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United States Nuclear Regulatory Commission

Protecting People and the Environment

NUREG-1931

Safety Evaluation Report

Related to the License Renewal of Susquehanna Steam Electric Station, Units 1 and 2

Docket Nos. 50-387 and 50-388

PPL Susquehanna, LLC

Office of Nuclear Reactor Regulation

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NUREG-1931

Safety Evaluation Report

Related to the License Renewal of Susquehanna Steam Electric Station, Units 1 and 2

Docket Nos. 50-387 and 50-338

PPL Susquehanna, LLC

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ABSTRACT

This safety evaluation report (SER) documents the technical review of the Susquehanna Steam Electric Station (SSES), Units 1 and 2, license renewal application (LRA) by the United States (US) Nuclear Regulatory Commission (NRC) staff (the staff). By letter dated September 13, 2006, PPL Susquehanna, LLC (PPL or the applicant) submitted the LRA in accordance with Title 10, Part 54, of the *Code of Federal Regulations*, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants." PPL requests renewal of the Units 1 and 2 operating licenses (Facility Operating License Numbers NPF-14 and NPF-22, respectively) for a period of 20 years beyond the current expirations at midnight July 17, 2022, for Unit 1, and at midnight March 23, 2024, for Unit 2.

SSES is located approximately 5 miles northeast of Berwick, PA. The NRC issued the construction permits for Units 1 and 2 on November 2, 1973. The NRC issued the operating licenses for Unit 1 on July 17, 1982, and on March 23, 1984, for Unit 2. Units 1 and 2 are of Mark 2 boiling water reactor (BWR) design. General Electric supplied the nuclear steam supply system and Bechtel originally designed and constructed the balance of the plant. On January 30th, 2008, an Extend Power Uprate amendment was approved for SSES and the licensed power output of each unit is 3952 megawatt thermal with a gross electrical output of approximately 1300 megawatt electric.

This SER presents the status of the staff's review of information submitted through July 28, 2009. The staff identified no open or confirmatory items. SER Section 6 provides the staff's final conclusion of its LRA review.

TABLE OF CONTENTS

ABBREVIATIONS

AAI	applicant action item
AB	auxiliary boiler
AC	alternating current
ACI	American Concrete Institute
ACRS	Advisory Committee on Reactor Safeguards
ACSR	Aluminum Conductor Steel Reinforced
ADAMS	Agencywide Document Access and Management System
ADS	automatic depressurization system
AEM	aging effect / mechanism
AERM	aging effect requiring management
AFW	auxiliary feedwater
AHU	air handling unit
AISC	American Institute of Steel Construction
aka	also known as
AMP	aging management program
AMR	aging management review
ANSI	American National Standards Institute
APRM	average power range monitor
AR	action request
ARI	alternate rod injection / alternate rod insertion
ART	adjusted reference temperature
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
AST	alternate source term
ASTM	American Society for Testing and Materials
ATWS	anticipated transient without scram
B&PV	boiler and pressure vessel
BTP APCSB	Branch Technical Position Auxiliary Power Conversion Systems Branch
BWR	boiling water reactor
BWRVIP	Boiling Water Reactor Vessel and Internals Program
CASS	cast austenitic stainless steel
CF	chemistry factor
CFR	*Code of Federal Regulations*
CI	confirmatory item
CIG	containment instrument gas
CIV	combined intermediate valve
CLB	current licensing basis
CM	condition monitoring
CMAA	Crane Manufacturers Association of America
CPEI	Chemistry Program Effectiveness Inspection
CPX	Component Maintenance System
CR	condition report

CRD	control rod drive
CRDH	control rod drive hydraulics
CRDRL	control rod drive return line
CREOASS	Control Room Emergency Outside Air Supply System
CS	carbon steel
CSS	core support structures
CSCW	control structure chilled water
CST	condensate storage tank
CTS	condensate transfer and storage
CWST	clarified water storage tank
CUF	cumulative usage factor
DAR	design assessment report
DBA	design basis accident
DBD	design basis document
DBE	design basis event
DC	direct current
DG	diesel generator
DOR	Division of Operating Reactors
DOT	Department of Transportation
DP	differential pressure
ECCS	emergency core cooling system
EDG	emergency diesel generator
EFPY	effective full-power year
EHL	emergency heat load
EOL	end of life
EPRI	Electric Power Research Institute
EPRI-MRP	Electric Power Research Institute Materials Reliability Program
EPU	extended power uprate
EQ	environmental qualification
ESF	engineered safety feature
ESS	Engineered Safeguard System
ESSW	engineered safeguards service water
ESW	emergency service water
FAC	flow-accelerated corrosion
F_{en}	environmental fatigue life correction factor
FERC	Federal Energy Regulatory Commission
FP	fire protection
FPCCS	Fuel Pool Cooling and Cleanup System
FPRR	fire protection review report
FR	*Federal Register*
FSAR	final safety analysis report
FW	feedwater
GALL	Generic Aging Lessons Learned Report
GDC	general design criteria or general design criterion

GE	General Electric
GEIS	Generic Environmental Impact Statement
GL	generic letter
GRRCCW	Gaseous Radwaste Recombiner Closed Cooling Water System
GSI	generic safety issue
HAZ	heat-affected zone
HCU	hydraulic control unit
HELB	high-energy line break
HEPA	high efficiency particulate air
HP	high pressure
HPCI	high pressure coolant injection
HVAC	heating, ventilation, and air conditioning
HWC	hydrogen water chemistry
HX	heat exchanger
I&C	instrumentation and controls
IASCC	irradiation assisted stress corrosion cracking
ICTM	isolated condenser treatment method
ID	inside diameter
IEEE	Institute of Electrical and Electronics Engineers
IGA	intergranular attack
IGSCC	intergranular stress corrosion cracking
IN	information notice
INPO	Institute of Nuclear Power Operations
IP	intermediate pressure
IPA	integrated plant assessment
IPE	individual plant evaluation
IPEEE	individual plant evaluation of external events
IR	insulation resistance
IRM	intermediate range monitor
ISFSI	independent spent fuel storage installation
ISG	interim staff guidance
ISI	inservice inspection
ISO	independent system operator
ISP	Integrated Surveillance Program
kV	kilo-volt
LLRWHF	low level radwaste holding facility
LOCA	loss of coolant accident
LP	low pressure
LPCI	low pressure coolant injection
LPCS	low pressure core spray
LPRM	local power range monitor
LR	license renewal
LRA	license renewal application
LTOP	low-temperature overpressure protection

MEB	metal-enclosed bus
MeV	million electron volts
MIC	microbiologically influenced corrosion
MOAB	motor operated air break
MRDB	maintenance rule database
MS	main steam
MSS	main steam system
MSIV/LCS	main steam isolation valve / leakage control system
MTS	main turbine system
MWt	megawatts-thermal
MWe	megawatts-electric
N/A	not applicable
NCR	Non-conformance Report
NDE	nondestructive examination
NEI	Nuclear Energy Institute
NFPA	National Fire Protection Association
Ni	nickel
NIMS	Nuclear Information Management System
NLDAE	new loads design adequacy evaluation
NMS	Neutron Monitoring System
NPS	nominal pipe size
NRC	US Nuclear Regulatory Commission
NSAS	non-safety affecting safety
NSE	nuclear system engineering
NSSS	nuclear steam supply system
ODCM	offsite dose calculation manual
ODSCC	outside-diameter stress corrosion cracking
OE	operating experience
OI	open item
OL	operating license
OQA	operational quality assurance
P&ID	piping and instrumentation diagrams
PASS	Post-Accident Sampling System
PGCC	Power Generation Control Complex
pH	Concentration of Hydrogen Ions
PM	preventive maintenance / performance monitoring
PPB	parts per billion
PPL	PPL Susquehanna, LLC
PPM	parts per million
P-T	pressure-temperature
PTS	pressurized thermal shock
PVC	polyvinyl chloride
PWR	pressurized water reactor
PWSCC	primary water stress corrosion cracking

QA	quality assurance
QAPD	quality assurance program description
RAI	request for additional information
RAMA	radiation analysis modeling application
RB	reactor building
RBCCW	*reactor building closed cooling water*
RBCW	reactor building chilled water
RBM	rod block monitor
RCIC	reactor core isolation cooling
RCPB	*reactor coolant pressure boundary*
RCS	reactor coolant system
RCSPB	reactor coolant system pressure boundary
RFO	refueling outage
RFP	*reactor feedwater pump*
RG	regulatory guide
RHR	residual heat removal
RHRSW	residual heat removal service water
RI	*reactor internals*
RIS	regulatory issue summary
ROFT	reduction of fracture toughness
RPT	recirculation pump trip
RPV	*reactor pressure vessel*
RR	reactor recirculation
RT	radiographic testing
RT_{NDT}	reference temperature nil ductility transition
RVID	reactor vessel integrity database
RWCU	Reactor Water Cleanup System
RWST	refueling water storage tank
SAS	service air system
SBO	station blackout
SC	structure and component
SCC	stress-corrosion cracking
SCW	source of cooling water
SDS	sanitary drainage system
SDV	scram discharge volume
SE	safety evaluation
SER	safety evaluation report
SFSP	spent fuel storage pool
SHE	Standard Hydrogen Electrode
SGTS	Standby Gas Treatment System
SJAE	steam jet air ejector
SLC	standby liquid control
SOC	statement of consideration
SOMS	Shift Operations Management System
SPE	steam packing exhauster
SPLEX	Susquehanna Plant Lifetime Excellence Program

SRM	source range monitoring
SRP	Standard Review Plan
SRP-LR	Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants
SRV	safety relief valve
SS	stainless steel
SSC	system, structure, and component
SSE	safe-shutdown earthquake
SSES	Susquehanna Steam Electric Station
SW	service water
TBCCW	turbine building closed cooling water
TEMA	Tubular Exchanger Manufacturers Association
TIP	traversing incore probe
TLAA	time-limited aging analysis
TRM	technical requirements manual
TS	technical specifications
USE	upper-shelf energy
UT	ultrasonic testing
UV	ultraviolet
VDC	volts direct current
VFLD	vessel flange leak detection
VHP	reactor vessel head penetration
XLPE	cross-linked polyethylene
XLPO	cross-linked polyolefin
WA	work authorization
Zn	zinc

SECTION 1

INTRODUCTION AND GENERAL DISCUSSION

1.1 Introduction

This document is a safety evaluation report (SER) on the license renewal application (LRA) for Susquehanna Steam Electric Station (SSES), Units 1 and 2, as filed by the PPL Susquehanna, LLC (PPL or the applicant). By letter dated September 13, 2006, PPL submitted its application to the U.S. Nuclear Regulatory Commission (NRC) for renewal of the SSES operating licenses for an additional 20 years. The NRC staff (the staff) prepared this report to summarize the results of its safety review of the LRA for compliance with Title 10, Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants," of the *Code of Federal Regulations* (10 CFR Part 54). The NRC project manager for the license renewal review is Evelyn Gettys. Ms Gettys may be contacted by telephone at 301-415-4029 or by electronic mail at Evelyn.Gettys@nrc.gov. Alternatively, written correspondence may be sent to the following address:

Division of License Renewal
US Nuclear Regulatory Commission
Washington, DC 20555-0001
Attention: Evelyn Gettys Mail Stop 011-F1

In its September 13, 2006, submission letter, the applicant requested renewal of the operating licenses issued under Section 103 (Operating License Nos. NPF-14 and NPF-22) of the Atomic Energy Act of 1954, as amended, for Units 1 and 2 for a period of 20 years beyond the current expirations at midnight July 17, 2022, for Unit 1, and at midnight March 23, 2024, for Unit 2. SSES is located approximately 5 miles northeast of Berwick, PA. The NRC issued the construction permits for Units 1 and 2 on November 2, 1973. The NRC issued the operating licenses for Unit 1 on July 17, 1982, and on March 23, 1984, for Unit 2. Units 1 and 2 are of Mark 2 boiling-water reactor (BWR) design. General Electric supplied the nuclear steam supply system and Bechtel originally designed and constructed the balance of the plant. The licensed power output of each unit is 3952 megawatt thermal with a gross electrical output of approximately 1300 megawatt electric. The updated final safety analysis report (UFSAR) shows details of the plant and the site.

The license renewal process consists of two concurrent reviews, a technical review of safety issues and an environmental review. The NRC regulations in 10 CFR Part 54 and 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," respectively, set forth requirements for these reviews. The safety review for the SSES license renewal is based on the applicant's LRA and on its responses to the staff's requests for additional information. The applicant supplemented the LRA and provided clarifications through its responses to the staff's requests for additional information (RAIs) in audits, meetings, and docketed correspondence. The public may view the LRA and all pertinent information and materials, including the UFSAR, at the NRC Public Document Room, located on the first floor of One White Flint North, 11555 Rockville Pike, Rockville, MD 20852-2738 (301-415-4737 / 800-397-4209). In addition, the public may find the LRA, as well as materials related to the license renewal review, on the NRC Web site at http://www.nrc.gov.

This SER summarizes the results of the staff's safety review of the LRA and describes the technical details considered in evaluating the safety aspects of the units' proposed operation for an additional 20 years beyond the term of the current operating licenses. The staff reviewed the LRA in accordance with NRC regulations and the guidance in NUREG-1800, Revision 1, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants" (SRP-LR), dated September 2005.

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

SER Appendix A is a table showing the applicant's commitments for renewal of the operating licenses. SER Appendix B is a chronology of the principal correspondence between the staff and the applicant regarding the LRA review. SER Appendix C is a list of principal contributors to the SER and Appendix D is a bibliography of the references in support of the staff's review.

In accordance with 10 CFR Part 51, the staff prepared a draft plant-specific supplement to NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants (GEIS)." This supplement discusses the environmental considerations for license renewals for Units 1 and 2. The staff issued draft, plant-specific GEIS Supplement 35 "Generic Environmental Impact Statement for License Renewal of Nuclear Plants Regarding Susquehanna Steam Electric Station, Units 1 and 2, Draft Report for Comment," in April 2008. The final, plant-specific GEIS Supplement 35, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants Regarding Susquehanna Steam Electric Station, Units 1 and 2, Final Report," was issued March 11, 2009.

1.2 License Renewal Background

Pursuant to the Atomic Energy Act of 1954, as amended, and NRC regulations, operating licenses for commercial power reactors are issued for 40 years and can be renewed for up to 20 additional years. The original 40-year license term was selected based on economic and antitrust considerations rather than on technical limitations; however, some individual plant and equipment designs may have been engineered for an expected 40-year service life.

In 1982, the staff anticipated interest in license renewal and held a workshop on nuclear power plant aging. This workshop led the NRC to establish a comprehensive program plan for nuclear plant aging research. From the results of that research, a technical review group concluded that many aging phenomena are readily manageable and pose no technical issues precluding life extension for nuclear power plants. In 1986, the staff published a request for comment on a policy statement that would address major policy, technical, and procedural issues related to license renewal for nuclear power plants.

In 1991, the staff published 10 CFR Part 54, the License Renewal Rule (Volume 56, page 64943, of the *Federal Register* (56 FR 64943), dated December 13, 1991). The staff participated in an industry-sponsored demonstration program to apply 10 CFR Part 54 to a pilot plant and to gain the experience necessary to develop implementation guidance. To establish a scope of review for license renewal, 10 CFR Part 54 defined age-related degradation unique to license renewal; however, during the demonstration program, the staff found that adverse aging effects on plant systems and components are managed during the period of initial license and that the scope of the review did not allow sufficient credit for management programs,

particularly the implementation of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," which regulates management of plant-aging phenomena. As a result of this finding, the staff amended 10 CFR Part 54 in 1995. As published May 8, 1995, in 60 FR 22461, amended 10 CFR Part 54 establishes a regulatory process that is simpler, more stable, and more predictable than the previous 10 CFR Part 54. In particular, as amended, 10 CFR Part 54 focuses on the management of adverse aging effects rather than on the identification of age-related degradation unique to license renewal. The staff made these rule changes to ensure that important systems, structures, and components (SSCs) will continue to perform their intended functions during the period of extended operation. In addition, the amended 10 CFR Part 54 clarifies and simplifies the integrated plant assessment process to be consistent with the revised focus on passive, long-lived structures and components (SCs).

Concurrent with these initiatives, the staff pursued a separate rulemaking effort (61 FR 28467, June 5, 1996) and amended 10 CFR Part 51 to focus the scope of the review of environmental impacts of license renewal in order to fulfill NRC responsibilities under the National Environmental Policy Act of 1969.

1.2.1 Safety Review

License renewal requirements for power reactors are based on two key principles:

(1) The regulatory process is adequate to ensure that the licensing bases of all currently operating plants maintain an acceptable level of safety with the possible exceptions of the detrimental aging effects on the functions of certain SSCs, as well as a few other safety-related issues, 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, 10 CFR 54.4, "Scope," defines the scope of license renewal as including those SSCs that (1) are safety-related, (2) whose failure could affect safety-related functions, or (3) are relied on to demonstrate compliance with the NRC's regulations for fire protection, environmental qualification, pressurized thermal shock, anticipated transient without scram, and station blackout.

