisfactory test results, along with the excessive heat transfer capacity, the staff concludes that the equipment will perform its intended function between inspections.

In addition, identification of crack indications by inspection personnel are subject to appropriate engineering evaluation. Areas that are unavailable for inspection due to inability to pass the eddy current probe are noted on the inspection report.

The applicant also provided information regarding the RHR heat exchanger tube leakage identified in 1996. The leakage was suspected due to detection of radionuclides in the RHRSW system. In October 1997, eddy current testing identified nine tubes, including one leaking tube, with significant damage. As a result, all nine tubes were plugged. Although no direct evidence of service-induced damage was identified, a follow-up inspection was recommended. In October 2000, eddy current inspections were performed on all heat exchanger tubes, except those plugged in October 1997. The result of this inspection did not reveal any accelerated degradation indicators and concluded that there was no evidence of any active service-induced degradation.

The staff requested that the applicant provide details regarding the denting found on a number of tube-to-tube support connections. In response, the applicant stated that denting, as referred to in the submitted operating history on the heat exchanger, is indicative of the tube roundness. Though tube dents can be service-induced, the denting is often the result of fabrication flaws from bending

or insertion. In addition, based on the October 2000 inspection results, no evidence exists to support localized corrosion or vibration as a significant factor in the tube dents identified.

On the basis of the additional information provided by the applicant, the staff concludes that this new inspection program provides a variety of methods to manage the aging effects associated with the RHR heat exchangers. In addition, the staff finds that the most recent inspection results obtained through the techniques emcompassed by this program support the applicant's conclusion that localized corrosion or vibration is not a significant factor in the tube dents identified.

On the basis of the information provided by the applicant and the staff's evaluation of this information, the staff concludes that the RHR heat exchanger augmented inspection program is adequate and appropriate to manage the aging effects associated with the RHR heat exchangers. Open Item 3.1.28-1 is closed.

3.2.3.1.1-1 Cast austenitic stainless steel (CASS) components in the reactor assembly system may be subject to loss of fracture toughness due to the effects of thermal and neutron embrittlement. CASS components are susceptible to thermal embrittlement if they operate at temperatures greater than 550°F (the threshold that the NRC has established as the point at which thermal aging of CASS components occurs). Also, as indicated in Appendix H to 10 CFR Part 50, neutron irradiation embrittlement becomes significant at neutron fluences greater than 10^{17} n/cm^2 (E>1Mev).

Table 2.3.1-1 of the LRA indicates that jet pump assemblies and fuel supports contain CASS components and are within the scope of license renewal. The Plant Hatch fuel supports support the weight of the fuel assemblies and distribute core flow into the fuel assemblies. Table 2.3.1-1 indicates that the CASS fuel supports have no aging effects requiring management. However, due to the fuel supports' proximity to the core, the staff believes that the CASS fuel supports are likely to be susceptible to neutron embrittlement.

In response to RAI 3.2.3.2-1, the applicant indicated that portions of the jet pump assemblies may experience fluence greater than 10^{17} n/cm^2, but will not experience temperatures exceeding 550°F. On the basis of this information, the staff concludes that jet pump assemblies fabricated from CASS will not be susceptible to thermal embrittlement; but may be susceptible to neutron embrittlement.

The BWRVIP generic AMP for the jet pump assembly components is described in EPRI report TR-108728, "BWRVIP BWR Jet Pump Assembly Inspection and Flaw Evaluation Guidelines (BWRVIP-41)." The BWRVIP-41 report does not recommend an inspection of CASS jet pump assembly components because CASS components are considered not susceptible to IGSCC. However, the BWRVIP-41 report does not contain any data to indicate the threshold for neutron embrittlement of CASS and does not identify the neutron fluence

experienced by the CASS jet pump assembly components. Because the BWRVIP-41 report does not provide data to support its conclusion that inspection of CASS components is not needed, the staff cannot conclude that the loss of fracture toughness resulting from irradiation embrittlement and cracking is not a plausible aging effect requiring aging management. However, the staff notes that irradiation embrittlement of CASS components becomes a concern only if cracks are present in the components. Therefore, if an applicant can show that cracks do not occur in the CASS components, then the staff can conclude that loss of fracture toughness resulting from neutron irradiation embrittlement will not be a significant aging effect.

The staff notes that industry-wide experience shows that cracking has not been observed in CASS jet pump assembly components. Therefore, as part of its safety evaluation of the BWRVIP-41 report, the staff has requested, and the BWRVIP is considering, the inclusion of a baseline inspection in the BWRVIP-41 report to ensure that cracking is not present in the components. Similarly, the staff requested that the applicant propose a one-time inspection of the CASS jet pump assembly components and fuel supports to confirm that the CASS components have not experienced cracking. The inspection should be performed prior to the beginning of the extended period of operation. This was identified as Open Item 3.2.3.1.1-1.

Since the development of this open item, the staff has reconsidered the safety basis for requiring the applicant to perform a one-time inspection of the CASS jet pump assemblies and fuel supports. Since neutron embrittlement becomes a concern only if cracking is present in the components, and because both industry and plant experience have not identified cracking in these components, the staff concludes that there is no demonstrated safety issue regarding neutron embrittlement of the components. Further, the BWRVIP-41 report requires inspections of several jet pump assembly welds, which are more susceptible to cracking than the CASS components and will therefore serve as an indication of the potential need for more extensive inspections later in life. These welds are considered to be more susceptible than the CASS components, which are made in one piece and have no welds, since the BWR environment has the potential to promote IGSCC under normal water chemistry conditions. Therefore, the staff finds that the welds to be inspected in accordance with the BWRVIP-41 report will provide adequate indication if additional inspections may be needed in the future. In addition, the staff is considering confirmatory research to determine the effects of high levels of neutron fluence on BWR internals. The results of this program will be used by the staff in evaluating the need for additional inspections of CASS jet pump assemblies in the renewal period. Therefore, the staff concludes that a one-time inspection of jet pump assemblies and fuel supports is not warranted at this time to support operation for the license renewal term.

Therefore, the staff concludes that a one-time inspection of jet pump assemblies and fuel supports is not warranted at this time to support operation for the license renewal term.

The BWRVIP and the NRC's Office of Nuclear Regulatory Research (RES) are considering joint confirmatory research to determine the effects of high levels of neutron fluence on BWR internals. Any future research results would help to determine whether additional inspections, or alternatives to inspections, are warranted. Should research results find that inspections of CASS jet pump assemblies and fuel supports are warranted, the results should be included in a staff-approved revision to the BWRVIP-41 report, or another staff-approved BWRVIP report.

By letter dated June 5, 2001, the applicant committed to continued participation in BWRVIP activities, including the implementation of future BWRVIP documents. Further, the applicant has committed to implementing the guidelines of the BWRVIP-41 report, and any staff-approved revisions to the BWRVIP-41 report.

On the basis that the industry has not observed cracking in CASS jet pump assemblies and fuel supports, the staff has determined that its request for the applicant to perform a one-time inspection to identify cracking in the CASS jet pump assemblies and fuel supports is not warranted at this time.

In addition, the applicant's commitment to implement future staff-approved BWRVIP documents related to aging management of CASS jet pump assembly components and fuel supports, and staff-approved BWRVIP guidelines, provides additional assurance that the aging effects associated with these components will be adequately managed during the period of extended operation.

On the basis of the information discussed above, the staff concludes that the loss of fracture toughness of CASS jet pump assemblies and fuel supports due to the effects of thermal and neutron embrittlement will be adequately managed for the period of extended operation. Open Item 3.2.3.1.1-1 is closed.

3.2.3.2.3-1 The staff was concerned that unanticipated high cycle thermal fatigue resulting from thermal stratification, turbulent penetration, or intergranular stress corrosion could result in cracking of small bore piping. These types of cracking are not evaluated as part of the component cyclic or transient limit program. The ASME Code Class 1 inspection requirements for small-bore piping include a surface examination, but not a volumetric examination. In order to detect cracking resulting from high cycle thermal fatigue or intergranular stress corrosion, a volumetric examination is required. Since the proposed program does not include a volumetric examination, it may not be capable of detecting high cycle thermal fatigue cracks resulting from thermal stratification, turbulent penetration, or intergranular stress corrosion. Therefore, the staff requested that the applicant supplement the existing programs with volumetric examination of the limiting locations in small-bore piping systems, excluding socket welds, which could have thermal stratification or turbulent penetration.

By letter dated September 5, 2001, the applicant committed to including small-bore butt-welded stainless steel piping in the scope of the treated water systems piping inspection (TWSPI) program. TWPSI is a one-time condition monitoring

program that provides for visual and volumetric inspections of a sample population intended to detect loss of material and cracking, and confirms the effectiveness of existing chemistry control programs. The staff's review of this aging management program is found in Section 3.1.24 of this SER. On the basis of the applicant's commitment to provide visual and volumetric examinations of the small-bore piping, Open Item 3.2.3.2.3-1 is closed.

3.6.3.1-1 In Section 2.4.7 of the LRA, the intended function of the reactor building penetrations (T54-01) is "maintain secondary containment leakage rates within design limits." In TS Section B 3.6.4.1, under "LCO," it is stated "For the secondary containment to be OPERABLE, it must have adequate leak tightness to ensure that the required (0.2 inch) vacuum can be established and maintained." Numerous penetrations associated with the reactor building could contribute towards violating the design limits established for secondary containment (i.e., reactor building). Thus, the applicant should have an AMP to demonstrate that the overall effect of numerous degradations has not violated the leakage characteristics of the reactor building. This was identified as Open Item 3.6.3.1-1.

By letter dated June 5, 2001, the applicant responded to this open item. The applicant stated that it had revised the structural monitoring program to include the provisions of Surveillance Requirement 3.6.4.1.4 of the Unit 1 and 2 technical specifications. The draw-down test performed pursuant to the surveillance requirement will be credited for aging management as an additional detection measure that is capable of detecting gross changes in flow that may be indicative of age-related degradation. The applicant also revised the FSAR Supplement to reflect this change.

On the basis of the applicant's inclusion of the secondary containment draw-down test as per the surveillance requirements of the TS, as a means to detect gross age-related degradation of secondary containment, the staff concludes that the applicant has an adequate AMP to demonstrate that the overall effect of numerous degradations will not violate the leakage characteristics of the reactor building. Open Item 3.6.3.1-1 is closed.

3.6.3.2-1 (a) In response to RAI 3.6-41 related to torus corrosion, the applicant provided a description of torus degradation found in both Plant Hatch units. However, the applicant emphasized that, in spite of the degradation, the actual shell thicknesses are well above the required minimum shell thicknesses. The applicant stated that it plans to continue to perform desludging, visual examination, and spot coating repairs periodically, based on the history of past inspection. The staff believed that operating experience at Plant Hatch and other industry operating experience related to torus corrosion indicated a need for a program to manage torus corrosion during the period of extended operation. In Open Item 3.6.3.2-1(a), the staff requested the applicant to provide justification as to why this program should not be a separate program in the LRA.

By letter dated January 31, 2001, the applicant provided a drawing showing a section through the torus and associated penetrations. The drawing also identified the AMPs associated with the penetrations above and below the water line. For torus penetrations above the water line, the applicant takes credit for implementing the inservice inspection program, the primary containment leakage testing program, the protective coating program, and the component cyclic or transient limit program. Additionally, for torus penetrations below the water line and in the splash zone of the torus shell, the applicant takes credit for implementing the suppression pool chemistry control program the torus submerged component inspection program, and the protective coatings program. Moreover, the applicant states, "a review of torus inspection reports indicates that degradation of the torus coating, in the form of thinned coatings, and some pitting corrosion in the torus immersion area is general in nature and occurs primarily on the torus shell. No specific corrosion has been noted around penetrations welded to the shell. Corrosion is generally more evident near the torus waterline and at or near the bottom of the torus where sludge or small debris collects." The applicant also provides a listing of penetrations in the torus of each unit. This information adequately responds to the staff's concern regarding the AMPs for torus degradation, and closes Open Item 3.6.3.2-1(a).

(b) Table 3.3.1-3 of the LRA did not provide any information regarding the aging management (including surveillance requirements) for gears, latches, and linkages of personnel hatches and penetrations. RAI 3.6-15 requested that the applicant identify where fretting and lockup of hinges, locks, and closure mechanisms for personnel hatches is discussed in the LRA, or provide a technical justification for not considering fretting and lockup as applicable aging effects for these components. The RAI also asked that the applicant provide a description of the AMP for the personnel hatches, consistent with the 10 elements in the SRP-LR, in sufficient detail to allow the staff to assess the adequacy of this program to manage the applicable aging effects. The applicant responded that locks and closure mechanisms are active components, and are not subject to an AMR. Therefore, fretting and lockup of hinges, locks, and closure mechanisms for personnel hatches and penetrations are not discussed in the LRA. However, aging management for personnel airlocks, hatches, equipment hatches, and penetrations are managed by the ISI program, protective coatings program, and primary leak rate testing program, as discussed in LRA Sections C.2.6.2, A.1.9, A.2.3, and A.1.14. This was identified as Open Item 3.6.3.2-1(b).

The primary containment leakage testing program is described in Section 18.2.14 of the Plant Hatch FSAR Supplement. It states that the applicant has chosen to identify the performance-based requirements and criteria for pre-operational testing and subsequent periodic leakage rate testing. The program ensures that leakage through the primary containment, or through systems and components that penetrate the primary containment, does not

exceed allowable leakage rates specified in the TS, and that the integrity of the containment structure is maintained during its service life.

The staff notes that the applicant's approach conforms with the performance-based approach described in Section XI.S4 of the Generic Aging Lessons Learned (GALL) report that was reviewed and approved by the staff, and issued in July, 2001. As such, the staff concludes that aging management by the ISI program, protective coatings program, and primary leak rate testing program, for personnel airlocks, hatches, equipment hatches, and penetrations , is adequate to ensure that leakage through the primary containment, or through systems and components that penetrate the primary containment, does not exceed allowable leakage rates. Open Item 3.6.3.2-1(b) is closed.

4.1.3-1 (a) Table 4.1.1-1 of the LRA identifies piping stress analyses that consider thermal fatigue cycles as a TLAA. The table does not identify the fatigue analyses of other reactor coolant pressure boundary components or the reactor vessel internals as TLAAs. Section 4.2 of the LRA does address the reactor pressure vessel. In RAI 4.1-2, the staff asked the applicant to identify other components of the reactor coolant pressure boundary that have fatigue analyses. The staff also asked the applicant to describe the TLAAs that were performed to address fatigue for the reactor coolant pressure boundary components, except for the reactor vessel, that were not included in Table 4.1.1-1, and to describe the TLAA performed for the reactor vessel internals. The staff also requested that the applicant indicate how these TLAAs meet the requirements of 10 CFR 54.21(c). In response, the applicant stated that the criteria of BWRVIP-74 were used to determine which fatigue analyses were sufficiently significant to constitute a TLAA. As indicated in the RAI, the applicant discussed the fatigue analysis of the reactor vessel internals in the UFSAR. In the SER issued in February, 2001, the staff requested that the applicant explain how the fatigue analysis of the vessel internals was found to be acceptable for the 60-year period. The staff also requested that the applicant identify any other components of the reactor coolant pressure boundary that had fatigue analyses, and explain how these analyses were found to be acceptable for the 60-year period. This was identified as part of Open Item 4.1.3-1 [4.1.3-1(a)].

The applicant provided a response to this open item by letter dated June 5, 2001. In the letter, the applicant indicated that the initial Plant Hatch vessel internals AMR noted that cracking due to fatigue was an aging effect requiring management and that the fatigue cumulative usage factor (CUF) calculation was a TLAA. The applicant's response also indicated that, subsequent to the development of the initial AMR, the end-of-life CUF was determined to be substantially less than 0.5. The applicant stated that since the end-of-life CUF was low, the fatigue calculation did not represent a TLAA. The staff disagrees with the applicant's premise that, because the calculated CUF was low, the fatigue calculation did not represent a TLAA. The applicant should have identified the vessel internals fatigue analysis as a TLAA in the LRA and described the disposition of the TLAA per the

requirements of 10 CFR 54.21(c)(1). However, the applicant's current fatigue analysis of the vessel internals, which projects that the CUF will remain below 1.0 for the period of extended operation, provides an acceptable TLAA evaluation in accordance with the requirements of 10 CFR 54.21(c)(1)(ii). The applicant did not identify any other components of the reactor coolant pressure boundary that had fatigue analyses. Therefore, this part of Open Item 4.1.3-1 [4.1.3-1(a)] is closed.

(b) Section 4.2.2 of the LRA contains a discussion of the Plant Hatch licensing-basis pipe break criteria. Part of the Plant Hatch pipe break criteria involves postulating pipe breaks at locations where the calculated fatigue usage exceeds a specified value. Although the applicant identified the fatigue cumulative usage factor (CUF) calculation as a TLAA, the applicant concluded that the pipe break criteria were only a screening mechanism and not a TLAA. The usage factor calculation used to identify postulated pipe break locations meets the definition of a TLAA, as specified in 10 CFR 54.3. In RAI 4.2-1, the staff asked the applicant to provide a description of a TLAA for the pipe break criteria at Plant Hatch, and describe how the TLAA meets the requirements of 10 CFR 54.21(c). In response, the applicant stated that it views the pipe break criteria to be selection criteria that establish a bounding set of locations for line break consideration. Although the staff agreed with the applicant's statement, the staff still considered pipe break postulations to be a TLAA because the fatigue calculation is a TLAA. Additionally, the NRC previously identified high-energy line break postulation founded on the fatigue CUF as a TLAA in accordance with 10 CFR 54.3 (60 FR 22480, May 8, 1995). Therefore, the staff requested that the applicant include pipe break postulations founded on the fatigue usage factor as a TLAA. This was identified as part of Open Item 4.1.3-1 [4.1.3-1(b)].

By letter dated September 5, 2001, the applicant responded to this open item. In the response to the open item, the applicant revised its LRA discussion of pipe break criteria to classify pipe break postulations based on fatigue CUF as TLAAs. The TLAA evaluation is discussed in Section 4.2.5 of the revised LRA. The licensing basis pipe break criteria required that breaks be postulated at piping locations where the calculated CUF exceeded 0.1. The applicant identified additional piping locations where the CUF criterion may be exceeded during the period of extended operation. The applicant proposed to monitor three bounding locations during the period of extended operation using its Component Cyclic or Transient Limit Program to address the TLAA. The applicant's proposed program, which involves monitoring a sample of bounding locations during the period of extended operation, is an acceptable method to address the pipe break postulation TLAA in accordance with the requirements of 54.21(c)(1). If the CCTLP identifies a location where the usage criterion may be exceeded, then the applicant must take corrective action in accordance with the corrective action program. As part of the corrective action, other potential locations must be addressed. This part of Open Item 4.1.3-1 [4.1.3-1(b)] is closed.

4.2.3-1 By letter dated February 9, 1998, the Electric Power Research Institute (EPRI) submitted two technical reports dealing with the fatigue issue. EPRI Reports TR-107515, "Evaluation of Thermal Fatigue Effects on Systems Requiring Aging Management Review for License Renewal for the Calvert Cliffs Nuclear Power Plant," and TR-105759, "An Environmental Factor Approach to Account for Reactor Water Effects in Light Water Reactor Pressure Vessel and Piping Evaluations" were part of an industry attempt to resolve GSI-190. As recommended in SECY 95-245, the EPRI analyzed components with high usage factors, using environmental fatigue data. The staff has open technical concerns regarding the EPRI reports. The staff's technical concerns were transmitted to the Nuclear Energy Institute (NEI) by letter dated November 2, 1998. The NEI responded to the staff's concerns in a letter dated April 8, 1999. The staff submitted its assessment of the response in a letter to the NEI, dated August 6, 1999. As indicated in the staff's letter, the NEI response did not resolve all of the staff's technical concerns regarding the EPRI reports.

The applicant indicated that EPRI license renewal fatigue studies have demonstrated that sufficient conservatism exists in the design transient definitions to compensate for potential reactor water environmental effects for Plant Hatch. As discussed above, the staff does not agree with the contention that the EPRI fatigue studies have demonstrated that sufficient conservatism exists in the design transient definitions to compensate for potential reactor water environmental effects. Although the letter dated August 6, 1999 identified the staff's concerns regarding the EPRI procedure and its application to PWRs, the technical concerns regarding the application of the Argonne National Laboratory (ANL) statistical correlations and strain threshold values are also relevant to BWRs. In addition to the concerns referenced above, the staff has additional concerns regarding the applicability of the EPRI BWR studies to Plant Hatch. EPRI Report TR-107943, "Environmental Fatigue Evaluations of Representative BWR Components," addressed a BWR-6 plant, and EPRI Report TR-110356, "Evaluation of Environmental Thermal Fatigue Effects on Selected Components in a Boiling Water Reactor Plant," used plant transient data from a newer vintage BWR-4 plant. In RAI 4.2-2, the staff requested that the applicant provide additional information regarding the use of the EPRI license renewal fatigue studies to resolve the environmental fatigue issue at Plant Hatch.

In response to the RAI, the applicant discussed its assessment of the impact of the environmental correction factors for carbon and low-alloy steels contained in NUREG/CR-6583, "Effects of LWR Coolant Environments on Fatigue Design Curves of Carbon and Low-Alloy Steels," and those for austenitic stainless steels contained in NUREG/CR-5704, "Effects of LWR Coolant Environments on Fatigue Design of Austenitic Stainless Steels," on the results of the EPRI studies. As a result of its assessment, the applicant concluded that the correlations have been adequately accounted for via the conservatism of the design-basis transients.

The applicant indicated that EPRI Report TR-110356 contained studies that are directly applicable to Plant Hatch because they involved a BWR-4 that is identical to the Plant Hatch design. The only components evaluated in TR-110356 are the feedwater nozzle and the control rod drive penetration locations. However, the

applicant indicated that both Plant Hatch units employ hydrogen water chemistry, whereas the plant in the EPRI study did not consider hydrogen water chemistry, which affects the level of dissolved oxygen in the primary system. Dissolved oxygen is an important factor in the environmental fatigue effects. The applicant stated that this issue was adequately addressed by its evaluation of the feedwater nozzle contained in EPRI Report TR-105759. It is not clear to the staff how the issue of hydrogen water chemistry was addressed in EPRI Report TR-105759. The applicant's response did not resolved the staff's concerns regarding the environmental fatigue issue at Plant Hatch.

The staff requested that the applicant provide an assessment of the six locations identified in NUREG/CR-6260, "Application of NUREG/CR-5999, 'Interim Fatigue Curves to Selected Nuclear Power Plant Components'," dated March 1995, for an older vintage BWR (BWR-4) considering the applicable environmental fatigue correlations provided in NUREG/CR-6583 and NUREG/CR-5704 reports for Plant Hatch Units 1 and 2. The applicant indicated that these locations are monitored by the CCTLP, and that the environmental factors have been adequately accounted for by the conservatism in the design basis transient definitions. On the basis of the above discussion, the staff did not agree with the applicant that environmental fatigue concerns regarding the six locations identified in NUREG/CR-6260 have been adequately addressed at Plant Hatch. The staff, therefore, requested that the applicant assess these six locations, considering applicable environmental fatigue correlations provided in NUREG/CR-6583 and NUREG/CR-5704, as applicable. This was identified as Open Item 4.2.3-1.

By letter dated September 5, 2001, the applicant provided a revised response to Open Item 4.2.3-1. The applicant committed to evaluate the locations identified in NUREG/CR-6260 using the applicable environmental fatigue correlations provided in NUREG/CR-6583 and NUREG/CR-5704. These locations are:

- Reactor Vessel (Lower Head to Shell Transition)
- Feedwater Nozzle
- Recirculation System (RHR Return Line Tee)
- Core Spray System (Nozzle and Safe End)
- Residual Heat Removal Line (Tapered Transition)
- Feedwater Line (RCIC Tee)

The applicant indicated that usage factor multipliers would be developed at each location to account for the environmental effects. The applicant further indicated that these environmental multipliers would be incorporated in the Hatch CCTLP. The applicant's CCTLP will monitor the CUF, which includes the environmental multipliers, at the six locations for comparison with the allowable CUF. The applicant's proposal adequately addresses the staff concern regarding environmental effects on fatigue usage and, therefore, Open Item 4.2.3-1 is considered closed.

1.5 Summary of License Conditions

As a result of it's review of the LRA, including the additional information and clarifications that were submitted by the applicant, the staff identified 3 license conditions. The first license condition is associated with the resolution of Open Item 3.0-1. This license condition requires the applicant to include the FSAR Supplement in the next UFSAR update, required by 10 CFR 50.71(e). The second license condition is associated with the resolution of Open Item 3.1.17-1. This license condition requires that, prior to operation in the renewal term, the applicant will notify the NRC of the its decision to implement either the staff-approved reactor vessel integrated surveillance program, or a plant-specific program, and provide the appropriate revisions to the FSAR Supplement summary descriptions of the vessel surveillance material testing program. The third license condition requires that the future inspection activities identified in the FSAR Supplement be completed before the beginning of the extended period of operation.

2 STRUCTURES AND COMPONENTS SUBJECT TO AN AGING MANAGEMENT REVIEW

This section of the SER describes the staff's review of the methodology used by the applicant to implement the scoping and screening requirements of 10 CFR Part 54 (the Rule), as well as the staff's evaluation of the applicant's scoping and screening results.

By letter dated February 29, 2000, the applicant submitted its request and application for renewal of the operating licenses for the Edwin I. Hatch Nuclear Plant, Units 1 and 2. As an aid to the staff during the review, the applicant provided evaluation boundary drawings that identify the functional boundaries for systems and components within the scope of license renewal. These evaluation boundary drawings are not part of the license renewal application.

On July 14 and July 28, 2000, the staff issued requests for additional information (RAIs) regarding the applicant's methodology for identifying structures, systems, and components (SSCs) at Plant Hatch that are within the scope of license renewal and subject to an aging management review (AMR) and the results of the applicant's scoping and screening process. On August 29 and October 10, 2000, the applicant provided responses to the RAIs.

2.1 Scoping and Screening Methodology

2.1.1 Introduction

In Section 2.1, "Scoping and Screening Methodology," of the Plant Hatch license renewal application (LRA), the applicant described the scoping and screening methodology used to identify structures, systems, and components (SSCs) at Plant Hatch that are within the scope of license renewal, and structures and components (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.

10 CFR 54.21, "Contents of Application — Technical Information," requires, in part, that each application for license renewal contain an integrated plant assessment (IPA) that identifies and lists those SSCs that satisfy the criteria in 10 CFR 54.4(a)(1), (a)(2), and (a)(3) that are subject to an AMR. 10 CFR 54.4, "Scope," defines the criteria for including SSCs within the scope of the Rule.

In developing the scoping and screening methodology for the Plant Hatch LRA, the applicant considered the requirements of the Rule, the Statements of Consideration (SOCs, 60 FR 22401, May 8, 1995) for the Rule, and the guidance provided by the Nuclear Energy Institute (NEI), "Industry Guideline for Implementing the Requirements of 10 CFR Part 54 - The License Renewal Rule," Revision 0 (NEI 95-10). In addition, the applicant also considered the staff's correspondence with other applicants and with the NEI in the development of this methodology. The applicant stated that the methodology was also developed with the knowledge that some provisions of the Rule may be satisfied by implementing 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants" (the Maintenance Rule) at Plant Hatch.

2.1.2 Summary of Technical Information in the Application

Section 2.1 of the Plant Hatch LRA describes the process that the applicant used to implement the scoping requirements of the Rule as specified in 10 CFR 54.21(a)(2). As used in the Plant Hatch

application methodology, scoping is the process of identifying systems and structures that meet the scoping criteria of 10 CFR 54.4(a)(1) - (3), including the identification of intended functions as defined by 10 CFR 54.4(b), i.e., those functions that are related to meeting one or more of the scoping criteria of 10 CFR 54.4(a)(1) - (3). The Plant Hatch scoping criteria, as applied to plant SSCs, are:

- reactor coolant pressure boundary integrity (10 CFR 54.4(a)(1)(i))
- safe reactor shutdown and maintenance (10 CFR 54.4(a)(1)(ii))
- accident consequence prevention or mitigation (10 CFR 54.4(a)(1)(iii))
- non-safety-related SSCs whose failure could prevent satisfactory accomplishment of any of the functions associated with the items above (10 CFR 54.4(a)(2))
- compliance with fire protection regulations (10 CFR 50.48) (10 CFR 54.4(a)(3))
- compliance with environmental qualification regulations for electrical equipment (10 CFR 50.49) (10 CFR 54.4(a)(3))
- compliance with anticipated transient without scram (ATWS) regulations (10 CFR 50.62) (10 CFR 54.4(a)(3))
- compliance with station blackout (SBO) regulations (10 CFR 50.63) (10 CFR 54.4(a)(3))

An additional regulation, 10 CFR 50.61, "Fracture Toughness Requirements for Protection Against Pressurized Thermal Shock Events," does not apply to Plant Hatch, because, as specified in the regulation, an evaluation in accordance with Regulatory Guide 1.154, "Format and Content of Plant-Specific Pressurized Thermal Shock Safety Analysis Reports for Pressurized Water Reactors," January 1987 is not required for boiling water reactor plants.

The identification and listing of SCs that are subject to an AMR is called "screening" in the Plant Hatch application methodology, as discussed in Section 2.1.3 of the LRA for civil/mechanical disciplines, and in Section 2.1.4 of the LRA for the electrical discipline.

2.1.2.1 Technical Information for Identifying Systems, Structures, and Components Within the Scope of License Renewal

As provided in 10 CFR 54.4(a)(1), design-basis events for license renewal are applied as defined in 10 CFR 50.49(b)(1), consistent with the current licensing basis (CLB). 10 CFR 54.4(b) provides that the intended functions that these SSCs must be shown to fulfill in 10 CFR 54.21 are those functions that are the bases for including them within the scope of license renewal as specified in 10 CFR 54.4(b), paragraphs (a)(1)-(3).

The process for implementing the requirements of 10 CFR 54.4(a) and (b) is summarized by the following steps and described in detail in Section 2.1.2 of the LRA:

- Plant systems and structures, and their functions, were identified.

- The function of each system and structure was reviewed to determine whether it met any of the scoping criteria specified in 10 CFR 54.4(a).

The applicant performed a comprehensive review of design documents in order to create a list of systems and structures to be scoped. Information sources included the Plant Hatch Equipment Location Index (ELI) which lists system and structure nomenclature used at the plant, as well as the plant's Maintenance Rule Scoping Manual, System Evaluation Document (SED), and UFSARs. In addition, a plant design drawing, which lays out a generic listing of system nomenclature for boiling water reactors (BWRs), was reviewed in order to thoroughly identify all potential system/structure identifiers. The resultant list of potential systems and structures provided a starting point for system and structure function identification.

The scoping requirements of the license renewal rule and the maintenance rule overlap. Because of the similarities in the rules, the Plant Hatch Maintenance Rule Scoping Manual was one of the information sources used to establish an initial listing of plant system and structure functions.

The final list of functions evaluated for license renewal encompasses all plant systems and structures, except as described in Section 2.1.2.3 of the LRA. The functions did not necessarily follow traditional system boundaries, in that the functions included structures and components, irrespective of traditional system nomenclature, that perform or support the identified function. To arrive at the component level, the applicant chose to scope at a function level and screen at the component level. The applicant elected to use the term "component function" when referring to the specific structure, component, or component group functions needed to support an intended function. Systems and structures that only provide emergency preparedness or physical protection functions were not evaluated in the scoping process.

Safety-Related Systems and Structures

10 CFR 54.4(a)(1)(i), (ii), and (iii) provide the scoping criteria for determining the functions of safety-related systems and structures that are within the scope of the Rule. Each system and structure function in the plant listing of scoping results (LRA Table 2.2-1) was reviewed with respect to these requirements by addressing the following questions:

- Is the function of the system or structure identified as safety-related because it is relied upon during and following design-basis events to ensure the integrity of the reactor coolant pressure boundary?

- Is the function of the system or structure identified as safety-related because it is relied upon during and following design-basis events to ensure the capability to shut down the reactor and maintain it in a safe shutdown condition?

- Is the function of the system or structure identified as safety-related because it is relied upon during and following design-basis events to ensure the capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposure comparable to the guidelines in 10 CFR 100.11?

To answer these questions, the applicant used engineering and licensing documents. The ELI and the SED are engineering documents that provide system-related design information. The UFSARs, the Maintenance Rule Scoping Manual, and the SED provide function-related information. The

UFSARs and applicable references identify the basis for design-basis events at Plant Hatch. If the answer to one or more of the three questions was "YES," the corresponding system or structure function was determined to be within the scope of the Rule and was designated as an intended function as identified by 10 CFR 54.4(b).

In certain cases, the applicant has conservatively chosen to designate some systems as safety-related, even though their functions may not meet any of the scoping criteria of 10 CFR 54.4(a)(1). System functions brought into scope by 10 CFR 54.4(a)(1) were also reviewed to determine whether they were also in scope based on the requirements of 10 CFR 54.4(a)(2) or 10 CFR 54.4(a)(3). In addition, functions may include, in a few cases, both safety-related and non-safety-related components. In those cases, a function would be identified as meeting the scoping criteria of 10 CFR 54.4(a)(1), as well as the requirement for 10 CFR 54.4(a)(2), as described below.

Non-safety-Related Systems and Structures Whose Failure Could Prevent Safety-Related Systems and Structures from Accomplishing Their Functions

10 CFR 54.4(a)(2) provides that "all non-safety-related systems, structures, and components whose failure could prevent satisfactory accomplishment of any of the functions identified in paragraphs (a)(1)(i), (ii), or (iii)" of 10 CFR 54.4 are within the scope of the Rule. Few system and structure functions at Plant Hatch satisfy this criterion because systems and structures supporting safety-related systems and structures were typically designed as safety-related. Each system and structure function in the plant's listing of scoping results was reviewed with respect to this requirement by addressing the following question:

- Is the function of the system or structure identified as non-safety-related whose failure could prevent satisfactory accomplishment of any of the functions identified in 10 CFR 54.4(a)(1)(i), (ii), or (iii)?

To answer this question, the applicant used engineering and licensing documents. The ELI and the SED were used to provide system-related design information. The UFSARs, the Maintenance Rule Scoping Manual, and the SED were used to provide function-related information. The UFSARs and applicable references were used to identify the basis for design basis events at Plant Hatch.

Based upon a review of the UFSARs, issues or events considered in association with this question for Plant Hatch were Seismic II/I, flooding, jet impingement, pipe whip, and missiles.

If a function was used to mitigate one or more of the issues or events, the answer to the above question was "YES," the corresponding system or structure function was brought in scope, and the function was identified as an intended function per 10 CFR 54.4(b). In making determinations associated with this question, the applicant also relied on the consideration of actual plant-specific experience, industry-wide operating experience, and existing plant-specific engineering evaluations that were originally addressed by the controlled Maintenance Rule Scoping Manual determinations. Hypothetical failures that result from postulated system functional interdependencies that are not part of the Plant Hatch safety analyses or effects evaluations and that have not been observed at Plant Hatch were not considered.

Systems and Structures Relied Upon to Demonstrate Compliance With Certain NRC Regulations

The applicant reviewed the NRC's Safety Evaluation Reports (SERs) and related docketed correspondence associated with four of the five regulations identified in 10 CFR 54.4(a)(3). The applicant used this review to identify the set of system and structure functions credited with satisfying the requirements associated with those regulations from the complete set of system and structure functions established by the process described in LRA Section 2.1.2.2. The four regulations are as follows:

- 10 CFR 50.48, "Fire Protection"
- 10 CFR 50.49, "Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants"
- 10 CFR 50.62, "Requirements for Reduction of Risk from Anticipated Transients Without Scram (ATWS) Events for Light-Water-Cooled Nuclear Power Plants"
- 10 CFR 50.63, "Loss of All Alternating Current Power"

An additional regulation, 10 CFR 50.61, "Fracture Toughness Requirements for Protection Against Pressurized Thermal Shock Events," does not apply to Plant Hatch, because, as specified in the regulation, an evaluation in accordance with Regulatory Guide 1.154 is not required for boiling water reactor plants.

Each system and structure function was reviewed with respect to these criteria by addressing the following questions:

- Is the function of the system or structure relied upon in safety analyses or plant evaluations to demonstrate compliance with the Commission's regulation for fire protection (10 CFR 50.48)?
- Is the function of the system or structure relied upon in safety analyses or plant evaluations to demonstrate compliance with the Commission's regulation for environmental qualification (10 CFR 50.49)?
- Is the function of the system or structure relied upon in safety analyses or plant evaluations to demonstrate compliance with the Commission's regulation for ATWS events (10 CFR 50.62)?
- Is the function of the system or structure relied upon in safety analyses or plant evaluations to demonstrate compliance with the Commission's regulation for SBO (10 CFR 50.63)?

The Environmental Qualification Master List (EQML) was used to identify the systems that are relied upon to comply with 10 CFR 50.49. For the second question, if system or structure components were listed in the EQML, then each system or structure function that required environmental qualification of the components was designated as being relied upon to demonstrate compliance with 10 CFR 50.49. These system or structure functions were brought in scope, and they were identified as intended functions per 10 CFR 54.4(b).

During the review of the EQML, NRC SERs, and docketed correspondence, the applicant confirmed that any credited functions and the systems and structures that specifically contribute to accomplishing the functions were included in the list of system or structure functions. For the remaining questions, regarding the fire protection, ATWS, and station blackout regulations, if the answer to any of the questions was "YES," then each corresponding system or structure function was brought into scope and was identified as an intended function per 10 CFR 54.4(b). The NRC SERs and associated docketed correspondence were used to answer these questions.

2.1.2.2 Technical Information for the Structures and Components Subject to an Aging Management Review

Civil/Mechanical Component Screening

The license renewal rule requires a review of plant SSCs to determine if the effects of aging will be adequately managed for certain SCs in the period of extended operation. The process described in LRA Section 2.1.2 was used to identify the intended functions, that is, those SSC functions that are within the scope of the Rule. 10 CFR 54.21(a) requires that an IPA process be applied to SSCs determined to be in scope per 10 CFR 54.4. The IPA process employed by the applicant required an initial review of those functions within the scope of the Rule, as determined by the process described in LRA Section 2.1.2, to define intended function evaluation boundaries. The intended function evaluation boundaries were then used to assist in the identification of the SCs that are subject to an AMR.

10 CFR 54.21(a)(1) requires applicants to identify and list the SCs subject to an AMR. LRA Section 2.1.3 defines a "screening" process whereby the applicant identified and listed the SCs that met the criteria of 10 CFR 54.21(a)(1)(i) and (ii). Use of the term "passive" within this application is intended to be identical to criterion (i). That is, SCs that perform an intended function without moving parts or without a change in configuration or properties are characterized as "passive." Likewise, use of the term "long-lived" is intended to be identical to criterion (ii). That is, structures and components that are not subject to replacement based on a qualified life or specified time period are characterized as "long-lived."

The applicant performed screening of the civil/mechanical intended functions for Plant Hatch in two steps:

1. Evaluation boundaries were established for each intended function.

2. Passive, long-lived components were identified within each evaluation boundary. The screening process first established an evaluation boundary to define the systems or structures that are required to accomplish an intended function. Then each evaluation boundary was used to assist in identifying the complete set of SCs within the evaluation boundary and to identify the passive, long-lived subset that represents those SCs subject to an AMR. This final set of SCs is presented in the tables in LRA Sections 2.3 through 2.5 in fulfillment of the requirement of 10 CFR 54.21(a)(1).

Intended Function Evaluation Boundaries

This step of the screening process defined the evaluation boundary for the system and structure functions determined to be within the scope of the Rule by the process described in LRA Section

2.1.2. These functions are the intended functions per the definition in the Rule. Defining the evaluation boundary focuses the screening process on the portions of systems and structures that contribute to the performance of one or more intended functions. Evaluation boundaries were established such that multiple, in-scope functions are included in one evaluation boundary description to the extent practical.

Evaluation boundaries were produced using controlled procedures to ensure a consistent approach to preparation and documentation. Evaluation boundaries, as used in this methodology, were not required to match other boundaries that are defined in existing documents such as the UFSARs or plant piping and instrumentation diagrams. Defining evaluation boundaries for license renewal does not require the plant to change or redefine other existing boundaries such as pipe class design boundaries or inservice inspection and testing boundaries. In addition, where a functional boundary was defined in the CLB for an in-scope function, the CLB-defined boundary was used. The applicant chose to conservatively designate certain components as "in scope" more broadly than the Rule might otherwise require.

The method of describing the evaluation boundary relied primarily on plant drawings. The set of drawings that were most appropriate to illustrate the boundary information was marked up with boundary designations that clearly indicate which portions or areas of the system are inside and which portions are outside the evaluation boundary. For example, system piping and instrumentation diagrams (P&IDs) were typically used to illustrate the evaluation boundary of intended functions from a mechanical perspective.

Due to the nature of civil/structural functions, evaluation boundary drawings were not produced for intended functions associated with structures; piping, cable tray, and conduit supports; electrical panel and rack supports; secondary containment doors; cranes; tornado vents; and penetrations. Instead, a plan view of the plant site was produced to identify the in-scope structures. The evaluation boundary of a structure that is a building included the entire building, including slabs, external and internal walls, roof and internal concrete, steel columns and beams, and framing. Miscellaneous steel items, such as base plates and embedded plates, were also included.

In the process of defining evaluation boundaries, emphasis was placed on ensuring that all interfaces were adequately considered. As necessary, other references, prepared lists, and written descriptions were used to supplement or further clarify the boundary designations on the marked-up drawings. The final set of illustrated mechanical and electrical drawings, references, and written descriptions formed the "boundary package" for an intended function, and was documented by controlled procedures. In order to maintain a consistent approach to screening, general and specific discipline interface guides were established and used to assist in designating the intended function evaluation boundaries and interfaces.

The applicant's screening process first defined civil/mechanical evaluation boundaries for intended functions. Then, all components included in the evaluation boundary were grouped, when practical, and screened. The applicant stated that this approach differs from NEI 95-10, Revision 0, which establishes groupings after the screening process is completed.

Component Types, Component Groups, and Component Functions

LRA Table 2.1-1 lists component types that are in scope for license renewal at Plant Hatch. This table is based on a table that originated as Appendix B of NEI 95-10, Revision 0. During the

process of screening structures and components at Plant Hatch, additional component types were identified and are included in LRA Table 2.1-1.

The list in LRA Table 2.1-1 represents the plant-wide list of in-scope structures and components, by component type. The tables in LRA Sections 2.3 through 2.5 present the screening results arranged by plant system or structure member. Each component type listed in the tables in LRA Sections 2.3 through 2.5 is a passive component as determined in LRA Table 2.1-1. Although not required by the Rule, in order to more efficiently screen SCs, component types within each intended function evaluation boundary were grouped to the maximum extent practicable. In creating these component groups, only components of the same type were grouped together. That is, a component group of valves did not include pipe. In addition, only component types within each intended function evaluation boundary that were fabricated of similar materials, and which were subjected to similar environments were grouped. Structural or mechanical components included in each component group were identified and documented by one or a combination of the following methods:

- by establishing a list of the MPL numbers
- by listing the reference drawings
- by describing the component or system

When establishing a passive and long-lived component group, specific information required to accurately describe the component function(s), materials composition, and internal and external environments for the components included in the component group was recorded in the screening records. In addition, the applicable drawings, system descriptions, design information, material specifications, and/or other information that could aid in performing an AMR were documented to the extent necessary to accurately and efficiently screen a component group.

Component function(s) for component types subject to an AMR were established on the basis of how the structure or component functions to support maintaining one or more intended functions consistent with the CLB, without reliance on redundancy or probabilistic considerations. LRA Table 2.1-2 provides the list of component functions used in the structure and component screening at Plant Hatch.

Passive Structures, Components, and Component Groups

The applicant's process defined evaluation boundaries for intended functions associated with structures and screened the boundaries to identify the passive and long-lived elements of the structures. Although intended function evaluation boundary drawings were not produced for the structures, the structural components screening included the active/passive and long/short-lived determinations as a matter of completeness and to facilitate the aging management reviews.

Components Subject to Periodic Replacement at a Set Frequency or Qualified Life

The detrimental effects of aging are assumed to be continuous and incremental. Thus, the detrimental effects of aging may increase as service life is extended, assuming no replacement of components. One way of effectively managing these effects is to replace selected structures and components on a specified time interval, based upon a qualified life of the structure or component. In this step of the screening process, the passive structures and components were reviewed to determine if they are subject to replacement based upon a specified time or qualified component

life. Structures and components that are not subject to such replacement were classified as "long-lived." In the methodology employed by the applicant, a replacement life must be less than 40 years for the structure or component to be considered "short-lived." Structures and components with replacement lives of 40 years or greater were considered "long-lived." Structures and components subject to replacement based on qualified life were identified as not being subject to an AMR.

Identification of Electrical Components Subject to an Aging Management Review

The process used to identify electrical components that are subject to an AMR is different from the method used to identify civil and mechanical components that are subject to an AMR. Electrical screening was based on the premise that the majority of electrical components installed in the plant perform their function with moving parts or a change in configuration or properties, and are therefore not subject to an AMR per the Rule. The applicant accomplished the electrical screening process using the following steps:

1. Develop a comprehensive list of all electrical component types installed in the plant without regard for system function or license renewal in-scope status.

2. Determine the basic function that each component type performs.

3. Determine which component types perform their function(s) without moving parts or a change in configuration or properties. This results in the list of electrical component types that are subject to an AMR for license renewal.

4. Apply the scoping criteria of 10 CFR 54.4(a)(1) through (3) to the list of component types that meet the screening criteria to determine if the list of electrical component types requiring an AMR can be further reduced.

In order to screen electrical component types to determine those which require an AMR, a complete list of all electrical component types installed in the plant was required. This list was compiled using the lists of components found in 10 CFR 54.21(a)(1)(i) and NEI 95-10, Appendix B, as the starting point. The resulting list of components was evaluated by plant engineering personnel and system experts who used their knowledge of plant systems and drawings to ensure that the list was complete and contained all electrical component types in use at Plant Hatch. Some component types with similar functions were grouped together for simplicity. The in-scope electrical component types installed at Plant Hatch are included in LRA Table 2.1-1. The list of electrical component types that are subject to an AMR appears in LRA Table 2.5.15-1.

Application of 10 CFR 54.21 Screening Criteria to Electrical Component Types

Having compiled the electrical component type list, 10 CFR 54.21 criteria were applied to determine which component types are subject to an AMR. The screening criteria of 10 CFR 54.21(a)(1)(i) and (ii) were applied to the comprehensive list of electrical component types to accomplish this step. Components are subject to an AMR if they meet both of the following screening criteria:

- 10 CFR 54.21(a)(1)(i) – The component performs an intended function as described in 54.4 without moving parts or without a change in configuration or properties.

- 10 CFR 54.21(a)(1)(ii) – The component is not subject to replacement based on a qualified life or a specified time period.

An active/passive determination in accordance with 10 CFR 54.21(a)(1)(i) was documented for each type of electrical component installed at Plant Hatch. This determination is presented in LRA Table 2.1-1.

When implementing the screening criteria of 10 CFR 54.21(a)(1)(ii), except for those cases where a determination was made for individual components (e.g., components qualified pursuant to 10 CFR 50.49), the determination was made for an entire component type or commodity group.

Individual components within the scope of the environmental qualification (EQ) program fall into two categories: those with a qualified life of 40 years or greater which are covered by a time-limited aging analysis (TLAA), and those with a qualified life of less than 40 years which are therefore subject to replacement based on a specified time period. The components with qualified lives of less than 40 years are currently on a replacement schedule which will continue into the renewal term; these components are not subject to an AMR. The qualified life calculations of those components with qualified lives greater than 40 years are treated as TLAAs and are evaluated in Section 4 of this SER. These TLAAs are dispositioned in accordance with the applicable disposition method per the Rule. In cases where a particular TLAA cannot be extended to 60 years, those components will be replaced or refurbished in accordance with the requirements of the EQ program. Therefore, no components included in the EQ program are subject to an AMR.

Application of 10 CFR 54.4 Scoping Criteria to Electrical Component Types

Scoping was performed as described in LRA Section 2.1. The set of passive, long-lived component types derived from the process described in LRA Section 2.1.4.1, steps 1 through 3, was then evaluated against the scoping criteria stated in step 4. This step was performed to further define the set of electrical component types that are subject to an AMR. The set of electrical component types remaining after completion of steps 1 through 4 of the screening process are included in the list in LRA Table 2.1-1 as component types that are subject to an AMR.

2.1.3 Staff Evaluation

The staff reviewed the methodology used by the applicant to identify SSCs at Plant Hatch that meet the scoping criteria of 10 CFR 54.4, and to identify SCs that meet the screening criteria of 10 CFR 54.21(a)(1) and (2). The staff used Standard Review Plan for License Renewal (SRP-LR), Section 2.1, "Scoping and Screening Methodology," to perform the scoping and screening review.

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

The staff evaluated the applicant's scoping methodology, as described in the LRA, to determine whether the methodology met the requirements of 10 CFR 54.4. As part of the evaluation process, the staff conducted an audit from June 12 through June 15, 2000, to determine whether the scoping methodology described by the applicant in its LRA was implemented consistent with the requirements of 10 CFR Part 54 and the Plant Hatch LRA. The audit took place at the SNC offices in Birmingham, Alabama. The audit consisted of a review of the scoping methodology implementing procedures and supporting information used by the applicant to identify the Plant

Hatch SSCs within the scope of the license renewal rule. The audit also examined a selected sample of products or results obtained by the applicant through its use of the scoping and screening methodology procedures.

The staff followed guidance provided in Section 2.1.3.1 of the SRP-LR to evaluate the scoping methodology described in Section 2.1.2.1 of this SER. The staff reviewed the applicant's process used to identify and classify SSCs as safety-related and non-safety-related, and to identify and classify SSCs that meet the definition of "regulated events" (i.e., those SSCs that are relied on in safety analyses or plant evaluations to perform functions that demonstrate compliance with the requirements of the fire protection (10 CFR 50.48), environmental qualification (10 CFR 50.49), pressurized thermal shock (10 CFR 50.61), anticipated transients without scram (10 CFR 50.62), and station blackout (10 CFR 50.63) regulations). Section 2.1.2.4 of the LRA described the applicant's process to identify safety-related SSCs that are within the scope of the Rule. Section 2.1.2.5 of the LRA described the applicant's process to identify non-safety-related SSCs within the scope of the Rule. Section 2.1.2.6 or the LRA described the applicant's process to identify those SSCs that meet the requirements of the regulations associated with regulated events. In Section 2.1.2.6 of the LRA, the applicant noted that 10 CFR 50.61 does not apply to Plant Hatch because, as specified in the regulation, an evaluation in accordance with Regulatory Guide 1.154, is not required for BWRs. The staff agrees with this determination.

On the basis of its review of the scoping methodology described in the LRA and summarized in Section 2.1.2.1 of this SER, the staff concludes that the methodology, as described in the LRA, is consistent with the requirements of the Rule, and that the scoping methodology will identify SSCs that meet the scoping criteria of 10 CFR 54.4. A summary of the scoping portion of the audit is described below.

During the audit at the SNC offices, the staff reviewed a variety of scoping methodology implementation procedures, including License Renewal Service Procedure (LRS) 1-1, "Revisions and Distribution of the License Renewal Services Procedures Manual," LRS 1-2, "Scoping Procedure," LRS 1-3, "Plant Hatch Scoping Template," LRS 1-4, "Boundary Procedure," and LRS 1-9, "LRS Database Control Procedure." The team also held discussions with SNC technical personnel, examined licensing basis documents, and reviewed samples of system functional boundary description packages to better understand the scoping and screening process.

Plant Hatch License Renewal Scoping and Screening Procedures Review Results

The applicant employed implementation procedures LRS 1-2 and LRS 1-3 to perform the scoping process. LRS 1-3 provided overall license renewal scoping evaluation guidance. The applicant began its process for identifying SSCs that are within the scope of the Rule by relying on 131 systems and 256 functions that were previously identified in the Plant Hatch maintenance rule scoping manual. Additional functions were also identified through a review of the CLB, which includes the Plant Hatch UFSARs, operating license/technical specifications, docketed correspondence, SEDs, and maintenance rule scoping database, and through a review of NRC safety evaluations reports to identify additional functions associated with regulated events as defined in 10 CFR 54.4(a)(3).

In the subsequent phase of the review, the applicant evaluated all Plant Hatch systems and structures on a function-by-function basis against specific license renewal criteria, including (a) safety-related — reactor coolant pressure boundary (§54.4(a)(1)(i)); (b) safety-related — safe

shutdown (§54.4(a)(1)(ii)); (c) safety-related — prevent or mitigate the consequences of accidents §54.4(a)(1)(iii)); (d) non-safety-related [functions] that affect safety-related functions (§54.4(a)(2)); and (e) relied on to demonstrate compliance with 10 CFR 50.48 (fire protection), 10 CFR 50.49 (environmental qualification), 10 CFR 50.62 (anticipated transient without scram), or 10 CFR 50.63 (station blackout). Following completion of this evaluation, 137 systems and 280 functions were identified and catalogued.

The applicant used LRS 1-4 to define the evaluation boundaries for electrical, mechanical, and civil system and structure functions that are determined to be within the scope of the Rule. This procedure provided the guidance necessary to generate system boundary diagrams including interfaces between mechanical and electrical boundaries. Boundary description packages (BDPs) were developed containing written descriptions of the evaluation boundary illustrated by the boundary diagrams and identified all in-scope functions included in the evaluation boundary. Review and sign-off authority for BDPs was also identified.

The applicant used LRS 1-9 in conjunction with TS 1-9, "Quality Assurance Records," to govern the documentation and quality assurance of the records of the scoping and screening process.

Based on its review of these procedures and from discussions held with SNC personnel, the audit team identified certain discrepancies between the scoping and screening process described in the procedures and the actual process that was followed. Specifically, the procedures did not provide a clear description and account for all essential activities in the scoping and screening process, nor did they clearly portray the sequence in which these activities were actually accomplished.

To gain a better understanding of the actual scoping and screening methodology used by the applicant, the staff selected three Plant Hatch systems (standby liquid control, high-pressure coolant injection, and service water) and performed a "walk-through" of the process described in the methodology procedures. SNC personnel assisted the audit team as it performed the walk-through.

Based on the results of the walk-through, and the staff's assessment of the actual implementation process and its oversight as applied by the applicant, the audit team determined that the procedures reviewed, in combination with the review of a sample of scoping and screening products, and with the benefit of insights provided by SNC personnel who were directly involved with the development of such products, provided adequate evidence that the scoping and screening process was conducted in accordance with the requirements of 10 CFR 54.4 and 10 CFR 54.21. However, the team also concluded that the applicant needed to update these procedures to satisfy the requirements of 10 CFR 54.37, "Additional Records and Recordkeeping Requirements," to reflect the actual scoping and screening process upon which the applicant relied and will rely to address future changes in the CLB.

Therefore, the applicant was requested to confirm, through a July 14, 2000, request for additional information (RAI 2.1-1), that the Plant Hatch license renewal scoping and screening procedures would be updated to clearly reflect the actual process used for both the current application as well as future updates to the application based on changes to the CLB, and to specify the time-frame during which this update would be accomplished.

In its response to the staff's RAI, dated August 29, 2000, the applicant stated its commitment to expand the existing procedures from a goal-oriented approach to a more detailed presentation of

the steps employed so that the scoping and screening processes were more clearly identified in the procedure steps. The applicant stated that these revised procedures would be used for the LRA update required by 10 CFR 54.21(b), and they would be in place prior to performing the first required LRA update. Accordingly, the applicant planned to have the revised procedures in place by September 11, 2000.

During the scoping and screening inspection conducted on September 11 through 15, 2000, the inspectors reviewed the revised procedures, and confirmed that they had been revised to adequately reflect the scoping and screening methodology. The staff concluded that the applicant's scoping and screening implementation procedures met the recordkeeping requirements of 10 CFR 54.37. On this basis, the issue identified in RAI 2.1-1 is resolved.

Review of 10 CFR 50.12 Plant Hatch Exemptions

The audit team reviewed the history of 10 CFR 50.12 exemptions at Plant Hatch to identify any potential SSCs that are within the scope of license renewal, but were not identified by the applicant's scoping methodology. The staff reviewed 32 exemptions and their associated correspondence. Of these, the staff noted that 1 exemption was not granted by the staff, 8 were no longer in effect, 22 were not age-related or time-limiting, and the remaining exemption was in effect, age-related, time-limiting, and the affected system had been included within the scope of license renewal.

Review of Design-Basis Events

Because the Plant Hatch scoping activities were primarily performed on the basis of intended function, rather than on design-basis events, the audit team reviewed the design-basis events identified in a study documented in a recent amendment to the Plant Hatch Unit 2 UFSAR. Plant Hatch Unit 2 UFSAR, Supplement 15C, "Nuclear Safety Operational Analysis" (NSOA), is a comprehensive summary of all design basis events, including anticipated operational occurrences, applicable to both Plant Hatch units and represents the culmination of an extensive design-basis review effort at Plant Hatch. However, the Plant Hatch license renewal scoping and screening process was completed before efforts associated with Supplement 15C to the Plant Hatch Unit 2 UFSAR were finalized.

Accordingly, the applicant was requested to provide information on actions it intended to undertake to ensure that the information relied on to generate the scoping and screening results in accordance with the methodology described in the Plant Hatch LRA is consistent with, and supported by, the design- and licensing-basis information in Supplement 15C to the Plant Hatch Unit 2 UFSAR. This was identified as RAI 2.1-2.

In its response to the staff's RAI, dated August 29, 2000, the applicant stated that it had informally reviewed the draft NSOA during preparation of the LRA. Although the document was not used as an "official" source of information due to its draft status, the applicant clarified that since the document has been incorporated into the CLB by virtue of its inclusion in the Plant Hatch Unit 2 UFSAR, Supplement 15C, the applicant would evaluate the NSOA using the scoping criteria of 10 CFR 54.4 to determine whether additional SSCs should be brought in scope based on the NSOA event sequences. The results of this evaluation will be documented internally, and any additions to the Plant Hatch LRA will be provided to the NRC in the scheduled annual update.

In its annual update of the Plant Hatch LRA, dated December 15, 2000, the applicant described the methodology used to complete the NSOA review to ensure that the information relied on to generate the scoping and screening results was consistent with the information in the NSOA. According to the applicant, the NSOA identifies the active system-level requirements that ensure that the Plant Hatch safety analysis is valid for all limiting operational conditions. However, while the Plant Hatch safety analysis is essentially consequences-oriented, the NSOA is event/system-oriented.

The methodology used in completing the NSOA review focused on the consideration of each of the NSOA events and the system functions required to accomplish the required action (e.g., reactor shutdown, core cooling, etc.). In performing this review, each event diagram and corresponding evaluation was compared to the LRA and supporting documentation to determine if, in each case, the required action is achieved by system functions within the scope of license renewal. In addition, UFSAR Supplement 15C supporting documentation was also reviewed to ensure that the information was addressed by the LRA. The support systems/functions for each function (e.g., DC and auxiliary AC power for core spray) were also evaluated by the applicant.

As a result of this review, Plant Hatch Function C51-02 - Rod Block Monitor, previously identified in the LRA as not within the scope of license renewal has been brought in scope. No new component types were added to the list of plant-wide electrical components that are subject to an AMR as a result of this scoping change.

Based on the information provided by the applicant in its Plant Hatch LRA annual update, the staff has determined that the actions taken by the applicant provide reasonable assurance that the information relied on to generate the scoping and screening results in accordance with the methodology described in the Plant Hatch LRA is consistent with, and supported by, the design- and licensing-basis information in Supplement 15C to the Plant Hatch Unit 2 UFSAR. On this basis, therefore, the concern identified in RAI 2.1-2 is resolved.

Review of Commission Orders

The staff reviewed 28 Commission Orders from 1974 through 1998. All of the SSCs referred to in each of the 28 Commission Orders were identified and compared to the list of SSCs included within the scope of license renewal. All SSCs identified in the 28 Commission Orders were included within the scope of license renewal.

Non-Safety-Related Piping Systems (Seismic II-over-I)

Section 54.29 of 10 CFR Part 54 (the Rule) states that a renewed license may be issued by the Commission if the Commission finds that actions have been or will be taken with respect to the matters identified in paragraphs (a)(1) and (a)(2) of this section such that there is reasonable assurance that the activities authorized by the renewed license will continue to be conducted in accordance with the CLB, and that any changes made to the CLB in order to comply with this paragraph are in accord with the Act and the Commission's regulations. These matters include managing the effects of aging during the period of extended operation to assure the functionality of structures and components that have been identified to require review under Section 54.21(a)(1).

The Statements of Consideration (SOC) for the Rule states that the objective of a license renewal review is to determine whether the detrimental effects of aging, which could adversely affect the

functionality of systems, structures, and components (SSCs) that the Commission determines require review for the period of extended operation, are adequately managed.

The SOC articulates the underlying philosophy of the Rule that during the extended period of operation, safety-related functions should be maintained in the same manner and to the same extent as during the current licensing term. Aging effects that could adversely impact on the ability of SSCs to maintain these safety-related functions during the extended period of operation should be evaluated.

Section 54.4(a)(2) of the Rule states that all non-safety-related systems, structures, and components whose failure could prevent satisfactory accomplishment of any of the functions identified in Section 54.4(a)(1) should be included within the scope of the Rule. The SOC provides additional guidance related to this scoping criterion. Specifically, the SOC states that "To limit this possibility for the scoping category relating to nonsafety-related systems, structures, and components... An applicant for license renewal should rely on the plant's CLB, actual plant-specific experience, industry-wide operating experience, as appropriate, and existing engineering evaluations to determine those nonsafety-related systems, structures, and components that are the initial focus of the license renewal review. Consideration of hypothetical failures that could result from system interdependencies that are not part of the CLB and that have not been previously experienced is not required." (Federal Register, Volume 60, No. 88, 22467).

An applicant for license renewal should consider two configurations of non-safety-related piping systems that could potentially meet the 54.4(a)(2) scoping criterion. The first configuration includes non-safety- related piping systems (including piping segments and supports) which are connected to safety-related piping. These non-safety-related piping systems should be included within the scope of license renewal up to and including the first seismic support past the safety-related/non-safety-related interface. The second configuration involves non-safety-related piping systems which are not connected to safety-related piping, but have a spatial relationship such that their failure could adversely impact on the performance of an intended safety function. For this type of piping system, the applicant has two options when performing its scoping evaluation: a mitigative option or a preventive option. With the mitigative option, the applicant must demonstrate that plant mitigative features (e.g., pipe whip restraints, jet impingement shields, spray and drip shields, seismic supports, flood barriers, etc.) are provided which protect safety-related SSCs from failures of non-safety-related piping segments. When evaluating the failure modes of non-safety-related piping segments and the associated consequences, age-related degradation must be considered. The staff notes that pipe failure evaluations typically do not consider age-related degradation when determining pipe failure locations. Rather, pipe failure locations are normally postulated based on high stress. Industry operating experience has shown that age-related pipe failures can, and do, occur at locations other than the high-stress locations postulated in most pipe failure analyses. Therefore, to utilize the mitigative option, an applicant should demonstrate that the mitigating devices are adequate to protect safety-related SSCs from failures of non-safety-related piping segments at any location where age-related degradation is plausible. If this level of protection can be demonstrated, then only the mitigative features need to be included within the scope of license renewal, and the piping segments need not be included within the scope. However, if an applicant cannot demonstrate that the mitigative features are adequate to protect safety-related SSCs from the consequences of non-safety-related pipe failures, then the applicant should utilize the preventive option, which requires that the entire non-safety-related piping system be brought into the scope of license renewal and an AMR be performed on the components within the piping system. Finally, an applicant may determine that in order to ensure adequate protection of the

safety-related SSC, a combination of mitigative features and non-safety-related SSCs must be brought within scope. Again, it is incumbent upon the applicant to provide adequate justification for the approach taken with respect to scoping of non-safety-related SSCs in accordance with the Rule.

A subset of non-safety-related piping systems that meet the 54.4(a)(2) criterion is seismic II over I (seismic II/I) piping. Seismic II/ I denotes non-seismic Category I SSCs interacting with seismic Category I SSCs as described in Position C.2 of Regulatory Guide 1.29, "Seismic Design Classification." The SOC specifically includes seismic II/I as a subset of the 54.4(a)(2) scoping requirement. In addition, Section 2.1.III.B of the Standard Review Plan for License Renewal (September, 1997) states that "The reviewer verifies that the so-called 'seismic II over I' systems, structures, and components consistent with the plant's CLB are identified by the applicant's proposed screening methodology."

By letter dated July 28, 2000, the staff issued two requests for additional information related to seismic II/I SSCs. RAI 3.4-11 asked the applicant to clarify whether the scope of the auxiliary systems discussed in Section 3.2.4 of the LRA includes any spatially-related components and piping segments within the category of seismic II/I, and how the aging management programs discussed in Table 3.2.4 of the application also apply to seismic II/I piping components. RAI 3.6-51 stated that it was not clear to the staff whether the scope of the primary containment system discussed in Table 3.3.1-3 of the LRA includes spatially-related components and piping systems within the category of seismic II/I, and asked the applicant to clarify the scope and whether the same aging management programs discussed in LRA Table 3.3.1-3 also applied to seismic II/I piping components.

By letter dated October 10, 2000, the applicant responded to these RAIs. In response to RAI 3.4-11 the applicant stated that intended function L35-01, "Pipe Supports," captures all safety-related and non-safety-related supports for components in configurations that could potentially result in loss of function for seismic Category I components based on spatial relationships. The applicant further stated that the key to managing both seismic Category I and non-seismic Category I systems so that no impact on safety-related functions occurs, is to assure that aging effects for the supports encompassed by L35-01 are appropriately managed, and that, based on empirical evidence related to piping and pipe supports under seismic loadings, managing the aging effects associated with the pipe supports for systems not otherwise in scope is adequate to assure no loss of safety-related functions. On this basis, the applicant concluded that no AMPs are applied to piping segments that are not in scope, but are supported by seismic II/I piping supports.

In response to RAI 3.6-51, the applicant stated that LRA Table 3.3.1-3 addresses components supporting the primary containment integrity function, including safety-related and non-safety-related components inside containment, but the piping supports are included in LRA Table 3.3.1-1, "Piping Specialties."

During subsequent discussions with the staff, the applicant clarified that for the protection of safety-related SSCs, seismic II/I piping segments are seismically supported. These seismic supports are within the scope of license renewal. The applicant further clarified that design features (e.g., jet impingement shielding and pipe whip restraints) credited for mitigating the consequences of seismic II/I piping failures are also included within the scope of license renewal. However, the applicant also stated that it does not consider the seismically-supported seismic II/I piping segments to be within the scope of license renewal and no aging management programs are

applied to those seismic II/I piping segments. The applicant believes that since the seismic II/I piping is seismically supported, consideration of its failure is hypothetical.

The staff did not agree with the applicant's scoping criteria for non-safety-related piping systems. The staff's concern is that seismic II/I piping, though seismically supported, would be subjected to the same plausible aging effects as safety-related piping. For example, depending on piping material, geometrical configuration, operating conditions such as water chemistry, temperature, flow velocity, and external environment, erosion and corrosion may be plausible aging effects for some seismic II/I piping. Those effects, if not properly managed, could result in age-related failures and adversely impact the safety functions of safety-related SSCs.

The staff reviewed the UFSAR and found that the information described in the UFSAR is not adequate to support the applicant's assertions that design features would protect safety-related SSCs from the impact associated with the potential aging-related failures of seismic II/I piping such that seismic II/I piping need not be included within the scope of license renewal. As a result, the staff requested that the applicant provide additional information to address the staff's concern. This was identified as Open Item 2.1.3.1-1.

By e-mail dated 6/19/01, the applicant provided the requested information. On the basis of the information provided in the e-mail, the staff found that the Plant Hatch CLB pipe break/crack analyses mainly postulated pipe failures at specific locations (e.g., at terminal ends and high stress points). Further, the mitigative features (e.g., jet impingement shielding and pipe whip restraints), which the applicant wanted to credit as the basis for excluding seismic II/I piping from scope, assume pipe failures in locations based on the CLB pipe break/crack analyses. As described above, the primary concern for license renewal is aging-related failures. Since aging-related degradation of piping depends on piping material, geometrical configuration, water chemistry, temperature, flow velocity, and external environment, the resulting pipe failure mechanism and failure location may be different from those postulated in the Plant Hatch CLB pipe break/crack analyses, which were based on stress criteria. Therefore, the staff concluded that the applicant had not demonstrated that safety-related SSCs at Plant Hatch are adequately protected from the consequences of seismic II/I pipe failures due to potential aging-related degradation. Thus, the staff's position was that seismic II/I piping systems, including piping segments and their supports, should be included within the scope of license renewal. For these seismic II/I piping systems, the applicant should perform an aging management review to determine if there are any plausible aging effects, and identify appropriate aging management programs.

By letter dated September 5, 2001, the applicant brought all seismic II/I piping systems into the scope of license renewal, provided the results of the associated AMRs, and provided a summary of the programs and activities that will be used to manage aging in these piping systems. The staff's review of the applicant's aging management of components in these piping systems is provided in Section 3.1 of this SER. On the basis of the additional information provided by the applicant, the staff concludes that the applicant has provided sufficient information to demonstrate that all SSCs that meet the 54.4(a)(2) scoping criterion, have been identified as being within the scope of license renewal. Open Item 2.1.3.1-1 is closed.

Impact of Rule Amendments

In Section 2.1.2.4 of the LRA, the applicant states that 10 CFR 54.4(a)(1)(i), (ii), and (iii), provide the scoping criteria for determining the functions of safety-related systems and structures that are

within the scope of the Rule. The applicant adds that each system and structure function in the plant listing of scoping results (Table 2.2-1 of the LRA) was determined with respect to these requirements by addressing the following questions:

1. Is the function of the system or structure identified as safety-related because it is relied upon during and following design-basis events to ensure the integrity of the reactor coolant pressure boundary?

2. Is the function of the system or structure identified as safety-related because it is relied upon during and following design-basis events to ensure the capability to shut down the reactor and maintain it in a safe shutdown condition?

3. Is the function of the system or structure identified as safety-related because it is relied upon during and following design-basis events to ensure the capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposure comparable to the guidelines in 10 CFR 100.11?

The staff notes, however, that the current language in 10 CFR 54.4 states, in part, that plant SSCs within the scope of license renewal are (1) 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 maintain the following functions:

- integrity of the reactor coolant pressure boundary

- capability to shut down the reactor and maintain it in a safe shutdown condition

- 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

By letter dated January 5, 2001, the staff requested that the applicant confirm that the information in the LRA met the revised requirements in 10 CFR Part 54.

By letter dated January 31, 2001, the applicant confirmed that the LRA met the revised requirements of 10 CFR Part 54. Specifically, the applicant stated that the provisions of 10 CFR 50.34(a)(1) do not impact the Plant Hatch LRA, and that the applicant has not incorporated the alternate source term provisions of 10 CFR 50.67(b)(2) into the Plant Hatch design or licensing basis. Thus, there is no effect on Plant Hatch license renewal scoping.

The staff reviewed the provisions of 10 CFR 50.34(a)(1) and 10 CFR 100.11 and concluded that the provisions of 10 CFR 100.11 are bounding with respect to the Plant Hatch LRA. In addition, the provisions of 10 CFR 50.67(b)(2) are not applicable to the Plant Hatch CLB. Therefore, the staff concludes that the Plant Hatch LRA meets the revised requirements of 10 CFR Part 54.

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

The staff evaluated the applicant's screening methodology, as described in the LRA, to determine whether the methodology met the requirements of 10 CFR 54.21(a)(1). The staff followed guidance provided in Section 2.1.3.2 of the SRP-LR to evaluate the screening methodology provided in Sections 2.1.3 and 2.1.4 of the LRA, and described in Section 2.1.2.2 of this SER. The staff reviewed the applicant's process used to identify and classify SCs as passive (those that perform their intended functions without moving parts or a change in configuration or properties) and long-lived (those that are not subject to periodic replacement based on qualified life or specified time period). Section 2.1.3 of the LRA describes the applicant's process to identify civil/mechanical SCs that are subject to an AMR. Section 2.1.4 of the LRA describes the applicant's process to identify electrical components that are subject to an AMR.

As part of the evaluation process, the staff conducted an audit from June 12 through June 15, 2000, to determine whether the screening methodology described by the applicant in its LRA was implemented consistent with the requirements of 10 CFR Part 54 and the Plant Hatch LRA. The audit took place at the SNC offices in Birmingham, Alabama.

On the basis of its review of the screening methodology described in the LRA and summarized in Section 2.1.2.2 above, the staff concludes that the methodology, as described in the LRA, is consistent with the requirements of the Rule, and that the screening methodology will identify SCs that meet the screening criteria of 10 CFR 54.21(a)(1). The screening portion of the audit is described below.

During the June 2000 audit, the staff reviewed a variety of screening methodology implementation procedures, including LRS 1-5, "Civil/Mechanical Structure/Component Screening Procedure" and LRS 1-8, "Electrical IPA Procedure." The applicant used LRS 1-5 to identify the civil/structural, mechanical, long-lived, passive structures, components, and commodities determined to be within scope and subject to an AMR.

LRS 1-8 was used by the applicant to screen electrical components and commodities to determine if they met the criteria of 10 CFR 54.21(a)(i) and (ii) regarding whether an intended function is performed without moving parts or change in configuration or properties and without being replaced based on a qualified life or specified time period. Those components and commodities that meet this criterion are subject to an AMR. The applicant used the "spaces approach" described in Sandia National Laboratory's document SAND 96-0344, "Aging Management Guideline for Commercial Nuclear Power Plants - Electrical Cables and Terminations." Starting with a list of structures in the scope of license renewal, they compiled a list of physical in-plant areas which contain in-scope electrical equipment. The areas were further divided using the Fire Hazards Analysis drawings. For these areas, the environmental parameters were determined (e.g. normal temperature, normal radiation dose rate, normal humidity, and "hot spots"). The applicant performed an extensive in-plant temperature monitoring program to gather measured temperature data. For the list of electrical commodities subject to an aging management review, the applicant then determined the 60-year life based on temperature and radiation dose. These limits were derived from data from the environmental qualification program, manufacturer's published data, and other industry information based on materials of construction. The resultant AMRs were documented in accordance with LRS 1-6, "Aging Management Review Procedure."

As discussed in Section 2.1.3.1 of this SER, the staff concluded that the screening results reviewed by the audit team provided adequate evidence that the scoping and screening process was conducted in accordance with the requirements of 10 CFR 54.4 and 10 CFR 54.21. However, the staff identified certain discrepancies between the screening process described in the procedures and the actual process that was followed. This issue was the subject of RAI 2.1-1, described above.

2.1.4 Conclusion

On the basis of the staff's review of the information presented in Section 2.1 of the LRA, the supporting information in the Plant Hatch UFSAR, the information provided during the scoping and screening audit and inspection, the applicant's responses to the staff's RAIs, as discussed above, and the applicant's response to Open Item 2.1.3.1-1, 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.

2.2 Plant Level Scoping Results

2.2.1 Introduction

In Section 2.2, "Scoping Results," of the LRA, the applicant provides the results of its scoping review. The staff reviewed this section of the LRA to determine whether there is reasonable assurance that the applicant has properly identified all plant level systems and structures that are within the scope of license renewal as required by 10 CFR 54.4.

2.2.2 Summary of Technical Information in the Application

Table 2.2-1 of the LRA presents the results of the applicant's plant-wide scoping of systems, structures, and intended functions. The table indicates whether or not the intended functions of a given system or structure are within the scope of license renewal. The applicant states on page 2.2-1 of the LRA that:

> "Each function is identified as either in scope or not in scope. Due to the cross-system nature of functions, each function has been assigned to a primary system or structure. However, in many cases the functional boundaries extend into other systems or structures as well. As was described in the scoping/screening methodology, Section 2.1, screening of structures/components was performed within functional boundaries. Structures or other features not bearing a system number were assigned to a system or structure and scoped with that system or structure."

This statement means that the results of the applicant's scoping methodology, presented in Table 2.2-1 of the LRA, do not show all intended functions for every system listed. In some cases, intended functions that cross system boundaries are listed under one primary system only. To simplify the staff's review, the applicant provided two comprehensive matrices in an e-mail dated May 24, 2000. Amended versions of these matrices were forwarded in an e-mail dated June 16, 2000. The first matrix provides a correlation of plant systems to their associated intended functions. The second matrix provides a correlation of intended functions to the plant systems that perform

each intended function. These matrices are intended to provide a comprehensive correlation between systems and structures and their intended functions.

2.2.3 Staff Evaluation

The staff reviewed Section 2.2 of the LRA to determine if there is reasonable assurance that the applicant has appropriately identified and listed systems and structures that are within the scope of license renewal, pursuant to the Rule. The staff focused its review on verifying that the implementation of the applicant's methodology discussed in Section 2.1 of this SER did not result in the omission of systems and structures from the scope of license renewal. Omission of in scope systems and components would lead to inadequate identification of structures and components subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1). The staff reviewed selected systems and structures that the applicant identified as not in the scope of license renewal to verify that they do not have any intended functions which would require them to be in scope.

The staff used the UFSARs for both units in performing its review. Pursuant to 10 CFR 50.34(b), the UFSAR contains

> "[a] description and analysis of the structures, systems, and components of the facility, with emphasis upon performance requirements, the bases, with technical justification therefor, 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 by referring to the listing of systems and structures in Table 2.2-1 of the LRA and the system-to-function matrices provided by the applicant to identify systems or structures that may have intended functions, meeting the criteria of 10 CFR 54.4, that the applicant did not include within the scope of license renewal. The staff selected several systems and structures, such as systems that support reactor coolant system integrity and systems that support primary containment cooling. In a letter to the applicant dated July 14, 2000, the staff requested additional information about the scoping results provided in Table 2.2-1 of the LRA.

During the course of this review, the staff identified a concern with regard to the information provided in Table 2.2-1 of the LRA. As noted in Section 2.2.2 of this SER, LRA Table 2.2-1 identifies system functions as being in scope or out of scope. In many cases, when multiple systems had the same function, the applicant grouped these individual system functions under one functional category. When this was done, Table 2.2-1 did not indicate that such a re-categorization had been made. As a result, several systems that would have been within the scope of license renewal based on their normal system function, were identified in Table 2.2-1 as not being within scope, and a function that would place these systems in scope is not listed under the system.

On July 14, 2000, the staff sent the applicant several RAIs related to this section. RAI-2.2-SR-1 requested that the applicant provide an updated LRA Table 2.2-1 because the staff had identified several systems which were clearly within the scope of license renewal, but were not shown in the table as being in scope. Not all of the functions of these systems were listed, and some of the omitted functions placed the system within the scope of license renewal. As noted above, the

applicant stated that many SSCs were grouped with other systems by similarity of intended functions; however, the table provided no information on where in the LRA these SSCs are addressed. In its August 29, 2000, RAI response, the applicant stated that the system/function matrices provided in the e-mails on May 24, 2000 and June 16, 2000, provided the requested information. Specifically, the applicant stated, "These matrices provide the capability to efficiently identify the functions that are in scope for any given system and conversely, the systems associated with any given in-scope function." On the basis of the information provided in the matrices, the staff performed its review to determine whether all intended functions had been identified by the applicant. During the review, the staff identified several additional items that required clarification.

RAI 2.2-SR-2 requested the applicant to clarify the intended function for the primary containment chilled water system (Unit 2 only) listed in Table 2.2-1 of the LRA because it was different from the function described in Section 2.3.4.10 of the LRA. Table 2.2-1 cited drywell cooling as the intended function of this system, putting it in scope for license renewal. However, Section 2.3.4.10 stated that containment integrity was an additional intended function. The applicant stated in the August 29, 2000, RAI response that the correct function was containment integrity. However, the staff identified another inconsistency in reviewing the RAI response. The system-to-function matrix submitted by the applicant listed two intended functions (drywell cooling and containment integrity). By letter dated January 5, 2001, the staff requested the applicant to resolve the discrepancies between the intended function identified in LRA 2.2-1 (drywell cooling only), the intended function identified in the response to RAI 2.2-SR-2 (containment integrity only), and the intended functions identified in LRA Section 2.3.4.10 and the matrices submitted by e-mails on May 24 and June 16, 2000 (drywell cooling and containment integrity). By letter dated January 31, 2001, the applicant responded that it has revised the description of intended function P64-02 in Section 2.3.4.10 of the LRA to clearly indicate that the intended function is primary containment integrity that is provided by the pressure boundary of the drywell cooling subsystem inside containment. A footnote was added to clarify that the "drywell cooling" label is being retained for consistency with the Plant Hatch Maintenance Rule function labels. A similar note was added to Table 2.2-1 of the LRA to show that the label is being retained but the only intended function is primary containment integrity. The letter goes on to state that the system-to-function matrix identifies functions that are in-scope and not in-scope whose boundaries include a part of the system, and cites the primary containment chilled water as an example. The evaluation boundaries for functions 2C61-01 (primary containment isolation & integrity) and 2P64-02 (drywell cooling) each include one or more primary containment chilled water components. Thus, the system-to-function matrix includes both functions.

The applicant's letter included revisions to Table 2.2-1 of the LRA and Section 2.3.4.10 of the LRA showing the clarifications

On the basis of the information provided by the applicant in its letter dated January 31, 2001, and the accompanying revisions to the table and system description, the staff finds that the applicant has clarified that containment integrity is the only intended function of the primary containment chilled water system.

RAI 2.2-SR-4 requested that the applicant provide the basis for excluding the drywell cooling system (Unit 2 only) from the scope of license renewal. Section 9.4.6.2.1 of the Unit 2 UFSAR states that the drywell cooling system is relied upon to maintain the drywell temperature below 165 ^{0}F during a loss of offsite power.

In the August 29, 2000, RAI response, the applicant stated that the drywell cooling system is not a safety system and is not relied upon to mitigate a loss-of-coolant accident combined with a loss of offsite power. The applicant further stated that this system is not relied upon to control drywell temperature during a station blackout. The staff agrees with these statements; however, 10 CFR 54.4 requires that non-safety systems whose failure could prevent the satisfactory capability to shut down the reactor or maintain it in a safe shutdown condition also be included in the scope of license renewal. The staff's concern relates to environmental qualification of equipment or sensors in the drywell. It appears from the UFSAR that this system may be required to maintain temperature conditions in the drywell during a loss of offsite power so that the applicant can maintain the capability to safely shut down the reactor or maintain it in a safe shutdown condition. The UFSAR does not provide any information on the basis for the 165 ^{0}F requirement. In a letter dated January 5, 2001, the staff requested that the applicant provide the basis for the 165 °F requirement.

By letter dated January 31, 2001, the applicant stated that the neutron monitoring cables are the components at issue. These cables are in the drywell and are not included in the environmental qualification program. Therefore, these cables do not have qualified lives. However, any event which could call into question the operability of the cables would be investigated under the corrective actions program. A temperature spike such as that postulated in the scenario in which a scram occurs simultaneously with a loss of drywell cooling would be the event which would result in a condition report being written, with a corrective action to investigate the condition and operability of the cables. These cables are included in the scope of the insulated cable and connections AMP. This AMP is evaluated in Section 3.1.30 of this SER.

On the basis of the information provided in the applicant's letter dated January 31, 2001, the staff concludes that the drywell cooling system does not perform an intended function and therefore is not in scope.

2.2.4 Conclusions

On the basis of the staff's review of the information presented in Section 2.2 of the LRA, the supporting information in the Plant Hatch UFSAR, the applicant's responses to the staff RAIs, and the information provided in the letter dated January 31, 2001, the staff concludes that there is reasonable assurance that the applicant has identified all systems and structures whose intended functions meet the scoping requirements of 10 CFR 54.4.

2.3 Scoping and Screening Results: Mechanical

2.3.1 Introduction

In Sections 2.3.2, "Reactor Coolant System," 2.3.3, "Engineered Safety Features," 2.3.4, "Auxiliary," and 2.3.5, "Steam and Power Conversion Systems," of the Plant Hatch LRA, the applicant describes the systems and components that are within the scope of license renewal and subject to an AMR. The staff reviewed these sections of the LRA to determine whether there is reasonable assurance that all SSCs within the scope of license renewal have been identified, as required by 10 CFR 54.4(a), and that all components subject to an AMR have been identified, as required by 10 CFR Part 54.21(a)(1).

2.3.2 Reactor Coolant System (RCS)

In Section 2.3.1, "Reactor," and Section 2.3.2, "Reactor Coolant Systems," of the Plant Hatch LRA, the applicant describes the components of the RCS that are within the scope of license renewal and subject to an AMR. The staff reviewed these sections of the LRA to determine whether there is reasonable assurance that all SSCs within the scope of license renewal have been identified, as required by 10 CFR Part 54.4(a), and whether all components subject to an AMR have been identified, as required by 10 CFR Part 54.21(a)(1).

The staff reviewed parts of the Plant Hatch UFSARs and the associated pressure boundary components and the structures and compared the information in the UFSAR with the information in the LRA to identify those structures and components that the LRA did not identify as being within the scope of license renewal and subject to an AMR. The staff then reviewed structures and components that were identified as not being within the scope of license renewal. The staff requested that the applicant provide additional information and/or clarifications on certain structures and components to verify:

- that these structures and components do not have any of the intended functions delineated under 10 CFR 54.4(a), and

- for structures and components that have an applicable intended function, either perform the function with moving parts or changes in configurations or properties, or are replaced 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 identify any function listed under 10 CFR 54.4(a) that was not identified as an intended function in the LRA, to verify that the function will be maintained for the period of extended operation.

After completing the initial review, the staff issued requests for additional information (RAIs) regarding the RCS by letter dated July 14, 2000. The applicant responded to the RAIs by letter dated August 29, 2000.

2.3.2.1 Fuel

Summary of Technical Information in the Application

Nuclear fuel is fissionable material that can be arranged in a critical array. This high-integrity assembly must be capable of efficiently transferring fission heat to the circulating coolant water while maintaining structural integrity and keeping the fission products contained. The external environment of the fuel is cladding surrounded by water. The fuel cladding experiences the complete range of reactor coolant pressure and temperatures.

System Intended Functions

- Energy Source: The high-integrity assembly of fissionable material efficiently transfers fission heat to the circulating reactor coolant water while maintaining its structural integrity and keeping the fission products contained. The nuclear fuel assembly is the initial barrier to release of fission products. The fuel assembly is designed to ensure that fuel damage

does not result in the release of radioactive materials in excess of the guideline values of 10 CFR Parts 20, 50, and 100.

- Spent Fuel Fission Product Barrier: This prevents the release of fission products in the spent fuel. The Zircaloy-2 cladding that covers the spent fuel mitigates the consequences of a fuel handling accident. The cladding ensures that fuel damage does not result in the release of radioactive materials in excess of the guideline values of 10 CFR Parts 20, 50, and 100.

No component groups requiring an AMR are identified in the LRA.

Staff Evaluation

On the basis of the information provided in the LRA and the supporting information in the Plant Hatch UFSAR regarding the intended functions and relevant aging effects associated with the fuel, the staff concludes that the fuel does not include any passive and long-lived components with aging effects which require aging management.

2.3.2.2 Nuclear Boiler System

Summary of Technical Information in the Application

The nuclear boiler system generates steam. The functions of the nuclear boiler system are to supply feedwater to the reactor, conduct steam from the reactor, and protect against reactor overpressure. The system also has some reactor control and/or engineered safety feature functions. The nuclear boiler system is in operation any time the plant is in operation. Most of the major components in the system are part of the reactor coolant pressure boundary. The system contains the following major components:

- main steam lines (MSLs)
- safety relief valves (SRVs)
- main steam isolation valves (MSIVs)
- feedwater lines
- feedwater line check valves
- instrumentation and controls

System Intended Functions

- Pressure Control: The pressure control function of the nuclear boiler system prevents overpressurization of the nuclear system. It also provides automatic depressurization for small breaks to allow for low-pressure coolant injection (LPCI) and core spray (CS) operation. This function is called the automatic depressurization system (ADS). The low-low set (LLS) function mitigates the thrust loads on the SRV discharge lines and the high-frequency loads on the torus shell from subsequent SRV actuations during small- and intermediate-break loss-of-coolant accidents (LOCAs). The LLS also allows the SRV discharge line water leg more time to return to the original level after an actuation.

- Reactor Coolant Pressure Boundary Integrity: The nuclear boiler system is designed to maintain the reactor coolant pressure boundary integrity. This is also the function of the

pressure-containing Class 1 piping and components which form a portion of the reactor coolant pressure boundary, with the exception of the pressure control and reactor recirculation functions.

- Rod Worth Minimizer: The rod worth minimizer provides a means of enforcing procedural restrictions on preprogrammed control rod manipulations to limit rod worth to the values assumed in the plant accident analysis (design basis rod drop accident).

- Nuclear Boiler Instrumentation: Nuclear boiler instrumentation provides process information to the operator and signals to other systems in the nuclear power plant.

Component Intended Functions

- Pressure boundary
- Fission product barrier
- Flow Restriction

The component groups requiring an AMR, identified in the LRA are as follows: bolting, crack growth monitor (Class 1), flow restrictor, piping (Class 1 and non-Class 1), restricting orifice (Class 1), thermowell (Class 1 and non-Class 1), and valve bodies (Class 1 and non-Class 1).

Staff Evaluation

In RAI 2.3.2-NBS-1, the staff asked the applicant to clarify why the safety relief valve (SRV) discharge lines and their supports have not been identified in Table 2.3.1-2 of the LRA as component groups requiring an AMR. The staff believes that these structures and components perform the passive function of withstanding significant loads, such as SRV discharges, and that their failure can defeat the SRVs' intended safety function. The applicant verified that the SRV discharge lines and supports have been identified in the application as components subject to an AMR, and clarified that the SRV discharge lines are scoped as part of the pressure control function (B21-01). The components are shown on boundary diagrams HL-16062 and HL-26000. Table 2.3.1-2 identifies the SRV discharge lines as piping. The applicant further clarified that the pipe supports for the SRV discharge lines are scoped as part of the pipe support function (L35-01) and identified in Section 2.4.1 of the LRA, "Piping Specialties." LRA Table 2.4.1-1 lists the pipe supports for the SRV discharge lines as hangers and supports for non-ASME Class 1 piping, tubing, and ducts.