Pursuant to 10 CFR 54.21(a), a license renewal applicant must review all SSCs within the scope of 10 CFR Part 54 to identify SCs subject to an aging management review (AMR). Those SCs subject to an AMR perform an intended function without moving parts or without change in configuration or properties and are not subject to replacement based on a qualified life or specified time period. Pursuant to 10 CFR 54.21(a), a license renewal applicant must demonstrate that the aging effects will be managed such that the intended function(s) of those SCs will be maintained consistent with the current licensing basis (CLB) for the period of extended operation. However, active equipment is considered to be adequately monitored and maintained by existing programs. In other words, detrimental aging effects that may affect active equipment can be readily identified and corrected through routine surveillance, performance monitoring, and maintenance. Surveillance and maintenance programs for active equipment, as well as other maintenance aspects of plant design and licensing basis, are required throughout the period of extended operation.

Pursuant to 10 CFR 54.21(d), the LRA is required to include a UFSAR supplement with a summary description of the applicant's programs and activities for managing aging effects and an evaluation of time-limited aging analyses (TLAAs) for the period of extended operation.

License renewal also requires TLAA identification and updating. During the plant design phase, certain assumptions about the length of time the plant can operate are incorporated into design calculations for several plant SSCs. In accordance with 10 CFR 54.21(c)(1), the applicant must either show that these calculations will remain valid for the period of extended operation, project the analyses to the end of the period of extended operation, or demonstrate that the aging effects on these SSCs will be adequately managed for the period of extended operation.

In 2005, the NRC revised Regulatory Guide (RG) 1.188, "Standard Format and Content for Applications to Renew Nuclear Power Plant Operating Licenses." This RG endorses Nuclear Energy Institute (NEI) 95-10, Revision 6, "Industry Guideline for Implementing the Requirements of 10 CFR Part 54 - The License Renewal Rule," issued in June 2005. NEI 95-10 details an acceptable method of implementing 10 CFR Part 54. The staff also used the SRP-LR to review the LRA.

In the LRA, the applicant fully utilized the process defined in NUREG-1801, Revision 1, "Generic Aging Lessons Learned (GALL) Report," dated September 2005. The GALL Report summarizes staff-approved aging management programs (AMPs) for many SCs subject to an AMR. If an applicant commits to implementing these staff-approved AMPs, the time, effort, and resources for LRA review can be greatly reduced, improving the efficiency and effectiveness of the license renewal review process. The GALL Report summarizes the aging management evaluations, programs, and activities credited for managing aging for most of the SCs used throughout the industry. The report is also a quick reference for both applicants and staff reviewers to AMPs and activities that can manage aging adequately during the period of extended operation.

1.2.2 Environmental Review

Part 51 of 10 CFR contains the environmental protection regulations. In December 1996, the staff revised the environmental protection regulations to facilitate the environmental review for license renewal. The staff prepared the GEIS to document its evaluation of possible environmental impacts associated with nuclear power plant license renewals. For certain types of environmental impacts, the GEIS contains generic findings that apply to all nuclear power plants and are codified in Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant," to Subpart A, "National Environmental Policy Act - Regulations Implementing Section 102(2)," of 10 CFR Part 51. Pursuant to 10 CFR 51.53(c)(3)(i), a license renewal applicant may incorporate these generic findings in its environmental report. In accordance with 10 CFR 51.53(c)(3)(ii), an environmental report also must include analyses of environmental impacts that must be evaluated on a plant-specific basis.

In accordance with the National Environmental Policy Act of 1969 and 10 CFR Part 51, the staff reviewed the plant-specific environmental impacts of license renewal, including whether there was new and significant information not considered in the GEIS. As part of its scoping process, the staff held a public meeting on November 15, 2006, in Berwick, PA, to identify plant-specific environmental issues. The draft, plant-specific GEIS Supplement 35 documents the results of the environmental review and makes a preliminary recommendation as to the license renewal action. The staff held another public meeting on May 28, 2008, in Berwick, PA, to discuss draft,

plant-specific GEIS Supplement 35. After considering comments on the draft, the staff published the final, plant-specific GEIS Supplement 35 in March 2009.

1.3 Principal Review Matters

Part 54 of 10 CFR describes the requirements for renewal of operating licenses for nuclear power plants. The staff's technical review of the LRA was in accordance with NRC guidance and 10 CFR Part 54 requirements. Section 54.29, "Standards for Issuance of a Renewed License," of 10 CFR sets forth the license renewal standards. This SER describes the results of the staff's safety review.

Pursuant to 10 CFR 54.19(a), the NRC requires a license renewal applicant to submit general information, which the applicant provided in LRA Section 1. The staff reviewed LRA Section 1 and finds that the applicant has submitted the required information.

Pursuant to 10 CFR 54.19(b), the NRC requires that the LRA 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." On this issue, the applicant stated in the LRA:

> The current indemnity agreement (No. B-90) for SSES states, in Article VII, that the agreement shall terminate at the time of expiration of the license specified in Item 3 of the Attachment to the agreement, which is the last to expire. Item 3 of the Attachment to the indemnity agreement, as revised by Amendment No. 3, lists SSES operating licenses NPF-14 and NPF-22. PPL Susquehanna, LLC requests that conforming changes be made to Article VII of the indemnity agreement, and Item 3 of the Attachment to that agreement, specifying the extension of agreement to the expiration date of the renewed SSES facility operating licenses sought in this application. In addition, should the license numbers be changed upon issuance of the renewal license, PPL Susquehanna, LLC requests that conforming changes be made to Item 3 of the Attachment to the indemnity agreement, and to other sections of the agreement as deemed appropriate.

The staff intends to maintain the original license numbers upon issuance of the renewed licenses, if approved. Therefore, conforming changes to the indemnity agreement need not be made and the 10 CFR 54.19(b) requirements have been met.

Pursuant to 10 CFR 54.21, "Contents of Application - Technical Information," the NRC requires that the LRA contain (a) an integrated plant assessment, (b) a description of any CLB changes during the staff's review of the LRA, (c) an evaluation of TLAAs, and (d) an UFSAR supplement. LRA Sections 3 and 4 and Appendix B address the license renewal requirements of 10 CFR 54.21(a), (b), and (c). LRA Appendix A satisfies the license renewal requirements of 10 CFR 54.21(d).

Pursuant to 10 CFR 54.21(b), the NRC requires that, each year following submission of the LRA and at least three months before the scheduled completion of the staff's review, the applicant submit an LRA amendment identifying any CLB changes to the facility that affect the contents of the LRA, including the UFSAR supplement. By letters dated September 12, 2007, September 26, 2008, and May 28, 2009 the applicant submitted an LRA update which summarize the CLB changes that have occurred during the staff's review of the LRA. These submissions satisfy 10 CFR 54.21(b) requirements.

Pursuant to 10 CFR 54.22, "Contents of Application - Technical Specifications," the NRC requires that the LRA include changes or additions to the technical specifications (TSs) that are necessary to manage aging effects during the period of extended operation. In LRA Appendix D, the applicant stated that it had not identified any TS changes necessary for issuance of the renewed SSES operating licenses. This statement adequately addresses the 10 CFR 54.22 requirements.

The staff evaluated the technical information required by 10 CFR 54.21 and 10 CFR 54.22 in accordance with NRC regulations and SRP-LR guidance. SER Sections 2, 3, and 4 document the staff's evaluation of the LRA technical information.

As required by 10 CFR 54.25, "Report of the Advisory Committee on Reactor Safeguards," the ACRS will issue a report documenting its evaluation of the staff's LRA review and SER. SER Section 5 is reserved for the ACRS report when it is issued. SER Section 6 documents the findings required by 10 CFR 54.29.

1.4 Interim Staff Guidance

License renewal is a living program. The staff, industry, and other interested stakeholders gain experience and develop lessons learned with each renewed license. The lessons learned address the staff's performance goals of maintaining safety, improving effectiveness and efficiency, reducing regulatory burden, and increasing public confidence. Interim staff guidance (ISG) is documented for use by the staff, industry, and other interested stakeholders until incorporated into such license renewal guidance documents as the SRP-LR and GALL Report.

Table 1.4-1 shows the current set of ISGs, as well as the SER sections in which the staff addresses them.

Table 1.4-1 Current Interim Staff Guidance

ISG Issue (Approved ISG Number)	Purpose	SER Section
Nickel alloy components in the reactor coolant pressure boundary (LR-ISG-19B)	Cracking of nickel alloy components in the reactor pressure boundary. ISG under development. NEI and EPRI-MRP will develop an augmented inspection program for GALL AMP XI.M11-B. This AMP will not be completed until the NRC approves an augmented inspection program for nickel alloy base metal components and welds as proposed by EPRI-MRP.	Not applicable (PWRs only)
Corrosion of drywell shell in Mark I containments (LR-ISG-2006-01)	To address concerns related to corrosion of drywell shell in Mark I containments.	Not applicable

ISG Issue (Approved ISG Number)	Purpose	SER Section
Staff Guidance Regarding the Station Blackout Rule (10 CFR 50.63) Associated with License Renewal Applications (LR-ISG-2008-01)	To clarify the scoping boundary of the offsite recovery paths that must be included within the scope of license renewal for station blackout. The staff issued the proposed ISG for public comments. On July 7, 2009, the staff withdrew LR-ISG-2008-01. See 74 FR 33478, dated July 13, 2009.	2.5.1.2
Changes to Generic Aging Lesson Learned (GALL) Report Aging Management Program (AMP) XI.E6, "Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements" (LR-ISG-2007-02)	To address the frequency of inspection of electrical cable connections not subject to 10 CFR 50.49 prior to the period of extended operation. The staff has addressed industry comments and the ISG is in the final stages of approval. The staff plans to issue it in September 2009.	3.0.3.1.27

1.5 Summary of Proposed License Conditions

Following the staff's review of the LRA, including subsequent information and clarifications from the applicant, the staff identified three proposed license conditions.

The first license condition requires the applicant to include the updated final safety analysis report (UFSAR) supplement required by 10 CFR 54.21(d) in the next UFSAR update required by 10 CFR 50.71(e) following the issuance of the renewed licenses. The applicant may make changes to the programs and activities described in the UFSAR supplement provided changes are evaluated pursuant to the criteria set forth in 10 CFR 50.59.

The second license condition requires future activities described in the UFSAR supplement to be completed prior to the period of extended operation and that the applicant notify the NRC in writing when these activities are complete and can be verified by NRC inspection.

The third license condition requires that all capsules in the reactor vessel that are removed and tested meet the requirements of American Society for Testing and Materials (ASTM) E 185-82 to the extent practicable for the configuration of the specimens in the capsule. Any changes to the capsule withdrawal schedule, including spare capsules, must be approved by the staff prior to implementation. All capsules placed in storage must be maintained for future insertion. Any changes to storage requirements must be approved by the staff, as required by 10 CFR Part 50, Appendix H.

SECTION 2

STRUCTURES AND COMPONENTS SUBJECT TO AGING MANAGEMENT REVIEW

2.1 Scoping and Screening Methodology

2.1.1 Introduction

Title 10, Section 54.21 of the *Code of Federal Regulations* (10 CFR Part 54.21), "Contents of Application Technical Information," requires that each application for license renewal contain an integrated plant assessment (IPA). Furthermore, the IPA must list and identify those structures and components (SCs) that are subject to an aging management review (AMR) for systems, structures, and components (SSCs) that are within the scope of license renewal in accordance with 10 CFR 54.4.

In license renewal application (LRA) Section 2.1, "Scoping and Screening Methodology," the applicant described the scoping and screening methodology used to identify the SSCs at the Susquehanna Steam Electric Station (SSES) that are within the scope of license renewal and the SCs subject to an AMR. The staff reviewed the PPL Susquehanna, LLC (the applicant), scoping and screening methodology to determine if it is consistent with the scoping requirements stated in 10 CFR 54.4(a) and the screening requirements stated in 10 CFR 54.21.

In developing the scoping and screening methodology for the LRA, the applicant considered the requirements of 10 CFR 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants" (the Rule), the statements of consideration related to the Rule, and the guidance provided in Nuclear Energy Institute (NEI) 95-10, "Industry Guideline for Implementing the Requirements of 10 CFR Part 54 - The License Renewal Rule," Revision 6. Additionally, in developing this methodology, the applicant considered the correspondence between the U.S. Nuclear Regulatory Commission (NRC), other applicants, and NEI.

2.1.2 *Summary of Technical Information in the Application*

In LRA Sections 2.0 and 3.0, the applicant provided the technical information required by 10 CFR 54.21(a). In LRA Section 2.1, the applicant described the process used to identify the SSCs that meet the license renewal scoping criteria pursuant to 10 CFR 54.4(a), and the process used to identify the SCs that are subject to an AMR, in accordance with 10 CFR 54.21(a)(1). The applicant provided the results of the process used for identifying the SCs subject to an AMR in the following LRA Sections:

- Section 2.2, "Plant Level Scoping Results"
- Section 2.3, "Scoping and Screening Results: Mechanical Systems"
- Section 2.4, "Scoping and Screening Results: Structures"

- Section 2.5, "Scoping and Screening Results: Electrical and Instrumentation and Control Systems"

In LRA Section 3.0, "Aging Management Review Results," the applicant described its aging management results as follows:

- Section 3.1, "Aging Management of Reactor Vessel, Internals and Reactor Coolant System"
- Section 3.2, "Aging Management of Engineered Safety Features"
- Section 3.3, "Aging Management of Auxiliary Systems"
- Section 3.4, "Aging Management of Steam and Power Conversion Systems"
- Section 3.5, "Aging Management of Containment, Structures and Component Supports"
- Section 3.6, "Aging Management of Electrical and Instrumentation and Controls"

In LRA Section 4.0, "Time-Limited Aging Analyses," the applicant described its identification and evaluation of time-limited aging analyses.

2.1.3 Scoping and Screening Program Review

The staff evaluated the LRA scoping and screening methodology in accordance with the guidance contained in NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants," Revision 1, Section 2.1, "Scoping and Screening Methodology" (SRP-LR). The following regulations form the basis for the acceptance criteria for the scoping and screening methodology review:

- 10 CFR 54.4(a), as it relates to identification of plant SSCs within the scope of the Rule
- 10 CFR 54.4(b), as it relates to identification of intended functions of plant structures and systems determined to be within the scope of the Rule
- 10 CFR 54.21(a)(1) and (a)(2), as they relate to methods utilized by the applicant to identify plant SCs subject to an AMR

As part of the review of the applicant's scoping and screening methodology, the staff reviewed the activities described in the following sections of the LRA using the guidance contained in the SRP-LR:

- Section 2.1, to ensure that the applicant has described a process for identifying SSCs that are within the scope of license renewal, as required by 10 CFR 54.4(a)
- Section 2.2, to ensure that the applicant has described a process for determining the SCs that are subject to an AMR as required by 10 CFR 54.21(a)(1) and (a)(2)

In addition, the staff conducted a scoping and screening methodology audit at SSES, located outside Berwick, Pennsylvania, during the week December 11-15, 2006. The audit focused on ensuring that the applicant had developed and implemented adequate guidance to conduct the scoping and screening of SSCs in accordance with the methodologies described in the LRA and the requirements of the Rule. The staff reviewed implementation of the project level guidelines and topical reports describing the applicant's scoping and screening methodology.

Also, the staff conducted detailed discussions with the applicant on the implementation and control of the license renewal program and reviewed administrative control documentation and selected design documentation used by the applicant during the scoping and screening process. The staff also reviewed training for personnel that developed the LRA and quality practices used by the applicant to develop the LRA. Further, the staff evaluated the quality attributes of the applicant's AMP activities described in LRA Appendix A, "Final Safety Analysis Report Supplement," and Appendix B, "Aging Management Programs." The staff also reviewed the training and qualification of the applicant's LRA development team. The staff reviewed scoping and screening results report for the main steam (MS) system and the turbine building (TB) to ensure that the applicant had appropriately implemented the methodology outlined in the administrative controls and that the results were consistent with the current licensing basis (CLB) documentation.

2.1.3.1 Implementation Procedures and Documentation Sources for Scoping and Screening

The staff reviewed the applicant's scoping and screening implementing procedures as documented in the audit report, dated May 24, 2007, to verify that the process used to identify SCs subject to an AMR was consistent with the information contained in the LRA and the SRP-LR. Additionally, the staff reviewed the scope of CLB documentation sources and the process used by the applicant to ensure that CLB commitments were appropriately considered and that the applicant adequately implemented the procedural guidance during the scoping and screening process.

2.1.3.1.1 Summary of Technical Information in the Application

In LRA Section 2.1, "Scoping and Screening Methodology," the applicant reviewed the following information sources during the license renewal scoping and screening process:

- Maintenance Rule Data Base
- Updated Final Safety Analysis Report (UFSAR)
- Design basis references
- Piping & Instrumentation Diagrams (P&IDs)
- Electrical drawings
- Docketed correspondence
- Technical Specifications (TSs) and Bases
- Technical Requirements Manual
- Individual Plant Examination (IPE)
- Individual Plant Examination of External Events (IPEEE)

The applicant stated that it used this information to identify the functions performed by plant systems and structures. It then compared these functions to the scoping criteria in 10 CFR 54(a)(1)-(3) to determine whether the associated plant system or structure performed a license renewal intended function. It also used these sources to develop the list of SCs subject to an AMR.