On the basis of the applicant's response to this RAI, the staff concludes that the applicant has clarified that the SRV discharge lines and its supports are identified as requiring an AMR.

In RAI 2.3.2-NBS-2, the staff stated that only two intended functions were identified for flow-restricting orifices (Table 2.3.1-2 of the LRA): pressure boundary and fission product barrier. However, some orifices are relied upon to limit mass flow rate during postulated breaks, and loss of material can degrade this function. The staff asked the applicant to show why limiting mass flow rate during postulated breaks is not an intended function of some orifices, per 10 CFR 54.4(a)(1)(iii), or provide an AMR for the orifices that have an intended function to limit mass flow rate. In response, the applicant acknowledged that some of the orifices are in fact relied upon to limit mass flow rate during postulated breaks, and that the component function, namely, "flow restriction", was inadvertently omitted from restricting orifice line items in Tables 2.3.1-2 and 3.2.1-2

of the LRA. The staff notes that the applicant has modified the tables accordingly, as described below. In addition, the flow restriction elements (venturi) of 1/2B21-N005A-D shown on boundary drawings HL-16062 and HL-26000 are credited for restricting the main steam flow and for limiting the mass flow rate during postulated breaks. Thus they perform an intended function and are subject to an AMR. The applicant submitted its revised AMPs as part of this RAI response, as described below. The revised AMPs address the flow restriction as a component function, so that this function will be maintained for the extended period of operation. The adequacy of the AMPs to manage and maintain the flow restriction function is discussed in Sections 3.1.1 and 3.1.12 of this SER for the reactor water chemistry control and component cyclic transient limit programs, respectively.

As discussed above, the applicant identified two components that were inadvertently omitted from the scope of license renewal. The main steam flow restrictor - Pipe (Class 1) and the main steam flow restrictor - Venturi were added to LRA Table 2.3.1-2 and the associated aging management information was added to LRA Table 3.2.1-2. The Class 1 main steam flow restrictor pipe performs both pressure boundary and fission product barrier functions and is made of carbon steel. It is located in a reactor water environment and can experience loss of material and cracking aging effects. The applicant credits the following aging management programs with managing the aging effects: reactor water chemistry control program, inservice inspection program, galvanic susceptibility inspections, component cyclic or transient limit program, flow accelerated corrosion program and treated water system piping inspection program. The venturi performs a flow restriction function and is made of cast austenitic stainless steel. It is also located in a reactor water environment and can experience loss of material and cracking aging effects. The applicant credits the reactor water chemistry control and component cyclic or transient limit programs with managing the aging effects.

The staff asked the applicant to clarify "main steam flow restrictor - pipe" in the tables. In response, the applicant states that this is merely the name of the section of piping that includes the venturi, and that the pipe does not have a flow restriction function. The flow restriction function only applies to the venturi.

On the basis of the applicant's response to this RAI, the staff concludes that the applicant has identified orifices that provide an in-scope function to limit mass flow rate during postulated breaks.

2.3.2.3 Reactor Assembly System

Summary of Technical Information in the Application

As described in the LRA, the reactor vessel has three major purposes:

- contain core, internals, and moderator.
- serve as a high-integrity barrier against leakage.
- provide a floodable volume.

The reactor assembly consists of the reactor pressure vessel (RPV) and its internal components, the core, shroud, steam separator and dryer assemblies, jet pumps, control rods, control rod drive (CRD) housings, and the CRD. The RPV is a vertical, cylindrical pressure vessel with hemispherical heads of welded construction. The major reactor internal components are the core (fuel, channels, control blades, and instrumentation), the core support structure (including the core

shroud, shroud head, separators, top guide, and core support), the steam dryer assembly, and the jet pumps. The reactor internal structural elements are made of stainless steel or other corrosion-resistant alloys.

The reactor vessel is inside the primary containment building. The internal environment of the RPV is reactor water, normally at 533 °F and 1055 psia during plant operation. Water quality is maintained within the specified limits. During plant conditions that require the operation of the shutdown cooling mode of the residual heat removal (RHR) system, reactor water can be cooled to approximately 117 °F via the RHR heat exchangers and recirculated back to the reactor through the reactor recirculating system (RRS) piping. During plant shutdown conditions, the water temperature in the RPV can be as low as 70 °F.

System Intended Functions

- The reactor vessel internals distribute coolant to allow power operation without fuel damage and positions and supports the fuel assemblies so that control rod movement is not impaired. The RPV, including the control rods and drives, is evaluated as part of the nuclear boiler system pressure boundary.

- The CRD housing supports mitigate damage to the fuel barrier in the event a drive housing breaks or separates from the bottom of the reactor.

Component Intended Functions

- pressure boundary
- fission product barrier
- structural support
- flow distribution

The component groups requiring an AMR identified in the LRA are as follows: access hole covers, appurtenances, attachments and connecting welds, closure studs, control rod drive, core ΔP/standby liquid control (SLC) line, core spray internal piping, core spray sparger, core support plate, CRD housing and control rod guide tubes, dry tube weld to guide tube, fuel supports, jet pump assemblies, nozzles, penetrations, safe ends, shell and closure heads, shroud, shroud supports, shroud tie rods, thermal sleeves, and top guide.

Staff Evaluation

In RAI 2.3.2-RA-1, the staff asked the applicant to identify the reactor vessel leakage monitoring piping as part of the pressure boundary and, accordingly, to include it in the scope of license renewal and to perform an AMR. If, however, the applicant believed that the component does not require an AMR, the applicant should provide a plant-specific justification as to why the component need not be subject to an AMR. In response, the applicant clarified that the RPV leakage-monitoring piping is in scope. In a June 26, 2000 telephone conference, the applicant clarified that the reactor vessel leakage monitoring piping is identified on Table 2.3.1-2 of the LRA as non-Class 1, stainless steel piping. In an e-mail on November 9, 2000, the applicant provided the following additional information on this piping.

The Unit 2 piping is shown on drawing HL-26000, grids C/D 3/4. Valve F062 has one inch ASME Section 3 Class 1 piping and valve-to-pressure switch N002 has 3/8-inch Class 2 tubing. As shown on the drawing, these components are within the evaluation boundary for the reactor coolant pressure boundary integrity function (B21-02). Tables 2.3.1-2 and 3.2.1-2 of the LRA list components that support nuclear boiler system intended functions. Thus, the components are listed in two tables. The material is stainless steel and the environment is reactor water. Thus, on Table 3.2.1-2, non-Class 1, reactor water, and stainless steel piping associated with this function are entered on the last line on page 3.2-5 of the LRA and Class 1, reactor water, and stainless steel piping associated with this function are entered on the next to last line on page 3.2-6 of the LRA. These line items provide the applicable links for the commodity evaluations and aging management programs.

The Unit 1 piping is shown on drawing HL-16062, grid C/D 3/4. Both 1-inch stainless steel piping and 3/8-inch stainless steel tubing fabricated to ANSI B31.1 requirements, upgraded, are shown to support the reactor coolant pressure boundary integrity function (B21-02). Thus, this piping is listed with the non-Class 1 piping noted above.

On the basis of the applicant's response to this RAI, the staff concludes that the reactor vessel leakage-monitoring piping was identified in the LRA as being within scope and subject to an AMR.

In its review of the applicant's submittal, the staff noticed a footnote in Table 2.3.1-1 of the LRA: "No aging effects requiring management." This footnote applies to the following component groups: access hole covers, core ΔP/SLC line, core support plate, fuel supports, and shroud tie rods. In RAI 2.3.2-RA-2, the staff asked the applicant to provide a basis for the conclusion that no aging effects require management for the above-mentioned component groups. In its response, the applicant stated that the conclusion that there are "no aging effects requiring management" was based on review of the function, materials, and environment of each component, as discussed in the AMR for the components. Furthermore, the applicant stated that the component-specific criteria of the Boiling Water Reactor Vessel Internals Program (BWRVIP) were applied where applicable.

On the basis of the applicant's response to this RAI, the staff concludes that the applicant has provided a basis for the conclusion that the component groups referenced above experience no aging effects requiring management.

In RAI 2.3.2-RA-3, the staff asked the applicant to explain why the intended function of the reactor vessel internals to provide gamma and neutron shielding was not identified on page 2.3-2 or in Table 2.3.1-1 of the LRA. The component specifically designed to perform this function, namely the thermal shield with its supporting structures, was also not identified as within scope and subject to an AMR. The staff believes that the radiation shielding function of the RPV internals should be identified in the LRA and an AMR should be done for those components that perform this passive function. In response, the applicant stated that the BWR internals are not relied upon to provide gamma or neutron shielding. This function is accomplished by the water. Further, the design does not employ a thermal shield. Therefore, there is no need to identify such components in the LRA.

On the basis of the applicant's response to this RAI, the staff concludes that the applicant has provided an adequate explanation of why the function of the reactor vessel internals to provide gamma and neutron shielding was not identified on page 2.3-2 of the LRA or in Table 2.3.1-1 of the LRA.

The low-pressure coolant injection (LPCI) coupling was identified in BWRVIP-06, "Safety Assessment of BWR Reactor Internals," as a safety-related component. In RAI 2.3.2-RA-4, the staff asked the applicant to identify the AMR for the LPCI coupling in the LRA or justify the exclusion of this component from aging management review. The applicant responded that the use of an LPCI coupling is limited to three BWR/4 plants and BWR/5 and BWR/6 plants and that neither Plant Hatch unit has an LPCI coupling. Therefore, it was not mentioned in the LRA.

On the basis of the applicant's response to this RAI, the staff concludes that the applicant has provided an adequate justification for the exclusion of this component from aging management review.

In addition to the RAIs discussed above, the staff held several telephone conference calls with the applicant to clarify the applicant's positions on several issues. In the call on June 26, 2000, the staff asked for justification for the decision to exclude the following vessel internals from the scope of license renewal: steam dryer, core shroud head and separators, feedwater spargers, and surveillance capsule holder. The applicant stated that consistent with BWRVIP-06, these components are not safety-related. The applicant also stated that failure of these non-safety-related components would not adversely affect the ability of the safety-related components to perform their functions, and that this is consistent with industry comments to the NRC related to Generic Aging Lessons Learned (GALL).

On the basis of the applicant's responses during this call, the staff concludes that the applicant has provided an adequate justification for excluding the vessel internals discussed above from the scope of license renewal.

In the call made on June 26, 2000, the staff expressed concern that blockage of the spray holes of the core spray spargers through aging could keep the core spray system from performing its intended function of spraying the fuel bundles following a LOCA, and thus may fail to provide adequate core cooling for the short- and long-term following the LOCA. The applicant replied that, because the core spray piping is made of stainless steel, corrosion is not a credible aging mechanism to cause flow blockage. The applicant further stated that BWRVIP-18, "Core Spray Internals Inspection and Flaw Evaluation Guidelines," provides a means to inspect the core spray piping. The staff believes that adequate long-term core cooling can only be assured by maintaining the original core spray distribution that was assumed for the CLB. The staff, therefore, will rely on the BWRVIP inspection program to provide reasonable assurance that the original spray distribution will be maintained during the period of extended operation.

On the basis of the applicant's responses during this call, the staff concludes that the applicant has provided an adequate justification for concluding that blockage of the spray holes through aging of the core spray piping is not a credible aging mechanism. The applicant has also confirmed that adequate core spray distribution is not an assumption or requirement in the LOCA analysis for Plant Hatch.

2.3.2.4 Reactor Recirculation System

Summary of Technical Information in the Application

The reactor recirculation system is one of two core reactivity control systems. The RRS system is part of the reactor coolant pressure boundary. Therefore, it also functions to maintain the

pressure boundary during normal operation, transients, and accident scenarios to prevent the release of radioactive liquid and gas.

The RRS consists of two parallel loops, each with a recirculation pump, suction and discharge block valves, piping, fittings, flow elements and connections, and differential pressure instrumentation. The RRS interfaces with the residual heat removal and reactor water cleanup (RWCU) systems to provide a flow path for shutdown cooling, low-pressure coolant injection (LPCI), RWCU, and reactor water level control functions.

System Intended Functions:

- Recirculating Pump Trip Breaker Trip: The recirculating pump trip (RPT) breakers are designed to trip the reactor recirculation pumps on appropriate signals—high reactor vessel steam dome pressure signal, or an indication of an ATWS (anticipated transient without scram)-RPT reactor water level. The RPT breakers trip to prevent the core from exceeding thermal limits during abnormal transients. The system is designed to help the reactor protection system (RPS) protect the integrity of the fuel barrier. This function meets the safe shutdown criteria because the RPS is necessary to allow the control rods or the standby liquid control system to safely and effectively shutdown the reactor.

- Reactor Coolant Pressure Boundary: The RRS ensures adequate core cooling during power operation by supplying coolant flow past the reactor fuel bundles. The system consists of two loops external to the RPV. The piping, pumps, and valves that form these loops make up part of the reactor coolant pressure boundary.

Component Intended Functions

- fission product barrier
- pressure boundary

The component groups requiring an AMR identified in the LRA are as follows: bolting (Class 1), flow nozzle (Class 1), piping (Class 1), pump casings and cover (Class 1), thermowell (Class 1), and valve bodies (Class 1).

Staff Evaluation

The staff has reviewed the information in the LRA, supplemented by information in the UFSAR, and concludes that the applicant has properly identified system and component intended functions associated with the RRS, and has properly identified those components within the RRS system which are within the scope of license renewal and which are subject to an AMR.

2.3.2.5 Conclusions

The staff has reviewed the information in Sections 2.3.1, "Reactor," and 2.3.2, "Reactor Coolant System," of the LRA. In its review, the staff identified an omission by the applicant. Specifically, the applicant had not evaluated orifices for the intended function of limiting mass flow rates during postulated breaks. The applicant subsequently evaluated the orifices and identified those that performed an in-scope function and revised the appropriate tables in the LRA. On the basis of this review, the staff concludes that the applicant has identified those components within the scope of

license renewal and that are subject to an AMR, as required by 10 CFR 54.4(a) and 10 CFR 54.21(a)(1).

2.3.3 Engineered Safety Features (ESF)

The applicant described the systems and components of the engineered safety features (ESF) systems that are within the scope of license renewal and are subject to an AMR, in LRA Sections 2.3.3.1, "Standby Liquid Control System"; 2.3.3.2, "Residual Heat Removal System"; 2.3.3.3, "Core Spray System"; 2.3.3.4, "High-Pressure Coolant Injection System"; 2.3.3.5, "Reactor Core Isolation Cooling System"; 2.3.3.6, "Standby Gas Treatment System"; 2.3.3.7, "Primary Containment Purge and Inerting System"; and 2.3.3.8, "Post-LOCA Hydrogen Recombiner System (Unit 2 Only)." The staff reviewed these sections of the LRA to determine whether there is reasonable assurance that the applicant has identified all components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and all components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

The staff reviewed Section 2.3.3 of the LRA to determine whether there is reasonable assurance that the applicant has adequately identified the ESF components and supporting structures that are within the scope of license renewal, and subject to AMR in accordance with the requirements of 10 CFR 54.4 and 10 CFR 54.21(a)(1).

As part of its evaluation, the staff reviewed portions of the UFSAR for the ESF 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 being within the scope of license renewal and subject to an AMR. The staff then reviewed structures and components (SCs) that were identified as not being within the scope of license renewal. The staff requested that the applicant provide additional information and/or clarifications for a selected number of these structures and components to verify the following characteristics:

- 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 any applicable intended function(s), verify that they either perform the specified function(s) with moving parts or a change in configuration or properties, or that they are subject to replacement on the basis of 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) that are delineated under 10 CFR 54.4(a), but were not identified as intended function(s) in the LRA, to verify that the SSCs with such function(s) will be adequately managed so that the function(s) will be maintained throughout the extended period of operation.

After completing the initial review, the staff issued RAIs regarding the ESF systems by letter dated July 14, 2000. The applicant responded to the RAIs by letter dated August 29, 2000.

In RAI 2.3.3-ESF-1, the staff indicated that in Section 2.3.3 of the LRA, tanks (including the vertical tanks erected in the field) are considered mechanical components. However, the tank foundation and anchorage systems are considered structural components. Tanks can have foundations that are made of concrete or steel. The staff requested that the applicant clarify whether the concrete

foundations or pads of the tanks needed for the ESF systems are included within the scope of license renewal, and whether they are subject to an AMR. In response, the applicant verified that tank foundations and anchorages supporting ESF systems are in scope and subject to an AMR. The applicant clarified that tank foundations are evaluated as structures (either as part of a building or as a yard structure). Each table that includes a tank foundation (building or yard structure) also identifies anchors and bolts associated with the tank anchorage system. On the basis of the applicant's response to this RAI, the staff concludes that the applicant has identified the ESF tank foundations as being within the scope of license renewal and subject to an AMR. Section 2.4 of the LRA identifies structural components that are subject to an AMR. The staff's evaluation of the scoping and screening results of structural components is found in Section 2.4 of this SER.

In RAI 2.3.3-ESF-2, the staff requested that the applicant verify whether the passive components (namely screens and vortex breakers) that are used in pump suction lines, for the intended function of protecting the pumps from debris and cavitation, respectively, and that could be located either inside the ESF tanks or in the sump, are subject to an AMR. If so, the staff requested that the applicant identify which tanks and sumps are equipped with these passive components and the location of the AMRs in the LRA for these components. If not, the staff requested that the applicant provide justification for excluding these components from an AMR. In its response, the applicant stated that "screens" used within ESF tanks would be considered long-lived, passive components subject to an AMR. The applicant further stated that at Plant Hatch, the only "screens" utilized within ESF tanks to protect ESF system pump suctions from debris are pump suction strainers located within the torus. These strainers protect the pump suctions for the following systems: Residual Heat Removal (RHR), Core Spray (CS), High-Pressure Coolant Injection (HPCI), and Reactor Core Isolation Cooling (RCIC). These strainers are included in Sections 2.3.3.2, 2.3.3.3, 2.3.3.4, and 2.3.3.5 of the LRA. The applicant acknowledged that vortex-breaking devices would also be considered long-lived, passive components subject to an AMR. However, neither unit at Plant Hatch utilizes vortex breakers within the torus, the condensate storage tank, or the Standby Liquid Control (SLC) storage tank. On the basis of the applicant's response to this RAI, the staff concludes that applicant has identified screens as being within the scope of license renewal and subject to an AMR, and that vortex breakers are not used in ESF tanks.

2.3.3.1 Core Spray System

Summary of Technical Information in the Application

The CS system is one of the emergency core cooling systems (ECCSs) that protect the core from overheating in the event of a loss-of-coolant accident (LOCA). The CS system is a low-pressure system that is actuated in response to low reactor vessel water level (level 1), high drywell pressure, or manual action. Injection valves to the reactor require a signal from the reactor low-pressure permissive switches before opening to provide overpressure protection to the system. The pumps take suction from the suppression pool and spray on the tops of the fuel assemblies to cool the core and limit the fuel cladding temperature. An alternative suction source for the CS system, the condensate storage tank (CST), is primarily is used to provide reactor pressure vessel (RPV) makeup and an injection test supply during outages, and would not normally be used following an accident. The CS system works in conjunction with low-pressure coolant injection (LPCI).

The CS system has two independent loops. Each loop includes a 100-percent capacity centrifugal pump driven by an electric motor, a sparger ring in the reactor vessel above the core, piping,

valves, and associated controls and instrumentation. To enable the CS system to make a quick startup and to minimize the water hammer possibilities during startup, the CS system discharge lines are always maintained full of water by the jockey pump system. The jockey pump system consists of two centrifugal pumps in each of the two loops. The suction and discharge lines of these pumps are connected through piping and valves to the suction and discharge lines of the CS pumps, respectively. Continuous operation of the jockey pumps ensures that the ECCS discharge lines remain full. The jockey pump system also provides the same feature for the RHR system.

System Intended Functions

The CS system serves the following intended functions:

- Core Cooling: The CS system protects the core by removing decay heat following a postulated design-basis LOCA or other design-basis event.

- Alternate Shutdown Cooling: The CS system provides an alternative means to cool and depressurize the reactor vessel following a fire.

- Emergency Core Cooling System Keep Fill: The jockey pumps of the CS system keep the CS and LPCI lines full of water, thereby minimizing the delay time for emergency core cooling and the possibility of water hammer. This function is brought into scope solely as a pressure boundary.

Component Intended Functions

The components of the CS system serve the following functions:

- pressure boundary
- fission product barrier
- flow restriction
- debris protection

The component groups requiring an AMR include the bolting, piping, pump casings, restricting orifice, strainers, and valve bodies.

Staff Evaluation

The staff was concerned that blockage of the spray holes of the core spray spargers could prevent the core spray system from performing its intended function by preventing adequate distribution of the spray on the fuel bundles. The staff discussed this issue with the applicant in telephone conferences on June 26 and June 29, 2000. In the telephone conference held on June 26, 2000, the staff expressed concern that blockage of the spray holes of the core spray spargers through aging could keep the core spray system from performing its intended function of spraying the fuel bundles following a LOCA, and thus may fail to provide adequate core cooling for the short- and long-term following the LOCA. The applicant stated that, because the core spray piping is made of stainless steel, corrosion is not a credible aging mechanism to cause flow blockage. Also, the applicant stated that BWRVIP-18, "Core Spray Internals Inspection and Flaw Evaluation Guidelines," provides a means to inspect the core spray piping. The staff believes that adequate long-term core cooling can only be assured by maintaining the original core spray distribution that

was assumed for the CLB. The staff, therefore, will rely on the BWRVIP inspection program to provide reasonable assurance that the original spray distribution will be maintained during the period of extended operation. On the basis of the staff's review of the information provided in the LRA and in the telephone conferences with the applicant, the staff concludes that the applicant has properly identified the components associated with the CS system that are within the scope of license renewal, as required by 10 CFR 54.4(a), and has properly identified the components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.2 High-Pressure Coolant Injection

Summary of Technical Information in the Application

The high-pressure coolant injection (HPCI) system supplies makeup coolant into the reactor vessel from a fully pressurized to a preset depressurized condition. Demineralized makeup water is supplied from the CST or treated water from the suppression pool. The flow rate of the system maintains the reactor vessel coolant inventory until the reactor pressure drops sufficiently to permit the low-pressure core cooling systems to automatically inject coolant into the vessel. The HPCI system consists of a turbine-driven pump train, piping, valves, and controls that provide a complete and independent ECCS. A test line permits functional testing of the system during normal plant operation. A minimum flow bypass line bypasses pump discharge flow to the suppression pool to protect the pump in the event of a stoppage in the main discharge line. Reactor vessel steam is supplied to the turbine, and turbine exhaust steam is then dumped to the suppression pool.

System Intended Functions

The HPCI system serves the intended function of core cooling. In that capacity, the HPCI system ensures that the reactor is adequately cooled to limit the fuel-clad temperature in the event of a small break in the reactor coolant system and a loss of coolant that does not result in rapid depressurization of the reactor vessel. This function permits shutdown of the plant, while maintaining sufficient reactor vessel water inventory until the reactor is depressurized.

Component Intended Functions

The components of the HPCI system serve the following functions

- pressure boundary
- fission product barrier
- structural support
- flow restriction
- debris protection

The component groups requiring an AMR, as identified in the LRA, include the bolting, flexible connectors, piping, pump baseplate, pump casings, restricting orifice, suction strainer, thermowell, turbine, and valve bodies.

Staff Evaluation

On the basis of the staff's review of the information provided in the LRA, and described in Section 2.3.3.2 of this SER, for the HPCI system, the staff concludes that the applicant has properly

identified the components associated with the HPCI system that are within the scope of license renewal, as required by 10 CFR 54.4(a), and has properly identified the components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.3 Post-LOCA Hydrogen Recombiners (Unit 2 Only)

Summary of Technical Information in the Application

The post-LOCA hydrogen recombiner system is designed as the combustible gas control system to ensure that hydrogen does not accumulate within the primary containment to combustible concentrations following a LOCA. In Section 2.3.3.8, "Post LOCA Hydrogen Recombiner System," of the LRA, the applicant described the intended functions and listed the components of the system that are subject to an AMR. The applicant described its process for identifying the mechanical components within the scope of license renewal in Section 2.1.2, "Scoping," and Section 2.1.3, "Civil/Mechanical Component Screening," of the LRA.

In Section 2.3.3.8 of the LRA, the applicant described the intended functions of the hydrogen recombiner system. The system ensures that hydrogen does not accumulate within the primary containment in combustible concentrations following a LOCA. This is accomplished by drawing primary containment atmosphere from the drywell, and passing it through the recombiner where the hydrogen reacts with available oxygen to form water vapor. The recombiner discharges to the suppression pool (torus). The hydrogen recombiner system is part of the combustible gas control system, and consists of two identical and independent 100 percent capacity trains. Each train consists of three packages, including the recombiner skid, the control console, and the power panel. The recombiner skid consists of inlet piping, flow meters, a flow control valve, an enclosed blower assembly, heater section, reaction chamber, direct contact water spray connected to the power panel, and the control console through instrument and power cables. Coolant for the water spray gas cooler is provided by the residual heat removal (RHR) system.

The initial scoping, performed by the applicant on the basis of system functions, has determined that hydrogen recombiner system has one intended function, T49-01 - Containment Combustible Gas Control, that is within the scope of license renewal. In that capacity, the hydrogen recombiner system ensures that hydrogen does not accumulate within the primary containment in combustible concentrations following a LOCA. This function applies to Unit 2 only.

The associated piping, valve bodies, and bolting are identified in Table 2.3.3-8 of the LRA as being subject to an AMR. The component functions of the piping, valve bodies, and bolting are the pressure boundary and fission product barrier.

Staff Evaluation

The applicant identified and listed the components that are subject to an AMR for the hydrogen recombiner system in Table 2.3.3-8 of the LRA using the screening methodology described in Sections 2.1.2 and 2.1.3 of the LRA. The screening methodology is evaluated by the staff in Section 2.1 of this SER.

The staff reviewed Section 6.2.5 of the Plant Hatch Unit 2 UFSAR to determine if there were any system functions that were not identified as intended functions in accordance with the requirements of 10 CFR 54.4. The staff then reviewed the associated boundary drawing

HL-26068 to verify that the applicant identified all of the components that are within the scope of license renewal in accordance with 10 CFR 54.4. Further, the staff verified the accuracy of the drawings and the completeness of Table 2.3.3-8 by sampling the components adjacent to, but outside, the highlighted portion of the system to verify that all of the components within the scope of license renewal were included in the application. In addition, the staff sampled the components that are within the scope of license renewal, but not subject to an AMR, to verify that all of the components that meet the requirements of 10 CFR 54.21(a)(1) were identified as being subject to an AMR.

After the initial review, in a letter dated July 14, 2000, the staff identified areas where additional information was needed to complete its safety review. The applicant responded to the RAIs in a letter dated August 29, 2000.

In response to RAI 2.3.3-HR-2, the applicant clarified that an unnamed component "B001A" in Drawing No. HL-26068, identified by multi-plant list (MPL) number 2T49-B001A, is the heater subcomponent of the skid-mounted hydrogen recombiner, 2T49-Z001A. The heater serves to preheat containment gases before combustion in the reaction chamber. The staff finds this response acceptable.

In response to RAI 2.3.3-HR-3, the applicant also confirmed that Plant Hatch Unit 1 does not use a hydrogen recombiner for post-LOCA hydrogen controls. Instead, it uses the inerted nitrogen gas to prevent explosive concentrations of hydrogen and oxygen. Therefore, the post-LOCA hydrogen recombiner system, described in Section 2.3.3.8 of the LRA, applies to Unit 2 only. The staff finds this response acceptable.

In RAI-2.3.3-HR-1 and RAI-2.3.3-HR-4, the staff asked the applicant to justify its exclusion of various components (highlighted in HL-26068) from an AMR. Specifically, these components included the water separator, water spray cooler, reaction chamber, blower (C0001A), heater (B001A), and instrument tubing. The applicant responded that these components are a part of skid-mounted hydrogen recombiners, which are active components, and thus not subject to an AMR. Therefore, the applicant determined that the components are also not subject to an AMR.

In a telephone conference on September 13, 2000, the staff expressed its disagreement with the applicant's determination to exclude these components from an AMR simply because they are skid-mounted. The staff requested that the applicant provide additional justification for its position. In response, the applicant provided a paper, entitled "Active Assemblies Used in License Renewal," via an email, dated November 6, 2000.

The staff has reviewed this paper, and finds that the applicant's basis for excluding hydrogen recombiner components, as discussed in the paper, is not consistent with the License Renewal Rule. The basis for the staff's conclusion is summarized below and is described in more detail in Section 2.3.4.2 of this report discussing the emergency diesel generators.

Components are subject to an AMR if they perform a passive function and are long-lived. A passive function is one performed without moving parts or a change in configuration or properties. A function performed with moving parts or a change in configuration or properties is considered an active function. Components that perform a passive function and are also long-lived must be subject to an AMR, whether they are skid-mounted or not. The staff believes that the water separator, water spray cooler, and reaction chamber are long-lived components with a passive

function, and therefore are subject to an AMR. On this basis, the staff requested that the applicant identify any applicable aging effects associated with these components, and any other long-lived components performing a passive function associated with the hydrogen recombiners, and identify AMPs credited with managing the aging effects. This was identified as part of Open Item 2.3.3.2-1 (2.3.3.2-1(a)).

By letter dated June 5, 2001, the applicant responded to this open item by identifying the following skid-mounted components that are subject to an AMR and listing these components in Table 2.3.3-8 of the LRA: blower casing, instrument, piping, reaction chamber, water separator, and water spray cooler. Further clarification was provided by letter dated September 5, 2001, where the applicant clarified that the hydrogen recombiner heater is electric and does not form a part of the pressure boundary. Therefore, the heater is an active component and not subject to an AMR. The staff reviewed the additional information and finds that the inclusion of these components in Table 2.3.3-8 of the LRA is acceptable. In addition, the staff agrees that the recombiner heater is not subject to an AMR. Open Item 2.3.3.2-1(a) is closed. The staff's review of the applicant's management of the aging effects associated with these components can be found in Section 3.3.3 of this SER.

On the basis of the staff's review of the LRA and associated drawings, the Plant Hatch Unit 1 and 2 UFSARs, and the applicant's responses to the RAIs and Open Item 2.3.3.2-1(a), the staff concludes that the applicant has identified the components of the Post-LOCA hydrogen recombiners system that are within the scope of license renewal and subject to an AMR.

2.3.3.4 Primary Containment Purge and Inerting System

Summary of Technical Information in the Application

The primary containment purge and inerting system is designed to supply and maintain an inert atmosphere inside primary containment for combustible gas control and fire protection. In addition, it is designed to purge and vent the containment atmosphere and provide vacuum relief between the torus and drywell, as well as between the torus and reactor building. In Section 2.3.3.7 of the LRA, the applicant described the intended functions and the components of the system that are subject to an AMR.

In Section 2.3.3.7 of the LRA, the applicant described the primary function of the containment purge and inerting system in inerting the primary containment. Plant Technical Specifications require that within 24 hours of reactor operation, the inerting system injects a sufficient amount of gaseous nitrogen into the drywell and torus so that the oxygen concentration falls below 4-percent by volume. Major equipment for the purge and inerting system includes a purge air supply fan, liquid nitrogen storage tank, ambient vaporizer, steam vaporizer, vacuum breaker, valves, piping, controls, and instrumentation. In addition, the primary containment purge and inerting system provides containment vent paths to the standby gas treatment system, which provides a vent path to the main stack for containment vent and purge operations.

The initial scoping, performed by the applicant on the basis of system functions, has determined that the following intended functions of the purge and inerting system are within the scope of license renewal.

- T48-01 – Primary Containment Nitrogen Inerting: The purge and inerting system provides and maintains an inerted atmosphere in the primary containment for combustible gas control and fire protection purposes.

- T48-03 – Primary Containment Vacuum Relief: The primary containment relief valves are designed to maintain an external pressure of not more than 2 psi greater than the concurrent internal pressure. This pressure prevents a collapse in either the drywell or torus as a result of the most rapid cooldown transient that can occur during operation or a postulated accident condition assuming the failure of a single active component.

- T48-04 – Containment/Reactor Building Parameter Monitoring: The containment/reactor building parameter monitoring function monitors and records drywell and torus safety parameters in the main control room. The parameters monitored include torus air and water temperature, water level, and pressure, and drywell pressure and temperature.

- T48-06 – Drywell Pneumatic Nitrogen Supply: The purge and inerting system provides a safety-grade backup supply of nitrogen gas for the drywell pneumatic system. The nitrogen gas provides motive force to the nuclear boiler system safety relief valves, main steam isolation valves, and various other safety-related valves in the event of a loss of normal drywell pneumatic supply.

The associated piping, valve bodies, bolting, flex hose, nitrogen tank jacket, pressure buildup coil, rupture disc, storage tank, thermowell, and vaporizer are identified in Table 2.3.3-7 of the LRA as being subject to an AMR. The component function of piping, valve bodies, bolting, rupture disc, storage tank, and thermowell is to serve as a pressure boundary; the functions of the flex hose are to serve as a pressure boundary and fission product barrier; the function of the nitrogen tank jacket is to serve as a structure support; the functions of the pressure buildup coil and vaporizer are to serve as a pressure boundary and heat exchanger.

Staff Evaluation

The applicant identified and listed the components that are subject to an AMR for the purge and inerting system in Table 2.3.3-7 of the LRA using the screening methodology described in Sections 2.1.2 and 2.1.3 of the LRA. The screening methodology is evaluated by the staff in Section 2.1 of this SER.

The staff reviewed Sections 5.2.3.8 and 5.2.3.9 of the Plant Hatch Unit 1 UFSAR and Section 6.2 of the Unit 2 UFSAR to determine if any system functions were not identified as intended functions in accordance with the requirements of 10 CFR 54.4. The staff then reviewed the evaluation boundary drawings (HL-16024, HL-16000, HL-16239, HL-16153, HL-16286, HL-26084, HL-26079, HL-26083, and HL-26020) to verify that the applicant identified all of the components that are within the scope of license renewal in accordance with 10 CFR 54.4. Further, the staff verified the accuracy of the drawings and the completeness of LRA Table 2.3.3-7 by sampling the components that are adjacent to, but outside the highlighted portion of the system to verify that all of the components within the scope of license renewal were included in the application. In addition, the staff sampled the components that are within the scope of license renewal, but not subject to an AMR, to verify that all of the components that meet the requirements of 10 CFR 54.21(a)(1) were identified as being subject to an AMR.

After the initial review, in a letter dated July 14, 2000, the staff identified areas where additional information was needed to complete its safety review. The applicant responded to the RAIs in a letter dated August 29, 2000.

In RAI 2.3.3-P&I-1, the staff requested that the applicant clarify whether the "vaporizer" listed in Table 2.3.3.7 of the LRA, represents the ambient vaporizer only, or both the ambient and steam vaporizers. In Section 2.3.3.7 of the LRA, both the ambient vaporizer and steam vaporizer are identified as major equipment for the system. The applicant responded that the "vaporizer" listed in Table 2.3.3.7 of the LRA stands for the ambient vaporizer only. The steam vaporizer does not perform an intended function and, therefore, is not within the scope of license renewal.
In RAI 2.3.3-P&I-3, the staff questioned the basis for excluding instrument tubing from an AMR. The applicant responded that, with the exception of copper, the LRA includes instrument tubing with piping for like materials. There is no copper instrument tubing in scope for functions associated with the primary containment purge and inerting system. On the basis of the information provided in the applicant's response to RAI 2.3.3-P&I-3, the RAI is resolved.

To verify that the applicant identified all of the components that are within the scope of license renewal in accordance with 10 CFR 54.4, the staff reviewed the intended functions (primary containment nitrogen inerting [T48-01], primary containment vacuum relief [T48-03], containment/reactor building parameter monitoring [T48-04], and drywell pneumatic nitrogen supply [T48-06]), along with nine evaluation boundary drawings (HL-16024, HL-16000, HL-16239, HL-16153, HL-16286, HL-26084, HL-26079, HL-26083, and HL-26020). Each drawing has a large number of components associated with several overlapping functions, and each drawing may have several systems. In addition, each intended function may be cross-referenced in several drawings.

In RAI 2.3.3-P&I-2, the staff requested that the applicant identify all of the drawings and major components that are associated with function T48-03, "Primary Containment Vacuum Relief." In its response, the applicant referred to drawings HL-16024 and HL-26084, but did not identify any of the components being used for function T48-03. The applicant stated that the Plant Hatch LRA does not present screening results on a function-by-function basis. Rather, all functions that are primarily associated with the system are grouped together for screening, and the results of the screening are listed in LRA Table 2.3.3-7. Given the available information and the RAI response, it was not clear to the staff whether the applicant had properly identified all of the components that are within the scope of license renewal in accordance with the requirements of 10 CFR 54.4.

To resolve the above concern, the staff included the purge and inerting system in its scoping and screening inspection, which was performed at the applicant's corporate offices in Birmingham, Alabama, during the week of September 11 - 15, 2000. During the inspection, as documented in NRC Inspection Report 50-321/00-09, 50-366/00-09, the NRC inspector reviewed additional onsite information associated with the system and concluded that the applicant had correctly identified the components that are subject to an AMR, as well as components that are not subject to an AMR. Given the results of this inspection, the staff agrees with the applicant that all of the components that are subject to an AMR are properly identified in Table 2.3.3.7 of the LRA.

On the basis of the NRC inspection and review of the LRA and associated drawings, the UFSARs for Plant Hatch Units 1 and 2, and the applicant's responses to RAIs, the staff was unable to find any omissions from the components highlighted in the diagrams that identify the function-level scoping boundaries. The staff also compared the components listed in Table 2.3.3-7 of the LRA to those highlighted in the drawings, and found them consistent.

On the basis of the review, the staff has determined that there is reasonable assurance that the applicant has adequately identified the intended functions of the primary containment purge and inerting system that are within the scope of license renewal in accordance with the requirements of 10 CFR 54.4 and the components that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.3.5 Reactor Core Isolation Cooling System

Summary of Technical Information in the Application

The reactor core isolation cooling (RCIC) system is a high-pressure coolant makeup system that supports reactor shutdown when the feedwater system is unavailable. The RCIC system provides the capability to maintain the reactor in a hot standby condition for an extended period. Normally, however, the RCIC system is used until the reactor pressure is sufficiently reduced to permit use of the shutdown cooling mode of the RHR system.

The RCIC system consists of a turbine-driven pump, piping and valves, and the instrumentation necessary to maintain the water level in the reactor vessel above the top of the active fuel in the event that the reactor vessel is isolated from normal feedwater flow. Also included in the design of the RCIC system is a barometric condenser and vacuum and condensate pumps to prevent steam from leaking into the environment.

System Intended Functions

The intended function of the RCIC system is core cooling. In that capacity, the RCIC system provides a high pressure makeup coolant system that supports the reactor shutdown when the feedwater system is unavailable.

Component Intended Functions

The components of the RCIC system serve the following functions

- Pressure boundary
- Fission product barrier
- Structural support
- Flow restriction
- Debris protection

The component groups requiring an AMR, as identified in the LRA, include the bolting, flexible connector, piping, pump baseplate, pump casing, restricting orifices, steam trap, strainer-steam exhaust, suction strainer, thermowell, turbine, and valve bodies.

Staff Evaluation

The staff reviewed Section 2.3.3.5 of the LRA to determine whether the applicant has identified the components in the RCIC system that are within the scope of license renewal and subject to an AMR, as required by 10 CFR 54.4 and 10 CFR 54.21(a)(1).

On the basis of the staff's review of the information provided in the LRA, and described for the RCIC system in Section 2.3.3.5 of this SER, the staff concludes that the applicant has properly identified the components associated with the RCIC system that are within the scope of license renewal, as required by 10 CFR 54.4(a), and those that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.6 Residual Heat Removal (RHR) System

Summary of Technical Information in the Application

The RHR system is composed of several components and subsystems that are required to perform the following functions:

- Restore and maintain reactor vessel water level after a LOCA.
- Limit temperature and pressure inside the containment after a LOCA.
- Remove heat from the suppression pool water.
- Remove decay and residual heat from the reactor core to achieve and maintain a cold shutdown condition.

The RHR system consists of four pumps and two heat exchangers divided into two loops of two pumps and one heat exchanger each, plus the associated instruments, valves, and piping. The RHR pumps take suction from the suppression pool or the reactor coolant recirculation loop. The pumps discharge into the recirculation loop, the suppression pool, the containment spray headers, or the spent-fuel pool cooling and cleanup system, depending upon the desired mode of system operation. The RHR system interfaces with the reactor recirculation system to provide a flow-path in support of shutdown cooling and LPCI. The RHR system is part of the reactor coolant pressure boundary; therefore, it also maintains the pressure boundary during normal operation, transients, and accident scenarios to prevent the release of radioactive liquid and gas. The RHR system is cooled through the heat exchangers by the residual heat removal service water (RHRSW) system, which takes suction from the Altamaha River. There are four RHRSW pumps per unit. The RHRSW system also serves as a standby coolant supply system by providing a means of injecting makeup water from the river to the RHR system to keep the core covered during an extreme emergency.

System Intended Functions

The RHR system serves the following intended functions:

- Low Pressure Coolant Injection (LPCI): The LPCI restores and maintains the coolant inventory in the reactor vessel so the core is adequately cooled following a design basis LOCA and other design basis events.
- Containment Spray: Containment spray provides post-accident containment atmosphere temperature and pressure control by use of spray nozzles located in both the drywell and the torus area.

- RHRSW Vessel/Containment Injection: RHRSW provides a reliable supply of cooling water to the reactor pressure vessel (RPV) following a loss of RHR/core spray or to flood the primary containment to provide cooling to the exterior of the reactor vessel using raw river water.

- Shutdown Cooling: Shutdown cooling removes decay and residual heat from the reactor during shutdown and cooldown when the reactor pressure is so low that the vacuum in the condenser cannot be maintained, rendering the condenser or the HPCI and/or RCIC pumps inoperable because of a lack of steam.

- Suppression Pool Cooling: Suppression pool cooling limits the water temperature in the suppression pool to ensure that it has adequate heat capacity remaining in the event of a design-basis LOCA, and removes heat following an accident and during testing of the HPCI and RCIC systems.

- Alternate Shutdown Cooling: Alternate shutdown cooling provides an alternative means to cool and depressurize the reactor vessel following a fire or other transient that leads to a loss of shutdown cooling.

Component Intended Functions

The components of the RHR system serve the following functions:

- pressure boundary
- fission product barrier
- shelter/ protection
- structural support
- flow restriction
- debris protection

The component groups requiring an AMR include the bolting, conductivity element, heat exchanger channel assembly, heat exchanger impingement plate, heat exchanger shell, heat exchanger tube sheet, heat exchanger tubes, piping, pump casings, pump casing bowl assembly, pump discharge head, pump sub base, restricting orifices, strainer bodies, strainers, thermowell, tubing, and valve bodies.

Staff Evaluation

In RAI 2.3.3-RHR–1, the staff indicated that in Table 2.3.3-2 of the LRA, the intended functions for heat removal tubes have been identified as a fission product barrier and pressure boundary. However, the staff believes that heat transfer is also an intended function of this component. The staff therefore requested that the applicant explain why this additional function need not be identified, and why an AMR is not necessary to ensure satisfactory performance of this function throughout the period of extended operation. The applicant responded by stating that although it was not listed in Table 2.3.3-2, heat transfer is part of the component function for the RHR heat exchanger tubes. The applicant further stated that this function was inadvertently omitted from the table; however, the AMR performed for the heat exchanger tubes in Section C.2.2.11 of the LRA included consideration of this function in the evaluation of aging effects requiring aging management.

On the basis of the staff's review of the information provided in the LRA, described in Section 2.3.3.6 of this SER, for the RHR system, as well as the response to the staff's RAI, the staff concludes that the applicant has properly identified the components associated with the RHR system that are within the scope of license renewal, as required by 10 CFR 54.4(a), and those that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.7 Standby Gas Treatment System

Summary of Technical Information in the Application

In Section 2.3.3.6, "Standby Gas Treatment System," of the LRA, the applicant described the components of the standby gas treatment system (SGTS) that are within the scope of license renewal and subject to an AMR. The staff reviewed this section of the LRA to determine whether there is reasonable assurance that the applicant has identified all components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and all components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

In Section 2.3.3.6 of the LRA, the applicant stated that additional information for the SGTS is provided in Sections 5.3.3.3 and 6.2.3 of the UFSAR for Units 1 and 2, respectively. The system scoping is shown in SGTS evaluation boundary drawings HL-16020, Rev. A, and HL-16174, Rev. A, for Unit 1, and HL-26078, Rev. A, for Unit 2.

The SGTS is an ESF system for ventilation and cleanup of the primary and secondary containment during certain postulated design-basis accidents (DBAs), and meets the design, quality assurance, redundancy, energy source, and instrumentation requirements for ESF systems. The SGTS is also used as a normal means of venting the drywell.

Plant Hatch Unit 1

The SGTS suction from the reactor building below the refueling floor and torus and drywell area is isolated during refueling activities by gagging closed certain valves in the reactor building suction lines to achieve modified secondary containment. Following the receipt of the isolation signal, the reactor zone and/or refueling zone isolation dampers close, supply and exhaust fans are shut off, and the SGTS is initiated. The SGTS system minimizes the release of radioactive material to the environment by filtering and exhausting via the main stack.

The basic SGTS consists of two identical parallel air filtration assemblies (trains) separated by a 42-inch-thick concrete wall and enclosed within a seismic Class 1 structure. The 18-inch underground discharge pipe leading to the main stack is seismic Class 1. Each train is full-capacity, and consists of a demister or moisture separator, electrical heating coil, pre-filter, high-efficiency particulate air (HEPA) filter, two charcoal adsorbers, final HEPA filter, and exhaust fan.

The total free volume of the secondary containment system is approximately 2×10^6 ft^3, and the portion of the volume above the refueling floor is 725,000 ft^3. On the basis of the free volume of the secondary containment system, each SGTS train has the capability for two air volume changes per day (assuming no wind). The discharge lines from the Unit 1 trains tie together into an 18-in. header for discharge into the main stack. Unlike the Unit 2 SGTS, the Unit 1 SGTS is designed with a timer logic such that trains A and B are set to trip at approximately

6 and 4 minutes, respectively, from initial start on sensing low airflow conditions. The details of the SGTS are described in Section 5.3.3.3 of the Unit 1 UFSAR.

Plant Hatch Unit 2

The SGTS is fully redundant and capable of performing following a single failure. In the event of a loss of offsite power (LOOP), the SGTS fans can be powered from the emergency service portions of the auxiliary power distribution system. The fan associated with each filter assembly is powered from a different emergency diesel in the event of LOOP. The system includes isolation dampers that fail open on loss of power to the solenoids or upon loss of instrument air to the air operators on the dampers. An interlock with the associated exhaust fan prevents the heating coil from operating when the fan is shut down. The system components and ductwork meet seismic Category I requirements.

In the event of an automatic initiation signal for the SGTS, the normally operating reactor building and refueling floor ventilation systems are isolated. Since other boundary penetrations (such as access doors or electrical cables) are normally sealed, the only potential fission product release path is through the SGTS to the main stack. Further, since no air path other than infiltration exists for replacement air, the area within the boundary connected to the SGTS is maintained at a negative pressure.

The SGTS automatically filters the exhaust air from the reactor building and/or the fuel handling area following an accident. As an alternative mode of operation, the drywell and/or torus purge exhaust are manually directed to the SGTS for processing before release up the main stack.

The SGTS consists of two identical, redundant, parallel air filtration assemblies, which are separated by a 4-ft 6-in.-thick concrete wall and completely enclosed within a seismic Category I structure. Each of the filtration assemblies and their respective components are designed for 100-percent-capacity operation. Each filtration assembly consists of a demister or moisture separator to reduce absolute humidity, electric heater for relative humidity control to maintain the adsorption efficiency of the carbon bed, pre-filter for removal of larger particulates to protect the HEPA filter, a HEPA filter for removal of small particulate matter, a 4-in. deep-bed impregnated-carbon adsorber to remove gaseous elemental iodine and methyl iodide, final HEPA filter for removal of postulated particulate matter that could be carried off the carbon adsorber by the air stream, and an exhaust fan to move the air. With the reactor building isolated, each of the two exhaust fans has the necessary capacity to reduce and hold the reactor building at a minimum negative pressure of 0.20-in. water. The details of the SGTS are described in Section 6.2.3 of the Unit 2 UFSAR.

In Section 2.3.3.6 of the LRA, the applicant identified the following intended functions for the SGTS that relate to 10 CFR 54.4(a)(1), 10 CFR 54.4(a)(2), and 10 CFR 54.4(a)(3):

- Minimize the release of radioactive materials to the environment during accident conditions and to

- Ventilate and clean up the primary and secondary containment during certain postulated DBAs.

On the basis of the functions identified above, the applicant determined that all SGTS safety-related components (electrical, mechanical, and instrument) are within the scope of license renewal. The applicant described its process for identifying the mechanical components that are subject to an AMR in Section 2.1.2 of the LRA. On the basis of this methodology, the applicant identified the portions of the SGTS that are within the scope of license renewal in SGTS evaluation boundary drawings HL-16020, Rev. A, and HL-16174, Rev. A, for Unit 1, and HL-26078, Rev. A, for Unit 2. Using the methodology described in Section 2.1 of the LRA, the applicant compiled a list of the mechanical components and component types that are within the scope of license renewal and subject to an AMR, and identified their functions. The applicant provided this list in Table 2.3.3-6 of the LRA.

The applicant identified the following 11 device types as being within the scope of license renewal and subject to an AMR:

- filter housing (galvanized steel)
- piping (carbon steel)
- piping (stainless steel)
- piping (copper)
- piping (galvanized steel)
- rupture disc (stainless steel)
- thermowell (stainless steel)
- valve bodies (gray cast iron)
- valve bodies (carbon steel)
- valve bodies (stainless steel)
- valve bodies (copper alloy)

In Table 2.3.3-6, the applicant further noted that the SGTS fission product barrier and pressure boundary functions are the only applicable functions associated with components of the SGTS that are subject to an AMR.

Staff Evaluation

The staff reviewed Section 2.3.3.6 of the LRA to determine whether there is reasonable assurance that the SGTS components that are within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.21(a)(1). The staff reviewed other information in the LRA and Sections 5.3.3.3 and 6.2.3 of the UFSAR for Units 1 and 2, respectively. After completing the initial review, the staff issued an RAI regarding the SGTS by letter dated July 14, 2000. The applicant responded to the RAI by letter dated August 29, 2000.

In LRA Section 2.1, the applicant discussed the process of identifying mechanical components that are subject to an AMR. The applicant's scoping methodology is evaluated by the staff in Section 2.1 of this SER.

In its review of the SGTS, the staff reviewed the SGTS evaluation boundary drawings HL-16020, Rev. A, and HL-16174, Rev. A, for Unit 1, and HL-26078, Rev. A, for Unit 2. The drawings show the evaluation boundaries for the portions of the SGTS that are within the scope of license renewal. The staff also reviewed Table 2.3.3-6 of the LRA which lists those mechanical components that are subject to an AMR.

The staff also reviewed Sections 5.3.3.3 and 6.2.3 of the UFSAR for Units 1 and 2, respectively, to determine if there were any portions of the SGTS that met the scoping criteria in 10 CFR 54.4 that the applicant did not identify as being within the scope of license renewal. The staff also reviewed the UFSAR sections to determine if there was any system function that was not identified as an intended function in the LRA, and to determine if there were SCs that have an intended function that might have been omitted from the scope of SCs requiring an AMR. The staff also reviewed the above SGTS evaluation boundary drawings to determine if any SCs that are within the evaluation boundaries were omitted from the scope of SCs requiring an AMR under 10 CFR 54.4(a)(1). The staff also compared the system and intended functions described in the UFSAR with those identified in the LRA. The staff then determined whether the applicant had properly identified SCs that are subject to AMR from among those identified as being within the scope of license renewal.

The applicant identified and listed the SCs that are subject to AMR for the SGTS in Table 2.3.3-6 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 sampled SCs from Table 2.3.3-6 to verify that the applicant identified the SCs that are subject to an AMR. The staff also sampled SCs that are within the scope of license renewal, but were not identified as being subject to an AMR to verify that these SCs perform their intended functions with moving parts or with a change in configuration or properties, or were subject to replacement on the basis of a qualified life or specified time period.

To help ensure that those portions of the SGTS that were not identified as being within the scope of license renewal did not perform any intended functions, the staff issued an RAI on the basis of the applicable information in the UFSARs and LRA. The staff noted that Section 2.3.3.6 of the LRA presents a summary description of the system functions, evaluation boundary drawings highlight the evaluation boundaries of the SGTS, and Table 2.3.3-6 tabulates components that are within the scope of license renewal and subject to an AMR. The corresponding drawings for this system in the UFSAR, however, show additional components that were not listed in Table 2.3.3-6 of the LRA.

In RAI 2.3.3-SGTS-1 and RAI 2.3.3-SGTS-2, the staff requested specific information concerning the exclusion of the following components from the scope of license renewal and/or from an AMR:

(1) differential pressure indicator and associated piping (Unit 1, Filter Assembly D001B, HL-16020, SGTS Sh. 1)

(2) temperature element and associated piping (Unit 1, Filter Assembly D001B, HL-16020, SGTS Sh. 1 @G4)

(3) flow switch (FS N011A) and open valves (N011A-RV1, N011A-RV2) and associated piping (3/8-inch diameter piping) (Unit 1, HL-16174, SGTS Sh. 2 @ C7)

(4) filter housing with pre-filter, high-efficiency particulate air (HEPA) and carbon filters (Unit 1, Filter Assemblies D001A and D001B, HL-16020 @ (C2, C3, C4, and C5) and (G2, G3, G4, and G5))

(5) bird screen or wire mesh, if provided as a protective cover for exhaust stack (Unit 1, HL-16174, SGTS Sh. 2 @ C10)

(6) guillotine damper housing (Unit 2, Filter Assemblies D001A and D001B, HL-26078 @ C4 and G4)

(7) filter housing with pre-filter, HEPA and carbon filters (Unit 2, Filter Assemblies D001A and D001B, HL-26078 @ (C2, C3, C4, and C5) and (G2, G3, G4, and G5))

(8) "buried pipe" (Unit 2, HL-26078 @ G10)

(9) bird screen or wire mesh, if provided as a protective cover for an exhaust stack (Unit 2, HL-26078 @ C11)

(10) outside air probe tubing (Unit 1, HL-16174, SGTS Sh. 2 @ A9, B9, and C9)

(11) fan housing (Unit 1, HL-16174, SGTS Sh. 2 @ C5 and F5)

(12) outside air probe tubing (Unit 2, HL-26078 @ A9, B9, and C9)

(13) fan housing (Unit 2, HL-26078 @ C4 and G4)

In a letter dated August 29, 2000, the applicant provided the following responses:

(1) Differential pressure indicators are active components (NEI 95-10 Rev. 0, Appendix B, Item 76) and, therefore, no AMR is required for the differential pressure indicators shown in HL-16020; associated tubing is made of copper and is screened as piping, and LRA Table 2.3.3-6 includes this component.

(2) Temperature element was screened as thermowell, which is made of stainless steel, and Table 2.3.3-6 includes this component; associated tubing is made of copper and is screened as piping, and Table 2.3.3-6 includes this component as well.

(3) Flow switches are active components (NEI 95-10 Rev. 0, Appendix B, Item 84) and, therefore, no AMR is required for the flow switches shown in HL-16174; valves and associated piping made of carbon steel are included in Table 2.3.3-6.

(4) Filter housing (Unit 1) on HL-16020 is made of galvanized steel; an AMR was performed on the filter housing, and this item is included in Table 2.3.3-6; pre-filter, HEPA filter, and carbon filter are in scope; however, these items are consumables and therefore not subject to an AMR. (These items were inadvertently omitted from boundary drawing HL-16020).

(5) Bird screen (Unit 1) is included in the exhaust stack as miscellaneous steel (see Table 2.4.11-1).

(6) Dampers are active components (NEI 95-10, Rev.0, Appendix B, Item 155) and, therefore, no AMR is required for the guillotine damper housing.

(7) Filter housing (Unit 2) on HL-26078 is made of galvanized steel; an AMR was performed on the filter housing, and this item is included in Table 2.3.3-6; prefilter, HEPA filter, and carbon filter are in scope; however, these items are consumables and therefore not subject to an AMR. (These items were inadvertently omitted from the boundary HL-26078).

(8) Buried piping is made of carbon steel, and is included in Table 2.3.3-6.

(9) Bird screen (Unit 2) is included in the exhaust stack as miscellaneous steel.

(10) Outside air probe tubing (Unit 1) is made of copper and screened as piping, and Table 2.3.3-6 includes this component.

(11) NEI 95-10, Rev. 0, Appendix B, Item 163, designates ventilation fans (Unit 1) as active components and, therefore, no AMR is required for the fan housing shown in HL-16174.

(12) Outside air probe tubing (Unit 2) is made of copper and screened as piping, and Table 2.3.3-6 includes this component.

(13) NEI 95-10, Rev. 0, Appendix B, Item 163, designates ventilation fans (Unit 2) as active components and, therefore, no AMR is required for the fan housings shown in HL-26078.

The staff reviewed the applicant's responses concerning the associated tubing for differential pressure indicators, the temperature element and its associated tubing, valves and associated piping for flow switches, the filter housing (Units 1 and 2) for carbon and HEPA filters, the bird screen (Units 1 and 2), buried piping, and outside air probe tubing (Units 1 and 2), and found them acceptable, since these component commodity groupings were within the scope of license renewal and subject to an AMR, in accordance with the applicable requirements of 10 CFR 54.21(a)(1), 10 CFR 54.4(a)(1), 10 CFR 54.4(a)(2), and 10 CFR 54.4(a)(3).

In its responses to RAI 2.3.3-SGTS-1 and RAI 2.3.3-SGTS-2, the applicant stated that differential pressure indicators, guillotine damper housings, and fan housings in the SGTS are not subject to an AMR on the basis of the guidance provided in NEI 95-10, Appendix B. The staff agrees that differential pressure indicators are considered components with an active function and, therefore, are not subject to an AMR. However, the staff questioned whether it was appropriate for the applicant to exclude guillotine damper housings and fan housings from an AMR. During a telephone conference on October 31, 2000, the staff asked the applicant to provide justification for why the housings for the guillotine dampers and fans should be excluded from an AMR.

In response to the staff's concerns regarding the exclusion from an AMR of the housings for components such as fans, dampers, and heating and cooling coils, the applicant provided, by an e-mail dated November 6, 2000, a paper titled "Active Assemblies Used in License Renewal."

The staff reviewed this paper and found that the applicant's basis for excluding fan, damper, and heating and cooling coil housings is not consistent with the license renewal rule, the Statements of Consideration (SOC) accompanying the Rule, or the staff's review guidance.

10 CFR 54.21(a)(1) provides that those components that perform their intended functions without moving parts and without a change in configuration or properties (10 CFR 54.21(a)(1)(i)) and that

are not subject to replacement based on qualified life or specified time period (10 CFR 54.21(a)(1)(ii)) are subject to an AMR. Such components are commonly considered as "long-lived" and as performing a passive function. 10 CFR 54.21(a)(1)(i) states that "structures and components [with passive functions] include, but are not limited to,... pump casings, valve bodies ... " and lists other components that perform passive functions. The examples cited in the license renewal rule illustrate components with significant passive functions.

Section III.f.i(a) of the SOC further explains that major components may have active functions, passive functions, or both, and cites pumps and valves as examples. Pumps and valves have moving parts, but the Commission concluded that the pressure-retaining function performed by the pump casing and the valve body were important enough to warrant an AMR. The SOC further explains that the Commission does not limit the consideration of pressure boundaries to reactor coolant pressure boundary. The exclusion regarding components is focused on active functions rather than on the exclusion of the entire component, while the AMR applies to the passive function of the component. On this basis, the staff concludes that fans, dampers, and heating and cooling coils may include significant passive pressure-retaining and structural support functions.

Section 2.2.III.A of the draft SRP-LR, September 1997, states that "...some functions of "active" components may meet the criteria of the "passive" description. For example, although a pump or a valve has some moving parts, a pump casing or valve body performs a pressure retaining function without moving parts. A pump casing or a valve body meets this description and would therefore be considered for an aging management review." It is clear by this passage, and by the examples provided of pumps and valves, that the passive functions of components are subject to an AMR.

In Section 2.1.1 of the LRA, the applicant states that the specific method used to identify in-scope functions and to screen the SSCs required to perform the in-scope functions was developed considering the guidance provided by NEI 95-10, Revision 0, "Industry Guideline on Implementing the Requirements of 10 CFR Part 54 - The License Renewal Rule," among other regulatory and guidance documents. Appendix B of NEI 95-10 provides a list of components and their active/passive functions. Item numbers 155 and 163 identify dampers and ventilation fans, respectively. Each of these components is identified in the appendix as performing an active function. The staff notes that the appendix, though it specifically identifies the dampers and ventilation fans, does not address housings for these components.

On the basis of the information in the Rule, the SOC, and guidance provided in the SRP-LR, the staff concludes that the housings for fans, dampers, and heating and cooling coils contribute to the performance of the intended function of fans, dampers, and heating and cooling coils without moving parts and without a change in configuration or properties, and thus are subject to an AMR. This issue also affects the scope of components with passive functions for the control building HVAC, outside structures HVAC, and reactor building HVAC systems, which are discussed in Section 2.3.4.2 of this SER.

Therefore, on the basis of the above staff positions, the staff requested that the applicant identify the passive functions for those fans, dampers, and heating and cooling coils that are within the scope of license renewal. For those passive functions, the applicant should identify any aging effects associated with the components and provide an AMP to manage the aging. This was identified as part of Open Item 2.3.3.2-2 [2.3.3.2-2(a)].

By letter dated June 5, 2001, the applicant provided information regarding the disposition of fans, dampers, and heating and cooling coils within the scope of license renewal. Consistent with the staff's guidance regarding evaluation of active components, the applicant identified the passive functions of damper frames and fan housings in the SGTS and added these components to the list of components in the LRA that are subject to an AMR. The applicant also identified any aging effects associated with the damper frames and fan housings and provided an AMP to manage the aging. The applicant added these components to those listed in Tables 2.3.3-6 and 3.2.3-6 in the LRA. The staff's review of the aging effects and AMPs for the SGTS can be found in Section 3.3.3 of this SER. On the basis of the additional information provided by the applicant, the staff agrees that the damper frames and fan housings are included in the scope of license renewal and subject to an AMR. Further, the staff concludes that the inclusion of these components in Tables 2.3.3-6 and 3.2.3-6 of the LRA is acceptable. On the basis of the additional information provided by the applicant, this part of Open Item 2.3.3.2-2, as it relates to SGTS components, is closed.

The applicant also agreed to clarify the function of the guillotine damper regarding, including whether this damper is safety-related and included within the scope of license renewal and subject to an AMR. This was also identified as part of Open Item 2.3.3.2-2 [2.3.3.2-2(a)].

By letter dated June 5, 2001, the applicant clarified the function of the guillotine damper utilized in the SGTS. The dampers represent a commodity group of dampers associated with SGTS filtration units, 2T46-D001A and 2T46-D001B. During accident and normal operating conditions, the dampers remain open. For filter testing purposes the dampers may be closed as needed. However, the dampers are not safety-related, do not perform an intended function , and can not prevent an intended function. Therefore, the guillotine dampers are not included in the scope of license renewal and are not subject to an AMR. On the basis of the additional information provided by the applicant, the staff agrees that the guillotine dampers are not within the scope of license renewal and not subject to an AMR. On the basis of the previously noted information, this part of Open Item 2.3.3.2-2 [2.3.3.2-2(a)], as relates to SGTS guillotine dampers, is closed.

The staff reviewed Section 2.3.3.6 of the LRA, supporting information in the UFSAR, the applicant's responses to the staff's RAIs, and additional information provided by letter dated June 5, 2001. In addition, the staff sampled several components in the previously mentioned evaluation boundary drawings of the LRA to determine whether the applicant properly identified the components that are within the scope of license renewal and subject to an AMR.

On the basis of this review, the staff has reasonable assurance that the applicant has adequately identified the SGTS components that are within the scope of license renewal and subject to an AMR in accordance with the requirements of 10 CFR 54.4, and 10 CFR 54.21.

2.3.3.8 Standby Liquid Control System

Summary of Technical Information in the Application

The SLCS ensures reactor shutdown, from full-power operation to cold subcritical, by mixing a neutron absorber with the primary reactor coolant. The system is designed for the condition when an insufficient number of control rods can be inserted from the full-power setting. The neutron absorber is injected within the core zone in sufficient quantity to provide a sufficient margin for

leakage or imperfect mixing. The system is not a scram or a backup scram system for the reactor; it is an independent backup system for the control rod drive (CRD) system.

The SLCS is located in the reactor building, and consists of a low-temperature sodium pentaborate solution storage tank, a test tank, a pair of full-capacity positive displacement pumps, two explosive actuated shear plug valves, two accumulators, the poison sparger, and the necessary piping, valves, and instrumentation. The SLCS is manually initiated from the control room by use of a three-position key-lock switch.

System Intended Functions

The SLCS serves the following intended functions:

- Reactivity control: The SLCS assures reactor shutdown from full power operation to cold subcritical by mixing a neutron absorber with the primary reactor coolant.

- SLCS testing: The testing function is not safety-related. However, to accomplish this function, equipment serving the reactivity control function is used, as well as the test tank and piping. The equipment common served by the reactivity control function is brought into scope under that condition. The test tank is qualified to seismic II/I criteria, and therefore has the potential to prevent a safety-related function. For this reason, this function is conservatively brought into scope.

Component Intended Function

The function of the SLCS components is to serve as a pressure boundary.

The component groups requiring an AMR, as identified in the LRA, include the bolting, piping, pump accumulators, pump casings, tanks, temperature element, temperature switch, and valve bodies.

Staff Evaluation

In RAI 2.3.3-SLCS-1, the staff indicated that Table 2.3.3-1 of the LRA identifies the pressure boundary as the only intended function for the components supporting the SLCS, per 10 CFR 54.4(a)(1)(i). However, the staff believes that the components have additional intended functions as delineated in 10 CFR 54.4(a)(1)(ii) and (iii), namely, the capability to shutdown the reactor and maintain it in a safe shutdown condition, and the capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposure, respectively. It was not clear in the LRA whether these functions were considered to be intended functions of the components supporting the SLCS. The staff, therefore, requested clarification from the applicant. In response, the applicant explained that its scoping process identified functions, and applied all of the Part 54 criteria, including 10 CFR 54.4(a)(1)(i), (ii) and (iii), to determine if the functions were intended functions that should be in scope. Portions of the SLCS were determined to be in scope because they met one or more of the criteria in 10 CFR 54.4. It was clarified that Table 2.2-1 of the LRA presents the scoping results. Function numbers C41-01 and C41-03, which are defined as reactivity control and SLCS testing, respectively, are in scope. On the basis of the applicant's response to this RAI, the staff concludes that the applicant has clarified the intended functions of the SLCS.

In RAI 2.3.3-SLCS-2, the staff questioned the basis for not including the SLCS poison standpipe/sparger within the scope of license renewal and not subjecting it to an AMR. The staff stated in the RAI that although the standpipe/sparger may not perform the pressure boundary function, it does perform other intended functions, such as the capability to shutdown the reactor and maintain it in a safe shutdown condition, and the capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposure. The staff further stated that aging effects, such as blockage of the standpipe/sparger perforations to prevent the injection of liquid poison solution and/or cracking of the component itself, may degrade its function to ensure good mixing and dispersion of the poison inside the reactor vessel. The staff, therefore, requested that the applicant submit an AMR, or present a justification for excluding the SLCS poison standpipe/ sparger from an AMR. In its response, the applicant stated in its response that the SLCS sparger was evaluated by the Boiling Water Reactor Vessel Internal Program (BWRVIP). The initial safety assessment is documented in BWRVIP-06, "Safety Assessment of BWR Reactor Internals," dated October, 1995, in which it was concluded that failure of the sparger as a result of cracking "has no performance or safety consequence." The NRC issued a safety evaluation for BWRVIP-06 on September 15, 1998. BWRVIP later performed a more detailed assessment of the SLCS piping and sparger to determine the need for any inspections. The results are documented in BWRVIP-27, "BWR Standby Liquid Control System/Core Plate ΔP Inspection and Flaw Evaluation Guidelines." This assessment, like BWRVIP-06, considered all modes of degradation and identified the actions necessary to ensure safe operation. Boron mixing was specifically addressed in Section 2.2.1 of BWRVIP-27. The conclusion was that cracking of the sparger would not prevent the poison from mixing and shutting down the reactor. BWRVIP-27 was reviewed and approved for generic use by the NRC in the SERs for both the current term (May 27, 1999) and for the license renewal term (December 20, 1999). Furthermore, the applicant stated that given the materials of construction and the environment, plugging of the sparger as a result of corrosion of the sparger is not a plausible aging effect. The applicant also stated that if crud from the bottom head region were to accumulate, the pressure associated with SLCS injection would dislodge any crud and flow would be ensured. Therefore, an aging management activity is not warranted. On the basis of the applicant's response to this RAI, the staff concludes that the standpipe/sparger does not perform an intended function and, therefore, is not subject to an AMR.

On the basis of the staff's review of the information provided for the SLCS in the LRA, and described in Section 2.3.3.8 of this SER, the staff concludes that the applicant has properly identified the components associated with the SLCS that are within the scope of license renewal, as required by 10 CFR 54.4(a), and those that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.9 Conclusions

On the basis of the staff's review of the information presented in Section 2.3.3 of the LRA, the supporting information in the Plant Hatch UFSAR, the applicant's response to the staff's RAIs, the additional information provided in telephone conversations between the applicant and the staff, and the applicant's responses to the open items, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the ESF systems that are within the scope of license renewal and subject to an AMR, in accordance with the requirements of 10 CFR 54.4(a) and 10 CFR 54.21(a)(1).

2.3.4 Auxiliary Systems

The applicant describes the auxiliary systems that are within the scope of license renewal and subject to an AMR in the following sections of the LRA: 2.3.4.1, "Control Rod Drive System"; 2.3.4.2, "Refueling Equipment System"; 2.3.4.3, "Insulation System"; 2.3.4.4, "Access Doors System"; 2.3.4.5, "Condensate Transfer and Storage System"; 2.3.4.6, "Sampling System"; 2.3.4.7, "Plant Service Water System"; 2.3.4.8, "Reactor Building Closed Cooling Water System"; 2.3.4.9, "Instrument Air System"; 2.3.4.10, "Primary Containment Chilled Water System"; 2.3.4.11, "Drywell Pneumatics System"; 2.3.4.12, "Emergency Diesel Generators System"; 2.3.4.13, "Cranes, Hoists, and Elevators System"; 2.3.4.14, "Tornado Vents System"; 2.3.4.15, "Reactor Building Heating, Ventilation, and Air Conditioning (HVAC) System"; 2.3.4.16, "Traveling Water Screens/Trash Racks System"; 2.3.4.17, "Outside Structures HVAC System"; 2.3.4.18, "Fire Protection System"; 2.3.4.19, "Fuel Oil System"; and 2.3.4.20, "Control Building HVAC System." For these systems, the applicant identifies the in-scope structures and components that are subject to an AMR. The staff reviewed these sections of the application to determine if there is reasonable assurance that the applicant has identified and listed those structures and components that are within the scope of license renewal, as required by 10 CFR 54.4, and subject to an AMR, as required by 10 CFR 54.21(a)(1).

The staff reviewed the LRA to determine whether there is reasonable assurance that the auxiliary system components and supporting structures that are 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). As part of the evaluation, the staff reviewed portions of the UFSARs for the auxiliary systems 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 being within the scope of license renewal and subject to an AMR. The staff then reviewed SCs that were identified as not being within the scope of license renewal. The staff requested that the applicant provide additional information and/or clarifications for a selected number of these SCs to verify the following characteristics:

- These SCs do not have any of the intended functions delineated under 10 CFR 54.4(a)

- Those SCs that have an applicable intended function(s) either perform the specified function(s) with moving parts or a change in configuration or properties, or they are subject to replacement on the basis of a qualified life or specified time period, as described in 10 CFR 54.21(a)(1).

The staff also reviewed all system functions to determine if any functions met the criteria of 10 CFR 54.4, but were not identified as intended functions in the LRA.

2.3.4.1 Access Doors System

Summary of Technical Information in the Application

The secondary containment access doors are designed to provide access to the reactor building for personnel and equipment. In Section 2.3.4.4 of the LRA, the applicant describes the intended functions and lists the components of the system that are subject to an AMR. The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Sections 2.1.2 and 2.1.3 of the LRA.

In Section 2.3.4.4 of the LRA, the applicant states that the secondary containment, in conjunction with the primary containment and other engineering safeguards, provides the capability to limit the release to the environment of radioactive materials so that the offsite dose from a postulated design-basis accident will be below the guideline values of 10 CFR Part 100.

The initial scoping, performed by the applicant on the basis of system functions, determined that the intended function of the access doors system, L48-01 - Containment Integrity, is within the scope of license renewal. Only the doors that are necessary to maintain secondary containment are included in this function. Secondary containment plays a role in preventing offsite releases from exceeding regulatory criteria. Secondary containment doors have a passive function to maintain structural integrity to preserve secondary containment.

The associated structural steel is identified in Table 2.3.4-4 of the LRA as being subject to an AMR. The functions of the structural steel are to serve as a missile barrier and fission product barrier.

Staff Evaluation

The staff reviewed the above information related to the access doors system to verify that the intended system functions that are within the scope of license renewal and the components that are subject to an AMR have been identified in accordance with the requirements of 10 CFR 54.4 and 10 CFR 54.21(a)(1).

The applicant identified and listed the components that are subject to an AMR for the access doors system in Table 2.3.4-4 of the LRA using the screening methodology described in Sections 2.1.2 and 2.1.3 of the LRA. The staff's evaluation of the screening methodology is addressed Section 2.1 of this SER.

The staff reviewed Section 2.3.4.4 of the LRA to determine if there were any system functions that are not identified as intended functions in accordance with requirements of 10 CFR 54.4. The staff then verified that the applicant identified all of the components that are within the scope of license renewal in accordance with 10 CFR 54.4. Further, the staff verified the completeness of LRA Table 2.3.4-4 to confirm that all of the components that are within the scope of license renewal were included in the application. In addition, the staff sampled the components that are within the scope of license renewal, but not subject to an AMR, to verify that all of the components that meet the requirements of 10 CFR 54.21(a)(1) were identified as being subject to an AMR.

After the initial review, in a letter dated July 14, 2000, the staff identified areas where additional information was needed to complete its safety review. The applicant responded to the RAIs in a letter dated August 29, 2000.

In RAI 2.3.4-AD-1, the staff requested that the applicant justify the exclusion of the access door and door seals from within the scope of license renewal and from being subject to an AMR. The applicant responded that the secondary containment access doors and door seals are within the scope of license renewal. However, the door seals are not subject to an AMR because they are replaced or repaired on the basis of the performance and conditions under preventive maintenance procedures. On the basis of the applicant's response to the RAI, the staff concludes that the door seals are not subject to an AMR.

In a telephone conference on September 13, 2000, the applicant clarified that the access doors are identified as "structural steel" in Table 2.3.4-4 of the LRA. In an e-mail correspondence dated November 22, 2000, the applicant provided further clarification that the containment integrity function (L48-01) refers to secondary containment integrity, not primary containment integrity. Secondary containment integrity is ensured by the standby gas treatment system (SGTS) drawdown limitations, which are specified in plant technical specifications for secondary containment operability and surveillance requirements once every 18 months.

On the basis of the staff's review of the LRA, the applicant's responses to the RAI, and followup discussions and correspondence, the staff was unable to find any omissions from the function level scoping boundaries. The staff also compared the components listed in Table 2.3.4-4 of the LRA and those described in the LRA. After clarification that the access doors are identified as "structural steel" in the table, the staff found that the table and the system description are consistent.

2.3.4.2 Condensate Transfer and Storage System

Summary of Technical Information in the Application

The condensate transfer and storage system provides the plant system makeup, receives reject flow, and provides condensate for any continuous service needs and intermittent batch-type services. In Section 2.3.4.5, "Condensate Transfer & Storage System," of the LRA, the applicant describes the intended functions and lists the components of the system that are subject to an AMR. The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.2, "Scoping," and Section 2.1.3, "Civil/Mechanical Component Screening," of the LRA.

The total stored design quantity of water is predicated on the demand requirements during refueling for filling the dryer separator pool and the reactor well. A 500,000 gallon CST supplies the various unit requirements. The Unit 1 tank is constructed of aluminum, and the Unit 2 tank of stainless steel. The system also consists of two condensate transfer pumps and associated piping and valves. The CST provides the preferred supply to the HPCI and RCIC systems. All other suctions are located above suction lines for these systems to provide a 100,000-gallon reserve.

The initial scoping, performed by the applicant on the basis of functions, determined that the intended function of the condensate transfer and storage system, P11-01 - ECCS/CRD Condensate Supply, is be within the scope of license renewal. While the CST is non-safety-related, the preferred water source for the RCIC and HPCI systems is the CST. The design of the tank ensures that 100,000 gallons of water are set aside for this supply. The HPCI and RCIC systems rely upon this volume of water during a response to station blackout.

The associated piping, valve bodies, bolting, and tanks are identified in Table 2.3.4-5 of the LRA as being within the scope of license renewal and subject to an AMR. The component function of these components is to serve as a pressure boundary.

Staff Evaluation

The staff reviewed the above information to verify that the intended functions of the condensate transfer and storage system that are within the scope of license renewal and the components that

are subject to an AMR have been identified in accordance with the requirements of 10 CFR 54.4 and 10 CFR 54.21(a)(1).

The applicant identified and listed the components that are subject to an AMR for the condensate transfer and storage system in Table 2.3.4-5 of the LRA using the screening methodology described in Sections 2.1.2 and 2.1.3 of the LRA. The screening methodology is evaluated by the staff in Section 2.1 of this SER.

The staff reviewed Section 11.9 of the UFSAR for Plant Hatch Unit 1 and Section 9.2.6 of the UFSAR for Unit 2 to determine if there were any system functions that were not identified as intended functions in accordance with the requirements of 10 CFR 54.4. The staff then reviewed the drawings (HL-16016, HL-16332, HL-16334, HL-26030, HL-26023, HL-26046) to verify that the applicant identified all of the components that are within the scope of license renewal in accordance with 10 CFR 54.4. Further, the staff verified the accuracy of the drawings and the completeness of Table 2.3.4-5 by sampling the components adjacent to, but outside, the highlighted portion of the system to verify that all of the components that are within the scope of license renewal were included in the application. In addition, the staff sampled the components that are within the scope of license renewal, but not subject to an AMR, to verify that all of the components that meet the requirements of 10 CFR 54.21(a)(1) were identified as being subject to an AMR.

After the initial review, in a letter dated July 14, 2000, the staff identified areas where additional information was needed to complete its safety review. The applicant responded to the RAIs in a letter dated August 29, 2000.

In reviewing drawing HL-16016, the staff found that valves E51-F009 and E41-F010 were not highlighted. These valves are locked open for flow from the CST to the HPCI system and the RCIC system, serving the intended function of P11-01, ECCS/CRD Condensate Supply. The staff believed that these valves are within the scope of license renewal. Therefore, the staff requested that the applicant justify why these valves are not highlighted in the drawing. The applicant responded that these two valves are within the scope of license renewal. These valves and associated piping downstream are shown in "phantom" (indicating that the information is supplied for reference only) on drawing HL-16016, and are not highlighted since they appear on other license renewal boundary drawings. Referring to license renewal boundary drawings HL-16332 and HL-16334, these two valves (along with the associated piping) are highlighted, indicating that these valves are within the scope of license renewal.

In reviewing the response that in-scope components are highlighted on one drawing but not on another drawing, the staff was concerned that onsite personnel attempting to inspect or confirm components within functional evaluation boundaries may have difficulty understanding which drawing is correct. In a telephone conference on September 28, 2000, the applicant stated that implementing procedures are being developed on the basis of functional drawings, scoping and screening procedures, and current licensing-basis documents. These documents, along with the staff's SER, will provide sufficient guidance and information to allow an NRC inspector to identify the functional evaluation boundaries, SSCs that are within the boundary and outside the boundary, and structures and components that are subject to an AMR.

The staff requested that the applicant explain why the flow line from the CST to the control rod drive (CRD) system is excluded from the scope of license renewal. The applicant responded that for the CRD system, only the reactivity control and alternate rod insertion functions are within the

scope of license renewal for Plant Hatch. A supply of demineralized water from the CST is not required for the CRD system to accomplish these two functions. Therefore, the flow line in question is not within the scope of license renewal.

The staff requested that the applicant justify the exclusion of the two condensate transfer pumps and associated piping and valves from the scope of license renewal. The applicant's response to the RAI did not provide sufficient explanation. In a telephone conference on September 13, 2000, the applicant explained that these pumps supply water from the demineralized water storage tank to the CST, which is not an essential water source for the intended safety function (the essential water source for the intended function is from the suppression pool, which has sufficient water to serve the safety function.)

The staff also questioned the basis for excluding instrument tubing from an AMR. The applicant responded that with the exception of copper, the LRA includes instrument tubing with piping for like materials. There is no copper instrument tubing in scope for functions associated with the condensate transfer and storage system.

On the basis of the staff's review of the LRA and associated drawings, the UFSAR for Plant Hatch Units 1 and 2, and the applicant's responses to RAIs, the staff was unable to find any omissions from the components highlighted in the diagrams that identify the function-level scoping boundaries. The staff also compared the components listed in Table 2.3.4-5 of the LRA and those highlighted in the drawings, and found them to be consistent.

On the basis of the review described above, the staff has determined there is reasonable assurance that the applicant has adequately identified the intended functions of the condensate transfer and storage system that are within the scope of license renewal in accordance with the requirements of 10 CFR 54.4, and those that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.4.3 Control Building HVAC

Summary of Technical Information in the Application

In LRA Section 2.3.4.20, the applicant identifies portions of the control building HVAC system and its components that are within the scope of license renewal and subject to an AMR. In Section 2.3.4.20 of the LRA, the applicant states that additional information for the system is provided in Section 9.7 of the UFSAR for Unit 2. The system scoping is shown in control building evaluation boundary drawings HL-16040, Rev. A, and HL-11609 for Unit 1, and HL-16042, Rev. A, and HL-26116, Rev. A, for Units 1 and 2.

The control building is served by both heating and air-conditioning (A/C) subsystems and a once-through ventilation subsystem. The A/C subsystems use direct expansion of chilled water cooling coils. Heating is provided by electric or hot water heating coils. The control room, computer room, water analysis room, chemistry laboratory and health physics area, and cold laboratory are the areas served by the heating and A/C subsystems. The LPCI inverter room and Unit 2 vital A/C room are served by separate coolers. All other areas of the control building are served by a once-through ventilation subsystem.

Plant Hatch Unit 1

The control building is served by HVAC systems. In the general area, outside air is supplied by three 50-percent-capacity fans. The air is filtered and distributed by ductwork in proportion to the equipment and lighting loads in these areas. The exhaust system is split between Units 1 and 2. Three 50-percent-capacity Unit 1 fans and two 100-percent-capacity Unit 2 fans exhaust air to the Units 1 and 2 reactor vent plenums.

Direct expansion water-cooled air-conditioning units fully air-condition the main control room (MCR), computer room, water sampling room, chemical laboratory and health physics area, cold lab, shift supervisor's area, LPCI inverter room, and Unit 1 and 2 vital AC rooms. The battery rooms have exhaust fans and heaters. The cable spreading room has a separate ventilation system. The details of HVAC systems serving these areas are described in Section 10.9.3.6 of the UFSAR for Unit 1.

Plant Hatch Units 1 and 2

The HVAC system is shared by Units 1 and 2. The MCR habitability systems are designed to provide safety and comfort for operating personnel during normal operations and postulated accident conditions. These habitability systems for the MCR include radiation shielding, charcoal and other filter systems, HVAC, sanitary facilities, and fire protection. A discussion of the MCR systems that control the climatic conditions existing within the MCR is provided in Section 9.4.1 of the Unit 2 UFSAR.

Previous analyses demonstrate that the LOCA is the limiting event for radiological exposures to operators in the MCR. The pressurization mode of operation of the MCR environmental control system (MCRECS) is provided to minimize the amount of radioactivity entering the MCR following an accident. The MCR atmosphere is recirculated through the MCRECS emergency filters with sufficient outside air being drawn in through the normal intake to maintain the MCR at a positive pressure of >0.1-in. water gauge (WG) relative to the surrounding turbine building. The MCR is designed to maintain its temperature below 79 °F with relative humidity of 75 percent. Fire protection for the MCR is discussed in Section 9.5.1 of the UFSAR for Unit 2. Since no gaseous chlorine is used or stored on site, the chlorine accident was not evaluated for the MCR.

The MCRECS is discussed in Section 9.4.1 of the UFSAR for Unit 2. The Unit 1 and 2 MCRs are housed in a shared facility. The habitability systems are designed to serve the Unit 1 and 2 combined control rooms. The principal equipment in the system includes (1) three 50-percent-capacity air-handling units (AHUs) with cooling coils and fans; (2) three 50-percent-capacity condensing units, each consisting of refrigerant compressor, condenser, and associated controls that service the AHU cooling coils; (3) two 100-percent-capacity exhaust air fans; (4) two trains of high-efficiency air filtration units consisting of a prefilter, a high-efficiency particulate air (HEPA) filter, an electric carbon drying heater, a carbon absorber, a second HEPA filter for emergency treatment of recirculated air or outside supply air, and two filtration unit booster fans, one for each filtration unit. The MCRECS is designed with sufficient redundancy and separation of active components to provide reliable operation under normal conditions and to ensure operation under emergency conditions. Where redundancy does not exist (e.g., restroom exhaust dampers and exhaust fan isolation dampers), the system is normally operated such that at least one isolation barrier is normally closed. In the case of the restrooms, the doors provide that barrier. Upon verification that the exhaust dampers have closed for the pressurization mode,

access to the restrooms is allowed via these doors. In the case of the exhaust fan isolation dampers, the fans are normally not operated, and the dampers are normally closed. The MCRECS normal operation and accident condition modes, and associated instrumentation application are described in Section 6.4 of the UFSAR for Unit 2. The control building HVAC systems are described in Section 9.4.7 of the UFSAR for Unit 2.

In Section 2.3.4.20 of the LRA, the applicant identified the following intended functions that relate to 10 CFR 54.4(a)(1), 10 CFR 54.4(a)(2), and 10 CFR 54.4(a)(3):

- Control Room Habitability (Z41-02)
- Control Building Environmental Support (Z41-03)

On the basis of the functions identified above, the applicant determined that all safety-related components (electrical, mechanical, and instrument) are within the scope of license renewal. The applicant described its process for identifying the mechanical components that are subject to an AMR in Section 2.1.2 of the LRA. On the basis of this methodology, the applicant identified the portions of the system that are within the scope of license renewal in control building evaluation boundary drawings HL-16040, Rev. A, and HL-11609, Rev. A, for Unit 1, and HL-16042, Rev. A, and HL-26116, Rev. A, for Units 1 and 2. Using the methodology described in Section 2.1.2 of the LRA, the applicant compiled a list of the mechanical components and component types within the license renewal boundaries that are subject to an AMR, and identified their functions. The applicant provided this list in Table 2.3.4-20 of the LRA.

The applicant identified the following 22 device types as being within the scope of license renewal and subject to an AMR:

- accumulator air valve (carbon steel)
- accumulator piping (carbon steel)
- accumulator tanks (stainless steel)
- bolting (carbon steel)
- duct gasket (fibers, non-asbestos, synthetic; elastomers, other)
- duct heater (aluminum)
- duct silencer (galvanized steel)
- ductwork (carbon steel)
- ductwork (galvanized steel)
- ductwork flex connector (fibers, non-asbestos synthetic; elastomers, other)
- filter housing (galvanized steel)
- flow element (stainless steel)
- instrument piping (copper alloy)
- instrument piping (stainless steel)
- louver (carbon steel)
- piping (stainless steel)
- radiation element (stainless steel)
- temperature sensor (stainless steel)
- tubing (copper)
- valve bodies (carbon steel)
- valve bodies (copper alloy)
- valve bodies (stainless steel)

In Table 2.3.4-20, the applicant further noted that the pressure boundary function is the only applicable function associated with components that are subject to an AMR.

Staff Evaluation

The staff reviewed the information related to the control building HVAC system to verify that the applicant identified components that are within the scope of license renewal and subject to an AMR. The staff determined whether there is reasonable assurance that the components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1). The staff reviewed the information in the LRA and Sections 6.4, 9.4.1, and 9.4.7 of the UFSAR for Unit 2 and Section 10.9.3.6 of the UFSAR for Unit 1. After completing the initial review, the staff issued RAIs regarding the control building HVAC system by letter dated July 14, 2000. The applicant responded to the RAIs in a letter dated August 29, 2000.

In LRA Section 2.1, the applicant discussed the process for identifying mechanical components that are subject to an AMR. The applicant's scoping methodology is evaluated by the staff in Section 2.1 of this SER.

In its review of the control building HVAC system, the staff reviewed the control building evaluation boundary drawings HL-16040, Rev. A, and HL-11609 for Unit 1, and HL-16042, Rev. A, and HL-26116, Rev. A, for Units 1 and 2. The drawings show the evaluation boundaries for the portions of the control building HVAC system that are within the scope of license renewal. The staff also reviewed Table 2.3.4-20 of the LRA which lists components that are subject to an AMR.