2.1.3.1.2 Staff Evaluation

Scoping and Screening Implementing Procedures. The staff reviewed the applicant's scoping and screening methodology implementing procedures, including license renewal guidelines,

documents, reports, and AMR reports, as documented in the audit report, to ensure the guidance was consistent with the requirements of the Rule, the SRP-LR, and NEI 95-10, "Industry Guidelines for Implementing the Requirements of 10 CFR Part 54 - The License Renewal Rule," Revision 6. The staff found the overall process to implement the 10 CFR Part 54 requirements described in the implementing documents and AMRs was consistent with the Rule, SRP-LR and industry guidance. Guidance for determining plant SSCs within the scope of the Rule, including determining which component types of the SCs within the scope of license renewal were subject to an AMR, were contained in the implementing documents. During the review of the implementing documents, the staff focused on the consistency of the detailed procedural guidance with information in the LRA, including the implementation of staff positions documented in the SRP-LR and information in the staff's request for addition information (RAI) responses dated April 17, 2007.

After reviewing the LRA and supporting documentation, the staff found that the scoping and screening methodology instructions were consistent with the applicant's description of the methodology contained in LRA Section 2.1. The applicant's methodology contained sufficient detail to provide concise guidance on the scoping and screening implementation process to be followed during the LRA activities.

Sources of Current Licensing Basis Information. The staff reviewed the scope and depth of the applicant's CLB review to verify that the methodology was sufficiently comprehensive to identify SSCs within the scope of license renewal, as well as component types requiring an AMR. As defined in 10 CFR 54.3(a), the CLB is the set of staff requirements applicable to a specific plant and a licensee's written commitments for ensuring compliance with, and operation within, applicable staff requirements and the plant-specific design bases that are docketed and in effect. The CLB includes certain NRC regulations, orders, license conditions, exemptions, TSs, design-basis information documented in the most recent UFSAR, and licensee commitments remaining in effect and made in docketed licensing correspondence such as licensee responses to NRC bulletins, generic letters (GLs), and enforcement actions, as well as licensee commitments documented in NRC safety evaluations or licensee event reports.

During the audit, the staff reviewed pertinent information sources utilized by the applicant that included the UFSAR, license renewal boundary diagrams, and maintenance rule information. In addition, the applicant's license renewal process identified additional potential sources of plant information pertinent to the scoping and screening process, including, design basis references, P&IDs, electrical drawings, docketed correspondence, TSs and bases, the fire hazards analysis, safety evaluations, and design documentation such as engineering calculations and design specifications. The staff verified that the applicant's detailed license renewal program guidelines required use of the CLB source information in developing scoping evaluations.

The SSES component database is the applicant's primary repository for component safety classification information. During the audit, the staff reviewed the applicant's administrative controls for SSES component database safety classification data. These controls are described and implementation is governed by plant administrative procedures. Based on a review of the administrative controls, and a sample of the SSES component database safety classifications, the staff concluded that the applicant has established adequate measures to control the integrity and reliability of SSES component database safety classification data and therefore, concluded that the SSES component database provided a sufficiently controlled source of component data to support scoping and screening evaluations.

During the staff's review of the applicant's CLB evaluation process, the applicant explained the incorporation of updates to the CLB and the process used to ensure those updates are adequately incorporated into the license renewal process. The staff determined that LRA Section 2.1 provided a description of the CLB and related documents used during the scoping and screening process that is consistent with the guidance contained in the SRP-LR. In addition, the staff reviewed technical reports the applicant used to support identification of SSCs relied upon to demonstrate compliance with the safety-related criteria, nonsafety-related criteria, as well as the five regulated events pursuant to 10 CFR 54.4(a)(1-3). The applicant's license renewal program guidelines provided a comprehensive listing of documents used to support scoping and screening evaluations. The staff found these design documentation sources useful for ensuring that the initial scope of SSCs identified by the applicant was consistent with the plant's CLB.

2.1.3.1.3 Conclusion

On the basis of its review of information in LRA Section 2.1, a review of the applicant's detailed scoping and screening implementing procedures; and the results from the scoping and screening audit, the staff concludes that the applicant's scoping and screening methodology considered CLB information, consistent with the guidance contained in the SRP-LR and NEI 95-10, and met the requirements of 10 CFR 54.4, and is therefore acceptable.

2.1.3.2 Quality Controls Applied to LRA Development

2.1.3.2.1 Staff Evaluation

The staff reviewed the applicant's quality controls to ensure that scoping and screening methodologies used in the LRA were adequately implemented. The staff found that the applicant applied the following quality assurance (QA) processes during LRA development:

- The applicant developed a project plan which was the QA guide implemented for preparation of the LRA.
- Implementation of the scoping and screening methodology was governed by written procedures. A tracking system was implemented to account for the dates that procedures were originally issued and for subsequent revisions.
- The applicant reviewed previous staff RAIs to ensure that applicable issues were addressed in the LRA.
- The SSES QA Committee performed an independent assessment of the LRA to verify that it was developed in accordance with the requirements of 10 CFR Part 54.
- The LRA was subjected to a peer review prior to submittal to the staff.
- The LRA was reviewed by the Off-Site Review Committees prior to submittal to the staff.

2.1.3.2.2 Conclusion

On the basis of its review of information in LRA Section 2.1 and discussion with the applicant's license renewal staff, and a review of quality assessment documents, the staff concludes that the QA activities meet current regulatory requirements and provide assurance that LRA

development activities were consistently performed with the applicant's license renewal program requirements.

2.1.3.3 Training

2.1.3.3.1 Staff Evaluation

The staff reviewed the applicant's training process to ensure the guidelines and methodology for the scoping and screening activities were applied in a consistent and appropriate manner. The license renewal project plan included the training requirements for the personnel who developed the LRA and indicated the level of training appropriate to the license renewal task being performed.

Training was required for the license renewal project personnel that included the contract personnel who prepared the application and the applicant's personnel who reviewed the application. The training was designed to vary depending on the level of the person's involvement and responsibility. As described above, the applicant's training guidelines specified the level of training required for the various groups participating in development of the LRA. The training consisted of a combination of reading and attending training sessions and was documented on a qualification card. All license renewal personnel were required to review applicable license renewal regulations, NEI 95-10 and associated procedures. The training also included initial training for the applicant's personnel and the contract personnel for project definition activities, process training for production of documents, subsequent training to the applicant's personnel to review the deliverables, and general training for the applicant's management and plant operations review committee and others involved in the development of the LRA. In addition, the applicant held periodic production meetings in which the license renewal project team members shared their knowledge and experience of a given subject with the team. Training material was developed to include lessons learned during the development of the SSES LRA and previous license renewal projects. The staff reviewed completed qualification and training records of several of the applicant's license renewal personnel and also reviewed completed check lists.

2.1.3.3.2 Conclusion

On the basis of its discussions with the applicant's license renewal project personnel responsible for the scoping and screening process, and a review of selected design documentation in support of the process, the staff concludes that the applicant's staff and contractor personnel understand the requirements and has adequately implemented the scoping and screening methodology established in the applicant's renewal application. The staff did not identify any concerns regarding the training of the applicant's license renewal project personnel.

2.1.3.4 Conclusion of Scoping and Screening Program Review

On the basis of its review of information provided by the applicant in LRA Section 2.1, a review of the applicant's detailed scoping and screening implementing procedures, discussions with the applicant's license renewal personnel and the results from the scoping and screening audit, the staff concludes that the applicant's scoping and screening program is consistent with the guidance contained in the SRP-LR and therefore is acceptable.

2.1.4 Plant Systems, Structures, and Components Scoping Methodology

In LRA Section 2.1, the applicant described the methodology used to scope SSCs pursuant to the requirements of the 10 CFR 54.4(a) scoping criteria. The applicant described the scoping process for the plant in terms of systems and structures. Specifically, the scoping process consisted of developing a list of plant systems and structures, identifying their intended functions, and determining which functions meet one or more of the three criteria of 10 CFR 54.4(a). The systems list was developed from the SSES Maintenance Rule Database and confirmed using the Nuclear Information Management System database and the UFSAR . The structures list was reviewed against site civil/structural and plant layout drawings. The license renewal evaluation boundaries include those portions of the SSCs that are necessary to ensure that the intended functions will be performed. Structures and components needed to support each of the system and/or structure-level intended functions identified in the scoping process are included within the evaluation boundary. The applicant's scoping methodology, as described in the LRA, is discussed in the sections below.

2.1.4.1 Application of the Scoping Criteria in 10 CFR 54.4(a)(1)

2.1.4.1.1 Summary of Technical Information in the Application

LRA Section 2.1.1.1, "Safety-Related Scoping," describes the scoping methodology as it relates to the safety-related requirements of 54.4(a)(1). With respect to the safety-related criterion, the applicant stated that the safety-related systems and structures are initially identified based on a review of the Maintenance Rule Database, then confirmed using Nuclear Information Management System and the UFSAR , system design-basis documents (DBDs), P&IDs, and SSES design standards. Systems and structures whose intended functions met one or more of the requirements of 10 CFR 54.4(a)(1) were included within the scope of license renewal. The staff confirmed that all plant conditions, including conditions of normal operation, design-basis accidents (DBAs), external events, and natural phenomena for which the plant must be designed, were considered for license renewal scoping in accordance with 10 CFR 54.4(a)(1) criteria.

2.1.4.1.2 Staff Evaluation

Pursuant to 10 CFR 54.4(a)(1), the applicant must consider all safety-related SSCs relied upon to remain functional during and following a design-basis event (DBE) to ensure the following functions: (a) the integrity of the reactor coolant pressure boundary; (b) the ability to shut down the reactor and maintain it in a safe-shutdown condition; or (c) the capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposures comparable to those referred to in 10 CFR 50.34(a)(1), 50.67(b)(2), or 100.11.

With regard to identification of DBEs, SRP-LR Section 2.1.3 states:

> The set of DBEs as defined in the Rule is not limited to Chapter 15 (or equivalent) of the UFSAR. Examples of DBEs that may not be described in this chapter include external events, such as floods, storms, earthquakes, tornadoes, or hurricanes, and internal events, such as a high energy line break. Information regarding DBEs as defined in 10 CFR 50.49(b)(1) may be found in any chapter of the facility UFSAR, the Commission's regulations, NRC orders, exemptions, or license conditions within the CLB. These sources should also be

reviewed to identify SSCs relied upon to remain functional during and following DBEs (as defined in 10 CFR 50.49(b)(1)) to ensure the functions described in 10 CFR 54.4(a)(1).

During the audit, the applicant stated that it evaluated the types of events listed in NEI 95-10 (i.e., anticipated operational occurrences, DBAs, external events and natural phenomena) that were applicable to SSES. The applicant identified the documents that described the events, all of which are contained in the UFSAR, with the exception of fire, which is contained in separate documentation. The applicant also reviewed the IPE and the IPEEE, as well as licensing correspondence and DBDs. The applicant stated that as a result of this review, no additional systems were identified and included within the scope license renewal. The staff concludes that the applicant's evaluation of DBEs was consistent with the guidance contained in the SRP-LR.

The applicant performed scoping of SSCs pursuant to 10 CFR 54.4(a)(1) criterion in accordance with the license renewal procedure guidelines which provide guidance for the preparation, review, verification, and approval of the scoping evaluations to assure the adequacy of the results of the scoping process. The staff reviewed these guidance documents governing the applicant's evaluation of safety-related SSCs, and sampled the applicant's scoping results reports to ensure the methodology was implemented in accordance with those written instructions. In addition, the staff discussed the methodology and results with the applicant's personnel who were responsible for these evaluations.

Specifically, the staff reviewed a sample of the license renewal scoping results for the MS system, the engineered safeguards (ES) service water pumphouse, and the TB to provide additional assurance that the applicant adequately implemented its scoping methodology in accordance with 10 CFR 54.4(a)(1). The staff verified that the scoping results for each of the sampled systems were developed consistent with the methodology, the SSCs credited for performing intended functions were identified, and the basis for the results as well as the intended functions were adequately described. The staff verified that the applicant had identified and used pertinent engineering and licensing information to identify the SSCs required to be within scope, in accordance with 10 CFR 54.4(a)(1).

The staff reviewed the applicant's evaluation of the Rule and CLB definitions pertaining to 10 CFR 54.4(a)(1). The SSES CLB definition of safety-related is not identical to the definition provided in the Rule. The applicant's definition of safety-related and exceptions to the definition in the Rule are documented in LRA Section 2.1.1.1. Based on its review, the staff confirms that 10 CFR 50.34(a)(1) is not applicable to SSES as this regulation pertains to applications for a construction permit and 10 CFR 50. 67(b)(2) is applicable to plants using an alternate source term. The staff noted that SSES has submitted a license amendment request, to the staff, (which was issued by letter dated January 31, 2007) to allow the use of an alternative source term for accident analyses in accordance with the requirements of 10 CFR 50.67(b)(2) and has conservatively included all SSCs which would be affected by the license amendment within the scope of license renewal. In addition, the applicant stated that certain components located in the TB do not have an intended function but are classified by SSES as safety-related and included within the scope of license renewal, in accordance with 10 CFR 54.4(a)(1). However, the staff notes that this process is not articulated by the applicant in the LRA nor is it documented in the license renewal procedures or guidelines. The staff's review of LRA Section 2.1.1 identified areas in which additional information was necessary to complete the review of the applicant's scoping and screening methodology.

In RAI 2.1-1, dated March 9, 2007, the staff requested that the applicant provide a written evaluation that addresses the impact, if any, of the use of differing definitions of safety-related and of not having explicitly considered in its scoping methodology for SSES, those structures, systems, or components that are relied upon to ensure "the capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposures comparable to the guidelines in 10 CFR 50.34(a)(1), 50.67(b)(2), or 100.11 of this chapter, as applicable," consistent with the CLB for SSES.

In the response to RAI 2.1-1, dated April 17, 2007, the applicant stated that the SSES source documents used for 10 CFR 54.4(a)(1) scoping include differing definitions of safety-related pertaining to the offsite exposure limits of 10 CFR 50.34(a)(1), 50.67(b)(2), and 100.11. The offsite exposure criterion is included in the safety-related definition used in each of the source documents, but refers only to the limits of 10 CFR Part 100. The applicant stated that 10 CFR 50.34(a)(1) is associated with facilities seeking a construction permit and therefore is not applicable to SSES license renewal and the dose guidelines of 10 CFR 50.67(b) are associated with accident source term limits which were not applicable to SSES, when the LRA was submitted. The applicant evaluated the variations in the safety-related definitions and concluded that there is no impact on the 10 CFR 54.4(a)(1) scoping performed for the LRA.

Based on its review, the staff finds the applicant's response to RAI 2.1-1 acceptable because the applicant has adequately evaluated the differing definitions of safety-related contained in its scoping source documents pertaining to the offsite exposure criterion. The staff concludes that there was no impact on the applicant's ability to accurately identify SSCs within the scope of license renewal, in accordance with the requirements of 10 CFR 54.4(a)(1). Therefore, the staff's concern described in RAI 2.1-1 is resolved.

In RAI 2.1-2, dated March 9, 2007, the staff requested that the applicant discuss the process and rationale by which it determined that certain nonsafety-related components were within the scope of license renewal in accordance with 10 CFR 54.4(a)(1). In addition, the staff requested that the applicant discuss how it reviewed other nonsafety-related SSCs for potential interaction (10 CFR 54.4(a)(2)) with the nonsafety-related components located within the TB, which have been included within the scope of license renewal pursuant to 10 CFR 54.4(a)(1).

In the response to RAI 2.1-2, dated April 17, 2007, the applicant stated that the SSES design bases states that not all equipment designated as "Q"-class, performs a safety-related function. PPL Design Standard GDS-06 states that "Q" items are either safety-related or are to be "treated as safety-related" under the Operational QA Program, even though they do not perform or prevent the performance of the safety-related function. To maintain consistency with normal plant practices, the set of SSCs that satisfy the 10 CFR 54.4(a)(1) criteria conservatively includes those components designated as "Q" that are "treated as safety-related," without performing a safety-related function. Although, certain pressure switches located in the TB are designated "Q" in accordance with normal plant operations and were included within the scope of license renewal in accordance with 10 CFR 54.4(a)(1), the component's do not have a safety-related function. The SSES CLB indicates that there are no components that perform a safety-related function located in the TB. Because the CLB establishes that there is no safety-related equipment in the TB, there would be no potential interaction (10 CFR 54.4(a)(2)) with the nonsafety-related components located within the TB.

Subsequent to the applicant's response to RAI 2.1-2, the LRA was amended by letter dated September 30, 2008, which stated that the Unit 2 turbine building contained safety-related

cables associated with the high pressure coolant injection (HPCI) System pump suction transfer between the condensate storage tank and the suppression pool for Unit 2. However, the applicant performed an analysis which concluded that the loss of these HPCI cables would not prevent the accomplishment of a safety-related intended function. The staff determined that this additional information did not impact the response to RAI 2.1-2.

Based on its review, the staff finds the applicant's response to RAI 2.1-2 acceptable because the applicant has provided a rationale for including the nonsafety-related SCs within the scope of license renewal in accordance with 10 CFR 54.4(a)(1), as consistent with normal plant operations. The staff's concern described in RAI 2.1-2 is resolved.

2.1.4.1.3 Conclusion

On the basis of its review of sample systems, discussions with the applicant, and review of the applicant's scoping process, the staff concludes that the applicant's methodology for identifying systems and structures is consistent with the scoping criteria pursuant to 10 CFR 54.4(a)(1) and therefore is acceptable.