The staff also reviewed Sections 6.4, 9.4.1, and 9.4.7 of the UFSAR for Unit 2 and Section 10.9.3.6 of the UFSAR for Unit 1 to determine if there were any portions of the control building HVAC system that met the scoping criteria in 10 CFR 54.4(a) that the applicant did not identify as being within the scope of license renewal. The staff also reviewed the UFSAR sections to determine if there was any system function that was not identified as an intended function in the LRA, and to determine if there were SCs that have an intended function that might have been omitted from the scope of SCs that are subject to an AMR. The staff also reviewed the evaluation boundary drawings to determine if any SCs within the evaluation boundaries were omitted from the scope of SCs requiring an AMR. The staff compared the functions described in the UFSAR with those identified in the LRA. The staff then determined whether the applicant had properly identified the SCs that are subject to an AMR from among those identified as being within the scope of license renewal.

The applicant identified and listed the SCs that are subject to AMR for the control building HVAC system in Table 2.3.4-20 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 sampled SCs from Table 2.3.4-20 to verify that the applicant identified the SCs that are subject to an AMR. The staff also sampled SCs that are within the scope of license renewal, but were not identified as being subject to an AMR, to verify that these SCs perform their intended functions with moving parts or with a change in configuration or properties, or were subject to replacement on the basis of a qualified life or specified time period.

To ensure that those portions of the control building HVAC system that were identified as not being within the scope of license renewal did not perform any intended functions, the staff issued RAIs on the basis of the information in the UFSAR and LRA. The staff noted that LRA Section 2.3.4.20

presents a summary description of the system functions, evaluation boundary drawings highlight the evaluation boundaries, and Table 2.3.4-20 lists the components that are within the scope of license renewal and subject to an AMR. The corresponding drawings for these systems in the UFSAR, however, show additional components that were not listed in Table 2.3.4-20 of the LRA.

The staff requested specific information concerning the exclusion of the following components from the scope of license renewal and/or an AMR:

(1) damper housing and associated ductwork (HL-16042 (several dampers), HL-16042 @ H7 (cable spreading room)); HL-26116 @ C4 and D4)

(2) filter train housing with carbon and HEPA filters (HL-16042 @ B8 and B9, F8 and F9)

(3) fan housing (HL-16042 @ E12 and F12, B7, E7; H5, H7 (cable spreading room))

(4) air handling units housing and heating and cooling coils (HL-16042 @ B2 and B3, D2 and D3, F2 and F3)

(5) filters (HL-16042 @ B5, F5)

(6) coolers for low-pressure coolant injection (LPCI) inverter room and Unit 2 vital A/C room (text of Section 2.3.4.20)

(7) sealants

In a letter dated August 29, 2000, the applicant provided the following responses:

(1) The damper housing is a part of the damper, which is an active component (NEI 95-10 Revision 0, Appendix B, Item 155). The ductwork is constructed of both carbon steel and galvanized steel and is subject to an AMR. Both types of ductwork are included in Table 2.3.4-20.

(2) The filter train housing is subject to an AMR and is included in Table 2.3.4-20. The carbon and HEPA filter media inside the filter housing are consumables.

(3) The in-scope fan housings are a part of fan assemblies, which are active components (NEI 95-10, Rev, 0, Appendix B, Item 163)

(4) The air-handling units, including the cooling coils, are part of the active fan assemblies (NEI 95-10, Rev. 0, Appendix B, Item 163). The heating coil housing, however, is subject to an AMR and is shown in Table 2.3.4-20.

(5) The filter media shown on HL-16042 (B5 and G5) is consumable. An AMR was performed on the filter housing, which is included in Table 2.3.4-20.

(6) The coolers for the LPCI inverter room and the Unit 2 vital AC room do not perform an in-scope function; however, the LPCI inverter room cooling coils do provide part of the pressure boundary function for P41-01, but were not subject to AMR since they are part of the active fan assemblies.

(7) Sealants are not used at Plant Hatch to maintain positive pressure for the MCR pressure boundary; sealants used to support intended functions are listed in Table 2.4.13-1

The staff reviewed the applicant's responses concerning the associated ductwork, the filter train housing with carbon and HEPA filters, and the heating coil housing, and found the responses to be acceptable. However, in its response to RAI 2.3.4-CBHVAC-1, the applicant also stated that, given the guidance on NEI 95-10, Appendix B, no damper housing, fan housing, and air handling units, including the cooling coils, are found within the license renewal portions of the control building HVAC system. The staff disagreed with the applicant's exclusion from an AMR of housings for fans, dampers, and air handling units, including cooling coils. The staff's position with regard to the treatment of the housings for fans, dampers, and heating and cooling coils is discussed in detail in the staff's review of the SGTS in Section 2.3.3 of this SER, which includes treatment of the component passive functions of the control building HVAC system. Resolution of this issue was part of Open Item 2.3.3.2-2 [2.3.3.2-2(b)].

By letter dated June 5, 2001, the applicant provided information regarding the disposition of fans, dampers, and heating and cooling coils within the scope of license renewal. Consistent with the staff's guidance regarding evaluation of active components, the applicant identified the passive functions of condensing unit shells, damper frames, fan housings, and fan screens in the control building HVAC system and added these components to the list of components in the LRA that are subject to an AMR. The applicant also identified any aging effects associated with the condensing unit shells, damper frames, fan housings, and fan screens and provided an AMP to manage the aging. The applicant added these components to those listed in Tables 2.3.4-20 and 3.2.4-20 in the LRA. The staff's review of the aging effects and AMPs for the control building HVAC system can be found in Section 3.4.3 of this SER. On the basis of the additional information provided by the applicant , the staff agrees that the condensing unit shells, damper frames, fan housings, and fan screens are within the scope of license renewal and subject to an AMR. On the basis of the previously noted information, this part of Open Item 2.3.3.2-2 [2.3.3.2-2(b)], as relates to control building HVAC system components, is closed.

Additionally, in a telephone conference held on October 31, 2000, the applicant clarified that the LPCI inverter room and the Unit 2 vital A/C room coolers are no longer in scope because of a design modification. The applicant committed to provide a description of the design modification that clarifies how the modification impacts the LPCI inverter room and Unit 2 vital A/C room cooler functions. The applicant also committed to address why heating coil housings are not specifically identified in Table 2.3.4-20 of the LRA. The design modification information and the resolution of the issue regarding Table 2.3.4-20 were identified as part of Open Item 2.3.3.2-2(b).

By letter dated June 5, 2001, the applicant provided a description of the design modification that clarified how the modification impacts the LPCI inverter room and Unit 2 vital A/C room cooler functions. Over a period of time, the LPCI inverters became obsolete and plant design change packages retired the Unit 1 and Unit 2 LPCI inverters. To continue to provide a diverse source of power for certain LPCI valves, Unit 2 Class 1E AC power supplies were selected as the normal source of power for the Unit 1 LPCI valves and Unit 1 Class 1E power supplies were selected as the normal source of power for the Unit 2 LPCI valves. The LPCI inverter function (R44-02) was removed from scope when the modifications were performed to remove the inverters, effectively deleting the function; therefore, the LPCI inverter room cooling function was not included in the LRA. By comparison, vital AC is not safety-related, as defined in 10 CFR 54.4(a)(1), its failure

does not prevent a safety function, as defined in 10 CFR 54.4(a)(2), and it is not required to operate during the events defined in 10 CFR 54.4(a)(3). Therefore, as seen in Table 2.2-1 of the LRA, this function does not meet the criteria for inclusion within license renewal scope. Consequently, the vital AC room cooling function is out of scope for license renewal. The applicant also addressed why heating coil housings are not specifically identified in Table 2.3.4-20 of the LRA. Control building heating coils are electric and thus, were considered to be active components. Consequently, the heating coils were screened out and not included in Table 2.3.4-20. The duct heater frame was evaluated in the LRA and included in Table 2.3.4-20. The applicant provided other clarifications and/or editorial changes, as appropriate. On the basis of the additional information provided by the applicant, the staff agrees that the LPCI inverter room and Unit 2 vital A/C room cooler functions and the heating coil housings are not within the scope of license renewal and not subject to an AMR. On the basis of the previously noted information, this part of Open Item 2.3.3.2-2(b), as relates to control building HVAC system components, is closed.

In RAIs 2.3.4-CBHVAC-2 and 2.3.4-CBHVAC-4, the staff also requested more specific information on the (1) description of the areas that constitute the main control room envelope (MCRE) for Units 1 and 2, and (2) the failure to submit evaluation boundary drawing HL-16040 for the control building HVAC system. In a letter dated August 29, 2000, the applicant responded that the MCRE consists of an area located on the 164' elevation of the control building and contains approximately 106,000 ft^3. This space is enclosed by reinforced concrete walls and floors, and is served by the MCRECS, which realigns into a pressurization mode should an accident signal be generated. In this mode, the MCRECS is designed to cool and filter the MCRE, thereby maintaining habitability in the control room. In the pressurization mode, the return air and outside air are directed through the filtration units shown on HL-16042 (Zones B-B, 9 and E, F-B, 9). The HVAC equipment required to perform this function (Z41-02) is included within the scope of license renewal, and the components subject to an AMR are shown on Table 2.3.4-20. With regard to the missing evaluation boundary drawing, the applicant provided it separately. In summary, the applicant applied the screening criteria prescribed by the Rule in determining the set of long-lived, passive components that are subject to an AMR.

The staff reviewed, and finds acceptable, the applicant's response concerning the MCRE description, including the applicant's treatment of those components that are inside the MCRE and identified on evaluation boundary drawing HL-16040 that are within the scope of license renewal and subject to an AMR.

The staff reviewed Section 2.3.4.20 of the LRA, supporting information in the UFSAR, the applicant's responses to the staff's RAIs, and the resolution of Open Item 2.3.3.2-2(b), as provided by letter dated June 5, 2001. In addition, the staff sampled several components in the previously mentioned evaluation boundary drawings of the LRA to determine whether the applicant properly identified the components that are within the scope of license renewal and subject to an AMR. On the basis of this review, the staff concludes that the applicant has identified those portions of the control building HVAC system that are within the scope of license renewal and subject to an AMR.

2.3.4.4 Control Rod Drive (CRD) System

Summary of Technical Information in the Application

The CRD hydraulic system provides pressurized, demineralized water for the cooling and manipulation of the CRD mechanisms. In addition, the CRD system provides purge water for the reactor water cleanup (RWCU) pump and reactor recirculation pump seals.

The alternate rod insertion system is a subsystem of the CRD system. It is a backup means of scramming the reactor by venting the scram air header. It is completely independent of the reactor protection system (RPS), and was installed for the purpose of reducing the probability of an anticipated transient without scram (ATWS) event.

Water enters the CRD system from the condensate header downstream of the condensate demineralizers (normal suction) or from the CST (alternate suction). The condensate header is the preferred suction source because the water contains less oxygen than water from the CST.

System Intended Functions

The CRD system serves the following functions:

- Reactor Scram: The scram mode allows quick shutdown of the reactor by rapidly inserting withdrawn control rods into the core in response to a manual or automatic signal.

- Alternate Rod Insertion: Alternate rod insertion reduces the probability of the occurrence of a scram event. Signals are provided that respond to an ATWS event or to a manual initiation to depressurize the CRD scram pilot valve air header using valves that are different from the RPS scram valves, thus providing a parallel path for control rod insertion.

Component Intended Function

The components of the CRD system serve the following functions:

- fission product barrier
- pressure boundary

The component groups that are subject to an AMR, as identified in the LRA include the accumulator, bolting, piping, rupture disc, and valve bodies. [See request for additional information (RAI) 2.3.4-CRD-1.]

Staff Evaluation

The CRD hydraulic system provides pressurized, demineralized water for the cooling and manipulation of the CRD mechanisms. In addition, the CRD system provides purge water for the RWCU pump and reactor recirculation pump seals.

The alternate rod insertion system is a subsystem of the CRD system, which provides a backup means of scramming the reactor by venting the scram air header. It is completely independent of the reactor protection system, and was installed reduce the probability of an ATWS event.

Water enters the CRD system from the condensate header downstream of the condensate demineralizers (normal suction) or from the CST (alternate suction). The condensate header is the preferred suction source because the water contains less oxygen than water from the CST.

After completing the initial review, the staff issued RAIs regarding the auxiliary systems. The applicant submitted responses to the RAIs, by letter dated August 29, 2000, as discussed below.

In RAI 2.3.4-CRD-1, the staff stated its belief that the scram discharge volume (SDV) of the CRD system (Section 2.3.4 of the LRA) is a passive, long-lived component that meets the requirements of 10 CFR 54.4(a) and, therefore, should be subject to an AMR. However, it was not clear in the LRA whether the SDV was subject to an AMR. Therefore, the staff requested that the applicant clarify whether the SDV is subject to an AMR and, if not, to provide a justification for excluding the SDV from an AMR. In response, the applicant confirmed that the SDV components are subject to AMR, and clarified that the components are included among those that support CRD intended functions as shown in Table 2.3.4-1. During a telephone conference on June 26, 2000, the applicant further clarified that the SDV is identified in LRA Table 2.3.4-1 as non-Class 1 stainless steel piping. Boundary drawings HL-16065 and HL-26007 include the SDV components.

On the basis of the staff's review of Section 2.3.4.1 of the LRA, and review of the response to the staff's RAI, the staff concludes that the applicant identified all of the components of the CRD system that are within the scope of license renewal and subject to an AMR.

2.3.4.5 Cranes, Hoists and Elevators System

Summary of Technical Information in the Application

In Section 2.3.4.13 of the LRA, the applicant provides a description of the cranes, hoists, and elevators system. The reactor building crane is the only component for this system that is within the scope of license renewal. The purpose of the reactor building crane is to provide the capability for moving major components for refueling operations and maintenance. The Unit 1 reactor building crane provides service to both Units 1 and 2. It has the capability to move loads up to 125 tons with the main hook. This capability includes the handling of shield plugs, reactor vessel heads, drywell heads, steam dryers, steam separators, and the spent-fuel shipping casks. The reactor building crane main and auxiliary hooks have an electrical interlock system to prevent their potential movement over spent fuel.

Although the reactor building crane provides the ability to handle the large loads associated with refueling operations and maintenance in the reactor building, the only intended function for the reactor building crane is that the load-bearing components must maintain their structural integrity.

The applicant described its process for identifying the mechanical components that are within the scope of license renewal and subject to an AMR in Section 2.1.3 of the LRA. On the basis of this methodology, the applicant identified the reactor building crane load-bearing components as the passive, long-lived portion of the system requiring an AMR. The applicant identified structural steel as the only component type that is subject to an AMR, and structural support is the function of this component.

Staff Evaluation

The applicant stated in Section 2.3.4.13 of the LRA that the cranes, hoists, and elevators system is within the scope of license renewal because of the reactor building crane and its intended function of handling heavy loads during refueling and maintenance operations. The portions of the system that are identified as supporting this intended function are the load-bearing portions of the crane. The staff reviewed Section 10.2, "New Fuel Storage," of the Unit 1 UFSAR and Section 9.1, "Fuel Storage and Handling," of the Unit 2 UFSAR to verify that the reactor building crane did not have intended functions other than the heavy load handling intended function. In addition, the staff verified that all of the components that support the heavy load handling intended function were identified as being within the scope of license renewal.

On the basis of the staff's review of the LRA and supporting information in the UFSAR, the staff has reasonable assurance that all portions of the cranes, hoists, and elevators system with intended functions that meet the criteria in 10 CFR 54.4 are identified as being within the scope of license renewal.

Using the information provided in the LRA, the staff reviewed the application to determine whether the applicant properly identified the passive, long-lived components as being subject to an AMR in Table 2.3.4-13 of the LRA. The applicant only identified structural steel as being subject to an AMR. The extent to which structural steel is within the scope of license renewal for the reactor building crane is defined in LRA Section 2.3.4.13 as being the "load-bearing components." On the basis of its review, the staff concludes that there is reasonable assurance that the applicant has adequately captured the passive, long-lived components under the structural steel category on the list of components that are subject to an AMR in Table 2.3.4-13. No omissions were identified. On the basis of this review, the staff has reasonable assurance that the applicant has identified the components of the cranes, hoists, and elevators system that are subject to an AMR.

2.3.4.6 Drywell Pneumatics System

Summary of Technical Information in the Application

The drywell pneumatic system supplies motive gas to equipment inside the drywell. In Section 2.3.4.11 of the LRA, the applicant described the intended functions and listed the components of the system that are subject to an AMR. The applicant described its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.2 and Section 2.1.3, of the LRA.

In Section 2.3.4.11 of the LRA, the applicant described the purpose of the drywell pneumatic system, which is to supply motive gas to equipment inside the drywell, including the reactor recirculation system sample line isolation valve, RPV head vent valve, CS system injection testable check valves and bypass valves, primary containment chilled water system control valves, RHR system LPCI check valves and bypass valves, and nuclear boiler system SRVs and main steam isolation valves (MSIVs). A major portion of the drywell pneumatic system is primarily obsolete and not currently used. The control air is supplied from the nitrogen makeup system or instrument air. The system components still exist in the plant, but are isolated by valve alignment or the lines are physically cut and capped. The drywell pneumatic system receives motive gas from the Unit 1 or 2 nitrogen storage tanks, the instrument air system, or the emergency nitrogen hookup stations. The system includes an air receiver, particulate filters, flow sensing elements, and various

process piping, valves, and regulators. Normally, all system equipment upstream of the receiver tank is isolated, and system pressure is maintained by the nitrogen backup supply with alternate supply through the instrument air supply system. Under emergency conditions, specific components in the drywell will be supplied with control air from emergency nitrogen bottles.

The initial scoping, performed by the applicant on the basis of system functions, determined that the intended function of the drywell pneumatic system, P70-01 - Nitrogen supply to Drywell Equipment, is within the scope of license renewal. The nitrogen supply to the drywell equipment provides the motive gas to various equipment. The nitrogen inerting system (T48) supplies the motive gas to the drywell equipment in the drywell during normal operation. After an accident, the motive gas to drywell equipment can be provided from either the drywell pneumatic nuclear boiler system (B21) accumulator, the nitrogen inerting system, or one of the two nitrogen hookup stations.

The associated piping, valve bodies, bolting, filter housings, flexible hose, flanges, and tubing are identified in Table 2.3.4-11 of the LRA as being within the scope of license renewal and subject to an AMR. The component function of all the above components is to serve as a pressure boundary.

Staff Evaluation

The staff reviewed the above information related to the drywell pneumatics system to verify that the intended functions of the system that are within the scope of license renewal and the components that are subject to an AMR have been identified in accordance with the requirements of 10 CFR 54.4 and 10 CFR 54.21(a)(1).

The applicant identified and listed the components that are subject to an AMR for the drywell pneumatics system in Table 2.3.4-11 of the LRA using the screening methodology described in Sections 2.1.2 and 2.1.3 of the LRA. The screening methodology is evaluated by the staff in Section 2.1 of this SER.

The staff reviewed Section 10.19 of the Plant Hatch Unit 1 UFSAR and Section 9.3.6 of the Unit 2 UFSAR to determine if there were any system functions that were not identified as intended functions in accordance with requirements of 10 CFR 54.4. The staff then reviewed the drawings (HL- 16286, HL-16299, HL-28023, and HL-26066) to verify that the applicant identified all of the components that are within the scope of license renewal in accordance with 10 CFR 54.4. Further, the staff verified the accuracy of the drawings and the completeness of LRA Table 2.3.4-11 by sampling the components that are adjacent to, but outside, the highlighted portion of the system to verify that all of the components that are within the scope of license renewal were included in the application. In addition, the staff sampled the components that are within the scope of license renewal, but not subject to an AMR, to verify that all of the components that meet the requirements of 10 CFR 54.21(a)(1) were subject to an AMR.

After the initial review, in a letter dated July 14, 2000, the staff identified, areas where additional information was needed to complete its safety review. The applicant responded to the RAIs in a letter dated August 29, 2000.

Section 2.3.4.11 of the LRA states that the drywell pneumatics system receives motive gas from the nitrogen storage tanks. Since the nitrogen storage tanks are passive and long-lived, the staff requested, in RAI 2.3.4-DPS-1, that the applicant justify the exclusion of the tanks from Table 2.3.4-11 from being subject to an AMR. The staff also requested that the applicant identify the

tanks in applicable drawings. The applicant responded that the nitrogen storage tanks are within scope and subject to an AMR, and are included in the primary containment nitrogen inerting function (T48-01), in LRA Section 2.3.3.7 and Table 2.3.3-7 (instead of Table 2.3.4-11). The nitrogen storage tanks are highlighted on boundary drawings HL-16000 and HL-26083 for the primary containment purge and inerting system. The staff confirmed that the "storage tank" is listed in Table 2.3.3-7 of the LRA.

Section 2.3.4.11 of the LRA states that the system includes an air receiver, particulate filters, and regulators, among other components. In RAI 2.3.4-DPS-2, the staff requested that the applicant justify the exclusion of these components from being subject to an AMR. The applicant responded that the air receiver was inadvertently omitted from Table 2.3.4-11. Subsequently, in a telephone conference on September 13, 2000, the applicant agreed to add the air receiver to Tables 2.3.4-11 and 3.2.4-11 as a part of the revision to the RAI response. By letter dated January 31, 2001, the applicant provided revised Tables 2.3.4-11 and 3.2.4-11 that included the air receiver. The staff noted that the air receiver is identified as a tank in the tables. The staff finds this acceptable.

The applicant stated that the particulate filters include the filter housing and a filter cartridge. The filter housings are included in Table 2.3.4-11. The filter cartridges are consumable items, and, thus, short lived. The cartridges are replaced during every refueling outage and, therefore, are not subject to an AMR. Regulators are pressure control valves, and are listed in Table 2.3.4-11 as "valve bodies."

Section 9.3.6.3 of the Unit 2 UFSAR states that a backup supply of nitrogen to the drywell is provided through three interchangeable nitrogen bottles and a manifold system at one of two emergency nitrogen hookup stations. In RAI 2.3.4-DPS-3, the staff requested that the applicant justify the exclusion of nitrogen bottles and manifold system from an AMR. The applicant responded that the nitrogen bottles are short-lived components and, therefore, not subject to an AMR. The nitrogen gas is used up during the course of normal operations. Once the pressure of the gas bottle decreases below a predetermined setpoint, the bottle is replaced and returned to the vendor. The gas bottles have an inspection interval typically once every 10 years. The manifold assembly is subject to an AMR and listed in Table 2.3.4-11 as piping, valves, and flex hoses.

On the basis of the staff's review of the LRA and associated drawings, the Plant Hatch UFSARs for Units 1 and 2, the applicant's responses to RAIs, and information provided in a telephone conference on September 13, 2000, and the letter dated January 31, 2001, the staff was unable to find any omissions from the components highlighted in the diagrams that identify the function level scoping boundaries. The staff also compared the components listed in Table 2.3.4-11 of the LRA and those highlighted in the drawings, and found them to be consistent. Therefore, the staff concludes that the applicant has adequately identified the components of the drywell pneumatics system that are within the scope of license renewal and subject to an AMR.

2.3.4.7 Emergency Diesel Generators System

Summary of Technical Information in the Application

The Hatch emergency diesel generators system is designed to provide onsite emergency backup power in the event of a LOOP. In LRA Section 2.3.4.12, "Emergency Diesel Generators System," the applicant describes the intended functions and lists the components of the system that are subject to an AMR. The applicant described its process for identifying the mechanical components

that are within the scope of license renewal in Section 2.1.2, "Scoping," and Section 2.1.3, "Civil/Mechanical Component Screening," of the LRA.

In Section 2.3.4.12 of the LRA, the applicant states that the purpose of the diesel generators is to provide emergency backup power to 4160-VAC emergency buses E, F, and G in the event of a LOOP. The diesel generators are designed to reach rated speed and voltage within 12 seconds after receiving a start signal. This allows operation of emergency equipment powered from these buses to perform their required function to safely shutdown the plant within the required time. The emergency diesel generators (EDGs) provide a highly reliable source of standby, onsite, ac power. There are five diesel generators supplying standby power to emergency buses. Diesel generator 1B is shared between Units 1 and 2 and has a selector switch with "Unit 1 control" and "Unit 2 control" positions, depending on whether it is supplying bus 1F or 2F.

The initial scoping, performed by the applicant on the basis of functions, determined that the intended function of the EDG system, R43-01 - Standby AC Power Supply, is within the scope of license renewal. The standby ac power supply provides ac power in the event of a LOOP. The EDG load sequencers are included in this function.

The associated piping, valve bodies, filter housing, flex hose, expansion tank, flexible connector, tanks, and restricting orifice are identified in Table 2.3.4-12 of the LRA as being subject to an AMR. The intended function of all these components is to serve as a pressure boundary.

Staff Evaluation

The staff reviewed the above information to verify that the intended functions of the diesel generators system that are within the scope of license renewal and the components that are subject to an AMR have been identified in accordance with the requirements of 10 CFR 54.4 and 10 CFR 54.21(a)(1).

The applicant identified and listed the components that are subject to an AMR for the diesel generators system in Table 2.3.4-12 of the LRA using the screening methodology described in Sections 2.1.2 and 2.1.3 of the LRA. The screening methodology is evaluated by the staff in Section 2.1 of this SER.

The staff reviewed Section 8.4 of the Plant Hatch Unit 1 UFSAR and Section 8.3 of the Unit 2 UFSAR to determine if there were any system functions that were not identified as intended functions in accordance with the requirements of 10 CFR 54.4. The staff then reviewed drawings (HL-21074, HL-11631 sheet 1 and 2, HL-11638 sheets 1 and 2) to verify that the applicant identified all of the components that are within the scope of license renewal in accordance with 10 CFR 54.4. Further, the staff verified the accuracy of the drawings and the completeness of Table 2.3.4-12 by sampling the components adjacent to, but outside, the highlighted portion of the system to verify that all of the components that are within the scope of license renewal were included in the application. In addition, the staff sampled the components that are within the scope of license renewal, but not subject to an AMR, to verify that all of the components that meet the requirements of 10 CFR 54.21(a)(1) were identified as being subject to an AMR.

After the initial review, in a letter of July 14, 2000, the staff identified areas where additional information was needed to complete its safety review. The applicant responded to the RAI in a letter dated August 29, 2000.

The staff had asked the applicant to explain the exclusion of the air receivers A005A, A006A, A003A, and A007A, which are highlighted in drawings HL-21074 and HL-11631, from being subject to an AMR. The applicant responded that air receivers are subject to an AMR, and are listed as "tanks" in LRA Table 2.3.4-12. The staff finds this response acceptable.

The staff asked the applicant to identify components C001A and C010A in drawing HL-11631 and justify the exclusion of these unnamed components from within the scope of license renewal. The applicant responded that C001A and C010A are compressors, which do not perform a passive function. The air receivers, which are within the scope of license renewal, are sized for sufficient air to accomplish the five required starts for the intended function. Each diesel generator is supplied with two air receivers. The staff finds this response acceptable.

In reviewing drawing HL-11631, the staff also found that the scavenging air heat exchanger, engine supply header, diesel engine crankcase, and turbo superchargers were highlighted as being within the scope of license renewal, but were not included in Table 2.3.4-12 of the LRA, as being subject to an AMR. The staff requested that the applicant justify the exclusion of these components from being subject to an AMR. The applicant responded that these components are part of the diesel generator, which is an active component. Therefore, the applicant determined that these components are not subject to an AMR.

In reviewing drawings HL-21074, HL-11631, HL-11638, the staff found that some of the pumps were highlighted as within the scope of license renewal, but there are no pumps listed in Table 2.3.4-12 as subject to an AMR. The staff requested the applicant to explain this discrepancy. The applicant explained that on drawings HL-11638 (sheets 1 and 2) and HL-11631 (sheets 1 and 2), all of the pumps are part of the diesel generator skid. The applicant further stated that the diesel generator is an active component and, thus, not subject to an AMR. Therefore, the applicant determined that these pumps, which are part of the diesel generator skid, are also not subject to an AMR. However, the pumps that are not part of the diesel generator skid (on drawing HL-21074) are subject to an AMR and appear in Table 2.3.4-19 of the LRA for the fuel oil system. The staff did not agree that pumps can be excluded from an AMR because they are part of the diesel generator skid that constitutes part of a complex assembly.

In a telephone conference on September 13, 2000, the staff expressed its disagreement with the applicant's decision to exclude these components from an AMR simply because these components are skid-mounted. The staff requested that the applicant provide additional justification for its position. In response, the applicant provided a paper, via e-mail, entitled "Active Assemblies Used in License Renewal," dated November 6, 2000.

The staff reviewed this paper and did not agree with the applicant's basis for excluding skid-mounted components that are part of a complex assembly from an AMR.

Regarding complex assemblies, NEI 95-10, Revision 0, stated:

> "There are structures and components that, when combined, are considered a complex assembly (e.g., diesel generator starting air skids or heating, ventilating, and air conditioning refrigerant units). The Rule and associated SOC do not specifically discuss such assemblies. For purposes of performing an aging management review, it is important to clearly establish the boundaries for review. An applicant should establish the boundaries for such assemblies by identifying each structure or component that makes up the complex

assembly and determining whether or not each structure and component is subject to an aging management review. (See example 5 in Appendix C.)"

Example 5 in Appendix C of NEI 95-10, Revision 0, provided an example of a control room chiller complex assembly and guidance on how to establish the boundaries for such an assembly. It notes that once the boundary is determined, long-lived components with a passive function would be appropriately subjected to an AMR.

Components are subject to an AMR if they perform a passive function and are long-lived. A passive function is one performed without moving parts or a change in configuration or properties. A function performed with moving parts or a change in configuration or properties is considered an active function. Components that perform a passive function and are also long-lived must be subject to an AMR, whether they are skid-mounted or not. The staff believes that some of the skid-mounted components are long-lived components with a passive function, and therefore are subject to an AMR.

In the staff's evaluation of the Oconee LRA, the staff reached a similar conclusion regarding the treatment of the vendor-supplied diesel generator skid-mounted equipment. Duke had drawn a boundary around the diesel generator skid and determined that everything within the boundary was active and therefore not subject to an AMR. The staff disagreed and noted that the assembly included some long-lived components with a passive function which were subject to an AMR. Duke subsequently redefined the evaluation boundaries to ensure that long-lived components with a passive function on the diesel generator skid were subject to an AMR.

On this basis, the staff requested that the applicant identify any applicable aging effects associated with these components, and any other long-lived components with a passive function associated with the emergency diesel generators, and identify AMPs credited with managing the aging effects. This was identified as part of Open Item 2.3.3.2-1 (2.3.3.2-1(b)).

By letter dated June 5, 2001, the applicant provided additional information. The EDGs include three subsystems that contain components that are passive and long-lived, and that perform a component function that supports the system intended function of standby ac power supply (R43-01). The subsystems are the diesel jacket water cooling subsystem, the diesel lubricating oil subsystem, and the scavenging air subsystem. The evaluation boundary for the extended set of skid-mounted components ends at the engine block and does not include the active portion of the diesel. On the basis of the above information, the applicant identified the following skid-mounted components that are subject to an AMR and listed in Table 2.3.4-12 of the LRA: bolting, heater housing, heat exchanger shell, heat exchanger tubes (piping), piping/tubing, pump casing, restricting orifice, strainer casing, strainer element, and valve bodies. The applicant also stated that aging management of these components would be accomplished with the torque activities, protective coatings, and diesel generator maintenance activities AMPs. The staff's review of the AMPs can be found in Section 3.1 of this SER. Staff evaluation of the applicants aging management activities for these components can be found in Section 3.4.3 of this SER. The staff finds this response acceptable, and considers Open Item 2.3.3.2-1(b) closed.

On the basis of the staff's review of the LRA and associated drawings, the Plant Hatch Unit 1 and 2 UFSARs, and the applicant's responses to RAIs and Open Item 2.3.3.2-1(b), the staff concludes that the applicant has identified the components of the emergency diesel generator system that are within the scope of license renewal and subject to an AMR.

2.3.4.8 Fire Protection

Summary of Technical Information in the Application

In Section 2.3.4.18, "Fire Protection System [X43]," of the Plant Hatch LRA, the applicant described the components of the fire protection system that are within the scope of license renewal and subject to an AMR. The staff reviewed this section of the LRA to determine whether there is reasonable assurance that all systems, structures, and components (SSCs) have been identified as being within the scope of license renewal, as required by 10 CFR 54.4(a), and that all components that are subject to an AMR have been identified, as required by 10 CFR 54.21(a)(1).

By letter dated August 29, 2000, the applicant responded to the staff's requests for additional information (RAIs) regarding the fire protection systems and components. In addition, the applicant provided additional information for the fire protection system during telephone conferences, which are documented in summaries dated September 12 and 28, 2000, October 1, 2000 (by email), October 13, 2000 (by email), and November 15, 2000.

Structures and mechanical systems that are relied upon to perform or support performance of a function that demonstrates compliance with the Commission's regulations described in 10 CFR 54.4(a)(3) are within the scope of license renewal. 10 CFR 54.4(a)(3) requires that all SSC's that are relied upon in safety analyses or plant evaluations to demonstrate compliance with the Commission's regulations in 10 CFR 50.48, be included within the scope of license renewal. 10 CFR 50.48 requires that the applicant implement and maintain a fire protection program. The fire protection system is relied upon to meet the requirements of 10 CFR 50.48. At Plant Hatch, the fire hazards analysis (FHA) is the focal point for information on how regulatory commitments are met through analyses and plant evaluations.

The purpose of the fire protection program at Hatch is to ensure, through defense-in-depth design, that a fire will not prevent the necessary safe plant shutdown functions from occurring. The defense-in-depth principle is aimed at achieving an adequate balance in these areas along with the following functions:

- prevent fires from starting
- detect fires quickly and rapidly suppress fires that occur and limit their damage
- design plant safety systems so that a fire that starts in spite of the fire protection program and burns for a significant period of time will not prevent essential plant safety functions from being performed.

The initial scoping at Plant Hatch was performed on the basis of functions. The intended functions shown in LRA Section 2.3.4.18 are associated with the fire protection system. The following fire protection intended functions are within the scope of license renewal:

- X43-01 - Cardox Fire Suppression for EDGs
- X43-04 - Plant Wide Fire Suppression With Water
- X43-06 - Fire Detection
- X43-07 - Penseals and Fire Barriers for Preventing Fire Propagation

- X43-08 - Manual Carbon Dioxide Fire Protection
- X43-10 - Cardox Fire Suppression for the Computer Room

In Table 2.3.4-18 of the LRA, the applicant identifies components that support the fire protection system [X43] intended functions that are within the scope of license renewal and subject to an AMR. The fire protection components that provide only a pressure boundary function that are identified in Table 2.3.4-18 are bolting, fire hydrants, fittings, fusible material, pilot valves, pipe line strainers, piping, pump casings, sprinkler head bulbs, sprinkler head links, strainer basket, tanks, tubing, tubing fittings, and valve bodies. In response to Part 7 of RAI-2.3.4-FPS-3, the applicant clarified in that the passive, long-lived components for hose stations are included in Table 2.3.4-18 as piping, valves, and nozzles.

The fire protection components that provide only a fire barrier function that are identified in Table 2.3.4-18 are fire doors, Kaowool and hold-down straps, and penetration seals.

Fire protection components that provide only a flow restriction function are nozzles. Restricting orifices provide both a pressure boundary and flow restriction function. The sprinkler heads provide a flow direction, pressure boundary, and flow restriction function. The tank insulation provides an environmental control function.

Staff Evaluation

The Commission's regulations in 10 CFR 54.21(a)(1), state that for those SSCs that are within the scope of this part, as delineated in 10 CFR 54.4, the integrated plant assessment (IPA) must identify and list those SCs that are subject to an AMR. The staff reviewed Section 2.3.4.18 of the LRA, as supplemented by telephone conferences that are documented in summaries dated September 12 and 28, 2000, October 1, 2000 (by email), October 13, 2000 (by email), and November 15, 2000, to determine whether there is reasonable assurance that the applicant has appropriately identified the components and supporting systems that serve fire protection-intended functions, and 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).

This evaluation is to determine whether the applicant has properly identified, for the fire protection system, the components that are within the scope of license renewal. The staff will then determine if the components which are within the scope of license renewal were properly identified by the applicant as being subject to an AMR.

In response to RAI 2.3.4-FPS-1, the applicant stated that Plant Hatch was docketed before July 1, 1976, and that the applicable regulatory requirements for the fire protection program were contained in Appendix A to Branch Technical Position (BTP) APCSB 9.5-1, "Fire Protection for Nuclear Power Plants," and Section III.G, III.J, and III.L of Appendix R. The applicant primarily used the FHA as the primary information source during the scoping process for fire protection SSCs. The FHA contains the analyses to demonstrate compliance with Appendix R and Appendix A to BTP 9.5-1. The applicant searched its FHA for commitments made to meet 10 CFR 50.48 (including compliance with Appendix R and Appendix A to BTP 9.5-1) and stated that any structures or components that are relied upon for meeting the regulatory commitments are included within the scope of license renewal.

The staff sampled portions of the FHA, which contains plant commitments and safety evaluations that form the basis of the fire protection program at Plant Hatch. The staff then compared a sample of the fire protection systems and components identified within the FHA to the fire protection system flow diagrams to verify that required components were identified within the evaluation boundaries of the flow diagram and were not excluded from the scope of license renewal. The staff also compared SSCs identified in NRC-approved SERs, which document Plant Hatch's compliance with the provisions of Appendix A to BTP 9.5-1, to the fire protection system flow diagrams to verify if there were additional portions of the fire protection system that were excluded from the scope of license renewal. As part of the evaluation, the staff also reviewed the same flow diagrams for the fire protection system to determine if there were any additional portions of the system piping or components located outside of the evaluation boundary, with intended functions that should have been identified as being within the scope of license renewal.

In accordance with 10 CFR 50.48(b), only the requirements of Sections III.G, III.J, and III.O in Appendix R to 10 CFR Part 50 were backfit to all nuclear plants to the extent that fire protection features proposed or implemented by the applicant have been accepted by the staff as satisfying the provisions of Appendix A to BTP 9.5-1, as reflected in staff fire protection safety evaluation reports. The staff was concerned that the applicant had excluded from its component database fire protection components that were identified in an NRC-approved SER dated October 4, 1978. This SER documents Plant Hatch's compliance with Appendix A to BTP 9.5-1. During telephone conferences on September 13 and September 28, 2000, the staff questioned whether the fire protection SSCs identified in the SER dated October 4, 1978, were evaluated during the scoping process. During the scoping inspection on September 11-15, 2000, the applicant provided the NRC inspector with its license renewal docketed correspondence list. This list shows all of the documents that the applicant reviewed for the scoping of fire protection SSCs. The staff noted that this list did not include any SERs before 1982, which show compliance to Appendix A to BTP 9.5-1. In a telephone conference, documented in a summary dated November 15, 2000, the applicant agreed to identify the path that shows how the components from the 1978 SER were captured in the FHA for compliance with Appendix A to BTP 9.5-1. The applicant referred the staff to a letter, with an accompanying SER, from NRC to Georgia Power Company dated November 24, 1986. On page 2 of the SER for the November 1986 letter, proposed change 1 was accepted, and the NRC stated "the applicant's compliance with the staff's SER [dated October 4, 1978] is now documented in Section 9.4, Appendix D, of the FHA." On the basis of this SER, the applicant has appropriately demonstrated to the staff how they were able to include components from the 1978 SER in the scoping methodology by using the FHA as the primary scoping document for fire protection.

The staff reviewed the SER dated October 4, 1978 to ensure that it did not require the fire protection components that are excluded from the scope of license renewal on the basis of the applicant's evaluation of the FHA, to meet BTP 9.5-1. Fire protection components listed in the SER dated October 4, 1978, which were initially excluded from the scope of license renewal, include the control building 112' elevation suppression system for protection of the lube oil tanks and the fire hydrants required for compliance with 10 CFR 50.48. After the staff's scoping inspection, the applicant designated these components as being within scope and revised plant documentation to show that they are required for compliance with 10 CFR 50.48 and are included within the scope of license renewal and are subject to an AMR.

The staff was concerned that the Unit 2 remote shutdown panel (RSP) halon suppression system and the radwaste fire suppression system appeared to have fire protection intended functions that

are required for compliance with 10 CFR 50.48, but were not included within the scope of license renewal and were not identified as being subject to an AMR.

The Unit 2 remote shutdown panel halon suppression system is identified in the LRA as fire protection intended function X43-02. However, the associated flow diagram (HL-50048) shows that components that support the halon system were removed from the scope of license renewal. In response to RAI 2.3.4-FPS-5, the applicant stated that at the time of submittal of the LRA, the RSP halon suppression system was within the scope of license renewal. However, an FHA change physically removed this system from the plant. After questioning the applicant on these findings, the applicant provided a 10 CFR 50.59 evaluation, entitled "Licensing Document Change Request 99-181, Revision 0," dated November 19, 1999, and FHA revision 18C. These documents analyzed the removal of the RSP halon fire suppression system from regulatory requirements, and provided the rationale for the decision. During the scoping inspection, the inspector questioned the appropriateness of using the 10 CFR 50.59 process to remove the regulatory requirement and the physical function of originally installed fire protection equipment without a prior Staff review. In an SER dated April 18, 1984 (located in FHA Section 9.3, Appendix C) the staff approved several exemptions from Sections III.G.3 and III.L of Appendix R to 10 CFR 50.48. Page 16 to Enclosure 2 of the SER, "RB South of Column Line R19-U2" states that the staff was concerned that for locations where components for redundant shutdown pathways were either not separated by the water curtain or were located in close proximity to each other on either side of the curtain, a fire would cause damage to both, such as RSPs 2C82-P001A and 1B. Since the applicant protected these panels by non-combustible barriers, an automatic halon fire suppression system, and fire detectors, the staff concluded that the existing fire protection, with the proposed modifications, would achieve an acceptable level of safety to that provided by Section III.G.2 and granted the applicant's exemption. Furthermore, in the applicant's letter of July 22, 1986, Section 4.11 of the FHA states that "The Unit 2 RSP is also equipped with an internal Halon 1301 fire suppression system."

During the NRC's scoping inspection, the applicant clarified that it had performed a detailed circuit analysis to demonstrate that the halon system was no longer required to protect the remote shutdown panel and meet Appendix R requirements. Also, the staff determined that the applicant had applied the 10 CFR 50.59 process appropriately in making the determination to remove the RSP halon fire suppression system from regulatory requirements. On this basis, the staff concluded that since the halon suppression system was no longer required to meet the applicant's CLB for fire protection, the halon suppression system was not required to be included within the scope of license renewal.

In its docketed response to RAI-2.3.4-FPS-8, the applicant states that the radwaste fire suppression system was excluded from the scope of license renewal on the basis that the system was not included in the regulatory requirements because it is not relied upon in FHA Section 9.2, Appendix B. The staff disagrees that the fire suppression systems for the radwaste building are not included in the regulatory requirements for Plant Hatch.

In an NRC-approved SER dated October 4, 1978, the staff reviewed the design criteria and bases for the water suppression systems in various areas that were approved to meet the guidelines of Appendix A to BTP 9.5-1. The radwaste building was one of the plant areas listed, which was equipped with an automatic suppression system. Furthermore, the applicant's October 1976 FHA to the staff (which the staff used as the basis for SER dated October 4, 1978) states that there is an automatic deluge system provided for dry waste storage and charcoal filters. This follows the

guidance of Section F.14 of Appendix A to BTP 9.5-1, which states that the radwaste building should have automatic sprinklers in all areas where combustible material is located. The scope of components required to satisfy 10 CFR 50.48 includes those components that are required for compliance with Appendix A to BTP 9.5-1.

By letter dated November 24, 1986, the staff approved a license amendment for Plant Hatch in accordance with Generic Letter 86-10, "Implementation of Fire Protection Requirements." The amendment revises the Technical Specification (TS) for Units 1 and 2 to relocate the fire protection surveillances to the FHA. It also states that the applicant's compliance with Appendix A to BTP 9.5-1, as shown in the staff's SER dated October 4, 1978, is now documented in FHA Section 9.4, Appendix D. The FHA submitted to the staff at the time of the license amendment is dated July 22, 1986. Furthermore, in Proposed Change 1 to the license amendment safety evaluation dated November 24, 1986, the staff states that this change also deletes the requirement to complete all modifications identified in the NRC's SER dated October 4, 1978. In accordance with the SER dated October 4, 1978, the radwaste building suppression system was already installed to satisfy Appendix A to BTP 9.5-1.

As mentioned above, Plant Hatch's compliance with Appendix A to BTP 9.5-1 is documented in FHA Section 9.4, Appendix D. With respect to the radwaste building, the staff reviewed the Plant Hatch FHA dated July 22, 1986, and concluded that fire suppression for certain areas in the radwaste building were included in the 1986 FHA. Specifically, Section IV.B.4.d of the FHA states that "fixed automatic water spray systems are installed in all charcoal filters in the plant." The radwaste building contains charcoal filters that are protected by fixed sprinkler systems. Therefore, the fire suppression piping leading to the charcoal filters, including the nozzles and sprinkler heads, should be included within the scope of license renewal and subject to an AMR.

In addition, Section IV.D of the FHA states that the guidelines for specific plant areas is presented for each specific plant area throughout the FHA. In both the June 1986 and July 1987 revisions to the FHA, the FHA analysis of fire area/zone 2301 (Radwaste Building - All Elevations) states that, "all sections of this area which contain specific fire hazards (charcoal filters) or high concentrations of combustibles (dry waste storage area, Radwaste Control Room) are equipped with detection, suppression, or both." Specifically, the west central portion of fire zone 2301J over the drywaste storage section is equipped with a wet pipe suppression system. To the staff's knowledge, the applicant has not submitted any information to show that the radwaste suppression system has been physically removed or altered so that it can't perform its intended function, and that no plant evaluations through 10 CFR 50.59 have determined that this suppression system is no longer required for compliance with Appendix A to BTP 9.5-1.

It was the staff's view that the radwaste suppression system should be included within the scope of license renewal and subject to an AMR. This issue was identified as Open Item 2.3.4.2-1.

After reviewing the Plant Hatch Fire Hazards Analysis (FHA) dated July 22, 1986, the staff raised a concern with the applicant's exclusion of the radwaste fire suppression system from within the scope of license renewal. The radwaste building contains charcoal filters which are protected by fixed sprinkler systems. Section IV.B.4.d of the FHA states that "fixed automatic water spray systems are installed in all charcoal filters in the plant". In addition, Section IV.D of the FHA states that the guidelines for specific plant areas are presented for each specific plant area,throughout the FHA. In both the June, 1986 and July, 1987 revisions to the FHA, the FHA analysis of fire area/zone 2301 (Radwaste Building - All Elevations) states that, "all sections of this area which

contain specific fire hazards (charcoal filters) or high concentrations of combustibles (dry waste storage area, Radwaste Control Room) are equipped with detection, suppression, or both." Specifically, the west central portion of fire zone 2301J over the drywaste storage section is equipped with a wet pipe suppression system.

In response to the staff's concern, the applicant responded in a letter dated June 5, 2001, that the radwaste building fixed fire suppression has been included in scope for license renewal and is subject to an AMR. No new component types, component materials, or internal or external environments result from this scope change. In addition, the following evaluation boundary drawings were revised or created to reflect the change in scope:

HL-11034	HL-11901
HL-11304, Sheet 7	HL-11905
HL-11304, Sheet 8	HL-11909
HL-11869	HL-21017
HL-11873	HL-21197
HL-11874	HL-21342
HL-11875	HL-26372

The staff's review of the aging effects associated with these components can be found in Section 3.4.3 of this SER. The staff is satisfied with the applicant's resolution of this issue and Open Item 2.3.4.2-1 is closed.

After the staff determined which components were within the scope of license renewal, the staff determined whether the applicant properly identified the components subject to an AMR from among those identified as being within the scope of license renewal. The staff reviewed selected components that the applicant identified as being within the scope of license renewal to verify that the applicant had identified these components as subject to an AMR if they perform intended functions without moving parts or without a change in configuration or properties, and are not subject to replacement on the basis of a qualified life or specified time period.

The staff reviewed mechanical components on flow diagrams and compared them to the list of components with intended functions that the applicant presented in Table 2.3.4-18 of the LRA, to verify that there were no omissions of passive, long-lived components that were subject to an AMR. The staff was concerned that the applicant's sprinkler head visual inspections would not be sufficient for an AMP throughout the period of extended operation and asked the applicant, in RAI 2.3.4-FPS-10, to discuss whether NFPA 25, Section 2.3.3.1, "Sprinklers," would be implemented at Plant Hatch. The staff's evaluation of this issue can be found in Section 3.1.18 of this SER.

In addition, the staff asked the applicant to justify the exclusion of fire extinguishers, air packs, and CO_2 hoses from an AMR. The applicant provided justification in an email to the staff dated October 13, 2000, to support that these components are short-lived and, therefore, by 10 CFR 54.21, are excluded from an AMR. The applicant considers that these components are short-lived, given the replacement intervals established by plant procedures. CO_2 fire extinguishers are replaced every 5 years, dry chemical fire extinguishers are replaced every 12 years, air packs are replaced every 15 years, CO_2 hoses are replaced every 5 years. The plant procedures also specify inspection and testing intervals. Water hoses are routinely monitored gor condition and performance, and are replaced on the basis of degradation criteria specified in a site-approved procedure. By plant procedure, water hoses are to be unracked, visually inspected, and hydrostatically tested every 2

years. Water fire hoses that do not meet the inspection or hydrostatic test criteria are replaced. Water hoses were inadvertently omitted from LRA Table 3.2.4-18. On the basis of the information provided by the applicant and summarized above, the staff concludes that the applicant has provided an acceptable basis to exclude these components from an AMR.

The staff did not find any other omissions of long-lived, passive components with intended functions.

On the basis of its review of the information presented in Section 2.3.4.18 of the LRA, the applicant's responses to the staff's RAIs, additional information provided in telephone conferences between the staff and the applicant, and resolution of Open Item 2.3.4.2-1, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the fire protection system that are within the scope of license renewal and subject to an AMR.

2.3.4.9 Fuel Oil System

Summary of Technical Information in the Application

The fuel oil system is designed to receive, store, and supply fuel oil to the diesel generator system. In Section 2.3.4.19, "Fuel Oil System," of the LRA, the applicant described the intended functions of the system, and listed the components that are subject to an AMR. The applicant described its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.2, "Scoping," of the LRA and and those that are subject to an AMR in Section 2.1.3, "Civil/Mechanical Component Screening," of the LRA.

In Section 2.3.4.19 of the LRA, the applicant states that the function of the fuel oil system is to receive, store, and supply fuel oil to the diesel generator system. Diesel engine fuel for Hatch Units 1 and 2 is stored in five interconnected buried tanks. Diesel fuel is transferred to the engine day tanks using dedicated, redundant transfer pumps and piping. The diesel fuel storage tanks are filled by gravity from a truck connection through a common header. Two of the buried tanks are dedicated to each of the Unit 1 and Unit 2 diesel generators. The remaining tank is used to supply the swing diesel (1B) to serve either Unit 1 or Unit 2. The fuel oil system transfer pumps operate continuously on demand from the day tank level controllers. Tank levels are monitored and alarmed (low level) in the main control room (MCR).

The initial scoping, performed by the applicant on the basis of functions, determined that the intended function of the fuel oil system, Y52-01 - Emergency Diesel Generator (EDG) Fuel Oil Supply, is within the scope of license renewal. The EDG fuel oil system provides a 7-day supply of fuel oil to the diesels in the event of a LOOP. The availability of the storage tanks is needed for an extended duration LOOP, which is a risk-significant event. The components associated with this function include the fuel oil supply piping, instrumentation, and valves in the piping from the fuel oil pumps to the EDGs.

The associated piping, valve bodies, bolting, discharge head, flex hose, manway shell, pump, strainer basket, and tank are listed in Table 2.3.4-19 of the LRA as being subject to an AMR. The component functions for the manway shell and strainer basket is to provide shelter/protection, and the function for the piping, valve bodies, bolting, discharge head, flex hose, pump, and tank is to serve as the pressure boundary.

The staff reviewed the above information to verify that the intended functions of the fuel oil system that are within the scope of license renewal and the components that are subject to an AMR have been identified in accordance with the requirements of 10 CFR 54.4 and 10 CFR 54.21(a)(1).

The applicant identified and listed the components that are subject to an AMR for the fuel oil system in Table 2.3.4-19 of the LRA using the screening methodology described in Sections 2.1.2 and 2.1.3 of the LRA. The screening methodology is evaluated by the staff in Section 2.1 of this SER.

The staff reviewed Section 8.4 of the Plant Hatch Unit 1 UFSAR and Section 9.5.4 Unit 2 UFSAR to determine if there were any system functions that were not identified as intended functions in accordance with requirements of 10 CFR 54.4. The staff then reviewed drawings (HL-11037, HL-11631 sheet 2, HL-11638 sheet 2, and HL-21074) to verify that the applicant identified all of the components that are within the scope of license renewal in accordance with 10 CFR 54.4. Further, the staff verified the accuracy of the drawings and the completeness of LRA Table 2.3.4-19 by sampling the components adjacent to, but outside, the highlighted portion of the system to verify that all of the components that are within the scope of license renewal were included in the application. In addition, the staff sampled the components that are within the scope of license renewal, but not subject to an AMR, to verify that all of the components that meet the requirements of CFR 54.21(a)(1) were subject to an AMR.

After the initial review, the staff had a few questions in identifying components in the drawings. In a telephone conference on July 6, 2000, the applicant responded to the staff's questions by clarifying the information and identifying all of the fuel oil storage tanks in the drawings (HL-11037 and HL-21074) so that the staff was able to complete its review.

On the basis of the staff's review of the LRA and associated drawings, the Plant Hatch Units 1 and 2 UFSAR, and the applicant's responses in the telephone conference, the staff was unable to find any omissions from the components highlighted in the diagrams that identify the function-level scoping boundaries. The staff also compared the components listed in Table 2.3.4-19 of the LRA and those highlighted in the drawings, and found them consistent.

On the basis of the review described above, the staff has determined there is reasonable assurance that the applicant has adequately identified the intended functions of the fuel oil system that are within the scope of license renewal in accordance with the requirements of 10 CFR 54.4 and those that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.4.10 Instrument Air System

Summary of Technical Information in the Application

The instrument air system provides dried and filtered air to all of the air-operated instruments and valves throughout the entire plant (with the exception of equipment inside the drywell). In Section 2.3.4.9, "Instrument Air System," of the LRA, the applicant described the intended functions and listed the components of the system that are subject to an AMR. The applicant described its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.2, "Scoping," and Section 2.1.3, "Civil/Mechanical Component Screening," of the LRA.

In Section 2.3.4.9 of the LRA, the applicant states that the purpose of the instrument air system is to provide dried and filtered air to all of the air-operated instruments and valves throughout the entire plant (with the exception of equipment inside the drywell). The instrument air system is divided into the following two subsystems:

- The noninterruptible system provides instrument air for the operation of certain emergency system components.

- The interruptible system provides instrument air to all other components not supplied by the noninterruptible system.

The drywell pneumatic system supplies the motive gas for components within the drywell. The requirements for the remainder of the compressed air systems are supplied by three oil-free screw-type compressors. Two of these air compressors have a capacity of 500 SCFM, and one has a capacity of 700 SCFM. During normal operation, the 700 SCFM compressor supplies all instrument air and high-pressure service air requirements outside of the drywell with one of the two 500 SCFM compressors on automatic standby and the other (which requires operator action for start) in the backup mode. Each compressor discharges into an air receiver, which in turn discharges into a common manifold that feeds the instrument and service air systems.

The initial scoping, performed by the applicant on the basis of functions, determined that the intended function of the instrument air system, P52-01 - Noninterruptible Essential Instrument Air Supply, is within the scope of license renewal. The noninterruptible essential instrument air supply includes the instrument air system downstream of the noninterruptible essential instrument air check valves, and includes the nitrogen backup supply valves. The P52 system is fed from the P51 air compressors under normal operating conditions, and has a nonredundant backup of the safety-related nitrogen distribution system. The noninterruptible portion of the instrument air system services certain valves in emergency systems for which operation is desirable, although not essential, following a loss of pressure in the service air or interruptible portion of the instrument air system.

The associated piping, valve bodies, bolting, hose, pressure regulator and tubing are identified in Table 2.3.4-9 of the LRA as being within the scope of license renewal and subject to an AMR. The component function for these components is to serve as a pressure boundary.

Staff Evaluation

The staff reviewed the above information to verify that the intended functions of the instrument air system that are within the scope of license renewal and the components that are subject to an AMR have been identified in accordance with the requirements of 10 CFR 54.4 and 10 CFR 54.21(a)(1).

The applicant identified and listed the components that are subject to an AMR for the instrument air system in Table 2.3.4-9 of the LRA using the screening methodology described in Sections 2.1.2 and 2.1.3 of the LRA. The screening methodology is evaluated by the staff in Section 2.1 of this SER.

The staff reviewed Section 10.11 of the Plant Hatch Unit 1 UFSAR and Section 9.3.1 of the Unit 2 UFSAR to determine if there were any system functions that were not identified as intended functions in accordance with requirements of 10 CFR 54.4. The staff then reviewed drawings (HL-

16299, HL-11667, HL-16251, HL-28023, HL-26064, HL-26070) to verify that the applicant identified all of the components that are within the scope of license renewal in accordance with10 CFR 54.4. Further, the staff verified the accuracy of the drawings and the completeness of Table 2.3.4-9 by sampling the components adjacent to, but outside, the highlighted portion of the system, to verify that all of the components that are within the scope of license renewal were included in the application. In addition, the staff sampled the components that are within the scope of license renewal, but not subject to an AMR, to verify that all of the components that meet the requirements of 10 CFR 54.21(a)(1) were identified as being subject to an AMR.

After the initial review, in a letter dated July 14, 2000, the staff identified areas where additional information was needed to complete its safety review. The applicant responded to the RAI in a letter dated August 29, 2000.

Section 9.3.1.2 of the Unit 2 UFSAR states that the instrument air system includes an air dryer and two 100 percent-capacity pre- and after-filters connected in parallel. The staff requested that the applicant justify the exclusion of the air-dryer, pre- and after-filters from LRA Table 2.3.4-9 from being subject to an AMR. The applicant responded that the only equipment that is within the scope of license renewal are the gas accumulators and the associated piping and valves. During normal operation, the accumulators are filled with dry nitrogen. The accumulators can be used following a design-basis accident to provide additional operational flexibility for certain air-operated valves. The air dryer, pre-filters, and after-filters are located in the portion of the system that is not associated with the accumulators and are not relied upon to perform a safety function.

Since the accumulators are within the scope of license renewal and subject to an AMR, the staff asked the applicant why the accumulators are not listed in Table 2.3.4-9 as being subject to an AMR. The applicant stated that the accumulators are listed in the table as "air receivers."

On the basis of the staff's review of the LRA and associated drawings, the Plant Hatch Unit 1 and 2 UFSAR, and the applicant's responses to RAIs, the staff was unable to find any omissions from the components highlighted in the diagrams that identify the function-level scoping boundaries. The staff also compared the components listed in Table 2.3.4-9 of the LRA and those highlighted in the drawings, and found them to be consistent.

On the basis of the review described above, the staff has determined that there is reasonable assurance that the applicant has adequately identified the intended functions of the instrument air system that are within the scope of license renewal in accordance with the requirements of 10 CFR 54.4, and those that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.4.11 Insulation

Summary of Technical Information in the Application

The intended function of insulation is to retain heat in process piping and equipment in various locations outside the drywell, prevent moisture from condensing on cold surfaces, protect equipment and personnel from high temperatures, prevent piping from freezing in cold areas of the plant, and protect heat tracing from damage. The application further states that heat tracing with insulation is required for the standby liquid control system to operate in order to meet ATWS requirements. Insulation is also credited in heat load calculations for safety-related rooms. Failure

of piping insulation in safety-related rooms could allow the heat load of the room to exceed the capability of the HVAC system, thereby exceeding the design temperature of the room. The insulation intended function can be more concisely stated as minimizing heat transfer between process piping and the environment and protecting heat tracing on piping.

The applicant provided eight drawings for Unit 1 and six drawings for Unit 2 that had intended function designations marked on the drawings to indicate piping insulation that is within the scope of license renewal. These drawings are DL-11001, DL-11004, HL-11033 (sheet 1), HL-11600, HL-16061, HL-16332, HL-16334, HL-16016, HL-21033, HL-21039, HL-26009, HL-26020, HL-26046, and HL-26023. The applicant described its process for identifying the mechanical components that are within the scope of license renewal and subject to an AMR in Section 2.1.3 of the LRA. On the basis of this methodology, the applicant identified insulation in various areas outside the drywell as the passive, long-lived portion of the system that requires an AMR. The six component types that were identified as being subject to an AMR include the aluminum jacket, insulation, insulation bolting (galvanized steel), insulation bolting (stainless steel), stainless steel jacket, and wire. The applicant identified environmental control as the function of these components.

Staff Evaluation

In Section 2.3.4.3 of the LRA, the applicant states that insulation in various locations outside the drywell is within the scope of license renewal because of its intended function. Specifically, the applicant identified the intended functions of insulation as retaining heat in process piping and equipment, preventing condensation on cold surfaces, protecting equipment and personnel from high temperatures, preventing freezing in cold areas of the plant, and protecting piping heat tracing. The applicant provided eight drawings for Unit 1 and six drawings for Unit 2 that had intended function designations to indicate piping and equipment insulation that is within the scope of license renewal. These drawings are DL-11001, DL-11004, HL-11033 (sheet 1), HL-11600, HL-16061, HL-16332, HL-16334, HL-16016, HL-21033, HL-21039, HL-26009, HL-26020, HL-26046, and HL-26023. The staff reviewed these drawings to ensure that the in-scope insulation was appropriately identified on the drawings. The staff sampled portions of the systems in these drawings that did not have insulation identified as in scope to verify that the insulation in these areas did not perform an intended function. The staff compared the drawings with the system descriptions in the UFSAR, LRA, and Technical Specifications to ensure that intended functions were not performed by insulation that was not identified as being within the scope of license renewal. Examples of written descriptions and technical requirements that were reviewed by the staff include:

- Sections 3.6.1.5 and B3.6.1.5, "Drywell Air Temperature," of the Unit 2 Technical Specifications

- Sections 9.4.2.2.3, "ECCS Room Coolers," and 4.2.3.4, "SLCS," of the Unit 2 UFSAR

- Sections 2.3.4.1, "Control Rod Drive (CRD) System," 2.3.3.5, "Reactor Core Isolation Cooling System (RCIC)," and 2.3.4.15, "Reactor Building HVAC System" of the LRA

On the basis of the staff's review of these documents and drawings, the staff identified several questions that were forwarded as RAIs to the applicant by letter dated July 14, 2000. The following additional information was provided by the applicant in their RAI response dated August 29, 2000:

- The insulation on heat bearing piping and equipment located in the Unit 1 and 2 RHR, CS, and HPCI rooms is within the scope of license renewal.

- Although the insulation on heat-bearing piping and equipment located in the RCIC pump room is not required to be within the scope of license renewal, it is conservatively included within scope.

- The insulation on heat-bearing piping and equipment located in the CRD pump room is not credited in the sizing of the room coolers and, therefore, is not within the scope of license renewal.

- Insulation that is within the scope of license renewal and located on outdoor piping to prevent freezing ceases to be in scope when the piping passes into either an environmentally controlled atmosphere or underground.

- Large-bore piping (12-inch diameter or greater) located outdoors, the condensate storage tank, and the fire protection storage tanks are not insulated per plant design.

- The SLC tank is insulated, but the insulation is not within the scope of license renewal because it is not needed to maintain the sodium pentaborate in solution. The SLC tank is located in an environmentally controlled portion of the plant.

The staff found the applicant's RAI responses to be acceptable. On the basis of the staff's review of the LRA, the drawings provided by the applicant, supporting information in the UFSAR, and the applicant's RAI responses, the staff has reasonable assurance that all portions of the insulation system that perform an intended function meeting the criteria in 10 CFR 54.4 are identified as being within the scope of license renewal.

Using the information provided in the LRA, the staff evaluated insulation components to determine whether the applicant properly identified the passive, long-lived components as being subject to an AMR in Table 2.3.4-3 of the LRA. The staff verified that the passive, long-lived components identified in LRA Section 2.3.4.3 appeared in the list of components that are subject to an AMR in Table 2.3.4-3. No omissions were identified. On the basis of this review, the staff has reasonable assurance that the applicant has identified the components of the insulation system that are subject to an AMR.

2.3.4.12 Outside Structures HVAC

Summary of Technical Information in the Application

In LRA Section 2.3.4.17, the applicant identified portions of the outside structures HVAC system and its components that are within the scope of license renewal and subject to an AMR. The applicant stated in Section 2.3.4.17 of the LRA that additional information for the outside structures HVAC system is provided in Sections 9.4.5 and 9.4.10 of the UFSAR for Unit 2. The system scoping is shown in outside structures HVAC system evaluation boundary drawing HL-44073, Rev. A.

The purpose of the intake structure HVAC system is to protect the intake structure equipment from adverse temperature conditions that could affect the reliability of the equipment. The diesel

generator building HVAC system protects diesel generator building equipment from adverse temperature conditions that could affect the reliability of the equipment.

The river intake structure HVAC system consists of three 50percent-capacity roof-mounted exhaust ventilators, four gravity-operated louvers, and six wall-mounted unit heaters. The ventilators are powered from separate power sources. Each ventilator has a separate control station and is operated by an individual thermostat. The independent controls are powered from the motor control center control transformer for the associated fan. Since selected plant service water pumps operate during normal and accident conditions in the plant, the three thermostats and the individual fan control stations are located in the Unit 1 and 2 PSW pump bay areas. The locations of the thermostats ensure that the ventilation system is always activated when operation of the PSW pumps causes a heat buildup in the area. The six unit heaters and their associated thermostats are strategically located in different areas of the building to provide adequate area coverage to maintain the building above freezing temperatures.

The heating and ventilating systems in the diesel generator rooms consist of one power roof exhaust ventilator in each room for exhausting heat from the rooms when the generator is shut down, and two 100percent-capacity power roof exhaust ventilators in each room for exhausting heat from the rooms during generator actuation. Two motor-operated wall air intake louvers, with fire dampers in each room, replenish the air that is removed by the exhaust ventilation. One louver serves as the air intake to the generator area; the other serves as the air intake to the battery rooms through the generator area.

In Section 2.3.4.17 of the LRA, the applicant identified the following intended functions for the outside structures HVAC system that relate to 10 CFR 54.4(a)(1), 10 CFR 54.4(a)(2), and 10 CFR 54.4(a)(3):

- Intake structure environmental control
- EDG building environmental control
- EDG building battery room H2 control
- EDG switchgear room heating and ventilation
- EDG building oil storage room ventilation

On the basis of the functions identified above, the applicant determined that all outside structures HVAC system safety-related components (electrical, mechanical, and instrument) are within the scope of license renewal. The applicant described its process for identifying the mechanical components subject to AMR in Section 2.1.2 of the LRA. On the basis of this methodology, the applicant identified the portions of the outside structures HVAC system that are within the scope of license renewal in evaluation boundary drawing HL-44073, Rev. A. Using the methodology described in Section 2.1.2 of the LRA, the applicant compiled a list of the mechanical components and component types that are within the license renewal boundaries and that are subject to an AMR, and identified their functions. The applicant provided this list in Table 2.3.4-17 of the LRA.

The applicant identified the following five device types that are identified as being within the scope of license renewal and subject to an AMR:

- bolting (carbon steel)
- bolting (stainless steel)
- duct sleeve (carbon steel)

- flow element (stainless steel)
- tubing (copper)

In Table 2.3.4-17 of the LRA, the applicant further noted that the outside structures HVAC system pressure boundary function is the only applicable function associated with components of the outside structures HVAC system that are subject to an AMR.

Staff Evaluation

The staff reviewed the above information related to the outside structures HVAC system to verify that the applicant identified the components that are within the scope of license renewal and subject to an AMR. The staff determined whether there is reasonable assurance that the components within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1). The staff reviewed the information in the LRA and Sections 9.4.5 and 9.4.10 of the UFSAR for Unit 2. After completing the initial review, the staff issued a request for additional information (RAI) by letter dated July 14, 2000. The applicant responded to the RAI by letter dated August 29, 2000.

In LRA Section 2.1, the applicant discussed the process for identifying mechanical components that are subject to an AMR. The applicant's scoping methodology is evaluated by the staff in Section 2.1 of this SER.

In its review, the staff reviewed the evaluation boundary drawing HL-44073, Rev. A. The drawing shows the evaluation boundaries for the portions of the outside structures HVAC system that are within the scope of license renewal. The staff also reviewed Table 2.3.4-17 of the LRA which lists components that are subject to an AMR.

The staff also reviewed Sections 9.4.5 and 9.4.10 of the UFSAR for Unit 2 to determine if there were any portions of the outside structures HVAC system that met the scoping criteria in 10 CFR 54.4(a) that the applicant did not identify as being within the scope of license renewal. The staff also reviewed the UFSAR sections to determine if there was any system function that was not identified as an intended function in the LRA, and to determine if there were SCs that have an intended function that might have been omitted from the scope of SCs that are subject to an AMR. The staff also reviewed the evaluation boundary drawing to determine if any SCs within the evaluation boundaries were omitted from the scope of SCs that are subject to an AMR under 10 CFR 54.4(a)(1). The staff compared the system and intended functions described in the UFSAR with those identified in the LRA. The staff then determined whether the applicant had properly identified the SCs that are subject to an AMR from among those identified as being within the scope of license renewal.

The applicant identified and listed the SCs that are subject to an AMR for the outside structures HVAC system in Table 2.3.4-17 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 sampled SCs from Table 2.3.4-17 to verify that the applicant did identify the SCs subject to an AMR. The staff also sampled SCs that were within the scope of license renewal, but not subject to an AMR, to verify that these SCs perform their intended functions with moving parts or with a change in configuration or properties, or were subject to replacement on the basis of a qualified life or specified time period.

To help ensure that those portions of the outside structures HVAC system that were identified as not being within the scope of license renewal did not perform any intended functions, the staff issued an RAI on the basis of the applicable information in the UFSAR and LRA. The staff noted that Section 2.3.4.17 of the LRA presents a summary description of the system functions, evaluation boundary drawings highlight the evaluation boundaries of the outside structures HVAC system, and Table 2.3.4-17 of the LRA lists components that are within the scope of license renewal and subject to an AMR. The corresponding drawings for this system in the UFSAR, however, show additional components that were not listed in Table 2.3.4-17.

The staff requested specific information concerning the exclusion of the following components from the scope of license renewal and/or from an AMR:

(1) roof-mounted exhaust ventilators housing (each with backdraft damper and vent fan), (HL-44073 @ G8, G9, and G10)

(2) wall-mounted unit heater housing (HL-44073 @ F7)

(3) gravity-operated louvers (each with inlet screen), (HL-44073 @ D6 and E6)

In the letter dated August 29, 2000, the applicant provided the following responses:

(1) The roof-mounted exhaust ventilator housing is part of an active component (fan and damper assembly - see NEI 95-10, Rev. 0, Appendix B, Items 155 and 163) and, consequently, no AMR is required.

(2) The wall-mounted unit heater housing is part of an active component (heater) and, consequently, no AMR is required.

(3) The gravity-operated louvers with inlet screens are active components and, consequently, no AMR is required.

In its response to RAI 2.3.4-OSHVAC-1, the applicant stated that roof-mounted exhaust ventilator housings and wall-mounted unit heater housings are not subject to an AMR, since these housings are part of active components (i.e., fan/damper assembly and heater, respectively). The staff disagreed with the applicant's exclusion of roof-mounted exhaust ventilator and wall-mounted unit heater housings from being subject to an AMR. The staff's position with regard to the treatment of the housings for roof-mounted exhaust ventilators and wall-mounted unit heaters is discussed in detail in the staff's evaluation of the SGTS in Section 2.3.3 of this SER. The staff's position in Section 2.3.3 of this SER also applies to the treatment of the component passive functions of the outside structures HVAC system. Resolution of this issue was identified as part of Open Item 2.3.3.2-2 [2.3.3.2-2(c)].

By letter dated June 5, 2001, the applicant provided information regarding the disposition of fans, dampers, and heating and cooling coils within the scope of license renewal. Consistent with the staff's guidance regarding evaluation of active components, the applicant identified the passive functions of damper frames, fan housings, and unit heater housings in the outside structures HVAC system and added these components to the list of components in the LRA that are subject to an AMR. The applicant also identified any aging effects associated with the damper frames, fan housings, and unit heater housings and provided an AMP to manage the aging. The applicant

added these components to Tables 2.3.4-17 and 3.2.4-17 in the LRA. The staff's review of the aging effects and AMPs for the outside structures HVAC system components can be found in Section 3.4.3 of this SER. On the basis of the additional information provided by the applicant, the staff agrees that damper frames, fan housings, and unit heater housings are within the scope of license renewal and subject to an AMR. On the basis of the previously noted information, this part of Open Item 2.3.3.2-2, as relates to outside structures HVAC system components, is closed.

The staff reviewed Section 2.3.4.17 of the LRA, supporting information in the UFSAR, the applicant's responses to the staff's RAI, and additional information provided by letter dated June 5, 2001. In addition, the staff sampled several components in the previously mentioned evaluation boundary drawings of the LRA to determine whether the applicant properly identified the components that are within the scope of license renewal and subject to an AMR. On the basis of its review, the staff concludes that the applicant has adequately identified the components of the outside structures HVAC system that are within the scope of license renewal and subject to an AMR.

2.3.4.13 Plant Service Water

Summary of Technical Information in the Application

The PSW system provides cooling water to safety-related and non-safety-related equipment during normal operating and shutdown conditions. The PSW also provides makeup water to the circulating water system heat exchangers, and is available for spent fuel pool emergency makeup, fire fighting, and radwaste dilution. The PSW is described in Sections 10.7 and 9.2.1 of the UFSAR for Plant Hatch Units 1 and 2, respectively.

The PSW system consists of four, one-third capacity vertical wetpit service water pumps and associated piping and controls, which divides into two divisions. Each division supplies cooling water to one redundant train of safety-related equipment. Water for equipment cooling is taken from the river via the intake structure by these pumps and distributed by the two headers to different areas for use, including the diesel generator building, the reactor and control buildings, and fuel pool cooling.

The applicant describes its process for identifying the mechanical components within the scope of license renewal and subject to an AMR in Section 2.1, "Scoping," of the LRA. On the basis of its methodology, the applicant identified the portions of the PSW system that are within the scope of license renewal on evaluation boundary diagrams DL-11004, HL-11600, HL-11609, HL-21033, and HL-21035. The intended functions of the PSW system are essential mechanical/environmental support, turbine building isolation, and 1B emergency diesel generator cooling. The applicant compiled a list of mechanical components and component functions within the license renewal boundaries that are subject to an AMR. The applicant also identified their functions and listed them in Table 2.3.4-7 of the LRA. The applicant identified 14 component types as being subject to an AMR, including the bolting, flexible connector, piping, pump bowl assembly, pump discharge column, pump discharge head, pump sub base, restricting orifices, sight glass body, strainer, strainer basket, thermowells, valve bodies, and venturi. The applicant stated that maintaining the pressure boundary, structural support, and debris protection are the applicable component functions.

Staff Evaluation

The staff reviewed Section 2.3.4.7 of the LRA and Sections 10.7 and 9.2.1 of the UFSAR for Units 1 and 2, respectively to determine whether there is reasonable assurance that the applicant appropriately identified the PSW components that are within the scope of license renewal in accordance with the requirements of 10 CFR 54.4, and that are subject to an AMR in accordance with the requirements of 10 CFR 54.21 (a)(1).

The applicant provided evaluation boundary diagrams DL-11004, HL-11600, HL-11609, HL-21033, and HL-21035 for the PSW, and identified the mechanical components that are within the scope of license renewal. The applicant highlighted the diagrams to identify those portions of the components that perform at least one intended function meeting the scoping requirements of 10 CFR 54.4. The staff compared the LRA flow diagrams to the description in the UFSAR to ensure that they were representative of the PSW system. The staff verified that the components that were not highlighted do not perform any intended functions that meet the requirements of 10 CFR 54.4.

Using the information on the PSW flow diagrams, the staff sampled several components to determine whether the applicant properly identified the passive long-lived components on the list of components identified as being subject to an AMR. The staff also verified that the passive long-lived components are highlighted on the flow diagrams and appear on the list of components that are subject to an AMR for the PSW system. No omissions were identified.

In a letter dated July 14, 2000, the staff issued RAI 2.3.4-PSW-1 regarding the functional boundary of turbine building isolation piping that ends in the middle of the piping run, and does not appear to be within the scope of license renewal. By letter dated August 29, 2000, the applicant stated that drawing HL-11600 shows that turbine building service water flow is monitored by safety-related differential pressure (dP) switches that are located downstream of the isolation valves. These switches are needed to annunciate in the control room such that the isolation valves to isolate the non-safety loads from the rest of the system during a break can be closed. The isolation valves and instrumentation for these dP switches are within the scope of license renewal and subject to an AMR. The dP switches located downstream of these valves detect flow and are required for proper isolation of the line. Because the location of the dP switches and the associated instrumentation extends beyond the point that would normally serve as the evaluation boundary, the applicant conservatively extends the AMR evaluation boundary up to the first anchor point at the valve box located beyond the location of each dP switch. The applicant committed to revise the drawing to include reference notes that depict this condition. By letter dated January 31, 2001, the applicant provided a revised version of evaluation boundary drawing HL-11600, which identifies the valve box walls that serve as the boundary for scoping evaluation. The staff finds this acceptable.

The applicant also responded that the loop seals to the diesel generator coolers in drawing HL-21033 provide a sealing function and keep the diesel generator coolers full of water by preventing the service water from leaving the cooler because of the vacuum created in the service water discharge line to the river. The loop seals and associated components are safety-related and within the scope of license renewal. The piping downstream of the loop seal connects to the radwaste dilution line, which is non-safety-related and discharges the water to the river. A break downstream of the loop seal piping will not impact the sealing function.

Also, during a scoping inspection conducted on September 11 through 15, 2000, the staff identified a guard pipe surrounding part of the PSW piping. The applicant stated that the function of this guard pipe could not be verified or confirmed in any plant licensing documents and, therefore, concluded that this guard pipe was not within the scope of license renewal. The applicant, however, stated that the PSW piping section that runs through the guard pipe is within the scope of license renewal and subject to an AMR. The applicant committed to perform a one-time inspection of the PSW outer piping surface inside the guard pipe to verify the integrity of this portion of the PSW piping. The one-time inspection is discussed in the response to RAI 3.1.4-1 and is evaluated in Sections 3.1.13 and 3.4.3.2 of this SER.

On the basis of its review of the LRA and supporting information in the UFSAR, the staff has reasonable assurance that all portions of the PSW system with intended functions meeting the criteria in 10 CFR 54.4 are identified as being within the scope of license renewal. The staff has also verified that all passive long-lived components have been identified as being subject to an AMR for the PSW system. No omissions were identified.

2.3.4.14 Primary Containment Chilled Water

Summary of Technical Information in the Application

In Section 2.3.4.10 of the LRA, the applicant describes the primary containment chilled water system (PCCW) for Unit 2 only. The PCCW is designed to maintain the drywell area below a maximum volumetric average temperature of 150 °F dry bulb during normal operation by providing chilled water to the drywell fan coil units. The system consists of two chilled water recirculation pumps, two centrifugal chillers, a chemical addition tank, a chemical feed pump, and an expansion tank. Each chiller includes a refrigerant compressor, condenser, cooler, accessories, and controls. The chilled water recirculation pumps circulate chilled water through their respective chiller to the fan coil units. Service water from the reactor building service water system is circulated through the chiller condensers for cooling. Demineralized water provides a source of makeup water for the chilled water system. The expansion tank, chemical addition tank, and associated makeup water supply are shared with the reactor and radwaste building chilled water system.

The only intended function of the PCCW system is to maintain containment integrity. Specifically, the components that are within the scope of license renewal function to maintain primary containment integrity via a closed loop inside containment. The controls and instrumentation associated with primary containment isolation for this system function are evaluated as part of LRA Section 2.5.3.

The applicant provided one drawing (HL-26081) for Unit 2 that is highlighted to indicate piping from this system that is within the scope of license renewal. The applicant described its process for identifying the mechanical components that are within the scope of license renewal and subject to an AMR in Section 2.1.3 of the LRA. On the basis of this methodology, the applicant identified the piping system inside the drywell as the passive, long-lived portion of the system that requires an AMR. The five component types that were identified as being subject to an AMR include the bolting, caps, piping, valve bodies, and thermowells. The applicant identified pressure boundary integrity as the function of these components.

Staff Evaluation

The applicant stated in Section 2.3.4.10 of the LRA that the PCCW system is within the scope of license renewal because of its containment integrity intended function. The applicant further stated that the in-scope components are those portions of the PCCW system that form a closed loop inside containment. The applicant provided one drawing (HL-26081) for Unit 2 that is color-coded to indicate the piping from this system that is within the scope of license renewal. Essentially all of the piping inside containment except small-bore piping downstream of vent and drain isolation valves is indicated as within the scope of license renewal. The staff reviewed the drawing and found that the piping identified as being within the scope of license renewal is consistent with the intended function description in LRA Section 2.3.4.10.

On the basis of the staff's review of the LRA, the applicant's RAI responses, and supporting information in the UFSAR, the staff has reasonable assurance that all portions of the PCCW system with intended functions that meet the criteria in 10 CFR 54.4 are identified as being within the scope of license renewal.

Using the information provided in the LRA, the staff sampled several components to determine whether the applicant properly identified the passive, long-lived components on the list of components that are subject to an AMR in Table 2.3.4-10 of the LRA. The staff verified that the passive, long-lived components identified in LRA Section 2.3.4.10 appeared on the list of components that are subject to an AMR in Table 2.3.4-10. No omissions were identified. On the basis of this review, the staff has reasonable assurance that the applicant has identified the components of the PCCW system that are subject to an AMR.

2.3.4.15 Reactor Building Closed Cooling Water

Summary of Technical Information in the Application

The intended functions of the reactor building closed cooling water (RBCCW) system are to provide cooling water to certain auxiliary equipment in the reactor building, and to serve as a closed-cycle barrier between potentially radioactive systems and the plant service water system. The RBCCW system consists of three one-half-capacity pumps, two full-capacity heat exchangers, a surge tank, and a chemical addition system. Two of the RBCCW pumps are normally operating with the third pump on standby. The heat rejected by the RBCCW system to the heat exchanger is removed by the PSW system. As discussed in Section 10.5 of the Unit 1 UFSAR Section 9.2.2 of the Unit 2 UFSAR, any possible leakage from the reactor auxiliary systems equipment will be into the RBCCW closed loop. The RBCCW system is continuously monitored for radioactivity by the process radiation monitoring system. Operation of the RBCCW system is not vital for safe shutdown of either Plant Hatch unit under normal or accident conditions, and the system is not required to be operable following a LOCA. In addition, failure of any component of the RBCCW will not cause a significant release of radioactivity. The RBCCW system is only within the scope of license renewal to the extent that it provides containment integrity.

The applicant described its process for identifying the mechanical components that are within the scope of license renewal and subject to an AMR in Section 2.1.2 of the LRA. On the basis of its methodology, the applicant identified the portions of the RBCCW system that are within the scope of license renewal on evaluation boundary diagrams HL-16009, HL-16066, HL-26003, and HL-26055. The applicant listed the mechanical components and component functions within the

license renewal boundaries that are subject to an AMR. In Table 2.3.4-8 of the LRA, the applicant identified nine component types as being subject to an AMR, including the bolting, flexible connectors, flow element, heat exchanger shells, piping, relief valve base, temperature probe, thermowell, and valve bodies. The applicant identified maintaining the pressure boundary as the function of each component.

Staff Evaluation

The applicant provided evaluation boundary diagrams HL-16009, HL-16066, HL-26003, and HL-26055 of the RBCCW, and identified the mechanical components that are subject to an AMR and their functions. The applicant highlighted the detailed flow diagrams to identify those portions of the RBCCW system that are within the scope of license renewal. The applicant highlighted those components that perform at least one intended function meeting the scoping requirements of 10 CFR 54.4. The staff compared the LRA flow diagrams to the descriptions in the UFSAR to ensure that they are representative of the RBCCW system. The staff verified that the components that were not highlighted do not perform any intended functions meeting the requirements of 10 CFR 54.4.

On the basis of a review of the LRA and supporting information in the UFSAR, the staff has reasonable assurance that all portions of the RBCCW system with intended functions that meet the criteria in 10 CFR 54.4 are identified as being within the scope of license renewal.

Using the information on the flow diagrams for the RBCCW, the staff sampled several components to determine whether the applicant properly identified the passive, long-lived components on the list of components that are subject to an AMR. The staff verified that the passive, long-lived components that are highlighted on the flow diagrams appear on the list of components that are subject to an AMR for the RBCCW system. No omissions were identified. On the basis of this review, the staff has reasonable assurance that the applicant has identified the components of the RBCCW system that are subject to an AMR.

2.3.4.16 Reactor Building HVAC

Summary of Technical Information in the Application

In LRA Section 2.3.4.15, the applicant identified portions of the reactor building HVAC System and the components that are within the scope of license renewal and subject to an AMR. The applicant stated in Section 2.3.4.15 of the LRA that additional information for the reactor building HVAC system is provided in Sections 10.9 and 9.4.2 of the UFSAR for Units 1 and 2, respectively. The system scoping is shown in evaluation boundary drawings HL-16005, Rev. A, HL-16014, Rev. A, and HL-16023, Rev. A, for Unit 1, and HL-26067, Rev. A, HL-26072, Rev. A, and HL-26071, Rev. A, for Unit 2.

The reactor building HVAC system utilizes a combination of air conditioning, heating, and once-through ventilation. Heat removal is provided by the ventilation air and the chilled-water (Unit 2 only) and service-water cooling coils that are served by the reactor and radwaste building chilled-water system and the PSW system, respectively. Hot water heating coils, served by the plant heating system, are provided for heating.

In Section 2.3.4.15 of the LRA, the applicant identified the following component functions that relate to 10 CFR 54.4(a)(1), 10 CFR 54.4(a)(2), and 10 CFR 54.4(a)(3):

- indirect radioactive release control
- essential mechanical/environmental support - ECCS room coolers
- essential mechanical/environmental support - RCIC and CRD room coolers

On the basis of the functions identified above, the applicant determined that all reactor building HVAC system safety-related components (electrical, mechanical, and instrument) are within the scope of license renewal. The applicant described its process for identifying the mechanical components subject to an AMR in Section 2.1.2 of the LRA. On the basis of this methodology, the applicant identified the portions of the reactor building HVAC system that are within the scope of license renewal in the system evaluation boundary drawings previously mentioned. Using the methodology described in Section 2.1.2 of the LRA, the applicant compiled a list of the mechanical components and component types within the license renewal boundaries that are subject to an AMR and identified their intended functions. The applicant provided this list in Table 2.3.4-15 of the LRA.

The applicant identified the following four device types that are identified as within the scope of license renewal and subject to an AMR:

- bolting (carbon steel)
- ductwork (galvanized steel)
- flow element (stainless steel)
- tubing (copper alloy)

In Table 2.3.4-15 of the LRA, the applicant further noted that the reactor building HVAC system fission product barrier and pressure boundary functions are the only applicable functions associated with components of the reactor building HVAC system that are subject to an AMR.

Staff Evaluation

The staff reviewed the above information to verify that the applicant identified the reactor building HVAC system components that are within the scope of license renewal and subject to an AMR. The staff determined whether there is reasonable assurance that the reactor building HVAC system components that are within the scope of license renewal and subject to an AMR have been identified in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1). The staff reviewed the information in the LRA and Sections 10.9 and 9.4.2 of the UFSAR for Units 1 and 2, respectively. After completing the initial review, the staff issued requests for additional information (RAIs) by letter dated July 14, 2000, regarding the reactor building HVAC system. The applicant responded to the RAIs by letter dated August 29, 2000.

In LRA Section 2.1, the applicant discussed the process for identifying mechanical components that are subject to an AMR. The applicant's scoping methodology is evaluated by the staff in Section 2.1 of this SER.

In its review of the reactor building HVAC system, the staff reviewed the reactor building HVAC system evaluation boundary drawings. The drawings show the evaluation boundaries for the portions of the reactor building HVAC system that are within the scope of license renewal. The

staff also reviewed Table 2.3.4-15 of the LRA which lists the components that are subject to an AMR.

The staff also reviewed Sections 10.9 and 9.4.2 of the UFSAR for Units 1 and 2, respectively, to determine if there were any portions of the reactor building HVAC system that met the scoping criteria in 10 CFR 54.4(a) that the applicant did not identify as being within the scope of license renewal. The staff also reviewed the UFSAR sections to determine if there was any system function that was not identified as an intended function in the LRA, and to determine if there were SCs that have an intended function that might have been omitted from the scope of SCs that are subject to an AMR. The staff also reviewed the reactor building HVAC evaluation boundary drawings to determine if any SCs within the evaluation boundaries were omitted from the scope of SCs that are subject to an AMR. The staff compared the system and intended functions described in the UFSAR with those identified in the LRA. The staff then determined whether the applicant had properly identified SCs that are subject to an AMR from among those identified as being within the scope of license renewal.

The applicant identified and listed the SCs that are subject to an AMR for the reactor building HVAC system in Table 2.3.4-15 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 sampled SCs from Table 2.3.4-15 to verify that the applicant identified the SCs that are subject to an AMR. The staff also sampled SCs that were identified as being within the scope of license renewal, but were not identified as being subject to an AMR, to verify that these SCs perform their intended functions with moving parts or with a change in configuration or properties, or are subject to replacement on the basis of a qualified life or specified time period.

To help ensure that those portions of the reactor building HVAC system that were identified as not being within the scope of license renewal do not perform any intended functions, the staff issued an RAI on the basis of the applicable information in the UFSAR and the LRA. The staff noted that Section 2.3.4.15 of the LRA presents a summary description of the system functions, evaluation boundary drawings highlight the evaluation boundaries of the reactor building HVAC system, and Table 2.3.4-15 of the LRA lists components that are within the scope of license renewal and subject to an AMR. The corresponding drawings for this system in the UFSAR, however, show additional components that were not listed in Table 2.3.4-15.