2.1.4.2 Application of the Scoping Criteria in 10 CFR 54.4(a)(2)

2.1.4.2.1 Summary of Technical Information in the Application

In LRA Section 2.1.1.2, "Nonsafety-Related SSCs Affecting Safety-Related SSCs Scoping," the applicant described the scoping methodology as it related to the nonsafety-related criteria in accordance with 10 CFR 54.4(a)(2). Also, the applicant's (a)(2) scoping methodology was based on guidance provided in Appendix F of NEI 95-10, Revision 6. The applicant evaluated the impacts of nonsafety-related SSCs that met 10 CFR 54.4(a)(2) criteria by using two major categories: 1) functional failure, and 2) physical failure. A summary description of these two categories is provided below.

Functional Failure of Nonsafety-Related SSCs. LRA Section 2.1.1.2.1, "Functional Failures of Nonsafety-Related SSC," stated that SSCs required to perform a function in support of safety-related components are classified as safety-related and are included in the scope of license renewal in accordance with 10CFR 54.4(a)(1). SSCs required to remain functional in support of safety-related components were included within the scope of license renewal in accordance with the requirements of 10 CFR 54.4(a)(2). Engineering and licensing documents were reviewed to determine the appropriate systems and structures in this category. The applicable sections of the UFSAR, Maintenance Rule Database, and design basis references provide the system and structure functional information to address these considerations. Systems, structures, and components that perform nonsafety-related intended functions credited in the current licensing basis and are subject to an AMR are identified in Sections 2.3, 2.4, and 2.5 of the LRA. In addition, nonsafety-related SSCs identified in the SSES alternate source term analyses have been included within the scope of license renewal in accordance with 10 CFR 54.4(a)(2).

Nonsafety-Related SSCs with the potential for spatial Interaction with Safety-Related SSCs. LRA Section 2.1.1.2.2, "Spatial Failures of Nonsafety-Related SSCs," states that nonsafety-related systems and nonsafety-related portions of safety-related systems are identified as in-scope under 10 CFR 54.4(a)(2) if there is a potential for spatial interactions with safety-related equipment. Spatial failures are defined as failures of nonsafety-related SSCs that

are connected to or located in the vicinity (same building) of safety-related SSCs creating the potential for interaction between the SSCs due to physical impact, harsh environment, flooding, spray or leakage that could impede or prevent the accomplishment of the safety-related functions of a safety-related SSC.

Certain mitigative features, such as missile barriers, flood barriers, and spray shields, are credited in the current licensing basis for the protection of safety-related SSCs from spatial interaction. These protective features are included within the scope of license renewal and evaluated as structural components.

In addition, SSES used the preventive option described in Appendix F of NEI 95-10 to determine the scope of license renewal with respect to the protection of safety-related SSCs from spatial interactions that are not addressed in the CLB. This scoping process required an evaluation based on equipment location and the related SSCs and whether fluid-filled system components are located in the same building or miscellaneous area as safety-related equipment, unless justification is provided that failures would not impact a safety function. Consistent with the related industry discussions in NEI 95-10, Appendix F, failure of nonsafety-related components that do not contain a fluid would not result in spatial interaction as there is no fluid to leak or spray onto safety-related SSCs and system pressure is such that there is no force that could cause significant movement of the failed component. This conclusion is confirmed by review of SSES and industry operating experience.

Nonsafety-Related SSCs directly connected to Safety-Related SSCs: The LRA stated that for nonsafety-related piping that is directly connected to safety-related piping, the seismic Category I design requirements are extended to the first seismic restraint beyond the defined boundaries (the nonsafety-related and safety-related interface). The seismic design is extended to the first point in the system which can be treated as an anchor to the plant structure. An anchor support is defined in SSES piping design specifications as a rigid support that restrains all 6 degrees of motion of the piping system. Anchors can include large fixed equipment such as pumps, tanks, heat exchangers, and in some cases, larger piping. The nonsafety-related structural components in the scope of license renewal include those that comprise seismic anchors. All seismic anchors and the associated piping and components for nonsafety-related to safety-related interfaces are within the scope of license renewal under 10 CFR 54.4(a)(2) using the base-mounted equipment and flexible connection options from NEI 95-10 (Reference 2.1-1), Appendix F, as well as including the entire length of piping that is connected on both ends to safety-related piping.

2.1.4.2.2 Staff Evaluation

Pursuant to 10 CFR 54.4(a)(2), the applicant must consider all nonsafety-related SSCs whose failure could prevent satisfactory accomplishment of safety-related SSCs relied upon to remain functional during and following a DBE to ensure the following functions: (a) the integrity of the reactor coolant pressure boundary; (b) the ability to shut down the reactor and maintain it in a safe-shutdown condition; or (c) the capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposures comparable to those referred to in 10 CFR 50.34(a)(1), 50.67(b)(2), or 100.11.

Regulatory Guide (RG) 1.188, "Standard Format and Content for Applications to Renew Nuclear Power Plant Operating Licenses," Revision 1, dated September 2005, provided staff endorsement on the use of NEI 95-10, "Industry Guidelines for Implementing the Requirements

of 10 CFR Part 54 - The License Renewal Rule," Revision 6, dated June 2005. RG 1.188 states that NEI 95 -10, Revision 6, provides methods that the staff considers acceptable for compliance with 10 CFR Part 54, when preparing a license renewal application. NEI 95 -10, Revision 6, discusses the staff position on 10 CFR 54.4(a)(2) scoping criteria; nonsafety-related SSCs, typically identified in the CLB; consideration of missiles, cranes, flooding, high-energy line breaks (HELBs); nonsafety-related SSCs connected to safety-related SSCs; nonsafety-related SSCs in proximity of safety-related SSCs; and the mitigative and preventative options related to nonsafety-related and safety-related SSCs interactions.

In addition, the staff position on NEI 95-10, Revision 6, states that applicants should not consider hypothetical failures, but rather, should base their evaluation on the plant's CLB, engineering judgment and analyses, and relevant operating experience. The paper further describes operating experience as all documented plant-specific and industry-wide experience that can be used to determine the plausibility of a failure. Documentation would include NRC generic communications and event reports, plant-specific condition reports, industry reports such as safety operational event reports, and engineering evaluations.

The staff reviewed LRA Section 2.1.1.2, where the applicant described its scoping methodology as it related to the nonsafety-related criteria in accordance with 10 CFR 54.4(a)(2). In addition, the staff reviewed the applicant's 10 CFR 54(a)(2) AMR report. The staff noted that the applicant's evaluations were performed in accordance with the guidance contained in NEI 95-10, Revision 6, for identification and treatment of SSCs which meet 10 CFR 54.4(a)(2) criteria. Also, as described in LRA Section 2.1.4.2.1, the applicant's evaluation of the nonsafety-related SSCs to meet 10 CFR 54.4(a)(2) criteria is based on categories of functional failure and physical failure.

Based on its review of the information provided by the applicant in the LRA, 10 CFR 54.4(a)(2) AMR report criteria, and the discussions with the applicant during the audit, the staff's evaluation pertaining to the categories described in paragraph two of this subsection immediately follows.

Nonsafety-Related SSCs Required to Perform a Function that Supports a Safety-Related SSC. Nonsafety-related SSCs required to remain functional to support a safety-related function were included within the scope of license renewal as safety-related, in accordance with the requirements of 10 CFR 54.4(a)(2). This evaluating criteria was discussed in the applicant's 10 CFR 54.4(a)(2) AMR report. The staff finds that the applicant has implemented an acceptable method for scoping of nonsafety-related systems that perform a function that supports a safety-related intended function.

Nonsafety-Related SSCs Directly Connected to Safety-Related SSCs. In order to identify the nonsafety-related SSCs directly connected to safety-related SSCs and required to be structurally sound to maintain the integrity of the safety-related SSCs, the applicant used a bounding approach as described in NEI 95-10, Appendix F and the SSES seismic analysis. The applicant reviewed each mechanical system safety-related to nonsafety-related interface to identify the components located between the interface and the structural boundary or equivalent anchor, if used. The applicant included all nonsafety-related SSCs within the analyzed structural boundary and within the scope of license renewal, in accordance with 10 CFR 54.4(a)(2). If the structural boundary was not indicated on the applicable drawing, the applicant identified the portion of the nonsafety-related SSCs beyond the safety-related SSCs, to the first equivalent

anchor or seismic anchor, and included this portion of the nonsafety-related SSCs within the scope of license renewal.

The applicant also indicated in the LRA that if the structural boundary could not be identified for the applicable nonsafety-related/safety-related interface, the nonsafety-related SSCs were included to a point beyond the nonsafety-related/safety-related interface to a base-mounted component, flexible connection, or the end of the piping run. The applicant based its actions on the guidance of NEI 95-10, Appendix F, which describes the use of "bounding criteria" as a method of determining the portion of nonsafety-related SSCs to be included within the scope of license renewal. This provided assurance that the nonsafety-related piping systems included in the design-basis seismic analysis are included in the scope of license renewal. The applicant's identification of these nonsafety-related systems and components at nonsafety-related to safety-related boundary is depicted in its 10 CFR 54.4(a)(2) AMR report. Also listed in this report are the AMR results of the component types with the corresponding intended function, material, environment, and aging effects and associated programs. In addition, the staff noted that the applicant stated in LRA Sections 2.3.3.2, 2.3.3.5, 2.3.3.9, 2.3.3.23, and 2.3.3.31, certain components (e.g., accumulator, tank, heating and ventilation units) perform an anchor function, but are not subject to an AMR based on evaluation of their construction, mounting and support function.

The staff's review of LRA Section 2.1.1.2.2 identified that the applicant had not included nonsafety-related piping attached to safety-related SSCs located within containment or nonsafety-related piping attached to safety-related piping at containment penetrations within the scope of license renewal. In addition, the applicant used an analysis, in lieu of it's documented screening process, to determine whether nonsafety-related components affecting safety-related components, as discussed in LRA Sections 2.3.3.2, 2.3.3.5, 2.3.3.9, 2.3.3.23 and 2.3.3.31, were subject to an AMR. The staff determined that additional information would be required to complete the review of the applicant's scoping methodology.

In RAI 2.1-3, dated March 9, 2007, the staff requested that the applicant explain the following:

(a) The rationale and basis for not including nonsafety-related piping attached to safety-related piping at containment penetrations and extending outside of containment, within the scope of license renewal

(b) The rationale and basis for not including nonsafety-related piping attached to safety-related SCs inside containment, within the scope of license renewal

(c) The rationale for the use of an analysis to determine that nonsafety-related SCs within the scope of license renewal were not subject to an AMR, the details and results of the analysis, and to indicate how the applicant's analysis met the criteria of the screening process used for other nonsafety-related SCs and the requirements of 10 CFR 54.21

In its response to RAI 2.1-3, dated April 17, 2007, the applicant stated:

(a) The applicant had performed a re-evaluation and determined that certain nonsafety-related components attached to safety-related piping at containment penetrations and extending outside of containment, had not

been included within the scope of license renewal. The applicant indicated that the nonsafety-related components are connected to, and provide support for, the attached safety-related equipment and have subsequently been included within the scope of license renewal as required by 10 CFR 54.4(a)(2). The applicant provided a list of the nonsafety-related equipment which had been included within the scope of license renewal and the results of the aging management reviews.

(b) The applicant had performed a re-evaluation which identified nonsafety-related equipment, inside primary containment, that is connected to safety-related equipment and provides the anchor for the safety-related equipment, which had not been included within the scope of license renewal. The applicant indicated that the nonsafety-related equipment has subsequently been included within the scope of license renewal as required by 10 CFR 54.4(a)(2). The applicant provided a list of the nonsafety-related equipment which had been included within the scope of license renewal and the results of the aging management reviews.

(c) The applicant had determined that certain nonsafety-related components attached to safety-related SSCs and which had been included within the scope of license renewal, had not been subject to an aging management review. The applicant performed an evaluation to determine the extent of condition and subsequently performed the required aging management reviews. The applicant provided a list of the components determined to be subject to an aging management review and the results of the aging management reviews.

Based on its review, the staff finds the applicant's response to RAI 2.1-3 acceptable because the applicant had performed evaluations to determine if nonsafety-related SCs should be included within the scope of license renewal in accordance with 10 CFR 54.4(a)(2) and if AMRs were required. The applicant's evaluations, as documented in the RAI response, resulted in (1) the inclusion of nonsafety-related components, attached to safety-related piping at containment penetrations and extending outside of containment within the scope of license renewal; (2) the inclusion of nonsafety-related equipment, inside primary containment, that is connected to safety-related equipment and provides the anchor for the safety-related equipment within the scope of license renewal; and (3) the performance of AMRs of nonsafety-related components attached to safety-related SSCs and which had been included within the scope of license renewal, but which had not been previously subject to an AMR. The staff determined that the nonsafety-related components, discussed in RAI 2.1-3, has been appropriately evaluated for inclusion within the scope of license renewal and subjected to an AMR and that the staff's concern in RAI 2.1-3 is resolved.

Nonsafety-Related SSCs with the Potential for Spatial Interaction with Safety-Related SSCs. The applicant considered physical impact (i.e, pipe whip, jet impingement), harsh environments, flooding, spray, and leakage when evaluating the potential for spatial interactions between nonsafety-related systems and safety-related SSCs. The applicant used a spaces approach for scoping of nonsafety-related systems with potential spatial interaction with safety-related SSCs. The spaces approach focused on the interaction between nonsafety-related and safety-related SSCs that are located in the same space, which was defined as a building which contains

safety-related SSCs. The space was defined such that any potential interaction between nonsafety-related and safety-related SSCs is limited to the space.

Physical Impact or Flooding. The applicant considered situations where nonsafety-related supports for non-seismic (including seismic II/I) piping systems and electrical conduit and cable trays with potential for spatial interaction with safety-related SSCs are included in the scope of license renewal per the Rule and subject to an AMR. These supports and components are addressed in a commodity fashion within civil/structural AMR reports. The applicant's review of earthquake experience identified no occurrence of welded steel pipe segments falling due to a strong motion earthquake. The applicant concluded that as long as the effects of aging on supports for piping systems are managed, falling of piping systems is not credible, except due to flow accelerated corrosion. Furthermore, the piping section itself was determined not to be in-scope for 10 CFR 54.4(a)(2), due to a physical impact hazard. The applicant evaluated whether missiles could be generated from internal or external events such as failure of rotating equipment or overhead-handling systems. The nonsafety-related design features which protect safety-related SSCs from such missiles were included within the scope of license renewal.

Pipe Whip, Jet Impingement, and Harsh Environment. The applicant evaluated nonsafety-related portions of high energy lines against the 10 CFR 54.4(a)(2) criteria. The applicant's evaluation was based on a review of the UFSAR and relevant site documentation. The applicant evaluated the high energy systems to ensure proper identification of components that are part of nonsafety-related high energy lines that can effect safety-related equipment. If the applicant's HELB analysis assumed that a nonsafety-related piping system did not fail or assumed failure only at specific locations, then that piping system (i.e., piping, equipment and supports) was included within the scope of license renewal pursuant to 10 CFR 54.4(a)(2) criteria and subject to and AMR, in order to provide assurance that those assumptions remain valid through the period of extended operation. Also, as discussed in the SSES AMR report for 10 CFR 54.4(a)(2) review, the applicant reviewed the reference documents that contained HELB analysis for inside as well as outside containment and identified high energy lines. Many of the identified systems were safety-related and included within the scope of license renewal in accordance with 10 CFR 54.4(a)(1). The remaining nonsafety-related high energy lines, which were determined to have potential interaction with safety-related SSCs, were included within the scope of license renewal.

Spray and Leakage. The applicant evaluated moderate and low-energy systems which have the potential for spatial interactions of spray and leakage. Nonsafety-related systems and nonsafety-related portions of safety-related systems with the potential for spray or leakage that could prevent safety-related SSCs from performing their required safety function were considered within the scope of license renewal. The applicant used a spaces approach to identify the nonsafety-related SSCs which were located within the same space as safety-related SSCs. As described by the applicant in the LRA, a space is defined as a building containing safety-related SSCs. The space is defined such that any potential interaction between nonsafety-related and safety-related SSCs is limited to the space. The applicant documented its review of each mechanical system for potential spatial interaction with safety-related SSCs in applicant's scoping results AMR review report, which also is documented in the audit report. Following identification of the applicable mechanical systems, the applicant reviewed the system functions to determine whether the system contained fluid, air or gas. Based on the spray or leakage and also operating experience, the applicant excluded the nonsafety-related SSCs containing air or gas from the scope of license renewal. The applicant then reviewed the mechanical systems to determine whether the system had any components located within a

structure containing safety-related SSCs. Those nonsafety-related SSCs determined to contain fluid and located within a space containing safety-related SSCs, were included within the scope license renewal.

Protective Features. The applicant evaluated protective features such as whip restraints, spray shields, supports, and missile and flood barriers, installed to protect safety-related SSCs against spatial interaction with nonsafety-related SSCs due to fluid leakage, spray, or flooding. Such protective features credited in the plant design were included within the scope of license renewal.

2.1.4.2.3 Conclusion

On the basis of its review of sample systems, discussions with the applicant, and review of the applicant's scoping process, the staff concludes that the applicant's methodology for identifying systems and structures is consistent with the scoping criteria of 10 CFR 54.4(a)(2) and therefore is acceptable.