In RAIs 2.3.4-RBHVAC-1, 2.3.4-RBHVAC-2, and 2.3.4-RBHVAC-3, the staff requested specific information concerning the exclusion of the following components from the scope of license renewal and/or from an AMR:

(1) air operated valve bodies, air-operated damper housing, and associated ductwork (Unit 1)

(2) safeguards equipment room cooler housing, especially the CRD pump room cooler housing that is not identified as being within scope (Unit 1)

(3) air-operated valve bodies, air-operated damper housing, and associated ductwork (Unit 2)

(4) safeguards equipment room cooler housing, especially the CRD pump room cooler housing that is not identified as being within scope (Unit 2)

(5) sealant materials

(6) ductwork (Unit 1)

In the letter dated August 29, 2000, the applicant provided the following responses:

(1) Air-operated valve dampers and associated damper operators (Unit 1) are active components and, therefore, are not subject to an AMR. Damper operators consist of control valves and piping.

(2) Although safeguards equipment cooler housings (Unit 1) are within the scope of license renewal, cooler housings are considered to be part of an active component (fan-coil unit) and, therefore, no AMR is required for these components.

(3) Air-operated valve dampers and associated damper operators (Unit 2) are active components and, therefore, are not subject to an AMR.

(4) Although safeguards equipment cooler housing (Unit 2) are within the scope of license renewal, cooler housings are considered to be part of an active component (fan-coil unit) and, therefore, no AMR is required for these components.

(5) Sealant materials that are used to protect against unfiltered out-leakage from secondary containment are within the scope of license renewal, and are shown as "panel joint seals and sealants" in Table 2.4.5-1 of the LRA.

(6) Ductwork identified by the staff is not within the scope of license renewal. Ductwork that is within the scope of license renewal and subject to an AMR is shown in Table 2.3.4-15 of the LRA and appears as highlighted ductwork on the appropriate boundary drawings

The staff reviewed the applicant's response for sealant materials and found the response to be acceptable. However, in its response to RAI 2.3.4-RBHVAC-1, the applicant stated that, given the guidance in NEI 95-10, Appendix B, safeguards equipment room cooler housings are not subject to an AMR. With regard to this RAI, the applicant also did not address the scope of license renewal and an AMR as it relates to air-operated valve bodies, the air-operated damper housings, and associated ductwork. Additionally, in a telephone conference held on October 31, 2000, the applicant agreed to reconsider its response to RAI 2.3.4-RBHVAC-3, concerning whether certain ductwork identified by the staff is within the scope of license renewal and subject to an AMR.

The staff believes that the safeguards equipment room cooler housings may be within the scope of license renewal and subject to an AMR. The staff's position with regard to the treatment of the housings for the safeguards equipment room coolers is discussed in detail in the staff's evaluation of the SGTS in Section 2.3.3 of this SER. The staff's position in Section 2.3.3 of this SER applies to the treatment of the component passive functions of the reactor building HVAC system. Resolution of this issue, including the scoping clarification for the air-operated valve bodies, air-operated damper housing, and associated ductwork, was identified as part of Open Item 2.3.3.2-2 [2.3.3.2-2(d)].

By letter dated June 5, 2001, the applicant provided information regarding the disposition of fans, dampers, and heating and cooling coils within the scope of license renewal. Consistent with the

staff's guidance regarding evaluation of active components, the applicant identified the passive functions of damper frames, fan housings, fan inlet housings, and fan inlet screens in the reactor building HVAC system and added these components to the list of components in the LRA that are subject to an AMR. The applicant also identified any aging effects associated with the damper frames, fan housings, fan inlet housings, and fan inlet screens and provided an AMP to manage the aging. The applicant added these components to those listed in Tables 2.3.4-15 and 3.2.4-15 in the LRA. The staff's review of the aging effects and AMPs for the reactor building HVAC system components can be found in Section 3.4.3 of this SER. The applicant provided other clarifications and/or editorial changes, as appropriate. On the basis of the additional information provided by the applicant, the staff agrees that damper frames, fan housings, fan inlet housings, and fan inlet screens are within the scope of license renewal and subject to an AMR. On the basis of the previously noted information, this part of Open Item 2.3.3.2-2 [2.3.3.2-2(d)], as relates to reactor building HVAC system components, is closed.

The staff reviewed Section 2.3.4.15 of the LRA, supporting information in the UFSAR, the applicant's responses to the staff's RAI, and additional information provided by letter dated June 5, 2001. In addition, the staff sampled several components in the previously mentioned evaluation boundary drawings of the LRA to determine whether the applicant properly identified the components that are within the scope of license renewal and that are subject to an AMR. On the basis of the staff's review, the staff concludes that the applicant has adequately identified the components of the reactor building HVAC system that are within the scope of license renewal and that are subject to an AMR.

2.3.4.17 Refueling Equipment System

Summary of Technical Information in the Application

Section 2.3.4.2 of the LRA provides a description of the refueling equipment (RE) system and a list of structures and components that are subject to an AMR. The refueling platform equipment assembly is used to handle and transport reactor core internals and service and handling equipment associated with the refueling operation. The refueling platform assembly consists of the refueling platform, fuel grapple, grapple headlight, and the hardware required to assemble these components into a workable unit. The applicant states that the intended function of the RE system is to support fuel movement and control rod change out. The SCs that support this intended function include the refueling bridge, grapple, hoists, spent fuel servicing equipment, tools, and refueling interlocks. The applicant identified the structural integrity of the refueling platform as the passive, long-lived portion of the assembly that is within the scope of license renewal.

The applicant described its process for identifying the mechanical components that are within the scope of license renewal and subject to an AMR in Section 2.1.3 of the LRA. On the basis of this methodology, the applicant identified the refueling platform structure as the passive, long-lived portion of the system that requires an AMR. The four component types that were identified as being subject to an AMR include the anchors and bolts, miscellaneous steel, rivets, and structural steel. The applicant identified maintaining the structural integrity of the refueling platform as the function of these components.

Staff Evaluation

The applicant stated that the RE system is within the scope of license renewal because of its fuel/control rod handling intended function. The portions of the system that were identified as supporting this intended function include the refueling bridge, grapple, hoists, spent fuel servicing equipment, tools, and refueling interlocks. The staff reviewed Section 7.6, "Refueling Interlocks," of the Unit 1 UFSAR and Section 9.1, "Fuel Storage and Handling," of the Unit 2 UFSAR. The staff verified that the RE system did not have intended functions other than the fuel/control rod handling intended function. In addition, the staff verified that all components supporting the fuel/control rod handling intended function were identified as being within the scope of license renewal.

On the basis of the staff's review of the LRA and supporting information in the UFSAR, the staff has reasonable assurance that all portions of the RE system with intended functions that meet the criteria in 10 CFR 54.4 were identified as being within the scope of license renewal. Using the information provided in the LRA, the staff sampled several components to determine whether the applicant properly identified the passive, long-lived components on the list of components as being subject to an AMR in Table 2.3.4-2 of the LRA. The staff verified that the passive, long-lived components identified in Section 2.3.4.2 of the LRA appeared on the list of components that were identified as being subject to an AMR in Table 2.3.4-2. No omissions were identified. On the basis of this review, the staff has reasonable assurance that the applicant has identified the components of the RE system that are subject to an AMR.

2.3.4.18 Sampling System

Summary of Technical Information in the Application

The purpose of the primary containment hydrogen and oxygen analyzing (sampling) system is to provide a means of monitoring hydrogen and oxygen in the primary containment (drywell and torus). The system consists of two separate, redundant subtems, each of which is capable of analyzing the hydrogen and oxygen content from the drywell or torus. Each analyzer channel is operated in parallel from separate penetrations in the drywell and torus. The sample is drawn through a sample cooler by the sample system inlet pump, and then pumped to the hydrogen and oxygen analyzer cells. The sample is then returned to the primary containment by the sample system outlet pump.

System Intended Functions

The intended function of the sampling system is to display hydrogen/oxygen information. The hydrogen-oxygen analyzer system continually measures the hydrogen and oxygen concentrations in the primary containment atmosphere following a LOCA. This information is recorded in the MCR, and hydrogen concentrations in the drywell above a predetermined level are annunciated. The system is treated as safety-related, consistent with the requirements of Regulatory Guide 1.97, "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident," and is included in the environmental qualification program.

Component Intended Function

The components of the sampling system perform the following functions:

- fission product barrier
- pressure boundary

The component groups requiring an AMR, as identified in the LRA, include the piping and valve bodies.

Staff Evaluation

The purpose of the primary containment hydrogen and oxygen analyzing (sampling) system is to provide a means of monitoring hydrogen and oxygen in the primary containment (drywell and torus). The system consists of two separate, redundant subsystems, each of which is capable of analyzing the hydrogen and oxygen content from the drywell or torus. Each analyzer channel is operated in parallel from separate penetrations in the drywell and torus. The sample is drawn through a sample cooler by the sample system inlet pump, and then is pumped to the hydrogen and oxygen analyzer cells. The sample is then returned to the primary containment by the sample system outlet pump.

The staff reviewed Section 2.3.4.6 of the LRA to determine whether the applicant has identified the components in the sampling system that are within the scope of license renewal and subject to an AMR.

On the basis of the staff's review of the information presented in Section 2.3.4.6 of the LRA and the supporting information in the Plant Hatch UFSAR, the staff did not find any omissions by the applicant and, therefore, concludes that there is reasonable assurance that the applicant has adequately identified those portions of the sampling system 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).

2.3.4.19 Tornado Vents System

Summary of Technical Information in the Application

In LRA Section 2.3.4.14 of the LRA, the applicant describes the tornado vents system (TV) system, which is comprised of blowout panels that are designed to relieve excess pressure in various site structures. The TV system will blowout and vent the reactor and control building roofs under the following conditions:

- when wind velocity reaches 300 mph or greater
- when the internal static pressure in the building is increased to 55 lb/ft^2
- when the temperature reaches approximately 212°F

The applicant identified pressure equalization as the intended function of the TV system. A rapid depressurization of air surrounding site structures can occur if a tornado funnel suddenly engulfs a structure. In this case, venting is accomplished by the blowout panels, which are designed to fail at a pressure lower than the safe internal building pressure capability, thereby relieving excess pressure in all essential parts of such structures. The reactor building tornado relief vents are

safety-related, and are required to maintain secondary containment during normal operation and during an earthquake. An inadvertent opening of the tornado vents could compromise secondary containment integrity. Tornado vents are relied upon to remain closed to prevent or mitigate the consequences of accidents that could result in potential offsite exposure. The opening of the vents during a tornado is a safety function to prevent collapse of safety-related structures.

The applicant described its process for identifying the mechanical components within the scope of license renewal and subject to an AMR in Section 2.1.3 of the LRA. On the basis of this methodology, the applicant identified tornado vents as passive, long-lived structures that are subject to an AMR. The component types that are identified as being subject to an AMR include the screws, support frame, and tornado vent relief dome. The applicant identified structural support as the function of the screw and support frame components, and fission product barrier as the function of the tornado vent relief dome component.

Staff Evaluation

In Section 2.3.4.14 of the LRA, the applicant states that the tornado vents (TVs) are within the scope of license renewal because of their pressure equalization intended function. The TVs prevent the collapse of safety-related structures by failing before the structure can become pressurized. The staff reviewed Section 3.3, "Wind and Tornado Loadings," of the Unit 2 UFSAR to verify that the TV system does not have intended functions other than the pressure equalization intended function. In addition, the staff verified that all components that support the pressure equalization intended function were identified as being within the scope of license renewal.

On the basis of the staff's review of the LRA and supporting information in the UFSAR, the staff has reasonable assurance that all portions of the TV system with intended functions that meet the criteria in 10 CFR 54.4 were identified as being within the scope of license renewal.

Using the information provided in the LRA, the staff sampled several components to determine whether the applicant properly identified the passive, long-lived components on the list of components identified as being subject to an AMR in Table 2.3.4-14 of the LRA. Figure 3.3-1 in the Unit 2 UFSAR provides a diagram of the tornado vent structural grill system. The staff identified two components in the diagram that are not listed in LRA Table 2.3.4-14 as being subject to an AMR. Specifically, these components are the tornado vent concrete curb and the tornado vent grill. In RAI 2.3.4-TV-1, the staff asked the applicant to explain the functions of these components and the bases for excluding them from an AMR. The applicant responded that the concrete curb is within scope, and is addressed as part of the reactor building in Tables 2.4.5-1 and 3.3.1-5 of the LRA. The applicant further stated that the function of the vent grill is primarily to prevent debris from falling into the spent fuel pool. The vent grill does not perform an intended function. After reviewing the applicant's response, the staff found the response acceptable. The staff verified that the passive, long-lived components identified in LRA Section 2.3.4.14 appeared on the list of components that are subject to an AMR in LRA Table 2.3.4-14. No omissions were identified. On the basis of this review, the staff has reasonable assurance that the applicant has identified the components of the TV system that are subject to an AMR.

2.3.4.20 Traveling Water Screens/Trash Racks System

Summary of Technical Information in the Application

The intended functions of the traveling water screens/trash racks system are intake structure trash removal and screen wash isolation. The traveling water screens prevent debris from entering the portion of the intake structure from which the PSW pumps take suction. Large pieces of debris are prevented from reaching the traveling screens by the trash racks. The traveling screens system at Plant Hatch is composed of two traveling screens, two motors, and two screen wash lines. For the intended function of intake structure trash removal, the intake structure is equipped with trash screens and racks to keep debris out of the pump wells. The debris is removed from the screens by the screen wash water.

The screens and racks must remain structurally intact during an accident, but are not required to move. Therefore, the applicant only considered the screens and racks to be in scope for license renewal, and not the motors or screen wash lines. For the intended function of screen wash isolation, isolation of the screen wash lines in the safe shutdown mode is required during a fire to maintain safe shutdown paths 1 and 3.

The applicant described its process for identifying the mechanical components that within the scope of license renewal and subject to an AMR in Section 2.1.2 of the LRA. On the basis of its methodology, the applicant identified the portions of the traveling water screens/trash racks system that are within the scope of license renewal on evaluation boundary diagrams DL-11001 and HL-21033. The applicant listed the mechanical components and component functions within the license renewal boundaries that are subject to an AMR. In Table 2.3.4-16 of the LRA, the applicant identified five component types as being subject to an AMR, including sight glasses, trash racks, traveling screens, bolting and valve bodies. The applicant identified maintaining the pressure boundary as the function of the sight glasses, bolting and valve bodies. The function of the trash racks and traveling screens was identified as debris protection.

Staff Evaluation

The applicant provided evaluation boundary diagrams DL-11001 and HL-21033 of the traveling water screens/trash racks, and identified the mechanical components that are subject to an AMR and their functions. The applicant highlighted the detailed flow diagrams to identify those portions of the traveling water screens/trash racks system that are within the scope of license renewal. The applicant highlighted those components which, they believe, perform at least one intended function meeting the scoping requirements of 10 CFR 54.4. The staff compared the LRA flow diagrams to the descriptions in Section 9.2.1.2 of the Unit 2 UFSAR to ensure that they were representative of the traveling water screens/trash racks system. The staff verified that the components that were not highlighted do not perform any intended functions meeting the requirements of 10 CFR 54.4.

On the basis of a review of the LRA and supporting information in the UFSAR, the staff has reasonable assurance that all portions of the traveling water screens/trash racks system with intended functions meeting the criteria in 10 CFR 54.4 are identified as being within the scope of license renewal.

Using the information on the flow diagrams for the traveling water screens/trash racks system, the staff sampled several components to determine whether the applicant properly identified the

passive, long-lived components in the list of components that were identified as being subject to an AMR. The staff verified that the passive, long-lived components highlighted on the flow diagrams appear on the list of components that are subject to an AMR for the traveling water screens/trash racks system. No omissions were identified. On the basis of this review, the staff has reasonable assurance that the applicant has identified the components of the traveling water screens/trash racks system that are subject to an AMR.

2.3.4.21 Conclusion

On the basis of the staff's review of the information presented in Section 2.3.4 of the LRA, the supporting information in the Plant Hatch UFSAR, and the applicant's response to the staff's RAIs and Open Items 2.3.3.2-1, 2.3.3.2-2, and 2.3.4.2-1, the staff did not find any omissions by the applicant. Therefore, the staff concludes that there is reasonable assurance that the applicant adequately identified those portions of the auxiliary systems and their associated (supporting) SCs 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).

2.3.5 Steam and Power Conversion Systems

2.3.5.1 Introduction

In Section 2.3.5, "Steam and Power Conversion Systems," of the Plant Hatch LRA, the applicant described the components of the electro-hydraulic control (EHC) system and the main condenser system that are within the scope of license renewal and subject to an AMR. The staff reviewed these sections of the LRA to determine whether there is reasonable assurance that the applicant has identified all of the SSCs that are within the scope of license renewal, as required by 10 CFR Part 54.4(a), as well as all of the structures and components that are subject to an AMR, as required by 10 CFR Part 54.21(a)(1).

The staff reviewed the information submitted by the applicant to verify that the applicant has identified the intended functions of the steam and power conversion system that are within the scope of license renewal, and the components that are subject to an AMR, in accordance with the requirements of 10 CFR 54.4 and 10 CFR 54.21(a)(1).

The applicant identified and listed the components that are subject to an AMR for the steam and power conversion system in Tables 2.3.5-1 and 2.3.5-2 of the LRA using the screening methodology described in Sections 2.1.2 and 2.1.3 of the LRA. The screening methodology is evaluated by the staff in Section 2.1 of this SER.

The staff reviewed Plant Hatch Unit 1 UFSAR Section 11.2 and Unit 2 UFSAR Sections 10.1, 10.2A.1, and 10.4.1 to determine if there were any system functions that were not identified as intended functions in accordance with requirements of 10 CFR 54.4. The staff then reviewed the evaluation boundary drawings (HL-11601, HL-11602, HL-21012, HL-26000, HL-21012, HL-21031, HL-21046, HL-21056, HL-21205, and HL-26045) to verify that the applicant identified of all the components that are within the scope of license renewal in accordance with 10 CFR 54.4. Further, the staff verified the accuracy of the drawings and the completeness of Tables 2.3.5-1 and 2.3.5-2 by sampling the components adjacent to, but outside, the highlighted portion of the system to verify that all of the components that are within the scope of license renewal were included in the application. In addition, the staff sampled the components that are within the scope of license

renewal, but not subject to an AMR, to verify that all of the components that meet the requirements of 10 CFR 54.21(a)(1) were identified as being subject to an AMR.

After the initial review, in a letter dated July 14, 2000, the staff identified areas where additional information was needed to complete its safety review. The applicant responded to the RAIs in a letter dated August 29, 2000.

In reviewing Section 2.3.5 of the LRA, the staff found that this section, which is entitled "Steam and Power Conversion Systems," describes only the EHC and main condenser systems. The main steam and feedwater systems, which are also included in the Plant Hatch steam and power conversion systems, are not described in the LRA. This is inconsistent with the description in Plant Hatch Unit 2 UFSAR Section 10.1, which states that portions of the main steam and feedwater systems provide safety functions. These portions meet the requirements of 10 CFR 54.4 and, as such, should be within the scope of license renewal. In response to RAI 2.3.5-SPCS-1, the applicant stated that LRA scoping is based on functions. The only in-scope function performed by the feedwater system and main steam system is captured in function B21-02, reactor coolant pressure boundary, which is described in Section 2.3.1.2 of the LRA. The steam and power conversion systems at Plant Hatch only include piping downstream of the MSIVs. The staff's scoping review of these safety-related portions of the main steam and feedwater systems is discussed in Section 2.3.2, "Reactor Coolant System," of this SER. The staff finds the applicant's response to this RAI acceptable.

2.3.5.2 Electro-Hydraulic Control System

Summary of Technical Information in the Application

The function of the EHC system is to provide control of reactor pressure during reactor startup, power operation, and shutdown. The EHC system also provides a means of controlling main turbine speed and acceleration during turbine startup, and protects the main turbine from undesirable operating conditions by initiating alarms, trips, and runbacks.

The initial scoping, performed by the applicant and based on the functions, has determined that intended function N32-02, Main Turbine Pressure Regulators, is within the scope of license renewal for the EHC system. The main turbine pressure regulator function controls turbine control valve position by adjusting EHC pressure based on main steam pressure. The EHC regulators that are within the scope of license renewal are 1N11-N042A/B and 2N32-N301A/B. Transient analysis takes credit for the backup pressure regulator to function to prevent fuel damage in the event of a downscale failure of the inservice regulator. The associated piping and valve bodies are listed in Table 2.3.5-1 of the LRA as being within the scope of license renewal and subject to an AMR. The component function for the identified piping and valve bodies is the pressure boundary.

Staff Evaluation

In RAI 2.3.5-EHC-1, the staff noted that four EHC regulators, identified in Section 2.3.5.1 of the LRA as being within scope, could not be located on the boundary drawings. The RAI requested that the applicant identify the EHC regulators (1N11-N042A/B and 2N32-N301A/B) in the boundary drawings. In response, the applicant clarified the locations on the boundary drawings for the two Unit 1 regulators (drawing No. HL-11601), as well as for the two Unit 2 regulators (drawing No. HL-21012). However, the applicant indicated that there was an error on drawing HL-11601, in that it

identified two separate components with the same identifying number (N11-N042B). Based on the additional information, the staff was able to find these four regulators in the drawings as stated. By letter dated January 31, 2001, the applicant provided revised drawing HL-11601 that corrected the component identification error. The staff finds this acceptable.

Section 2.3.5.1 of the LRA states that transient analysis takes credit for the backup pressure regulator to function to prevent fuel damage in the event of a downscale failure of the inservice regulator. In the referenced UFSAR Sections (Section 11.2 for Unit 1, and Section 10.2A.1 for Unit 2), the staff found the information about the turbine overspeed protection function, but nothing about the "downscale failure of the inservice regulator." In RAI 2.3.5-EHC-2, the staff requested that the applicant explain the event of a "downscale failure of the inservice regulator" and the involvement of the EHC and associated components in the event. In response, the applicant stated that Unit 2 UFSAR Section 15.2.3.8 discussed the event of the "downscale failure of the inservice regulator," but called it "Pressure Regulator Failure - Closed." If the controlling regulator fails in the closed position, the backup regulator takes control of the turbine admission valves, preventing a serious transient. The event is only significant if the regulator fails closed without an operable backup regulator. Only the regulators and the piping and valves from the main steam piping to the regulators are needed for this function. The applicant stated that the main function of the EHC system is turbine control, which is not within the scope of license renewal. Furthermore, in a telephone conference on September 13, 2000, the applicant clarified that these regulators are instruments, which are active components (per the guidance in NEI 95-10) and therefore, are not subject to an AMR. On the basis of the information provided in the RAI response and the telephone conference on September 13, 2000, the staff concludes that the applicant has adequately clarified the nature of the "downscale failure of the inservice regulator."

2.3.5.3 Main Condenser System

Summary of Technical Information in the Application

The function of the main condenser system is to provide a heat sink for turbine exhaust steam, turbine bypass steam, and other flows such as cascading heater drains, air ejector condenser drains, exhaust from the feed pump turbines, gland seal condenser, feedwater heater shell operating vents, and condensate pump suction vents. The main condenser also deaerates and provides storage capacity for the condensate water to be used.

The main condenser system is a two-shell, single-pass, divided water box, deaerating type designed for condenser duty of 5.66×10^9 Btu/h, an inlet water temperature of 90 °F, and an average back pressure of 3.5 in. Hg absolute. During plant operation, steam from the last-stage, low-pressure turbine is exhausted directly downward into the condenser shells through exhaust openings in the bottom of the turbine casings. The condenser serves as a heat sink for several others flows, such as exhaust steam from the feed pump turbines, cascading heater drains, air ejector condenser drain, gland-seal condenser drain, feedwater heater shell operating vents, and condensate pump suction vents. Other flows occur periodically. These originate from condensate and reactor feed pump startup vents, reactor feed pump minimum recirculation flow, feedwater lines startup flushing, turbine equipment clean drains, low-point drains, extraction steam spills, makeup, and condensate. During abnormal conditions, the condenser is designed to receive (not simultaneously) turbine bypass steam, feedwater heater high-level dumps, and relief valve discharge from feedwater heater shells, steam-seal regulator, and various steam supply lines.

The initial scoping, performed by the applicant and based on the functions, has determined that the post-accident radioactive decay holdup function (N61-03) of the main condenser system is the intended function within the scope of license renewal. The main condenser system provides a method for main steam isolation valve (MSIV) leakage treatment. It uses the main steam drain lines to convey the MSIV leakage during post-accident conditions to the isolated main condenser. The main condenser provides holdup and allows "plate-out" of the fission products that may leak out from the closed MSIV during post-accident conditions. MSIV leakage that enters the condenser is ultimately released to the turbine building as noncondensible gases through the low-pressure turbine seal after significant plate-out of iodine. This function applies to Unit 2 only.

The associated piping, valve bodies, bolting, condenser shell, preheater, orifices, strainer, and thermowell are identified in LRA Table 2.3.5-2 as being subject to an AMR. The component functions of the valve bodies is pressure boundary, and the functions of all other components are pressure boundary and fission product barrier.

Staff Evaluation

In RAI 2.3.5-MC-1, the staff asked the applicant to explain the reason why the intended function of post-accident radioactive decay holdup (N61-03) for the main condenser system is not applicable for Unit 1. In response, the applicant stated that the licensing basis of the MSIV leakage control for Unit 1 and Unit 2 is different. Unit 1 was built and licensed without an MSIV leakage control system. Unit 2 was originally licensed with an MSIV leakage control system, but the MSIV leakage control system of Unit 2 was subsequently removed, with NRC approval, based on a commitment to include a portion of the Unit 2 condenser and associated piping as the radioactive decay holdup boundary for performing the MSIV leakage control function. Therefore, the intended function is not applicable for Unit 1. On the basis of the information provided in the RAI response, the staff concludes that the post-accident radioactive decay holdup function is applicable to Unit 2 only.

2.3.5.4 Conclusion

On the basis of the staff's review of the information presented in Section 2.3.5 of the LRA, the supporting information in the Plant Hatch UFSAR, the applicant's responses to the staff's RAIs, and the additional information provided in telephone conversations between the applicant and the staff, and letters dated September 13, 2000 and January 31, 2001, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the steam and power conversion systems that are within the scope of license renewal, as required by 10 CFR 54.4(a), and subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4 Scoping and Screening Results: Structures and Structural Components

2.4.1 Introduction

The applicant described the structures and structural components that are within the scope of license renewal and subject to an AMR in the following sections of the LRA: 2.4.1, "Piping Specialties"; 2.4.2, "Conduits, Raceways, and Trays"; 2.4.3, "Primary Containment"; 2.4.4, "Fuel Storage"; 2.4.5, "Reactor Building"; 2.4.6, "Drywell Penetrations"; 2.4.7, "Reactor Building Penetrations"; 2.4.8, "Turbine Building"; 2.4.9, "Intake Structure"; 2.4.10, "Yard Structures"; 2.4.11, "Main Stack"; 2.4.12, "EDG Building"; and 2.4.13, "Control Building." The staff reviewed these sections of the LRA to determine whether there is reasonable assurance that the applicant has

identified all of the structures, systems, and components (SSCs) that are within the scope of license renewal, as required by 10 CFR 54.4(a), and all of the structures and components (SCs) that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2 Conduits, Raceways, and Trays

Summary of Technical Information in the Application

LRA Section 2.4.2 describes the extent to which conduits, raceways, and trays are within the scope of license renewal and subject to an AMR. The purpose of conduits, raceways, and trays is to support cables and penetrations that are selected, routed, and located to prevent a loss of function of any system as a result of a cable failure, in order to ensure survivability during design-basis events.

The applicant listed two intended functions for conduits, raceways, and trays. The first is function R33-01, "Wire and Cable Integrity." This intended function is performed by conduits, raceways, and trays that are mounted seismic Category I. Conduits, raceways, and trays that perform this intended function are considered safety-related. Seismic Category I conduits, raceways, and trays support essential cable that feeds power supplies and controls. The second intended function is R33-02, "Wire and Cable Integrity - Non-Safety-Related." This intended function is performed by conduits, raceways, and trays that are not mounted seismic Category I or seismic Category II/I, and are considered non-safety-related. Non-safety-related conduits, raceways, and trays support non-essential cable that feeds power supplies and controls. Also, some nonseismic raceways are included in safe shutdown pathways.

The applicant described its process for identifying the structural/civil components that are within the scope of license renewal and subject to an AMR in Section 2.1.3 of the LRA. On the basis of this methodology, the applicant identified cable trays and supports as passive and long-lived components that are subject to an AMR. Specifically, the component types that were identified as being subject to an AMR in Table 2.4.2-1 of the LRA include cable trays and supports (carbon steel, galvanized steel, and aluminum). The applicant identified maintaining the structural support and non-safety-related structural support as the functions of these components.

Staff Evaluation

In Section 2.4.2 of the LRA, the applicant stated that conduits, raceways, and trays are within the scope of license renewal because of their wire and cable integrity intended functions. Conduits, raceways, and trays ensure the integrity of safety-related cables to survive a design-basis event. Seismic Category I conduits, raceways and trays are considered safety-related. The staff reviewed the application, as well as Section 8.8 of the UFSAR for Plant Hatch Unit 1 and Section 8.3 of the UFSAR for Plant Hatch Unit 2, to verify that the conduits, raceways, and trays do not have intended functions other than the cable integrity intended functions that are listed in the application. In addition, the staff verified that all of the components that support the cable integrity intended functions were identified as being within the scope of license renewal.

The staff reviewed the LRA and supporting information in the UFSAR, and forwarded one RAI to the applicant by letter dated July 14, 2000. RAI 2.4-CRT-1 primarily related to defining the boundaries of conduits, raceways, and trays that the applicant considers to be within the scope of license renewal. Since the applicant did not provide drawings to show which conduits, raceways,

and trays are considered to be within the scope of license renewal, the staff requested clarification as to the boundaries that define which conduits, raceways, and trays are within the scope of license renewal and those that are not within scope. In its response to the staff's RAI, dated August 29, 2000, the applicant provided the following additional information to clarify the boundaries of conduits, raceways, and trays that are considered to be within the scope of license renewal:

> "Except for non-safety-related conduits, raceways and trays and their supports (R33-02) that are not located within in-scope buildings and structures, all conduits, raceways and trays with the intended functions R33-01 (safety-related) and the remaining R33-02 (non-safety-related) components are in scope for license renewal."

Thus, intended functions R33-01 (Wire and Cable Integrity) and R33-02 (Wire and Cable Integrity/Non-Safety-Related) include the following components that are within the scope of license renewal:

1. all safety-related conduits, raceways, and trays regardless of location

2. all non-safety-related conduits, raceways, and trays that are located in buildings or structures that are within the scope of license renewal

The staff finds this to be acceptable. On the basis of the staff's review of the application and the applicant's RAI response, the staff concludes that there is reasonable assurance that the applicant has identified all portions of conduits, raceways, and trays with intended functions that meet the criteria in 10 CFR 54.4(a) as being within the scope of license renewal.

Using the information provided in the LRA and the UFSAR, the staff sampled several components to determine whether the applicant properly identified the passive, long-lived SCs that the applicant listed as being subject to an AMR in Table 2.4-2 of the LRA. No omissions were identified. On the basis of this review, the staff has reasonable assurance that the applicant has identified the SCs related to conduits, raceways, and trays that are subject to an AMR in Table 2.4-2.

2.4.3 Control Building

Summary of Technical Information in the Application

LRA Section 2.4.13 describes the basis for including the control building within the scope of license renewal, and identifies the components that are subject to an AMR. The control building houses the common control room for Units 1 and 2 and associated auxiliarjes. The building is a reinforced concrete structure with steel framing that consists of the following major reinforced concrete structural components:

- foundation mat
- floors with reinforced concrete beam and girder framing
- reinforced concrete or concrete block interior walls
- columns
- exterior walls and prestressed exterior wall panels
- slab on metal roof deck system supported by steel framing

The application lists function Z29-01, "Equipment Integrity and Personnel Habitability," as the only intended function of the control building. The control building includes the substructure, foundations, superstructure, walls, floors, and roof, which are necessary to maintain equipment integrity and personnel habitability. The control building is designed as a seismic Category I structure to protect vital equipment and systems both during and following the most severe natural phenomena. Access doors are separately addressed under function L48-01, "Containment Integrity."

The applicant described its process for identifying the structural/civil components that are within the scope of license renewal and subject to an AMR in Section 2.1.3 of the LRA. On the basis of this methodology, the applicant identified various component types as the passive and long-lived components that are subject to an AMR in Table 2.4.13-1 of the LRA. Specifically, the identified component types include anchors and bolts, blowout panels, miscellaneous steel, reinforced concrete, and structural steel. The applicant identified five component functions that support the control building intended function of these component types. These component functions are structural support, non-safety-related structural support, missile barrier, fission product barrier, and shelter/protection.

Staff Evaluation

In Section 2.4.13 of the LRA, the applicant states that the control building is within the scope of license renewal because of its equipment integrity and personnel habitability intended function. The staff reviewed the application, as well as Section 12.3.3 1.1 of the UFSAR for Plant Hatch Unit 1 and Section 3.2.1 of the UFSAR for Plant Hatch Unit 2, to verify that all control building intended functions are identified in the application. In addition, the staff verified that all components that support the control building intended function are identified as being within the scope of license renewal.

On the basis of the staff's review of the application and information in the UFSAR, the staff concludes that there is reasonable assurance that the applicant has identified all portions of the control building with intended functions that meet the criteria in 10 CFR 54.4(a) as being within the scope of license renewal.

Using the information provided in the LRA and the UFSAR, the staff sampled components to determine whether the applicant properly identified the passive, long-lived SCs that are listed as being subject to an AMR in Table 2.4.13-1 of the LRA. No omissions were identified. On the basis of this review, the staff has reasonable assurance that the applicant has identified the control building SCs that are subject to an AMR in Table 2.4.13-1.

2.4.4 Drywell Penetrations

Summary of Technical Information in the Application

LRA Section 2.4.6 describes the extent to which drywell penetrations are within the scope of license renewal and subject to an AMR. Drywell penetrations provide a path for cable currents/signal transmissions to pass through the primary containment to support various operating modes of associated systems, while maintaining the integrity of the primary containment. The general category of containment penetrations includes both electrical penetration assemblies, as well as the mechanical penetrations. However, mechanical penetrations, which serve a similar function

for mechanical piping penetrations as the electrical penetrations covered in this section, are covered under Section 2.4.3 of the LRA. Electrical penetrations are hermetically sealed penetrations that are welded to the primary containment shell plate. They are designed to maintain primary containment pressure integrity during all postulated operating and accident conditions. Accordingly, they are designed for the same pressure and temperature conditions as the drywell and pressure suppression chamber.

The application lists function T52-01, "Primary Containment Integrity," as the only intended function of the drywell penetrations. The penetrations maintain containment integrity, while providing a free path for cable currents/signals to pass through the primary containment. These signals support the various modes of operation of the systems that are associated with the cables.

The applicant described its process for identifying the structural/civil components that are within the scope of license renewal and subject to an AMR in Section 2.1.3 of the LRA. On the basis of this methodology, the applicant identified structural steel as the passive and long-lived component that is subject to an AMR in Table 2.4.6-1 of the LRA. The applicant identified the fission product barrier as the function of this component type.

Staff Evaluation

In Section 2.4.6 of the LRA, the applicant states that the drywell penetrations are within the scope of license renewal because of their primary containment integrity intended function. In this section of the LRA, the applicant referred only to electrical penetrations. Mechanical system penetrations are covered with the primary containment in Section 2.4.3 of the LRA. The drywell penetrations discussed in Section 2.4.6 provide a path for cable currents and signals to pass through the primary containment boundary to support operation of the various plant systems. The staff reviewed the application, as well as Section 5.2 of the Unit 1 UFSAR and Section 6.2.1 of the Unit 2 UFSAR, to verify that the drywell penetrations do not perform intended functions beyond the primary containment integrity intended function listed in the application. In addition, the staff verified that all components that support the drywell penetration intended function were identified as being within the scope of license renewal.

The staff reviewed the LRA and supporting information in the UFSAR, and issued an RAI related to this section, which was forwarded to the applicant by letter dated July 14, 2000. RAI 2.4-1 requested that the applicant provide clarifying information (either drawings or written descriptions) to define the boundaries of drywell penetrations that are within the scope of license renewal. The drywell penetration components subject to an AMR are listed in Table 2.4.6-1 of the LRA. In its response to the staff's RAI, dated August 29, 2000, the applicant provided no additional information. However, by letter dated January 31, 2001, the applicant clarified that all drywell penetrations are within the scope of license renewal. The staff finds this acceptable.

On the basis of the staff's review of the application, the staff concludes that there is reasonable assurance that the applicant has identified all drywell penetrations with intended functions that meet the criteria in 10 CFR 54.4(a) as being within the scope of license renewal.

Using the information provided in the LRA and the UFSAR, the staff reviewed the application to determine if the applicant properly identified the penetration components that are passive, long-lived, and subject to an AMR. Drywell penetration SCs that are subject to an AMR are identified in Table 2.4.6-1 of the LRA. No omissions were identified. On the basis of this review, the staff

has reasonable assurance that the applicant has identified the drywell penetration SCs that are subject to an AMR in Table 2.4.6-1.

2.4.5 EDG Building

Summary of Technical Information in the Application

LRA Section 2.4.12 describes the basis for including the emergency diesel generator (EDG) building within the scope of license renewal, and identifies components subject to an AMR. The EDG building houses the EDGs and their accessories, which are essential for safe plant shutdown for both Unit 1 and Unit 2. The EDG building is a reinforced concrete structure consisting of the following major reinforced concrete structural components:

- foundation mat
- exterior walls and interior walls
- roof and parapet wall

The EDG building includes labyrinth access openings for protection against tornado missiles. The building is designed as a seismic Category I structure because it protects vital equipment and systems both during and following the most severe natural phenomena.

The application lists function Y39-01, "EDG and Equipment Integrity," as the only intended function of the EDG building. In performing this intended function, the EDG building supports the EDGs and their accessories, and protects the equipment integrity for the EDGs, which provide essential ac power.

The applicant described its process for identifying the structural/civil components that are within the scope of license renewal and subject to an AMR in Section 2.1.3 of the LRA. On the basis of this methodology, the applicant identified various component types as the passive and long-lived components requiring an AMR in Table 2.4.12-1 of the LRA. Specifically, the identified component types include anchors and bolts, miscellaneous steel (carbon and galvanized), reinforced concrete, and structural steel (carbon and galvanized). The applicant identified four component functions that support the EDG building intended function for these component types. These component functions are structural support, non-safety-related structural support, missile barrier, and shelter/protection.

Staff Evaluation

In Section 2.4.12 of the LRA, the applicant stated that the emergency diesel generator (EDG) building is within the scope of license renewal because of its EDG and equipment integrity intended function. The staff reviewed the application, as well as Section 12.2.6 of the Unit 1 UFSAR and Section 9.4.5 of the Unit 2 UFSAR, to verify that all EDG building intended functions are identified in the application. In addition, the staff verified that all components that support the EDG building intended function are identified as being within the scope of license renewal.

In its review of the LRA and supporting information in the UFSAR, the staff forwarded one RAI to the applicant by letter dated July 14, 2000. RAI 2.4-EDGB-1 primarily related to clarifying information on whether ventilation components for the EDG (both cooling and combustion air) are within the scope of license renewal. EDG building components subject to an AMR are listed in

Table 2.4.12-1 of the LRA. The following summarizes the information provided in the applicant's RAI response, dated August 29, 2000:

> The following components associated with the EDG are within the scope of license renewal: the EDG combustion air intake and exhaust air components (intended function R43-01), and the EDG building ventilation components (intended functions X41-02, X41-03, X41-04, and X41-05). The ventilation components are listed on LRA Table 2.3.4-17. The following combustion components are listed on LRA Table 2.3.4-12: filter housing, carbon steel piping, and galvanized steel piping.

The staff finds the applicant's RAI response to be acceptable. On the basis of the staff's review of the application and the applicant's RAI response, the staff concludes that there is reasonable assurance that the applicant has identified all portions of the EDG building with intended functions that meet the criteria in 10 CFR 54.4(a) as being within the scope of license renewal.

Using the information provided in the LRA, the applicant's RAI response, and the UFSAR, the staff sampled components to determine whether the applicant properly identified the passive, long-lived SCs that are listed as being subject to an AMR in Table 2.4.12-1 of the LRA. No omissions were identified. On the basis of this review, the staff has reasonable assurance that the applicant has identified the EDG building SCs that are subject to an AMR in Table 2.4.12-1, or in other appropriate sections of the LRA.

2.4.6 Fuel Storage

Summary of Technical Information in the Application

LRA Section 2.4.4 provides a description of the extent to which the fuel storage system is within the scope of license renewal and subject to an AMR. The fuel storage system provides specially designed underwater storage space for the spent-fuel assemblies that require shielding during storage and handling. The fuel storage facility is located inside the secondary containment on the refueling floor, and includes the spent fuel pool, concrete vault and stainless steel liner, fuel pool gates, fuel racks, and other equipment that is necessary to properly store irradiated fuel and components.

The application lists two intended functions of the fuel storage system. The first is function T24-01, "Spent Fuel Integrity." This intended function is performed by the spent fuel pool, concrete vault and stainless steel liner, fuel pool gates, fuel racks, and other equipment that is necessary to properly store irradiated fuel and components. The fuel storage facility provides specially designed underwater storage space for the spent fuel assemblies that require shielding and cooling during storage and handling. The second intended function is T24-02, "New Fuel Integrity." This intended function is performed by the concrete vault and fuel racks. The portion of the fuel storage facility provides specially designed dry, clean storage areas for the new fuel assemblies.

The applicant described its process for identifying the structural/civil components that are within the scope of license renewal and subject to an AMR in Section 2.1.3 of the LRA. On the basis of this methodology, the applicant identified various component types as the passive and long-lived components that are subject to an AMR in Table 2.4.4-1 of the LRA. Specifically, the identified component types include anchors/bolts (carbon and stainless steel), miscellaneous steel, reinforced concrete, seismic restraints for the spent fuel storage racks (aluminum), storage racks

(aluminum), and structural steel. The applicant identified four functions of these components, including structural support, non-safety-related structural support, shelter/protection, and fission product barrier.

Staff Evaluation

In Section 2.4.4 of the LRA, the applicant stated that the fuel storage system is within the scope of license renewal because of its spent and new fuel integrity intended functions. The fuel storage system ensures integrity by providing safe storage either under water for spent fuel or in dry storage for new fuel. The staff reviewed the application, as well as Sections 10.2 and 10.3 of the Unit 1 UFSAR and Section 9.1 of the Unit 2 UFSAR, to verify that the fuel storage system does not have intended functions beyond the fuel integrity intended functions listed in the application. In addition, the staff verified that all components that support the fuel integrity intended functions were identified as being within the scope of license renewal.

The staff reviewed the LRA and supporting information in the UFSAR, and forwarded three RAIs to the applicant by letter dated July 14, 2000. RAIs 2.4-FS-1, 2.4-FS-2, and 2.4-FS-3 primarily related to clarifying information on the fuel storage system components subject to an AMR, as listed on Table 2.4.4-1 of the LRA. Since the applicant did not provide drawings to show which SCs are considered to be within the scope of license renewal, the staff requested clarification as to the boundaries that define which SCs are subject to an AMR. In its response to the staff's RAIs, dated August 29, 2000, the applicant provided the following additional information and clarifications:

- The new fuel storage racks are made of aluminum. The spent fuel storage racks are made of stainless steel and include Boral as a neutron absorber material. These racks were identified as Structural Steel in Table 2.4.4-1.

- The spent fuel storage racks are credited in maintaining the stored spent fuel in a subcritical state under all normal and abnormal storage configurations. The Boral plates are used as a neutron absorber. Therefore, reactivity control is an intended function of the Boral plates. The applicant determined that Boral had no aging effects that required management.

- The term "other equipment" used in the application in describing the boundaries of SCs that perform intended function T24-01 (Spent Fuel Integrity) includes items such as miscellaneous embedded steel, anchors and bolts, and a leak chase system. These items also contribute to maintaining the integrity of the spent fuel pool to meet its intended function.

On the basis of its response to the staff's RAIs, the applicant provided amended information which corresponds to the relevant line items in Table 2.4.4-1. The new fuel storage racks and spent fuel storage racks, their functions, and their materials are explicitly identified. Boral was added as a component material, and reactivity control was added as a component function for the spent fuel storage racks.

The staff finds the applicant's RAI responses to be acceptable. On the basis of the staff's review of the application and the applicant's RAI responses, the staff concludes that there is reasonable assurance that the applicant has identified all portions of the fuel storage system with intended functions that meet the criteria in 10 CFR 54.4(a) as being within the scope of license renewal.