2.1.4.3 Application of the Scoping Criteria in 10 CFR 54.4(a)(3)

2.1.4.3.1 Summary of Technical Information in the Application

In LRA Section 2.1.1.3, "Regulated Events Scoping," the applicant described the methodology for identifying systems and structures that are in the scope of license renewal based on the regulated events criteria. The SSCs that perform intended functions required for compliance with a regulated event and subject to an AMR are identified in LRA Sections 2.3, 2.4, and 2.5. Mechanical and structural systems that perform a fire protection, anticipated transients without scram (ATWS), and/or station blackout (SBO) intended function are included in the scope of license renewal. All plant electrical and instrumentation and control (I&C) systems and electrical equipment in mechanical systems were included in-scope of license renewal.

Fire Protection. In LRA Section 2.1.1.3.1, "Fire Protection (10 CFR 50.48)," the applicant described the scoping of mechanical systems and structures required to demonstrate compliance with the fire protection requirements. In the LRA, the applicant stated that the SSES was licensed after January 1, 1979 and is therefore not bound to the provisions of 10 CFR 50.48(b). However, as a result of licensing commitments and standard fire protection licensing condition for plants licensed after January 1, 1979, the SSES generated a Fire Protection Review Report which addresses compliance with pertinent regulations. The applicant's CLB includes the Fire Protection Review Report, which contains a safe-shutdown analysis (to demonstrate compliance with Appendix R), description of the fire protection system, the fire hazard analysis (to demonstrate that a single postulated fire will not affect the ability of both units to be brought to and maintained in cold shutdown condition), and any deviation requirements. Section 2.1.1.3.1 further states, based on its review of its CLB for fire protection, the applicant identified systems and structures and determined the corresponding intended functions that meet the requirements of 10 CFR 50.48 in addition to 10 Part 50, Appendix R. This determination included both the features required for fire protection of safety-related equipment and any system function that was included in, or provides necessary support for, one or more of the three safe-shutdown paths credited for compliance with 10 CFR Part 50, Appendix R. Mechanical systems and structures credited with fire prevention, detection, mitigation in areas containing equipment important to safe operation of the plant, and

equipment credited with safe-shutdown in the event of a fire were included within the scope of license renewal.

Environmental Qualification (EQ). The applicant described the EQ requirements of 10 CFR 50.49 in LRA Section 2.1.1.3.2, "Environmental Qualification (10 CFR 50.49)." The electrical equipment at SSES, which is required to be environmentally qualified for a "harsh" environment by 10 CFR 50.49, is identified in the SSES - Nuclear Information Management System database. In the LRA, the applicant stated that EQ at SSES applies to electrical equipment installed in mechanical systems, instruments or valve operators in a fluid system, and also the electrical equipment installed in electrical systems. Electrical equipment that is required to be environmentally qualified is identified to be within the scope of license renewal.

Pressurized Thermal Shock. These requirements are not applicable because SSES units are of boiling-water reactor (BWR) design.

Anticipated Transient Without Scram. The applicant described the scoping of mechanical systems and structures required to demonstrate compliance with the ATWS requirements of 10 CFR 50.62 in LRA Section 2.1.1.3.4, "Anticipated Transients without Scram (10 CFR 50.62)." Mechanical systems and structures that perform a 10 CFR 50.62 intended function were included within the scope of license renewal.

Station Blackout. The applicant described the scoping criteria in LRA Section 2.1.1.3.5, "Station Blackout (10 CFR 50.63)." The applicant's licensing basis requires an SBO coping duration of four hours, and therefore the mechanical systems and structures required to support the four-hour coping duration are included within the scope of license renewal. The applicant stated that, at SSES, all plant equipment which includes systems and instrumentation necessary to cope with the SBO was identified and investigated to assure that all items necessary for the equipment to function would be available for at least four-hours. This is the equipment relied upon for compliance with 10 CFR 50.63 requirements. Also, the applicant stated that based on its CLB for SBO, the intended functions for each system and structure supporting the 10 CFR 50.63 requirements were determined, and the SSCs that perform an intended function for SBO were included in the scope of license renewal.

2.1.4.3.2 Staff Evaluation

The staff reviewed the applicant's approach to identifying the mechanical systems and structures relied upon to perform functions related to regulated events applicable to BWRs in accordance with 10 CFR 54.4(a)(3). As part of this review and during its scoping and screening audit at SSES, the staff discussed the methodology with the applicant, reviewed the documentation developed to support the license renewal, and evaluated a sample of the resultant mechanical systems and structures identified as within scope pursuant to 10 CFR 54.4(a)(3) criteria. The staff's review of the applicant's documentation included, but was not limited to: (a) license renewal project guidelines, (b) license renewal project documents, (c) plant drawings, (d) UFSAR, (e) maintenance rule design-basis documentation, and (f) the applicant's Fire Protection Review Report.

The license renewal project guidelines described the applicant's process for identifying systems and structures that are within the scope of license renewal. As described in the license renewal project guidelines, all mechanical systems and structures that perform an intended function pursuant to 10 CFR 54.4(a)(3), were included within the scope of license renewal, and the

results of scoping are documented in the applicant's license renewal project document scoping results reports. The license renewal project documents stated that the scope of license renewal includes all SSCs relied on in safety analyses or plant evaluations to perform a function that demonstrates compliance with the 10 CFR 54.4(a)(3) regulated events. The staff reviewed the applicant's evaluation of mechanical systems and structures for compliance with the scoping criteria of 10 CFR 54.4(a)(3) and discussed the results of applicant's evaluation with the applicant's license renewal project team members. The staff's review of the applicant's evaluation and results of scoping requirements pursuant to 10 CFR 54.4(a)(3), for each regulated event, is described below.

Fire Protection. As described in the LRA and the license renewal project documents, based on a review of the Fire Protection Review Report for SSES, fire hazards analysis, topical design basis documents, and other CLB documents, the applicant identified systems and structures and determined the corresponding intended functions that meet the requirements of fire protection license renewal scoping requirements of 10 CFR 54.4(a)(3). In a sample review of the applicant's methodology for meeting 10 CFR 54.4(a)(3) regulation for fire protection, the staff verified that the license renewal project document report identified the mechanical systems that are within the scope of license renewal because they perform intended functions pursuant to 10 CFR 50.48. The license renewal project documents summarized the scoping results for mechanical systems and identified several mechanical systems that have one or more intended functions pursuant to 10 CFR 50.48. The staff performed a sample review of the residual heat removal service water (RHRSW) system, core spray system (CSS), and circulating water pump house (CWPH) systems and structure for their inclusion as in-scope for fire protection. Based on its review of the applicant's documentation and discussions with the applicant's license renewal project team members, the staff finds that the applicant has implemented an acceptable method for identifying systems and structures that perform a function that meets the fire protection requirements of 10 CFR 54.4(a)(3) and has included those systems and structures within the scope of license renewal.

Environmental Qualification. During the scoping and screening audit, the staff reviewed the LRA and the applicant's implementing procedures and results reports (license renewal project documents) for the EQ regulated event. Also, the staff discussed with the applicant's license renewal project team, the details of the applicant's EQ scoping process and the information sources used, to determine compliance with 10 CFR 50.49. The staff confirmed that the applicant's primary sources of information for scoping electrical components for license renewal was the Nuclear Information Management System database and the CLB, which identified electrical equipment required by 10 CFR 50.49 to be environmentally qualified for harsh environments, and the intended functions of those systems. The staff reviewed selected portions of Nuclear Management System database and the SSCs identified within the scope of license renewal in accordance with 10 CFR 54.4(a)(3). The staff determined that the applicant had appropriately identified SSCs supporting environmental qualification and had accurately identified the intended functions.

Anticipated Transient Without Scram. The three primary systems at SSES, that perform intended functions pursuant to 10 CFR 50.62 to mitigate an ATWS event, are: standby liquid control (SLC), alternate rod insertion, and reactor recirculation pump trip systems. Also, several other SSCs support these systems in performing intended functions in accordance with 10 CFR 50.62. The applicant's scoping results report identified these mechanical systems as included within the scope of license renewal, because they perform a 10 CFR 50.62 intended function. During the audit, the staff reviewed the applicant's license renewal implementing

procedures and results documents. The staff performed a sample review of the above three systems that perform 10 CFR 50.62 intended functions. The staff also reviewed the primary sources of information that the applicant used for identifying these intended functions. Sources the applicant reviewed for scoping the systems and structures pursuant to 10 CFR 50.62 included topical design basis documents for ATWS, Maintenance Rule Database documentation, the UFSAR, and SERs related to compliance with 10 CFR 50.62. Based on its review of the source documentation and the system functions, the applicant included those SSCs that perform an intended function for ATWS within the scope of license renewal.

Station Blackout. In accordance with the CLB, the coping period for SSES is four hours, during which time, all systems and structures relied on in safety analyses or plant evaluations to perform a function that demonstrates compliance with 10 CFR 50.63 for SBO, be included within the scope of license renewal. The staff reviewed the LRA, as well as the applicant's implementing procedures and the results reports in accordance with the criteria found in 10 CFR 50.63 and the applicant's results report which identified mechanical systems and structures that are included within the scope of license renewal because they perform an intended function pursuant to 10 CFR 50.63. The staff reviewed selected portions of the sources of information used by the applicant for the scoping of systems and structures in compliance with 10 CFR 50.63 including the UFSAR, site technical report for coping assessment for the SSES during an SBO, and site calculations (UFSAR Section 15.8). Based on review of these information sources and the CLB, the staff determined that the applicant had correctly identified the intended functions for each system and structure meeting the requirements of 10 CFR 50.63, had identified the SSCs that perform an intended function for a SBO and included them within the scope of license renewal.

2.1.4.3.3 *Conclusion*

On the basis of the sample review, discussions with the applicant, and review of the applicant's scoping process, the staff concludes that the applicant's methodology for identifying systems and structures meets the scoping criteria pursuant to 10 CFR 54.4(a)(3) and therefore is acceptable.

2.1.4.4 Plant-Level Scoping of Systems and Structures

2.1.4.4.1 Summary of Technical Information in the Application

System and Structure Level Scoping. The applicant documented its methodology for scoping of SSCs in accordance with 10 CFR 54.4(a) in the license renewal project guidelines and license renewal project documents, as documented in the audit report. The applicant's approach to system and structure scoping provided in the site guidance was consistent with the methodology described in LRA Section 2.1. Specifically, the license renewal project guidelines specified that the personnel performing license renewal scoping use CLB documents and describe the system or structure including a list of functions that the system or structure is required to accomplish. Sources of information regarding the CLB for systems included the Maintenance Rule Database, UFSAR , DBDs, P&IDs, electrical drawings, and docketed correspondence. The applicant then compared identified system or structures function lists to the scoping criteria to determine whether the functions met the scoping criteria of 10 CFR 54.4(a). The applicant documented the results of the plant-level scoping process in accordance with the license renewal project guidelines. These results were provided in the systems and structures license renewal project documents. The license renewal project.

documents contained information including a description of the structure or system, a listing of functions performed by the system or structure, identification of intended functions, the 10 CFR 54.4(a) scoping criteria met by the system or structure, references, and the basis for the classification of the system or structure intended functions. During the audit, the staff reviewed a sampling of license renewal project document reports and concluded that the applicant's scoping results in the license renewal project documents contained an appropriate level of detail to document the scoping process.

Component Level Scoping. After the applicant identified the intended functions of systems or structures within the scope of license renewal, a review determined which components of each in-scope system and structure support license renewal intended functions. The components that support intended functions were considered within the scope of license renewal and screened to determine whether an AMR was required. The applicant considered three component/commodity groups during this stage of the scoping methodology: (1) mechanical, (2) structural commodity, and (3) electrical commodity.

Commodity Groups Scoping. The applicant applied commodity group scoping to structural and electrical SCs as discussed in Sections 2.1.4.6 and 2.1.4.7.

Insulation. LRA Section 2.1.2.6, "Treatment of Insulation," stated that at SSES, piping and equipment insulation is classified as nonsafety-related and is required to maintain its structural integrity for nonsafety affecting safety considerations. Insulating materials that function to limit heat transfer, serve as fire barriers, or are required to maintain their structural integrity are included within the scope of license renewal and are addressed as structural commodities in Section 2.4 of the LRA.

Consumables. LRA Section 2.1.2.4, "Treatment of Consumables," states that the guidance in Section 4.1 of NEI 95-10 was used to categorize and evaluate consumables. Consumables were divided into the following five categories for the purpose of license renewal: (a) packing, gaskets, component seals, and O-rings; (b) structural sealants; (c) oil, grease, and component filters; (d) system filters, fire extinguishers, fire hoses, and air packs; and, (e) mechanical sealants.

Group (a) subcomponents are not relied upon to form a pressure-retaining function and, therefore, are not subject to an AMR. Group (b) subcomponents are structural sealants for structures within the scope of license renewal that require an AMR. Group (c) subcomponents are periodically replaced according to plant procedures and, therefore, are not subject to an AMR. Group (d) consumables are subject to replacement based on National Fire Protection Association standards and Department of Transportation standards according to plant procedures and, therefore, are not subject to an AMR. Group (e) mechanical sealants in the heating, ventilation, and air conditioning (HVAC) system include duct tape, and gaskets. Upon evaluation, the applicant determined that these consumables did not have an intended function for license renewal and therefore is not subject to an AMR.

2.1.4.4.2 Staff Evaluation

The staff reviewed the applicant's methodology for performing the scoping of plant systems and components to ensure compliance with 10 CFR 54.4(a). The methodology used to determine the mechanical systems and components within the scope of license renewal was documented in license renewal project documents, and plant level scoping results for mechanical systems

were identified in LRA Table 2.2-1. The scoping process defined the plant in terms of systems and structures. Specifically, the license renewal project guidelines (a) identified the systems and structures that are subject to review in accordance with 10 CFR 54.4, (b) described the processes for capturing the results of the review, and (c) were used to determine whether the system or structure performed intended functions consistent with the requirements of 10 CFR 54.4(a). The process was completed for all systems and structures to ensure that the entire plant was addressed. The applicant's personnel performed initial reviews on systems and structures identified in the CLB.

2.1.4.4.3 Conclusion

Based on its review of the LRA, scoping and screening implementing procedures, and a sampling of system scoping results during the audit, the staff concludes that the applicant's methodology reasonably identifies SSCs and commodity groups within the scope of license renewal and their intended functions. The staff also concludes that the applicant's scoping methodology for plant SSCs, commodity groups, insulation, and consumables meets the scoping criteria pursuant to 10 CFR 54.4(a)(3) and therefore is acceptable.

2.1.4.5 Mechanical Component Scoping

2.1.4.5.1 Summary of Technical Information in the Application

LRA Section 2.1 describes the methodology for identifying license renewal evaluation boundaries. For mechanical systems, the mechanical components include those portions of the system that are necessary to ensure that the intended functions will be performed. Structures and components needed to support each of the system/structure-level intended functions identified in the scoping process are included within the evaluation boundary.

The evaluation boundaries for mechanical systems are documented on license renewal boundary drawings created by marking mechanical piping and instrumentation diagrams to indicate the components within the scope of license renewal. Components within the evaluation boundary are reviewed to determine whether they perform an intended function. Typically, components in mechanical systems perform a pressure boundary function. Some components may perform other functions such as heat transfer, filtration, or flow control. Intended functions are established based on whether a particular function of a component is necessary to support the system functions that meet the scoping criteria.

2.1.4.5.2 Staff Evaluation

The staff evaluated LRA Section 2.1 and the guidance in license renewal project documents, license renewal project guidelines, and AMR reports to complete the review of mechanical scoping process. The project document and guidelines provided instructions for identifying the evaluation boundary. Determination of the mechanical system evaluation boundary requires an understanding of system operations in support of intended functions. This process was based on review of P&IDs, DBDs, Maintenance Rule basis documents, component databases, and CLB documents such as the Environmental Protection Plan, the UFSAR, the Fire Protection Review Report, the Offsite Dose Calculation Manual, the QA Program Description, the Technical Requirements Manual, and the TSs and Bases. The evaluation boundaries for mechanical systems are documented on license renewal boundary drawings created by

marking mechanical piping and instrumentation diagrams to indicate the components within the scope of license renewal.

Components within the evaluation boundary were reviewed to determine whether they perform an intended function. Intended functions are established based on whether a particular function of a component is necessary to support the system functions that meet the scoping criteria. Mechanical components were grouped, where practical, by component type.

The staff reviewed the implementation guidance and the CLB documents associated with mechanical system scoping, and found that the guidance and CLB source information noted above were acceptable to identify mechanical components and support structures in mechanical systems that are within the scope of license renewal. The staff conducted detailed discussions with the applicant's license renewal project management personnel and reviewed documentation pertinent to the scoping process. The staff assessed whether the applicant had appropriately applied the scoping methodology outlined in the LRA and implementing procedures and whether the scoping results were consistent with CLB requirements. The staff determined that the applicant's procedural methodology was consistent with the description provided in LRA Section 2.1 and the guidance contained in SRP-LR Section 2.1, and was adequately implemented.

The staff reviewed the applicant's methodology for identifying MS mechanical component types meeting the scoping criteria as defined in the Rule. The staff also reviewed the scoping methodology implementation procedures and discussed the methodology and results with the applicant. The staff verified that the applicant has identified and used pertinent engineering and licensing information in order to determine the MS mechanical component types required to be within the scope of license renewal. As part of the review process, the staff evaluated each system intended function identified for the MS system, the basis for inclusion of the intended function, and the process used to identify each of the system component types. The staff verified that the applicant has identified and highlighted system P&IDs to develop the license renewal evaluation boundaries in accordance with the procedural guidance. The applicant was knowledgeable about the process and conventions for establishing boundaries as defined in the license renewal implementing procedures. Additionally, the staff verified that the applicant's results are in accordance with the governing procedures. Specifically, other license renewal personnel knowledgeable about the system had independently reviewed the marked-up drawings to ensure accurate identification of system intended functions. The applicant performed additional cross-discipline verification and independent reviews of the resultant highlighted drawings before final approval of the scoping effort.

2.1.4.5.3 Conclusion

Based on its review of the LRA, scoping implementing procedures, and the system sample and discussions with the applicant, the staff concludes that the applicant's methodology for identifying mechanical systems meets the scoping criteria pursuant to 10 CFR 54.4(a) and therefore is acceptable.

2.1.4.6 Structural Component Scoping

2.1.4.6.1 Summary of Technical Information in the Application

In LRA Section 2.1, the applicant described the methodology for identifying structures that are in the scope of license renewal. Initially, all plant structures were reviewed to determine whether they were in-scope for license renewal. The list of structures was identified using CLB documents such as the UFSAR, the Maintenance Rule document for structures, the Fire Protection Review Report, topical design basis documents, and plant drawings. Structures that have an intended function for 10 CFR 54.4(a) were included in the scope of license renewal and listed in LRA Table 2.2-3. LRA Section 2.4 described the scoping results for the individual structures that are in-scope of license renewal.

2.1.4.6.2 Staff Evaluation

The staff reviewed the applicant's approach for identifying structures relied upon to perform the functions pursuant to 10 CFR 54.4(a). As part of this review, the staff discussed the methodology with the applicant, reviewed the documentation developed to support the review, and evaluated the scoping results for several structures that were identified as within the scope of license renewal.

The license renewal project guidelines described the applicant's process for identifying structures that are within the scope of license renewal and stated that all structures that perform an intended function are to be included within the scope of license renewal and that the scoping results are to be documented in the scoping results report. The scoping results report listed all the structures that were evaluated, and also described the procedures the applicant used to identify structures.

The staff reviewed the applicants implementing procedures and scoping results reports. The applicant performed structural scoping in a manner to ensure that all plant buildings, yard structures, and SBO related non-plant structures were considered. The scoping results report identified the intended functions for each structure required for compliance with one or more criteria pursuant to 10 CFR 54.4(a). The structural component intended functions were identified based on the guidance provided in NEI 95-10, and the SRP-LR. For structures, the applicant determined the evaluation boundaries by developing a complete description of each structure with respect to the intended functions performed by the structure. The results of the review were documented in the scoping results report which contained a list of structures, evaluation results for each structure pursuant to 10 CFR 54.4(a) criteria, a description of structural intended functions, and source reference information for the functions. The applicant identified 16 structures and or buildings as within the scope of license renewal.

The staff conducted detailed discussions with the applicant's license renewal team and reviewed documentation pertinent to the scoping process. The staff assessed whether the scoping methodology outlined in the LRA and procedures were appropriately implemented and whether the scoping results were consistent with CLB requirements. The staff also reviewed structural scoping evaluation results for the ES service water (SW) pump-house and the TB to verify proper implementation of the scoping process. Based on these audit activities, the staff did not identify any discrepancies between the methodology documented and the implementation results.

2.1.4.6.3 Conclusion

On the basis of the staff's review of information in the LRA, the applicant's detailed scoping procedures, and a sampling review of structural scoping results, the staff concludes that the applicant's methodology for identification of the structures within the scope of license renewal meets the scoping criteria pursuant to 10 CFR 54.4(a) and therefore is acceptable.

2.1.4.7 Electrical Component Scoping

2.1.4.7.1 Summary of Technical Information in the Application

LRA Section 2.1.1.4.3, "Electrical and Instrumentation and Control Systems" and Section 2.5, "Scoping and Screening Results: Electrical and Instrumentation and Control Systems," describes the scoping process associated with electrical systems and components. A bounding scoping approach was used for electrical equipment. All electrical components were determined to be within the scope of license renewal and subject to an AMR unless they were scoped out at the system level or are screened out at the component level by commodity group. Therefore, detailed evaluation boundaries were not depicted for electrical scoping.

2.1.4.7.2 Staff Evaluation

The staff evaluated LRA sections 2.1.1.4.3 and 2.5 and the applicant's implementing procedures and AMR reports, as documented in the audit report governing the electrical scoping methodology. The applicant reviewed the electrical and I&C systems in accordance with the requirements of 10 CFR 54.4 and determined which systems were to be included within the scope of license renewal. The applicant used the Maintenance Rule Data Base, the UFSAR and systems DBDs to determine whether systems met the requirements for inclusion pursuant to 10 CFR 54.4(a)(1), (2) or (3). All electrical components contained in plant systems within the scope of license renewal and non-plant electrical systems, including switchyard components required to support SBO, were included within the scope of license renewal. In addition, the applicant identified 20 fuse boxes as included within the scope of license renewal. The staff reviewed selected portions of the data sources and selected several examples of components including switchyard components required to support SBO and fuse boxes, for which the applicant demonstrated the process used to determine whether electrical components were within the scope of license renewal.

2.1.4.7.3 Conclusion

On the basis of its review of information contained in the LRA, the applicant's scoping implementing procedures, and a sampling review of electrical scoping results, the staff concludes that the applicant's methodology for identification of electrical components within the scope of license renewal meets the scoping criteria pursuant to 10 CFR 54.4(a), and therefore is acceptable.

2.1.4.8 Conclusion for Scoping Methodology

On the basis of its review of the LRA and the scoping implementing procedures, the staff determines that the applicant's scoping methodology is consistent with the guidance contained in the SRP-LR. The staff further determines that the applicant has identified those SSCs that are safety-related, whose failure could affect safety-related functions, and are necessary to

demonstrate compliance with staff regulations for fire protection, EQ, ATWS, and SBO. The staff concludes that the applicant's methodology is consistent with the requirements of 10 CFR 54.4(a) and therefore is acceptable.

2.1.5 Screening Methodology

2.1.5.1 General Screening Methodology

After determining the systems and structures within the scope of license renewal, the applicant implemented a process for determining which SSCs were subject to an AMR, in accordance 10 CFR 54.21.

2.1.5.1.1 Summary of Technical Information in the Application

In LRA Section 2.1.2, "Screening Methodology," the applicant discussed the method of identifying components from in-scope systems and structures that are subject to an AMR. The screening process consisted of the following steps:

- Identification of components, long-lived or passive, for each in-scope mechanical system, structure and electrical commodity group
- Identification of the license renewal intended function(s) for all mechanical and structural component types and electrical commodity groups

Active components were screened out and therefore, did not require AMR. The screening process also identified short lived components and consumables. The short lived components are not subject to an AMR. Consumables are a special class of items that include packing, gaskets, component seals, O-rings, oil, grease, component filters, system filters, fire extinguishers, fire hoses, and air packs. Sealants for structures were the only consumables within the scope of license renewal that require an AMR

2.1.5.1.2 Staff Evaluation

Pursuant to 10 CFR 54.21, the staff requires that each LRA contain an integrated plant assessment (IPA) that identifies SCs within the scope of license renewal and subject to an AMR. The IPA must identify components that perform an intended function without moving parts or a change in configuration or properties (passive), as well as components that are not subject to periodic replacement based on a qualified life or specified time period (long-lived). The IPA includes a description and justification of the methodology used to determine the passive and long-lived SCs, and a demonstration that the effects of aging on those SCs will be adequately managed so that the intended function(s) will be maintained under all design conditions imposed by the plant-specific CLB, for the period of extended operation.

The staff reviewed the methodology used by the applicant to determine whether mechanical and structural component types, and electrical commodity groups within the scope of license renewal should be subject to an AMR. The applicant implemented a process for determining which SCs were subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1). In LRA Section 2.1.2, the applicant discussed these screening activities as they related to component types and commodity groups within the scope of license renewal.

The screening process evaluated these in-scope component types and commodity groups to determine which ones were long-lived and passive and therefore, subject to an AMR. The staff reviewed LRA Sections 2.3, 2.4, and 2.5, which documented the results of the process the applicant used to identify component types and commodity groups subject to an AMR. The staff also reviewed the screening results reports for the MS system and the TB.

The applicant provided the staff with a detailed discussion of the processes used for each discipline and provided administrative documentation that described the screening methodology. Specific methodology for mechanical, electrical, and structural is discussed below.

2.1.5.1.3 Conclusion

On the basis of its review of the LRA, the screening implementing procedures and a sampling of screening results, the staff concludes that the applicant's screening methodology is consistent with the guidance contained in the SRP-LR and is capable of identifying passive, long-lived components within the scope of license renewal and subject to an AMR. The staff concludes that the applicant's process for determining which component types and commodity groups are subject to an AMR is consistent with the requirements of 10 CFR 54.21 and therefore, is acceptable.

2.1.5.2 Mechanical Component Screening

2.1.5.2.1 Summary of Technical Information in the Application

LRA Section 2.1.2.1, "Screening of Mechanical Systems," discusses the screening methodology for identifying passive and long-lived mechanical components and their support structures that are subject to an AMR. License renewal drawings were prepared to indicate portions of systems that support system intended functions within the scope of license renewal (with the exception of those systems in-scope for 10 CFR 54.4(a)(2) for physical interactions, as discussed below).

2.1.5.2.2 Staff Evaluation

The staff evaluated the mechanical screening methodology in LRA 2.1.2.1, the license renewal project documents, license renewal project guidelines, and the AMR reports. The mechanical system screening process began with the results from the scoping process. The applicant reviewed each system evaluation boundary, as illustrated on P&IDs, to identify passive and long-lived components. Within the system evaluation boundaries, all passive, long-lived components that perform or support an intended function are subject to an AMR. To streamline the AMR process, the applicant grouped components into component types. The component types were then reviewed against the list contained in NEI 95-10, Appendix B. The results of the review are documented in the AMR reports. The AMR reports contain system intended functions, system evaluation boundaries, component materials and environments, component intended functions, and AMR results.

The staff reviewed the results of the boundary evaluations and further discussed the process with the applicant. The staff confirmed that mechanical system evaluation boundaries were established for each system within the scope of license renewal. These boundaries were determined by mapping the pressure boundary associated with system-level license renewal

intended functions onto the P&IDs. A preparer and an independent reviewer performed a comprehensive evaluation of the boundary drawings to ensure the completeness and accuracy of the review results.

Additionally, the staff reviewed the screening activities associated with the MS system. The staff reviewed the system intended functions and associated source documents identified for the system, the MS flow diagrams, and the associated results documented in the AMR report. The staff did not identify any discrepancies with the evaluation, and determined that the applicant has adequately followed the process documented in the license renewal project documents, and adequately documented the results in the AMR reports.

2.1.5.2.3 Conclusion

Based on its review of the LRA, the screening implementing procedures, and a sample of MS system screening results, the staff concludes that the applicant's mechanical component screening methodology is consistent with SRP-LR guidance. The staff further concludes that the applicant's methodology for identifying passive, long lived mechanical components within the scope of license renewal and subject to an AMR meets the requirements of 10 CFR 54.21(a)(1) and therefore, is acceptable.

2.1.5.3 Structural Component Screening

2.1.5.3.1 Summary of Technical Information in the Application

LRA Section 2.1.2.2, "Screening of Structures," states that for each structure within the scope of license renewal, the screening process identified those structural components that were subject to an AMR. LRA Section 2.4, "Scoping and Screening Results: Structures," presents the results for structures. The screening process for structural components involved a review of design documents (UFSAR, drawings) to identify the specific structural components that make up the structure. Structural components typically do not have unique identifiers similar to those provided for mechanical components. Therefore, grouping structural components and commodities were first based on materials of construction and then subdivided based on component design and function which provided a means of categorizing them for an AMR. Commodity groups were based on materials of construction, such as steel, concrete, elastomers, or earthen. Once the structural commodity groups were identified within an in-scope structure or building, the commodity groups were subdivided into discrete structural component types based on design, such as walls, floors, fire doors, and equipment supports. Structures contain inherently passive, long-lived structural components and therefore the structural components within the scope of license renewal that perform an intended function were identified as subject to an AMR.

2.1.5.3.2 Staff Evaluation

The staff reviewed the applicant's methodology for identifying structural components that are subject to an AMR as required in 10 CFR 54.21(a)(1). As part of this review, the staff discussed the methodology with the applicant, reviewed the documentation developed to support the activity, and evaluated the screening results for several structures that were identified as within the scope of license renewal.

The applicant's AMR reports, as described in the audit report, provided detailed implementation guidance on the applicant's process for identifying and screening structural components that are subject to an AMR. The report stated that all structural components that perform an intended function and are passive and long-lived are subject to an AMR. In addition, the applicant described the screening results for each system in separate AMR reports for each system.

The staff reviewed the applicant's methodology used for structural screening described in LRA sections noted above, and in the applicants implementing guidance and AMR reports. The applicant performed the screening review in accordance with the implementation guidance and captured pertinent structure design information, component, materials, environments, and aging effects. The staff confirmed that the applicant used the lists of passive SCs embodied in the regulatory guidance as an initial starting point and supplemented that list with additional items unique to the site or for which a direct match to the generic lists did not exist (*i.e.*, material and/or environment combinations). The boundary for a structure was the entire building including base slabs, foundations, walls, beams, slabs, and steel superstructure. The applicant provided the staff with a detailed discussion that described the screening methodology, as well as the screening reports for a selected group of structures.

The staff conducted detailed discussions with the applicant's license renewal team and reviewed documentation pertinent to the screening process. The staff assessed whether the screening methodology outlined in the LRA and procedures was appropriately implemented and whether the scoping results were consistent with CLB requirements. The staff also reviewed structural screening results for SCs contained in the ES SW pump-house and the TB to verify proper implementation of the screening process. Based on these audit activities, the staff did not identify any discrepancies between the methodology documented and the implementation results.

2.1.5.3.3 Conclusion

On the basis of its review of information contained in the LRA, the applicant's detailed screening implementing procedures, and a sampling review of structural screening results, the staff concludes that the applicant's methodology for identification of structural components subject to an AMR met the requirements of 10 CFR 54.21(a)(1) and therefore, is acceptable.

2.1.5.4 Electrical Component Screening

2.1.5.4.1 Summary of Technical Information in the Application

In the LRA section 2.1.2.3, "Screening of Electrical and Instrumentation and Control Systems," the applicant discussed the screening of electrical and instrumentation and control system components. For each electrical system within the scope of license renewal, the screening process identified those electrical components and commodities that are subject to an AMR. Electrical components in mechanical systems were included in the scope of license renewal and were addressed under the electrical screening process.

The process of electrical screening differed from the mechanical and structural processes because the electrical components were addressed completely within their respective commodity groups. Each electrical component within the scope of license renewal is assigned to an electrical component commodity group for the screening evaluation. The screening of

electrical components for license renewal was performed utilizing a commodity group basis. An electrical commodity group is a group of electrical components grouped by type of equipment and/or function. The listing of electrical component commodity groups included in Appendix B to NEI 95-10 is used as the starting point for establishing commodity groups. Review of SSES documents (FSAR, single-line drawings, and electrical layout drawings) was used to validate the listing as complete.

For the electrical equipment within the scope of license renewal, the passive, long-lived components that perform or support an intended function are subject to an AMR. NEI 95-10, Appendix B, identifies the electrical commodities considered to be passive and potentially requiring an AMR. For SSES, electrical commodity groups were identified and cross-referenced to the appropriate NEI 95-10 commodity, which identifies the passive commodity groups. Electrical commodities determined to be active were not subject to an AMR. Electrical commodities that are not subject to replacement based on a qualified life or specified time period were considered long-lived. Components that are subject to replacement are addressed in replacement programs, such as the Environmental Qualification Program, or other controlled programs that establish a specific service life, qualified life, or replacement frequency. Components that are not long-lived are not subject to an AMR.

2.1.5.4.2 Staff Evaluation

The staff reviewed the applicant's methodology used for electrical screening in LRA Section 2.1.2.3 and the applicant's implementation procedures and AMR reports. Based on a review of the LRA, applicant's implementing procedures and screening reports, the staff determined that the applicant used the screening process described in these documents to identify the electrical commodity groups subject to AMR and that the applicant used the component database, the stations single-line drawings, and cable procurement specifications as data sources to identify the electrical and I&C components, including fuses-holders. The applicant determined there were 20 fuse-holders located outside of active devices and subject to an AMR.

The staff determined that the applicant assembled a table of four commodities which were determined to meet the passive criteria which were grouped in accordance with NEI 95-10 as (a) non-insulated cables and connections, (b) non-insulated metal enclosed (phase) bus, (c) high-voltage insulators, and (d) transmission conductors and connections. Based on the review of the applicant's screening reports, the staff determined that the applicant evaluated the identified, passive commodities to determine whether they were subject to replacement based on a qualified life or specified time period (short-lived), or not subject to replacement based on a qualified life or specified time period (long-lived). The remaining passive, long lived components were determined to be subject to an AMR. The staff reviewed the applicant's screening of selected components including switchyard components required to support SBO and fuse boxes, to verify the correct implementation of the methodology.