Using the information provided in the LRA and the UFSAR, the staff sampled several components to determine whether the applicant properly identified the passive, long-lived SCs that are listed as being subject to an AMR in Table 2.4.4-1 of the LRA. No omissions were identified. On the basis of this review, the staff has reasonable assurance that the applicant has identified the fuel storage system SCs that are subject to an AMR in Table 2.4.4-1.

2.4.7 Intake Structure

Summary of Technical Information in the Application

LRA Section 2.4.9 describes the basis for including the plant service water system intake structure within the scope of license renewal, and for identifying its components as being subject to an AMR. The intake structure protects both the residual heat removal service water and plant service water equipment from the influence of adverse environmental conditions such as flooding, earthquakes, and tornadoes. Constructed of concrete and steel, the intake structure consists of the following major structural components:

- reinforced concrete foundation mat
- reinforced concrete exterior walls and internal walls
- reinforced concrete floors and roof
- structural steel framing and grating, steel water spray and internal missile shield barriers, stairs, and platforms

The intake structure is shared by both units. Labyrinth access openings protect the intake structure internal safety-related components from tornado missiles.

The application lists function W35-01, "RHRSW and PSW System Integrity," as the only intended function of the intake structure. The purpose of the intake structure is to prevent the influence of environmental conditions (e.g., flooding, earthquake, and tornadoes) from adversely impacting equipment that is essential for plant shutdown. The intake structure is a seismic Category I structure.

The applicant described its process for identifying the structural/civil components that are within the scope of license renewal and subject to an AMR in Section 2.1.3 of the LRA. On the basis of this methodology, the applicant identified various component types as the passive and long-lived components requiring an AMR in Table 2.4.9-1 of the LRA. Specifically, the identified component types include anchors and bolts, miscellaneous steel (carbon and galvanized), reinforced concrete, and structural steel (carbon and galvanized). The applicant identified six component functions that support the intake structure intended function of these component types. These component functions are structural support, non-safety-related structural support, shelter/protection, flood barrier, missile barrier, and flow direction.

Staff Evaluation

In Section 2.4.9 of the LRA, the applicant states that the plant service water (PSW)/residual heat removal service water (RHRSW) system intake structure is within the scope of license renewal because of its RHRSW and PSW system integrity intended function. The staff reviewed the application, as well as Section 12.2.7 of the Unit 1 UFSAR and Sections 3.8.4, 3.8.5, and 3.8.6 of the Unit 2 UFSAR, to verify that all intake structure intended functions are identified in the

application. In addition, the staff verified that all components that support the intake structure intended function are identified as being within the scope of license renewal.

In its review of the LRA and supporting information in the UFSAR, the staff forwarded four RAIs to the applicant by letter dated July 14, 2000. RAIs 2.4-IS-1, 2.4-IS-2, 2.4-IS-3, and 2.4-IS-4 primarily related to clarifying information regarding whether intake structure components have been adequately identified as being within the scope of license renewal. Intake structure components subject to an AMR are listed in Table 2.4.9-1 of the LRA. The following summarizes the new and clarifying information provided in the applicant's RAI responses, dated August 29, 2000:

- The difference between "miscellaneous steel" and "structural steel" in Table 2.4.9-1 is that structural steel is defined as substructure or superstructure steel that is part of the primary structural support function of a building or structure. Miscellaneous steel is defined as steel that does not perform a primary structural integrity function for a building, but does provide secondary structural support for equipment or components that are within the building. In some cases, it may provide protection around openings in floors or walls. For the intake structure, structural steel includes steel barriers utilized as water spray barriers and internally generated missile barriers. Miscellaneous steel includes embedded plates and/or frames and anchors used to support the missile or spray shields. The term "flow direction" used in LRA Table 2.4.9-1 is a label described in LRA Table 2.1-2 as "Provide spray shield or curbs for directing flow."

- Coarse trash racks, trash rakes, traveling water screens, and stop logs are within the scope of license renewal. Trash rakes and water screens are included in the traveling water screen/trash rack system, and stop logs are included in the intake structure. Traveling water screens and trash racks are described in LRA Section 2.3.4.16 and Table 2.3.4-16. Stop logs and steel supports for the trash racks are included in Section 2.4.9 of the LRA. In LRA Table 2.4.9-1, stop logs are included as structural steel components, and trash rack supports are included as miscellaneous steel components. Aging management of these components is addressed in Section C.2.6.3 of the LRA.

- The steel sheet piles are not considered to be within the scope of license renewal. The sheet piles were installed to facilitate dewatering of the intake structure excavation, and subsequent construction of the intake structure. As described in Section 12.2.7 of the Unit 1 UFSAR, the sheet piles provide protection to the intake structure from a direct hit by river traffic or debris flowing across the river channel. However, the UFSAR states that the sheet piles could fail and not prevent a safety function. Wood fender piles provide protection to the sheet pile cells by dissipating dynamic effects of moving loads. Impact of debris or river traffic on the sheet piles, wood fender piles, or on the front of the intake structure would not prevent the structure from providing water to the plant service water and RHR service water systems.

- The creosote wall constructed near the intake structure is not considered to be within the scope of license renewal. The UFSAR does describe the creosote wall as rerouting river water flow and preventing undercutting of the intake structure. However, given the flow characteristics of the river, and the river channel being located near the north bank and the intake structure being located on the south bank of the river, undercutting of the intake structure is not a credible event requiring protection for the Plant Hatch intake structure. Therefore, the creosote wall was not considered to be within the scope of license renewal.

The staff finds the applicant's RAI responses to be acceptable. On the basis of the staff's review of the application and the applicant's RAI responses, the staff concludes that there is reasonable assurance that applicant has identified all portions of Intake Structure with intended functions that meet the criteria in 10 CFR 54.4(a) as being within the scope of license renewal.

Using the information provided in the LRA, the applicant's RAI responses, and the UFSAR, the staff sampled components to determine whether the applicant properly identified the passive, long-lived SCs that are listed as being subject to an AMR in Table 2.4.9-1 of the LRA. No omissions were identified. On the basis of this review, the staff has reasonable assurance that the applicant has identified the Intake Structure SCs that are subject to an AMR in Table 2.4.9-1, or in other appropriate sections of the LRA.

2.4.8 Main Stack

Summary of Technical Information in the Application

LRA Section 2.4.11 describes the basis for including the main stack within the scope of license renewal, and for identifying components subject to an AMR. The main stack supports and protects monitoring equipment, and provides for the monitoring and elevated release of gaseous waste. The main stack is a cylindrical concrete structure that consists of the following major reinforced concrete components:

- the foundation mat supported on steel "H" piles
- the truncated conical cylinder stack structure
- the internal floors
- the loading bay, which consists of a concrete base slab, external and internal walls, and roof

Units 1 and 2 share a single main stack used to discharge gaseous waste. The main stack extends 120 meters above ground level.

The application lists function Y32-01, "Gaseous Effluent Elevated Release," as the only intended function of the main stack. In performing this intended function, the main stack houses equipment for monitoring gaseous effluent releases and ensures elevated release of these gaseous wastes to the environment.

The applicant described its process for identifying the structural/civil components that are within the scope of license renewal and subject to an AMR in Section 2.1.3 of the LRA. On the basis of this methodology, the applicant identified various component types as the passive and long-lived components requiring an AMR in Table 2.4.11-1 of the LRA. Specifically, the identified component types include anchors and bolts (carbon and stainless steel, copper alloy (bronze)), miscellaneous steel (galvanized), reinforced concrete, and structural steel (galvanized). The applicant identified five component functions that support the main stack intended function of these component types. These component functions are structural support, non-safety-related structural support, fission product barrier, radiation shielding, and shelter/protection.

Staff Evaluation

In Section 2.4.11 of the LRA, the applicant states that the main stack is within the scope of license renewal because of its gaseous effluent elevated release intended function. The staff reviewed the application, as well as Section 5.3.4 of the Unit 1 UFSAR and Section 11.3 of the Unit 2, to verify that all main stack intended functions are identified in the application. In addition, the staff verified that all components that support the main stack intended function are identified as being within the scope of license renewal.

On the basis of the staff's review of the application and supporting UFSAR information, the staff concludes that there is reasonable assurance that the applicant has identified all portions of the main stack with intended functions that meet the criteria in 10 CFR 54.4(a) as being within the scope of license renewal.

Using the information provided in the LRA and the UFSAR, the staff sampled components to determine whether the applicant properly identified the passive, long-lived SCs that are listed as being subject to an AMR in Table 2.4.11-1 of the LRA. No omissions were identified. On the basis of this review, the staff has reasonable assurance that the applicant has identified the main stack SCs that are subject to an AMR in Table 2.4.11-1.

2.4.9 Piping Specialties

Summary of Technical Information in the Application

LRA Section 2.4.1 describes of the extent to which structural piping supports are within the scope of license renewal and subject to an AMR. Piping specialties provide support for essential piping systems. The application defines "essential piping systems" as those required to maintain the integrity of safety-related and non-safety-related systems during normal operations and transient/accident mitigation. Section 2.4.1 also states that the "piping specialties" category also includes such components as snubbers and pipe restraints, regardless of the associated system supported, as well as non-ASME HVAC duct supports and tube trays.

The applicant listed two intended functions of piping specialties. The first is function L35-01, "Pipe Supports." This intended function is performed by all safety-related plant pipe supports, pipe restraints, and tubing supports. These pipe supports are provided for the reactor coolant system and subsystems to ensure the pressure-retaining capability of the piping systems when subjected to weight, seismic, and fluid dynamic loads. Pipe supports maintain the integrity of non-safety functions during accident and seismic events. The second intended function is L35-02, "Nonseismic Pipe Supports." This intended function is performed by pipe supports on non-safety-related piping (nonseismic category) located throughout the plant. These supports are designed only for dead weight and thermal loads. They are not designed for seismic loads. Section 2.4.1 of the LRA states that all seismic Category II supports are excluded from the scope of license renewal, unless they are required to support functions X43-04 (Plant Wide Fire Suppression With Water), W33-03 (Screen Wash Isolation), and N61-03 (Post-Accident Radioactive Decay Holdup).

The applicant described its process for identifying the structural/civil components that are within the scope of license renewal and subject to an AMR in Section 2.1.3 of the LRA. On the basis of this methodology, the applicant identified pipe supports, tube trays, and covers as passive and

long-lived components which require AMRs. The following three component types were specifically identified as being subject to an AMR in Table 2.4.1-1 of the LRA:

- hangers and supports for ASME Class I piping
- hangers and supports for non-ASME Class I piping, tubing, and ducts
- tube trays and covers

The applicant identified maintaining structural support as the component function that supports the piping specialties intended functions for these component types.

Staff Evaluation

In Section 2.4.1 of the LRA, the applicant states that piping specialties are within the scope of license renewal because of their piping support intended functions. These piping supports ensure the pressure retaining capability of piping, and are designed to withstand weight, seismic, and fluid dynamic loads. The staff reviewed the application to verify that the piping specialties do not have intended functions other than the piping support intended functions listed in the application. In addition, the staff verified that all components that support the piping support intended functions were identified as being within the scope of license renewal.

The staff reviewed the LRA and supporting information in the UFSAR, and forwarded several RAIs to the applicant by letter dated July 14, 2000. RAIs 2.4-PS-1, 2.4-PS-2, and 2.4-PS-3 primarily related to defining the boundaries of piping supports that the applicant considered to be within the scope of license renewal. Since the applicant did not provide drawings to show which piping specialty components are considered to be within the scope of license renewal, the staff requested clarification as to the boundaries that define the piping supports that are within the scope of license renewal, and those that are not within scope. In its response to the staff's RAIs, dated August 29, 2000, the applicant provided the following additional information to clarify the scope of piping supports that are considered to be within the scope of license renewal:

> "Pipe supports for non-safety-related piping that ensure the functionality of boundary valves that separate portions of systems required to remain functional during and after a design basis event are included in function L35-01. These supports comprise the group referenced in the second sentence of the L35-01 intended function in Section 2.4.1 that states, "[Other] Pipe supports maintain the integrity of non-safety functions during accident and seismic events." This sentence can be clarified to state that these non-safety pipe supports, which are located in Seismic Category I structures, are considered for Seismic II/I criteria to prevent failure of the non-safety piping system from adversely impacting the ability of a safety system to perform its function. Thus, all pipe supports located in a Seismic Category I structure, regardless if the supports are for safety-related or non-safety-related systems, are conservatively included in function L35-01 and are in-scope for license renewal. The only Seismic Category II supports not located in a Seismic Category I structure that are included in-scope for license renewal are for functions X43-04, W33-03, and N61-03."

Thus, intended function L35-01 (Pipe Supports) includes piping supports that are qualified to seismic Category I or seismic Category II/I requirements, regardless of system designation. The staff finds this to be acceptable. On the basis of the staff's review of the application and the

applicant's RAI responses, the staff concludes that there is reasonable assurance that the applicant has identified all portions of the piping specialties with intended functions that meet the criteria in 10 CFR 54.4(a) as being within the scope of license renewal.

Using the information provided in the LRA, the staff sampled several components to determine whether the applicant properly identified the passive, long-lived SCs that are listed as being subject to an AMR in Table 2.4-1 of the LRA. No omissions were identified. Treatment of piping segments for seismic Category II/I is addressed in Section 2.1.3.1 of this SER. On the basis of this review, the staff has reasonable assurance that the applicant has identified the piping specialty SCs that are subject to an AMR in Table 2.4.1-1.

2.4.10 Primary Containment

Summary of Technical Information in the Application

LRA Section 2.4.3 describes the primary containment and its intended function, which places it within the scope of license renewal and identifies it as being subject to an AMR. The purpose of the primary containment is to isolate and contain fission products that are released from the reactor primary system following a design-basis accident (DBA), and to confine the postulated release of radioactive material. The primary containment is a pressure suppression containment design which consists of a drywell, a pressure suppression chamber (torus) that stores a large volume of water (the suppression pool), a connecting vent system between the drywell and the pressure suppression pool, isolation valves, vacuum relief system, containment cooling systems, and other service equipment. The drywell houses the reactor vessel, the reactor coolant recirculating loops, and other branch connections of the reactor primary system. The pressure suppression chamber is a steel, torus-shaped pressure vessel located below the drywell. The torus is approximately 107 ft in its outer diameter and has a cross-sectional diameter of approximately 28 ft. The primary containment is designed so that seismic loadings are transmitted by the suppression chamber to the reinforced concrete foundation slab of the reactor building. The suppression chamber is designed so that it can be inspected from the outside.

The applicant provided nine evaluation boundary drawings for Unit 1 and seven drawings for Unit 2, all of which had intended function designations marked on the drawing to indicate the piping that is within the scope of license renewal because of the torus/drywell function (T23-01) intended function. These drawings are HL-16013, HL-16015, HL-16024, HL-16060, HL-16135, HL-16173, HL-16176, HL-16286, HL-16561, HL-26016, HL-26026, HL-26042, HL-26047, HL-26057, HL-26058, and HL-26993. The applicant lists T23-01, "Torus/Drywell," as the only intended function of the primary containment. The intended function of the primary containment system is to limit the release of fission products in the event of a postulated DBA so that offsite doses do not exceed the guidelines of 10 CFR Part 100. The pressure suppression pool initially serves as a heat sink for any postulated transient or accident condition in which the normal heat sink (main condenser or shutdown cooling system) is unavailable.

The applicant described its process for identifying the structural/civil components that are within the scope of license renewal and subject to an AMR in Section 2.1.3 of the LRA. On the basis of this methodology, the applicant identified various component types as the passive and long-lived components which require AMRs in Table 2.4.3-1 of the LRA. Specifically, the identified components include anchors/bolts, blind flanges, containment isolation valves (carbon and stainless steel), containment penetrations (mechanical), miscellaneous steel, piping (carbon and

stainless steel), reinforced concrete, steel bellows. structural steel, tubing, unreinforced concrete, vent pipe, vent header, and downcomers. The applicant identified several functions of these components, including structural support, non-safety-related structural support, fission product barrier, radiation shielding, pipe whip restraint, flood barrier, shelter/protection, missile barrier, high-energy/moderate energy (HE/ME) shielding, heat exchange, and pressure boundary.

Staff Evaluation

In Section 2.4.3 of the LRA, the applicant stated that the primary containment system is within the scope of license renewal because of its intended function to limit the release of fission products during a design basis accident. The staff reviewed the application, as well as Sections 5.1.2 of the Unit 1 UFSAR and Section 6.2.1 of the Unit 2 UFSAR, and the 16 drawings provided by the applicant (showing the portions of the primary containment that are within the scope of license renewal), to verify that all of the primary containment intended functions are identified in the application. In addition, the staff verified that all components that support the primary containment intended function are identified as being within the scope of license renewal.

The staff reviewed the LRA, the drawings provided by the applicant, and supporting information in the UFSAR, and forwarded two RAIs to the applicant by letter dated July 14, 2000. RAIs 2.4-PC-1 and 2.4-PC-2 primarily related to clarifying information on the primary containment system components subject to an AMR, as listed in Table 2.4.3-1 of the LRA. The following summarizes the staff's RAIs and the applicant's responses, dated August 29, 2000:

- Unidentified component number D001, located at position G3 on DWG HL-26016, was identified on the drawing as supporting intended function T23-01 (Torus/Drywell) and as being within the scope of license renewal. The staff could not determine what type of component it was from the legend provided by the applicant. In its RAI response, the applicant stated that this component is a flex hose made of stainless steel and was screened as piping in Table 2.4.3-1 of the LRA. In addition, the applicant stated that the aging management of this component can be found in Section C.2.2.9.2 of the LRA.

- The applicant neglected to identify five components as being within the scope of license renewal for the primary containment in drawings referenced for intended function T23-01, even though they do perform a primary containment pressure boundary function. Specifically, the five omitted components include 1) the tubing segment penetrating the primary containment at position B2 on DWG HL-26057, 2) the tubing segment penetrating the primary containment at position A2 on DWG HL-26057, 3) the personnel lock located at position D2 on DWG HL-26057, 4) the two equipment access hatches and the control rod drive removable hatch described in Section 3.8.2.1.3 of the Unit 2 UFSAR, and 5) the traversing in-core probe guide tube penetration described ection 3.8.2.1 of the Unit 2 UFSAR. The staff requested that the applicant indicate where these components are evaluated for an AMR in the LRA, or justify their exclusion from the scope of license renewal. In its RAI response, the applicant stated that tubing segments are routinely identified in the LRA as piping. The specific tubing segments penetrating the primary containment at A2 and B2 on HL-26057 are included in LRA Table 3.3.1-3 as piping. (This table links to LRA Section C.2.2.9.2 for the AMR and demonstration.) Personnel locks and equipment hatches penetrating containment are identified in LRA Table 2.4.3-1 as intended function T23-01 penetrations. The TIP is included in function C51-03 (Traversing In-core Probe), and is not within the scope of license renewal. However, the TIP guide tube does

support primary containment intended function T23-01, and is addressed in Table 2.4.3-1. The penetration for the TIP guide tube is covered under intended function T52-01 (Primary Containment Integrity) in Section 2.4.6 of the LRA.

The staff finds the applicant's RAI responses to be acceptable. On the basis of the staff's review of the application and the applicant's RAI responses, the staff concludes that there is reasonable assurance that the applicant has identified all portions of the primary containment system with intended functions that meet the criteria in 10 CFR 54.4(a) as being within the scope of license renewal.

Using the information provided in the LRA and the UFSAR, the staff sampled several components to determine whether the applicant properly identified the passive, long-lived SCs that are listed as being subject to an AMR in Table 2.4.3-1 of the LRA. No omissions were identified. On the basis of this review, the staff has reasonable assurance that the applicant has identified the primary containment system SCs that are subject to an AMR in Table 2.4.3-1.

2.4.11 Reactor Building

Summary of Technical Information in the Application

LRA Section 2.4.5 describes the extent to which the reactor building is within the scope of license renewal and subject to an AMR. The purpose of the reactor building is to shelter and support the refueling and reactor servicing equipment, new and spent fuel storage facilities, and other reactor auxiliary and service equipment. The building is a reinforced concrete structure with a steel superstructure that consists of the following major reinforced concrete structural components:

- foundation mat
- exterior walls and prestressed exterior wall panels
- floors with reinforced concrete beams and girders framing
- interior walls with some blockouts filled with concrete masonry
- roof slab on metal roof deck system supported by steel superstructure

The reactor building also completely houses the primary containment system, as well as the core standby cooling systems, reactor water cleanup demineralizer system, standby liquid control system, control rod drive system, reactor protection system, and electrical equipment components. The building is designed for minimum leakage to ensure the capability of the standby gas treatment system to reduce and hold the reactor building at a subatmospheric pressure under normal wind conditions.

The application lists intended function T29-01, "Containment and Support," as the only intended function of the reactor building. The reactor building provides primary containment during reactor refueling and maintenance operations. During these conditions, the primary containment may be open. When the primary containment is functional, the reactor building also provides an additional barrier to fission product release. Therefore, it is relied on to prevent or mitigate the consequences of accidents that could result in potential offsite exposure comparable to the guidelines of 10 CFR Part 100. This evaluation includes the blowout panels in the pipe-chase between the reactor building and the turbine building.

The applicant described its process for identifying the structural/civil components that are within the scope of license renewal and subject to an AMR in Section 2.1.3 of the LRA. On the basis of this methodology, the applicant identified various component types as the passive and long-lived components which require AMRs in Table 2.4.5-1 of the LRA. Specifically, the identified component types include anchors/bolts, blowout panels, (aluminum) miscellaneous steel, panel joint seals and sealants, reinforced concrete, and structural steel. The applicant identified various functions for these components, including structural support, non-safety-related structural support, HE/ME shielding, flood barrier, radiation shielding, missile barrier, fire barrier, shelter/protection, and fission product barrier.

Staff Evaluation

In Section 2.4.5 of the LRA, the applicant states that the reactor building is within the scope of license renewal because of its intended function to mitigate the consequences of accidents that could result in offsite exposure comparable to the guidelines in 10 CFR Part 100. The staff reviewed the application, as well as Section 12.2.1 of the Unit 1 UFSAR and Section 3.0 of the Unit 2 UFSAR, to verify that all reactor building intended functions are identified in the application. In addition, the staff verified that all components that support the reactor building intended function are identified as being within the scope of license renewal and subject to an AMR.

In its review of the LRA and supporting information in the UFSAR, the staff forwarded three RAIs to the applicant by letter dated July 14, 2000. RAIs 2.4-RB-1, 2.4-RB-2, and 2.4-RB-3 primarily related to clarifying information regarding the boundaries of the reactor building that are within the scope of license renewal, as well as clarifying information as to whether certain components are within the scope of license renewal. Reactor building components subject to an AMR are listed in Table 2.4.5-1 of the LRA. The following summarizes the information provided in the applicant's RAI responses, dated August 29, 2000:

- The reactor building structural components that are within the scope of license renewal include the refueling water seal assembly, the main steam line enclosure, the reactor pedestal, and the reactor coolant pump supports. The applicant indicated that the refueling water seal assembly is generically included in LRA Table 2.4.3-1 under "Structural Steel," the main steam line enclosure is included in Table 2.4.3-1 under the generic heading of "Concrete," and the reactor pedestal is included in LRA Table 2.4.3-1. The reactor pedestal is made of unreinforced concrete encased in a structural steel frame for Unit 2, and of reinforced concrete for Unit 1. In addition, the lug support attachments at the reactor recirculation pumps are evaluated as part of the pump casing in LRA Table 2.3.2-1 of the LRA. The supports and lug attachments to the structural steel are evaluated in LRA Table 2.4.1-1 as part of hangers and supports for ASME Class 1 piping. The foam glass inserts between buildings, described in Section 12.2.15.2.2 of the Unit 1 UFSAR, are not within the scope of license renewal. The foam glass originally maintained a gap between structures during construction so that there can be free movement during an earthquake. After construction of the plant, the foam glass was removed in all areas except below grade between the reactor building and its adjacent structures (control, turbine, and radwaste buildings). The foam glass served only as form work for maintaining the gap, and has no intended structural function.

- In general, the LRA includes the entire reactor building, along with all structural components that are within its boundary, within the scope of license renewal. These components are

primarily evaluated under function T29-01 (Containment and Support). However, several items have been addressed in greater detail in separate sections. For example, these separate sections in the reactor building include SCs with intended functions associated with primary containment (Torus/Drywell [T23-01]), fuel storage (Spent Fuel Integrity [T24-01] and New Fuel Integrity [T24-02]), penetrations (Primary Containment Integrity [T52-01] and Secondary Containment Integrity [T54-01]), cranes (Reactor Building Crane [T31-02]), tornado vents (Pressure Equalization [T38-01]), and so forth. These SCs were separately considered to facilitate evaluation of the components for specialized loadings, environmental parameters, and/or aging effects.

- In RAI-2.4-RB-3, the staff stated that airlock water stops appear to perform an intended function because they are part of the pressure boundary for the secondary containment. Accordingly, they should be included within the scope of license renewal. The applicant responded that only the three-bulb rubber water stop in the joint between the railroad airlock and the reactor building should have been in the LRA. The applicant stated that the three-bulb water stop is part of the pressure boundary for the secondary containment, does contribute to the intended function, and should have been included in the LRA. The applicant stated that the water stop will be subject to an AMR, and the results will be provided in a subsequent submittal. By letter dated January 31, 2001, the applicant stated that a screening record was prepared for the three-bulb waterstop embedded in the separation joint between the Unit 1 reactor building and the railroad airlock structure. Thus, the three-bulb waterstop has been added to the scope of license renewal. The letter stated that the intended function of this waterstop is to provide a pressure boundary or a fission product retention barrier to protect public health and safety during any postulated design-basis events. The waterstop has been addressed by an AMR.

On the basis of the staff's review of the application and the applicant's RAI responses, as well as the clarifying information provided in the applicant's letter dated January 31, 2001, the staff concludes that there is reasonable assurance that the applicant has identified all portions of the reactor building with intended functions that meet the criteria in 10 CFR 54.4(a) as being within the scope of license renewal.

Using the information provided in the LRA, the applicants RAI responses, and the UFSAR, the staff sampled several components to determine whether the applicant properly identified the passive, long-lived SCs that are listed as being subject to an AMR in Table 2.4.5-1 of the LRA. No omissions were identified. On the basis of this review, the staff has reasonable assurance that the applicant has identified the reactor building SCs that are subject to an AMR in Table 2.4.5-1, or in other appropriate sections of the LRA.

2.4.12 Reactor Building Penetrations

Summary of Technical Information in the Application

LRA Section 2.4.7 describes the basis for including reactor building penetrations that are within the scope of license renewal, and for identifying components subject to an AMR. The purpose of the reactor building penetrations is to allow mechanical and electrical equipment and personnel to pass through the secondary containment to support plant operations, while maintaining secondary containment integrity within design limits. As noted in LRA Section 2.4.5, the reactor building provides a barrier to fission product release when the primary containment is open (e.g., for

refueling or maintenance operations). Penetrations for piping and ducts are designed for leakage characteristics consistent with containment requirements for the entire building. Electrical cables and instrument leads pass through ducts that are sealed into the building wall.

The application lists function T54-01, "Secondary Containment Integrity," as the only intended function of reactor building penetrations. In performing this intended function, reactor building electrical and mechanical penetrations maintain secondary containment leakage rates within design limits, while allowing piping and conductors to penetrate the secondary containment boundary. The applicant stated that this function also includes the structural support feature of Nelson Frames. The electrical aspect of Nelson Frames is included as part of Electrical Screening (refer to LRA Table 2.5.15-1), and is evaluated in Section 2.5 of this SER.

The applicant described its process for identifying the structural/civil components that are within the scope of license renewal and subject to an AMR in Section 2.1.3 of the LRA. On the basis of this methodology, the applicant identified structural steel (galvanized and carbon steel) as the passive and long-lived component requiring an AMR in Table 2.4.7-1 of the LRA. The applicant identified the fission product barrier as the function of this component type.

Staff Evaluation

In Section 2.4.7 of the LRA, the applicant states that the reactor building penetrations are within the scope of license renewal because of their secondary containment integrity intended function. In this section of the LRA, the applicant referred to both mechanical and electrical penetrations. The reactor building penetrations discussed in Section 2.4.7 provide a path for mechanical and electrical components and signals, and personnel, to pass through the secondary containment to support operating modes of various plant equipment and systems, while maintaining secondary containment integrity. The staff reviewed the application, as well as Section 5.3.3.2 of the Unit 1 UFSAR and Figure 8.3-11 of the Unit 2 UFSAR, to verify that the reactor building penetrations do not perform intended functions beyond the secondary containment integrity intended function listed in the application. In addition, the staff verified that all components that support the reactor building penetration intended function were identified as being within the scope of license renewal.

The staff reviewed the LRA and supporting information in the UFSAR, and issued an RAI related to this section, which was forwarded to the applicant by letter dated July 14, 2000. RAI 2.4-1 requested that the applicant provide clarifying information (either drawings or written descriptions) to define the boundaries of reactor building penetrations that are within the scope of license renewal. The reactor building penetration components subject to an AMR are listed in Table 2.4.7-1 of the LRA. In its response to the staff's RAI, dated August 29, 2000, the applicant provided no additional information. However, by letter dated January 31, 2001, the applicant clarified that all external reactor building penetrations are within the scope of license renewal. The staff finds this acceptable.

On the basis of the staff's review of the application, the staff concludes that there is reasonable assurance that the applicant has identified all reactor building penetrations with intended functions that meet the criteria in 10 CFR 54.4(a) as being within the scope of license renewal.

Using the information provided in the LRA and the UFSAR, the staff sampled components to determine if the applicant properly identified the penetration components that are passive, long-lived, and subject to an AMR. Reactor building penetration SCs that meet the intended function

are subject to an AMR and are identified in Table 2.4.7-1 of the LRA. No omissions were identified. On the basis of this review, the staff has reasonable assurance that the applicant has identified the reactor building penetration SCs that are subject to an AMR in Table 2.4.7-1.

2.4.13 Turbine Building

Summary of Technical Information in the Application

LRA Section 2.4.8 describes the basis for including the turbine building within the scope of license renewal, and identifies the components subject to an AMR. The turbine building houses the turbine-generator and associated auxiliaries, such as the condensate and feedwater systems. Constructed of steel and concrete, the turbine building consists of the following major, reinforced concrete, structural components:

- foundation mat
- both self-supporting floors and floors supported by structural steel framing
- concrete block or reinforced concrete interior walls
- turbine pedestal resting on concrete mat foundation
- exterior walls
- concrete slab on metal roof deck system supported by steel framing

The turbine building does not house any equipment or instrumentation that would preclude the ability to safely shut down the reactor if it were damaged by a high-energy line failure. The turbine building is designed and constructed to ensure that it will not damage Category I structures or equipment located inside or adjacent to it in the event of a design-basis event (DBE).

The application lists function U29-01, "BOP [Balance of Plant] Equipment Integrity and Support," as the only intended function of the turbine building. This intended function places portions of the turbine building within the scope of license renewal. Specifically, the cable chase area below elevation 147 ft is designed to seismic Category I criteria. A seismic Category I barrier is located between the main steam and feedwater piping above elevation 147 ft and the cable chase area below. This barrier prevents the postulated failure of the main steam or feedwater piping in the turbine building from adversely affecting the cables below. These cables provide trip inputs for the recirculation pump trip and reactor scram following either a generator load rejection or turbine trip originating in the turbine building. On the basis of these considerations, the portions of the Unit 1 turbine building and the cable chase area below elevation 147 ft are within the scope of license renewal. Similarly, the portions of the Unit 2 turbine building and the cable chase area below elevation 147 ft are also within scope, as are the supports over the radioactive release pathway for the main condenser.

The applicant described its process for identifying the structural/civil components that are within the scope of license renewal and subject to an AMR in Section 2.1.3 of the LRA. On the basis of this methodology, the applicant identified various component types as the passive and long-lived components requiring an AMR in Table 2.4.8-1 of the LRA. Specifically, the identified component types include anchors and bolts, miscellaneous steel, reinforced concrete, and structural steel. The applicant identified four component functions that support the turbine building intended function for these component types. These component functions are structural support, non-safety-related structural support, shelter/protection, and radiation shielding.

Staff Evaluation

In Section 2.4.8 of the LRA, the applicant states that the turbine building is within the scope of license renewal because of its balance of plant equipment integrity and support intended function. The staff reviewed the application, as well as Section 12.2.2 of the Unit 1 UFSAR and Section 3.2 of the Unit 2 UFSAR, to verify that all turbine building intended functions are identified in the application. In addition, the staff verified that all components that support the turbine building intended function are identified as being within the scope of license renewal.

In its review of the LRA and supporting information in the UFSAR, the staff forwarded one RAI to the applicant by letter dated July 14, 2000. RAI 2.4-TB-1 primarily related to clarifying information on the boundaries of the turbine building that are within the scope of license renewal. Turbine building components subject to an AMR are listed in Table 2.4.8-1 of the LRA. The following summarizes the information provided in the applicant's RAI responses, dated August 29, 2000:

- The staff identified an apparent discrepancy in the information provided by the applicant. Section 2.4.8 of the LRA states that the turbine building is designed and constructed to ensure that it will not damage any seismic Category I structure or equipment located inside or adjacent to it. In addition, cables that are important to safety are located in a seismic Category I chase area within the turbine building. Drawing EL-10173, "General Building Site Plan," indicates that the entire turbine building for Units 1 and 2 is within the scope of license renewal. However, Section 2.4.8 of the LRA indicates that the applicant proposed to include only certain portions of the structure within the scope of license renewal. The staff, therefore, requested that the applicant clarify whether the entire turbine building structure for Units 1 and 2 is within the scope of license renewal, or provide a justification for omitting portions of the turbine building from the scope of license renewal. In its response, the applicant stated that only certain portions of the Unit 1 and 2 turbine buildings meet any of the scoping criteria of the License Renewal Rule. The turbine buildings are Category II structures. Therefore, failure of either structure will neither result in the release of significant radioactivity nor prevent reactor shutdown. The Unit 1 and 2 turbine buildings, as structures, are only within the scope of license renewal to the extent that they are non-safety-related structures that could prevent a safety-related function. That extent is discussed in the following paragraphs.

- A portion of each turbine building was designed to seismic Category I criteria. The cable chase area below elevation 147 ft, described in Unit 1 UFSAR Section N.3.2.4 and Unit 2 UFSAR Section 15A.3.2.D, has been included witin the scope of license renewal. As stated in Section 12.2.15.2.2 of the Unit 1 UFSAR, the turbine buildings are designed and constructed to ensure that they will not damage Category I structures or equipment located inside or adjacent to them in the event of a DBE. Thus, the applicant only considered those portions of each turbine building adjacent to Category I structures or having Category I equipment inside them as being within scope. The applicant's assessment also includes within scope for license renewal the south end of the Unit 1 turbine building up to and including the bay extending north of the Unit 1 reactor building, and the north end of the Unit 2 turbine building up to and including the bay extending south of the Unit 2 reactor building. The structural elements included in this scope are the base mat, columns, exterior walls, and roof, as well as the cable chase areas described above.

- The evaluation boundary drawing (EL-10173) depicting the in scope structures shows that the entire turbine building is in scope for both units. This drawing reflects the practical consideration that the scope of the program credited to manage aging effects for the turbine building structural components includes the entire building. Thus, in practice, any distinction as to the portions of the turbine buildings that are in scope is rendered unnecessary.

The staff finds the applicant's RAI response to be acceptable. On the basis of the staff's review of the application and the applicant's RAI response, the staff concludes that there is reasonable assurance that the applicant has identified all portions of the turbine building with intended functions that meet the criteria in 10 CFR 54.4(a) as being within the scope of license renewal.

Using the information provided in the LRA, the applicant's RAI responses, and the UFSAR, the staff sampled several components to determine whether the applicant properly identified the passive, long-lived SCs that are listed as being subject to an AMR in Table 2.4.8-1 of the LRA. No omissions were identified. On the basis of this review, the staff has reasonable assurance that the applicant has identified the turbine building SCs that are subject to an AMR in Table 2.4.8-1.

2.4.14 Yard Structures

Summary of Technical Information in the Application

LRA Section 2.4.10 describes the basis for including yard structures in the scope of license renewal, and identifies the components subject to an AMR. Yard structures provide structures for maintaining equipment integrity and personnel habitability on the plant site. Among others, this category includes:

- the concrete wall and foundation accommodating the condensate storage tank
- the foundation of the nitrogen storage tank
- the service water valve pit boxes
- the foundation for the fire pump house
- the foundations for the two fire protection water storage tanks
- the foundations for the two fire protection diesel pump fuel tanks
- the underground concrete duct runs and pull boxes between Class I structures

The application lists function Y29-01, "Equipment Integrity and Personnel Habitability," as the only intended function of yard structures. In performing this intended function, the yard structures provide for equipment integrity and personnel habitability within the various structures listed above. For instance, the liquid nitrogen tank foundation is within the scope of license renewal because the foundation is seismic Category I, thus ensuring the integrity of the nitrogen tank during a seismic event. The liquid nitrogen tank provides the safety-related backup supply of motive gas for the drywell inerting system and the drywell pneumatic system, and is relied upon in certain safety analyses described in the UFSAR. In addition, the liquid nitrogen tank is relied upon to achieve safe shutdown in the event of a fire. Similarly, the enclosure around the CST, the wall, and the CST foundation are also seismically qualified to Category 1 requirements to ensure the functionality of the CST during a seismic event. The service water valve boxes are also within the scope of license renewal because they contain piping for the plant service water system that is also within the scope of license renewal. As stated above, the concrete duct runs and pull boxes that traverse the yard between various Class I structures are also within the scope of license renewal. These

duct runs provide protection for the safety-related circuits that are routed through them. The foundations for the fire pump house, fire protection water storage tanks, and fire protection diesel pump fuel tanks are also within the scope of license renewal.

The applicant described its process for identifying the structural/civil components that are within the scope of license renewal and subject to an AMR in Section 2.1.3 of the LRA. On the basis of this methodology, the applicant identified various component types as the passive and long-lived components requiring an AMR in Table 2.4.10-1 of the LRA. Specifically, the identified component types include anchors and bolts, pull box cover plates (aluminum), miscellaneous steel, reinforced concrete, and structural steel. The applicant identified four component functions that support the yard structures intended function of these component types. These component functions are structural support, non-safety-related structural support, shelter/protection, and flood barrier.

Staff Evaluation

In Section 2.4.10 of the LRA, the applicant states that yard structures are within the scope of license renewal because of their equipment integrity and personnel habitability intended function. The staff reviewed the application, as well as Section 5.2.3.9 of the Unit 1 UFSAR and Section 3.8.5.1 of the Unit 2 UFSAR, to verify that all yard structures' intended functions are identified in the application. In addition, the staff verified that all components that support the yard structures intended function are identified as being within the scope of license renewal.

In its review of the LRA and supporting information in the UFSAR, the staff forwarded one RAI to the applicant by letter dated July 14, 2000. RAI 2.4-1 primarily related to clarifying information on what yard structures are within the scope of license renewal. Yard structures components subject to an AMR are listed in Table 2.4.10-1 of the LRA. The following information was provided in the applicant's RAI response, dated August 29, 2000:

> "Yard structures are addressed in Section 2.4.10 and screening results shown in Table 2.4.10-1. On page 2.4-1 of the application, Section 2.4, the application "[notes] that the intended functions define the boundaries by which various component groups are analyzed for aging management purposes. The system description is informational and is not intended to define boundaries." Not all yard structures are in the scope of license renewal. This is why the application refers to "some of the structures" on page 2.4-19. Only the yard structures that support an intended function are included within the evaluation boundaries described on pages 2.4-19 and 2.4-20. Supporting information for the scoping and screening of structures pursuant to both the Rule requirements and the scoping and screening methodology described in the LRA is available at the SNC corporate offices for NRC review."

This response did not adequately provide the information that the staff needed to complete its review. Therefore, a telephone conference was held with the applicant on December 28, 2000. In this conference call, the applicant stated that the yard structures listed in Section 2.4.10 of the LRA are the only yard structures with an intended function. Therefore, they are the only yard structures that are within the scope of license renewal. After further review, the staff did not identify any yard structures with intended functions that were not included in this list, or covered elsewhere in the application. Therefore, the staff finds that the applicant's RAI response is acceptable. On the basis of the staff's review of the application and the applicant's RAI response, the staff

concludes that there is reasonable assurance that the applicant has identified all portions of the yard structures with intended functions that meet the criteria in 10 CFR 54.4(a) as being within the scope of license renewal.

Using the information provided in the LRA, the applicant's RAI response, and the UFSAR, the staff sampled components to determine whether the applicant properly identified the passive, long-lived SCs that were listed as being subject to an AMR in Table 2.4.10-1 of the LRA. No omissions were identified. On the basis of this review, the staff has reasonable assurance that the applicant has identified the yard structure SCs that are subject to an AMR in Table 2.4.10-1.

2.4.15 Conclusions

As part of this evaluation, the staff reviewed the information presented in Sections 2.4.1 through 2.4.13 of the LRA, the supporting information in the Plant Hatch UFSARs, the applicant's responses to the staff's RAIs, and the additional information provided in telephone conferences and by letter dated January 31, 2001. On the basis of that review, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the Plant Hatch structures and structural components 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).

2.5 Scoping and Screening Results: Electrical Components

In Section 2.5, "Electric Power and Instrumentation and Controls Screening Results," of the Plant Hatch LRA, the applicant describes the electrical components that are within the scope of license renewal and subject to an AMR. The staff reviewed this section of the LRA to determine whether there is reasonable assurance that all SSCs within the scope of license renewal have been identified, as required by 10 CFR Part 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)(1).

2.5.1 Summary of Technical Information in the Application

The electrical component screening process has the following steps:

- Develop a comprehensive list of all electrical component types installed in the plant without regard for system function or license renewal in-scope status.

- Determine the basic function of each type of electrical component.

- Determine which component types perform their functions without moving parts or a change in configuration or properties. This results in the list of electrical component types which are subject to an aging management review for license renewal.

- Apply the scoping criteria of 10 CFR 54.4(a)(1) through (3) to the list of component types to determine if the list can be reduced.

On the basis of this scoping methodology, the applicant identified the following systems in order to determine which electrical components groups are subject to an aging management review:

- analog transmitter trip system

- nuclear steam supply shutoff system
- primary containment isolation system
- reactor protection system
- remote shutdown panels system
- process radiation monitoring system
- heat trace system
- main control room panels system
- in-plant auxiliary control panels system
- plant AC electrical system
- DC electrical system
- plant communications system
- power transformers system
- emergency response facilities system

The applicant's scoping methodology identified the following electrical device types and their intended functions as subject to an aging management review:

• Cable (inside containment)	Provides insulation resistance to prevent shorts, grounds, and unacceptable leakage currents
• Cable (outside containment)	Provides insulation resistance to prevent shorts, grounds, and unacceptable leakage currents
• Electrical connectors, splices, terminal blocks	Provides insulation resistance to prevent shorts, grounds, and unacceptable leakage currents
• Electrical penetration assemblies	Provide insulation resistance to prevent shorts, grounds, and unacceptable leakage currents
• Nelson frames	Fission product barrier Fire protection
• Phase bussing	Provides insulation resistance to prevent shorts, grounds, and unacceptable leakage currents

2.5.2 Staff Evaluation

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

Electrical Components Within the Scope of License Renewal and Subject to an Aging Management Review

In the first step of its evaluation, the staff determined that the applicant had properly identified the electrical component types installed in the plant. The applicant developed the following comprehensive list of electrical component types installed in the plant without regard for system function or license renewal in-scope status:

alarm units
analyzers
annunciators
batteries
battery chargers
cables
circuit breakers
controllers
converters
electric heaters
electrical connectors
electronic devices
emergency lighting
fuses
grounding
heat tracing
indicators
installed communication equipment
isolators
magnetic contactors
motor-generator sets
motors
penetration assemblies
penetrations (Nelson frames)
phase bussing
power distribution
power supply
recorders
regulators
relays
sensors
signal conditioners
switches
timers
transformers
transmitters
valve operators

In the second step of its evaluation, the staff reviewed the basic function of each component type and the applicant's determination of which component types perform their functions without moving parts or a change in configuration or properties (passive and long-lived components) and therefore are subject to an AMR. The staff concludes that the applicant has properly identified the passive, long-lived component types.

In the third step of its evaluation, the staff reviewed the list of passive, long-lived component types to determine which met the criteria of 10 CFR 54.4(a)(1) through (3). This step defined the set of electrical component types subject to an AMR

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

- cable (inside containment)
- cable (outside containment)
- electrical connectors, splices, terminal blocks
- electrical penetration assemblies
- Nelson frames (penetrations)
- phase bussing

Finally, the staff reviewed the information submitted by the applicant and verified that the applicant had not omitted or misclassified any electrical components requiring an AMR.

2.5.3 Conclusions

On the basis of the staff's review of the information presented in Section 2.5 of the LRA and the supporting information in the Plant Hatch UFSAR, the staff did not find any omissions by the applicant, and therefore concludes that there is reasonable assurance that the applicant has identified those parts of the electrical systems that are within the scope of license renewal, as required by 10 CFR Part 54.4(a), and subject to an AMR, as required by 10 CFR Part 54.21 (a)(1).