2.1.5.4.3 Conclusion

The staff reviewed the LRA, procedures, electrical drawings, and a sample of the results of the screening methodology and concludes that the applicant's methodology is consistent with the description provided in LRA and the applicant's implementing procedures. On the basis of its review of information contained in the LRA, the applicant's screening implementing procedures, and a sampling review of electrical screening results, the staff further concludes that the

applicant's methodology for identification of electrical commodity groups subject to an AMR is consistent with the requirements of 10 CFR 54.21(a)(1) and therefore, is acceptable.

2.1.5.5 Conclusion for Screening Methodology

On the basis of its review of the LRA, the screening implementing procedures, discussions with the applicant's staff, and a sample review of screening results, the staff determines that the applicant's screening methodology is consistent with the guidance contained in the SRP-LR and that the applicant has identified those passive, long-lived components within the scope of license renewal that are subject to an AMR. The staff concludes that the applicant's methodology is consistent with the requirements of 10 CFR 54.21(a)(1) and therefore, is acceptable.

2.1.6 Summary of Evaluation Findings

The staff review of the information presented in LRA Section 2.1, the supporting information in the scoping and screening implementing procedures and reports, the information presented during the scoping and screening methodology audit, and the applicant's responses to the staff's RAIs dated March 9, 2007, formed the basis of the staff's determination. The staff confirmed that the applicant's scoping and screening methodology is consistent with the requirements of the Rule. From this review, the staff concludes that the applicant's methodology for identifying SSCs within the scope of license renewal and SCs requiring an AMR is consistent with the requirements of 10 CFR 54.4 and 10 CFR 54.21(a)(1) and therefore, is acceptable.

2.2 Plant-Level Scoping Results

2.2.1 Staff Evaluation

In LRA Section 2.1, the applicant described its methodology for identifying systems and structures within the scope of license renewal and subject to an AMR. The staff verified that the applicant properly implemented its methodology, the staff's review focused on the implementation results shown in LRA Tables 2.2-1, 2.2-2, and 2.2-3, to confirm that there were no omissions of plant-level systems and structures within the scope of license renewal.

The staff determined whether the applicant properly identified the systems and structures within the scope of license renewal in accordance with 10 CFR 54.4. The staff reviewed selected systems and structures that the applicant did not identify as within the scope of license renewal to verify whether the systems and structures have any intended functions requiring their inclusion within the scope of license renewal. The staff's review of the applicant's implementation was conducted in accordance with the guidance in SRP-LR Section 2.2, "Plant-Level Scoping Results."

The staff's review of LRA Section 2.2 identified areas where additional information was necessary to complete the review of the applicant's scoping and screening results. The applicant responded to the staff's RAIs as discussed below.

In RAI 2.2-1, dated August 27, 2007, the staff noted that LRA Table 2.2-1 defines the electro-hydraulic control and logic system and the electro-hydraulic control hydraulic power

system as not within the scope of license renewal. Electro-hydraulic control systems assist to provide holdup and plate-out of fission products that may leak through the closed main steam isolation valves (MSIVs). This is a function performed by components located in the main condenser and MSIV leakage pathway. In doing so, they fulfill intended functions pursuant to 10 CFR 54.4(a)(2). The staff requested that the applicant provide additional information to justify exclusion of the electro-hydraulic control and logic system and the electro-hydraulic control hydraulic power system from the scope of license renewal.

In its response to RAI 2.2-1, dated October 18, 2007, the applicant stated:

> The Electro-Hydraulic Control and Logic System, and the Electro-Hydraulic Control Hydraulic Power System are not within the scope of license renewal and are not subject to Aging Management Review (AMR). Control of fission products that may leak through a closed MSIV is provided by directing the leakage to the condenser prior to release to atmosphere. This function is performed by the Main Steam System, as discussed in LRA Section 2.3.4.6. The Susquehanna FSAR, Section 6.7 states: "The MSIV leakage Isolated Condenser Treatment Method (ICTM) controls and minimizes the release of fission products which could leak through the closed main steam isolation valves (MSIVs) after a LOCA. The treatment method provides this control by processing MSIV leakage prior to release to the atmosphere. This is accomplished by directing the leakage through the main steam drain line to the condenser." The primary path for the ICTM method as used at Susquehanna depends on the drain line pathway to the condenser. The primary path is in-scope and subject to AMR and is depicted on LR-M-141/2141-1 and LR-M-205/2105-1. The secondary path depends on the Main Steam line drip legs, is in-scope and subject to AMR, and is depicted on LR-M-101/2101-1. The ICTM does not depend on either the Electro-Hydraulic Control and Logic System, or the Electro-Hydraulic Control Hydraulic Power System to maintain any valves open to provide the pathway from the MSIVs to the condenser for either the primary or the secondary paths.
>
> Per FSAR Section 6.7.2.1.1, the primary pathway to the condenser is the main steam drain line through the HV-1(2)41F020 and HV-1(2)41F021 motor-operated valves. The HV-1(2)41F020 valve is normally open and will not need to be operated. The HV-1(2)41F021 valve is normally closed and will need to be opened by an operator by means of a hand switch in the control room. There are three normally open motor-operated valves that will need to be closed by an operator to prevent leakage to other areas of the TB. These boundary valves are HV-1(2)0107 to steam jet air ejector, HV-1(2)0109 to steam seal evaporator, and HV-1(2)0111, to reactor feed pump turbines. The hand switches for these valves are in the control room.
>
> Per FSAR Section 6.7.2.1.2, alternate orificed pathways (which do not require the opening of any valves) exist as a backup to direct MSIV leakage to the condenser should the HV-1(2)41F021 valve not open as expected. These pathways include: the orificed bypass line around the HV-1(2)041F021 valve; the four orificed drain lines from the main steam line eight inch drip legs; and the one orificed drain line from the main steam line twelve inch drip leg.

> The Electro-Hydraulic Control and Logic System and the Electro-Hydraulic Control Hydraulic Power System do not perform any safety-related functions and therefore do not meet the criteria of 10 CFR 54.4(a)(1).
>
> The Electro-Hydraulic Control and Logic System and the Electro-Hydraulic Control Hydraulic Power System do not have the potential to adversely affect safety-related systems or components through spatial interaction and therefore do not meet the criteria of 10 CFR 54.4(a)(2). As stated in LRA Section 2.1.1.2.2, there are no components located in the TB that either perform or would prevent a safety-related function from occurring.
>
> The Electro-Hydraulic Control and Logic System and the Electro-Hydraulic Control Hydraulic Power System are not relied upon to demonstrate compliance with, nor satisfy the 10 CFR 54.4(a)(3) scoping criteria for, any regulated event.

Based on its review, the staff finds the applicant's response to RAI 2.2-1 acceptable because the applicant clarified why the electro-hydraulic control and logic system and the electro-hydraulic control hydraulic power system are not within the scope of license renewal. Therefore, the staff's concern described in RAI 2.2-1 is resolved.

In RAI 2.2-2, dated August 27, 2007, the staff noted that LRA Table 2.2-1 defines the circulating water system (CWS) as not within the scope of license renewal. Applicants with similar plant designs have included the CWS within the scope of license renewal in accordance with 10 CFR 54.4(a)(2). The staff requested that the applicant provide additional information to justify exclusion of the CWS from scope with respect to the applicable requirements pursuant to 10 CFR 54.4(a).

In its response to RAI 2.2-2, dated October 18, 2007, the applicant stated:

> As described in Section 10.4.5 of the FSAR, the Circulating Water System for SSES has no safety-related functions and is designed to remove the latent heat from the main condenser and sensible heat from the Service Water System and dissipate both in a hyperbolic natural draft cooling tower. Failure of the Circulating Water System will not prevent the satisfactory accomplishment of any safety-related functions and therefore, does not meet the criteria of 10 CFR 54.4(a)(1).
>
> In addition, failure of the Circulating Water System will not adversely affect any safety-related systems or components through spatial interaction and system piping is not connected to any safety-related piping. There is no potential for spatial interaction of the Circulating Water System with safety-related components, because circulating water piping is not routed in structures or outdoor areas that contain safety-related components. Portions of the Circulating Water System are routed in the Turbine Building. However, as described in Section 2.1.1.2.2 of the LRA (pg. 2.1-6) there are no components located in the Turbine Building that either perform or would prevent a safety-related function from occurring. Therefore, the Circulating Water System does not meet the criteria of 10 CFR 54.4(a)(2).

> As evaluated in FSAR Section 10.4.1.3.3, flooding due to the rupture of a circulating water expansion joint in the Turbine Building will not affect any safety-related equipment. The Circulating Water System is not relied upon to demonstrate compliance with any regulated event and, therefore, does not meet the criteria of 10 CFR 54.4(a)(3).

In a telephone conference call, "Summary of Telephone Conference Call Held December 28, 2007, between the U.S. Nuclear Regulatory Commission and PPL Susquehanna, LLC, Concerning Requests for Additional Information Pertaining to the Susquehanna Steam Electric Station, Unit 1 and 2, License Renewal Application," (see Appendix B) the staff noted that UFSAR Section 10.4.5 identifies the cooling towers and its piping as part of the CWS. The UFSAR identifies the cooling towers and the piping from the cooling towers as a secondary source of fire protection water, making this portion of the CWS within the scope of license renewal, based on criterion pursuant to 10 CFR 54.4(a)(3). Furthermore, boundary drawings LR-M-115, "Unit 1 License Renewal Boundary Drawings Circulating Water," and LR-M-2115, "Unit 2 License Renewal Boundary Drawing Circulating Water," identify the cooling tower basins and a portion of the pipes from the cooling tower basins as within the scope of license renewal, based on criterion in accordance with 10 CFR 54.4(a)(3).

The applicant replied as follows:

> The 108-inch piping exiting the Unit 1 cooling tower basin and the 78-inch line exiting the Unit 2 cooling tower basin provide water to both the circulating water system and the service water system. Therefore, this piping is functionally part of two systems. Within the SSES maintenance program this piping is considered part of the cooling tower system. The LRA system designation is based on the "functional" purpose of the cooling tower basins and piping rather than the FSAR description.

Based on its review, the staff finds the applicant's response to RAI 2.2-2 acceptable because the applicant has clarified that the LRA system designation is based on the functional purpose of the cooling tower basins and piping rather than the UFSAR system designation and that within the SSES maintenance program, this piping is considered part of the cooling tower system, which is within the scope of license renewal. Therefore, the staff's concern described in RAI 2.2-2 is resolved.

In RAI 2.2-1, dated July 25, 2007, the staff requested that the applicant provide justification for the exclusion of the miscellaneous HVAC systems (Chlorination Building HVAC, Circulating Water Pump Room HVAC, Intake Works HVAC, Service and Administration Building HVAC, Service Water Pump Room HVAC, Turbine Building HVAC, and Water Treatment Room HVAC) and their applicable components and passive functions from the scope of license renewal. If these systems and their applicable components are within the scope of license renewal, in accordance with 10 CFR 54.4(a), and subject to an AMR pursuant to 10 CFR 54.21(a)(1), update the LRA by providing the applicable information in the appropriate LRA sections, tables, and boundary drawings.

In its response to RAI 2.2-1, dated August 23, 2007, the applicant stated:

> Chlorination Building HVAC - The Chlorination Building is part of the structure that is identified in the LRA as the Chlorination and Acid Storage Building. As stated in LRA Table 2.2-3, the Chlorination and Acid Storage Building is not within the scope of license renewal. There are no safety-related components located in the building. Therefore, the HVAC components located in the building are not in-scope based upon the criteria of 10 CFR 54.4(a)(1) and 10 CFR 54.4(a)(2). In addition, no components located in the building support any regulated events for a BWR. Therefore, the HVAC components are also not in-scope based on the criterion of 10 CFR 54.4(a)(3). The Chlorination Building HVAC System does not provide a supporting function applicable to equipment within the scope of license renewal, therefore it is not within the scope of license renewal.
>
> Circulating Water Pump Room HVAC - The Circulating Water Pump Room is part of the structure identified in the LRA as the Circulating Water Pumphouse and Water Treatment Building. As stated in LRA Table 2.2-3, the Circulating Water Pumphouse and Water Treatment Building is within the scope of license renewal. LRA Section 2.4.4 states that the building is relied upon to demonstrate compliance with the regulation 10 CFR 50.48 for Fire Protection by providing physical support and protection to the fire water pumps. There are no safety-related components located in the Circulating Water Pumphouse and Water Treatment Building, which contains the Circulating Water Pump Room. Therefore, the HVAC components located in the Circulating Water Pump Room are not in-scope based upon the criteria of 10 CFR 54.4(a)(1) and 10 CFR 54.4(a)(2). While there is fire protection equipment located in Circulating Water Pumphouse and Water Treatment Building that is in-scope, based on criterion of 10 CFR 54.4(a)(3), this equipment does not require support from the Circulating Water Pump Room HVAC. Therefore, the HVAC components located in Circulating Water Pump Room are not in-scope based upon the criterion of 10 CFR 54.4(a)(3). The Circulating Water Pump Room HVAC System does not provide a supporting function for any equipment within the scope of license renewal, therefore, it is not within the scope of license renewal.
>
> Intake Works HVAC - The Intake Works is part of the structure identified in the LRA as the River Intake Structure. As stated in LRA Table 2.2-3, the River Intake Structure is not within the scope of license renewal. There are no safety-related components located in the structure. Therefore, the HVAC components located in the structure are not in-scope based upon the criteria of 10 CFR 54.4(a)(1) and 10 CFR 54.4(a)(2). In addition, no components located in the structure support any regulated events for a BWR. Therefore, the HVAC components are also not in-scope based on the criterion of 10 CFR 54.4(a)(3). The Intake Works HVAC System does not provide a supporting function applicable to equipment within the scope of license renewal, therefore, it is not within the scope of license renewal.
>
> Service and Administration Building HVAC - As stated in LRA Table 2.2-3, the Service and Administration Building is not within the scope of license renewal. There are no safety-related components located in the Service and

Administration Building. Therefore, the HVAC components located in the Service and Administration Building are not in-scope based upon the criteria of 10 CFR 54.4(a)(1) and 10 CFR 54.4(a)(2). In addition, no components located in the Service and Administration Building support any regulated events for a BWR. Therefore, the HVAC components are also not in-scope based on the criterion of 10 CFR 54.4(a)(3). The Service and Administration Building HVAC System does not provide a supporting function applicable to equipment within the scope of license renewal, therefore it is not within the scope of license renewal.

Service Water Pump Room HVAC - The Service Water Pump Room is part of the structure identified in the LRA as the Circulating Water Pumphouse and Water Treatment Building. As stated in LRA Table 2.2-3, the Circulating Water Pumphouse and Water Treatment Building is within the scope of license renewal. LRA Section 2.4.4 states that the building is relied upon to demonstrate compliance with the regulation 10 CFR 50.48 for Fire Protection by providing physical support and protection to the fire water pumps. There are no safety-related components located in the Circulating Water Pumphouse and Water Treatment Building, which contains the Service Water Pump Room. Therefore, the HVAC components located in the Service Water Pump Room are not in-scope based upon the criteria of 10 CFR 54.4(a)(1) and 10 CFR 54.4(a)(2). While there is fire protection equipment located in Circulating Water Pumphouse and Water Treatment Building that is in-scope based on criterion of 10 CFR 54.4(a)(3), this equipment does not require support from the Service Water Pump Room HVAC. Therefore, the HVAC components located in the Service Water Pump Room are not in-scope based upon the criterion of 10 CFR 54.4(a)(3). The Service Water Pump Room HVAC System does not provide a supporting function applicable to equipment within the scope of license renewal, therefore it is not within the scope of license renewal.

Turbine Building HVAC - As stated in LRA Table 2.2-3, the Turbine Building is within the scope of license renewal. LRA Section 2.4.8 provides the reasons for the building being in-scope. There are no safety-related components located in the Turbine Building. Therefore, the HVAC components located in the Turbine Building are not in-scope based upon the criterion of 10 CFR 54.4(a)(1). While there is equipment in the Turbine Building that is in-scope based on the criteria of 10 CFR 54.4(a)(2) and 10 CFR 54.4(a)(3), this equipment does not require support from the Turbine Building HVAC. Therefore, the HVAC components located in the Turbine Building are not in-scope based upon the criteria of 10 CFR 54.4(a)(2) and 10 CFR 54.4(a)(3). The Turbine Building HVAC System does not provide a supporting function for the equipment within the scope of license renewal, therefore it is not within the scope of license renewal.

Water Treatment Room HVAC - The Water Treatment Room is part of the structure identified in the LRA as the Circulating Water Pumphouse and Water Treatment Building. As stated in LRA Table 2.2-3, the Circulating Water Pumphouse and Water Treatment Building is within the scope of license renewal. LRA Section 2.4.4 states that the building is relied upon to demonstrate compliance with the regulation 10 CFR 50.48 for Fire Protection by providing physical support and protection to the fire water pumps. There are no safety-related components located in the Circulating Water Pumphouse and Water

Treatment Building, which contains the Water Treatment Room. Therefore, the HVAC components located in the Water Treatment Room are not in-scope based upon the criteria of 10 CFR 54.4(a)(1) and 10 CFR 54.4(a)(2). While there is fire protection equipment located in the Circulating Water Pumphouse and Water Treatment Building that is in-scope based on criterion of 10 CFR 54.4(a)(3), this equipment does not require support from the Water Treatment Room HVAC. Therefore, the HVAC components are also not in-scope based on the criterion of 10 CFR 54.4(a)(3). The Water Treatment Room HVAC System does not provide a supporting function applicable to equipment within the scope of license renewal, therefore it is not within the scope of license renewal.

Based on its review, the staff finds the applicant's response to staff's RAI 2.2-1 acceptable because the applicant clarified why the miscellaneous HVAC systems (Chlorination Building HVAC, Circulating Water Pump Room HVAC, Intake Works HVAC, Service and Administration Building HVAC, Service Water Pump Room HVAC, Turbine Building HVAC, and Water Treatment Room HVAC systems) are not within the scope of license renewal. Therefore, the staff's concern described in RAI 2.2-1 is resolved.

2.2.2 Conclusion

The staff reviewed LRA Section 2.2, the RAI responses, and the UFSAR supporting information to determine whether the applicant failed to identify any systems and structures within the scope of license renewal. On the basis of its review, the staff concludes that the applicant has appropriately identified the systems and structures within the scope of license renewal in accordance with 10 CFR 54.4 and therefore, is acceptable.

2.3 Scoping and Screening Results: Mechanical Systems

This section documents the staff's review of the applicant's scoping and screening results for mechanical systems. Specifically, this section discusses:

- Reactor vessel (RV), RV internals, and reactor coolant system (RCS)
- Engineered safety features (ESF)
- Auxiliary systems
- Steam and power conversion systems

The staff evaluation of the mechanical system scoping and screening results applies to all mechanical systems reviewed. Those systems that required RAIs to be generated (if any) include an additional staff evaluation which specifically addresses the applicant's response to the RAI(s).

In accordance with the requirements of 10 CFR 54.21(a)(1), the applicant must list passive, long-lived SCs within the scope of license renewal and subject to an AMR. To verify that the applicant properly implemented its methodology, the staff's review focused on the implementation results. This focus allowed the staff to confirm that the applicant has identified the mechanical system structures and components that meet the scoping criteria and are subject to an AMR, and to confirm that there were no omissions.

The staff's evaluation was performed using the evaluation methodology described here, in SER Section 2.3 and the guidance in SRP-LR Section 2.3, and took into account (where applicable) the system function(s) described in the UFSAR. The objective was to determine whether the applicant identified, in accordance with 10 CFR 54.4, components and supporting structures for mechanical systems that meet the license renewal scoping criteria. Similarly, the staff evaluated the applicant's screening results to verify that all passive, long-lived components were subject to an AMR in accordance with 10 CFR 54.21(a)(1).

In the scoping evaluation, the staff reviewed the LRA, UFSAR, license renewal boundary drawings, and other licensing basis documents, as appropriate, for each mechanical system within the scope of license renewal. The staff reviewed the licensing basis documents to confirm that the LRA specified all intended functions pursuant to 10 CFR 54.4(a). The review then focused on identifying components with intended functions in accordance with 10 CFR 54.4(a) that had not been identified as within the scope of license renewal.

After reviewing the scoping results, the staff evaluated the applicant's screening results. For those SCs with intended functions delineated under 10 CFR 54.4(a), the staff verified the applicant properly screened out only: (1) SCs that have functions performed with moving parts or a change in configuration or properties or (2) SCs that are subject to replacement after a qualified life or specified time period, as described in 10 CFR 54.21(a)(1). For SCs not meeting either of these criteria, the staff confirmed the remaining SCs received an AMR, as required by 10 CFR 54.21(a)(1). The staff requested additional information to resolve any omissions or discrepancies identified.

The staff performed an alternate review of selected systems contained in Section 2.3.3, Auxiliary Systems, and Section 2.3.4, Steam and Power Conversion Systems. The systems selected for an alternate review were determined to have the following characteristics:

- Low safety or low risk significance
- Little operating experience indicating likely passive failures
- No previous LRA experience indicating a need to perform a detailed review

For the systems selected for alternate review, the staff evaluated the system's function(s) described in the LRA and UFSAR to verify that the applicant included in the scope of license renewal all component types identified by 10 CFR 54.4(a). The staff reviewed the LRA and UFSAR to confirm that the applicant has identified the component types that are typically found within the scope of license renewal. The staff also verified that the applicant has identified the component types subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

Those systems that received an alternate review are as follows:

- 2.3.3.10 Domestic Water System
- 2.3.3.16 Nitrogen and Hydrogen System
- 2.3.3.20 Radwaste Solids Handling System
- 2.3.3.21 Raw Water Treatment System
- 2.3.3.29 Sanitary Drainage System
- 2.3.4.1 Auxiliary Boiler System
- 2.3.4.2 Bypass Steam System

- 2.3.4.8 Makeup Demineralizer System
- 2.3.4.9 Makeup Transfer and Storage System
- 2.3.4.11 Refueling Water Transfer and Storage System

2.3.1 Reactor Vessel, Reactor Vessel Internals, and Reactor Coolant System

In LRA Section 2.3.1, the applicant identified the RV, RV internals, and RCS SCs subject to an AMR for license renewal. The applicant described the supporting SCs of the RV, RV internals, and RCS in the following LRA sections:

- 2.3.1.1 Reactor pressure vessel
- 2.3.1.2 Reactor vessel internals
- 2.3.1.3 Reactor coolant system pressure boundary

2.3.1.1 Reactor Pressure Vessel

2.3.1.1.1 Summary of Technical Information in the Application

LRA Section 2.3.1.1 describes the reactor pressure vessel (RPV), which provides a high integrity barrier against the leakage of radioactive materials, contains and supports the reactor core, RV internals, and coolant moderator, and provides a floodable volume in which the core can be adequately cooled in the event of a break in a line external to the vessel. The RPV contains safety-related components relied upon to remain functional during and following DBEs. LRA Table 2.3.1-1 identifies RPV component types within the scope of license renewal and subject to an AMR.

2.3.1.1.2 Conclusion

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA, UFSAR, and applicable boundary drawings, the staff concludes that applicant has appropriately identified the RPV system mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system components subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.1.2 Reactor Vessel Internals

2.3.1.2.1 Summary of Technical Information in the Application

LRA Section 2.3.1.2 describes the RV internals, which provide a high integrity barrier against the leakage of radioactive materials, support the reactor core and RV internals, provide a floodable volume in which the core can be adequately cooled in the event of a break in a line external to the vessel, and distribute flow as designed to promote mixing. The RV internals contain safety-related components relied upon to remain functional during and following DBEs. The failure of nonsafety-related SSCs in the RV internals potentially could prevent the satisfactory accomplishment of a safety-related function. In addition, the RV internals performs functions that support ATWS. LRA Table 2.3.1-2 identifies RV internals component types within the scope of license renewal and subject to an AMR.

2.3.1.2.2 Staff Evaluation:

The staff reviewed LRA Section 2.3.1.2 and UFSAR Section 3.9.5 using the evaluation methodology described in SER Section 2.3 and the guidance in SRP-LR Section 2.3. The staff's review identified areas requiring additional information to complete the review of the applicant's scoping and screening results. The applicant responded to the staff's RAIs as discussed below.

In RAI 2.3.1-1, dated October 24, 2007, the staff noted in LRA Table 2.3.1-1, the nozzle N9 and cap for N9 were listed as in-scope as a pressure boundary. The staff identified boundary drawing LR-M-141-2 as showing nozzle N9 as out of scope. The staff requested that the applicant confirm that N9 nozzle and cap were in-scope.

In its response to RAI 2.3.1-1, dated November 14, 2007, the applicant stated:

> The highlighting of nozzle N9 and the cap for N9 on boundary drawing LR-M-141-2 was inadvertently omitted. As listed in LRA Table 2.3.1-1, nozzle N9 and the associated cap are within the scope of license renewal and subject to an AMR. The highlighting on LR-M-141-2 has been corrected to highlight nozzle N9 from the vessel wall to and including the associated cap. The highlighting of the Unit 2 N9 nozzle on LR-M-2141-2 has also been clarified to clearly show highlighting from the vessel wall to and including the cap. These were highlighting omissions on the boundary drawings and no changes to the LRA are required.

The staff confirms that the applicant has submitted revised boundary drawings LR-M-141-2 and LR-M-2141-2. Based on its review, the staff finds the applicant's response to RAI 2.3.1-1 acceptable because the applicant has clarified that the highlighting for nozzle N9 and the cap for N9 were inadvertently omitted and appropriate revisions were made to boundary drawings LR-M-141-2 and LR-M-2141-2. Therefore, the staff's concern described in RAI 2.3.1-1 is resolved.

In RAI 2.3.1-2, dated October 24, 2007, the staff noted boundary drawing LR-M-146 depicted valve 146-F004, and associate piping for a drive water pressure control station as out of scope. However, isolation valves between the out of scope and in-scope piping were not shown. The staff believes that this bypass line and valve should be within the scope of license renewal as a pressure boundary. The staff requested the applicant clarify whether the subject components were in-scope, thus, requiring an AMR and; if excluded, provide a justification.

In its response to RAI 2.3.1-2, dated November 14, 2007, the applicant stated:

> The highlighting of valve 146-F004 and the associated piping on boundary drawing LR-M-146-1 was inadvertently omitted. Valve 146-F004 and the associated piping are within the scope of license renewal and subject to aging management review. These components meet the scoping criteria for 10 CFR 54.4(a)(2) and are included in LRA Section 2.3.3.3, Table 2.3.3-3 and Table 3.3.2-3. The Unit 2 boundary drawing, LR-M-2146-1 shows the correct highlighting. This was a highlighting error and no changes to the LRA are required.

The staff confirmed that the applicant has submitted revised boundary drawing LR-M-146-1. Based on its review, the staff finds the applicant's response to RAI 2.3.1-2 acceptable because the applicant clarified that valve 146-F004 and associated piping are within the scope of license renewal and the highlighting was inadvertently omitted. The staff confirms that the applicant has made appropriate revisions to boundary drawings LR-M-141-2 and LR-M-2141-2. Therefore, the staff's concern described in RAI 2.3.1-1 is resolved.

2.3.1.2.3 Conclusion

The staff reviewed the LRA, UFSAR, boundary drawings (original and revised), and RAI responses to determine whether the applicant failed to identify any components within the scope of license renewal. In addition, the staff's review determined whether the applicant failed to identify any components subject to an AMR. On the basis of its review, the staff concludes that the applicant has appropriately identified the RV internals mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the RV internals components subject to an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1) and therefore, the response is acceptable.

2.3.1.3 Reactor Coolant System Pressure Boundary

2.3.1.3.1 Summary of Technical Information in the Application

LRA Section 2.3.1.3 describes the RCS pressure boundary, which includes the ASME Code Class 1 portions of these systems:

- Control Rod Drive Hydraulic System (Class 1 portions only)
- Core Spray System (Class 1 portions only)
- Feedwater System (Class 1 portions only)
- High-Pressure Coolant Injection System (Class 1 portions only)
- Main Steam System (Class 1 portions only)
- Reactor Core Isolation Cooling System (Class 1 portions only)
- Reactor Nonnuclear Instrumentation System (Class 1 portions only)
- Reactor Recirculation System
- Reactor Vessel and Auxiliaries (vent line and flange leak detection line only)
- Residual Heat Removal System (Class 1 portions only)
- Reactor Water Cleanup System (Class 1 portions only)
- Standby Liquid Control System (Class 1 portions only)
- In-scope portions of the reactor recirculation system are included for purposes of license renewal evaluation.

The RCS pressure boundary contains safety-related components relied upon to remain functional during and following DBEs. The failure of nonsafety-related SSCs in the RCS pressure boundary potentially could prevent the satisfactory accomplishment of a safety-related

function. In addition, the RCS pressure boundary performs functions that support fire protection, ATWS, SBO, and EQ. LRA Table 2.3.1-3 identifies RCS pressure boundary component types within the scope of license renewal and subject to an AMR.

2.3.1.3.2 Conclusion

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA, UFSAR, and applicable boundary drawings, the staff concludes that applicant has appropriately identified the RCS system mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system components subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.2 *Engineered Safety Features*

In LRA Section 2.3.2, the applicant identified the ESFs SCs subject to an AMR for license renewal. The applicant described the supporting SCs of the ESF in the following LRA sections:

- 2.3.2.1 Residual heat removal (RHR) system
- 2.3.2.2 Reactor core isolation cooling (RCIC) system
- 2.3.2.3 Core spray system (CSS)
- 2.3.2.4 High-pressure coolant injection (HPCI) system
- 2.3.2.5 Containment and suppression system
- 2.3.2.6 Containment atmosphere control system
- 2.3.2.7 Standby gas treatment system (SGTS)

2.3.2.1 *Residual Heat Removal System*

2.3.2.1.1 Summary of Technical Information in the Application

LRA Section 2.3.2.1 describes the RHR system, which is comprised of two independent loops, each with two motor-driven pumps, a heat exchanger, piping, valves, instrumentation, and controls. The RHR system contains safety-related components relied upon to remain functional during and following DBEs. The failure of nonsafety-related SSCs in the RHR system potentially could prevent the satisfactory accomplishment of a safety-related function. In addition, the RHR system performs functions that support fire protection, ATWS, and EQ. LRA Table 2.3.2-1 identifies RHR system component types within the scope of license renewal and subject to an AMR.

2.3.2.1.2 Conclusion

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA, UFSAR, and applicable boundary drawings, the staff concludes that applicant has appropriately identified the RHR system mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system components subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.2.2 Reactor Core Isolation Cooling System

2.3.2.2.1 Summary of Technical Information in the Application

LRA Section 2.3.2.2 describes the RCIC system, which consists of a steam-driven turbine-pump unit, valves, and piping capable of delivering water from either the condensate storage tank (CST) or the suppression pool to the RV via one of the feedwater lines. The RCIC system contains safety-related components relied upon to remain functional during and following DBEs. The failure of nonsafety-related SSCs in the RCIC system potentially could prevent the satisfactory accomplishment of a safety-related function. In addition, the RCIC system performs functions that support fire protection, ATWS, SBO, and EQ. LRA Table 2.3.2-2 identifies RCIC system component types within the scope of license renewal and subject to an AMR.

2.3.2.2.2 Staff Evaluation

The staff reviewed LRA Section 2.3.2.2 and UFSAR Section 5.4.6 using the evaluation methodology described in SER Section 2.3 and the guidance in SRP-LR Section 2.3. The staff's review identified areas where additional information was necessary to complete the review of the applicant's scoping and screening results. The applicant responded to the staff's RAIs as discussed below.

In RAI 2.3.2.2-1, dated October 24, 2007, the staff noted boundary drawings LR-M-150 and -2150 of the LRA depicted piping between the RCIC vacuum tank and the barometric condenser vacuum pump as not in-scope. The staff identified that Table 2.3.2-2 listed the piping and piping components function (under the vacuum tank) as structural integrity. Additionally, Tanks 1/2 T219 were depicted as in-scope in boundary drawing LR-M-150-1; but they were not listed in Table 2.3.2-2. The staff requested the applicant to confirm the connecting piping was included within the scope of license renewal and subjected to AMR as structural boundary or to justify its exclusion. In addition, the staff requested the applicant to modify Table 2.3.2-2 to reflect the response.

In its response dated November 14, 2007, the applicant stated:

> The piping between the RCIC Barometric Condenser Vacuum Tank air space and the suction of the RCIC Barometric Condenser Vacuum Pump is not in-scope because these lines are not fluid filled. The RCIC Barometric Condenser Vacuum Pump is primarily removing air and non-condensables from the steam that is condensed in the RCIC Barometric Condenser. Therefore, this segment of piping does not contain sufficient liquid that would leak or spray on adjacent equipment.
>
> The RCIC Barometric Condenser Vacuum Pump and associated discharge piping is highlighted in magenta because it provides a structural integrity function for safety-related connected piping as indicated in license renewal Note C on the subject drawings. The piping between the RCIC Barometric Condenser Vacuum Tank air space and the suction of the RCIC Barometric Condenser Vacuum Pump does not provide structural integrity for either the RCIC Barometric Condenser or Barometric Condenser Vacuum Pump, which also supports the piping not included in-scope for license renewal. Based on the above, LRA

drawings LR-M-150 and LR-M-2150, Sheet 1, H7 are correct and no change is required.

Review of LRA Table 2.3.2-2 and Table 3.2.2-2 identified that the RCIC Barometric Condenser Vacuum Pump (1/2P219) was inadvertently omitted from these tables. In addition, it was identified that the piping between the RCIC Barometric Condenser Vacuum Pump discharge and the suppression pool was inadvertently omitted from Table 3.2.2-2. The license renewal application was amended to include the RCIC Barometric Condenser Vacuum Pump and associated discharge piping as subject to aging management review.

The applicant submitted revised LRA Tables 2.3.2-2 and 3.2.2-2.

Based on its review, the staff finds the applicant's response to RAI 2.3.2.2-1 acceptable because the applicant explained that the piping in question is not fluid filled and the RCIC Barometric Condenser Vacuum Pump removes air and non-condensables from steam. The applicant also explained that the piping in question does not provide structural integrity for any required components. The applicant identified several items that were inadvertently omitted from LRA Tables 2.3.2-2, "Reactor Core Isolation Cooling System Components Subject to Aging Management Review," and Table 3.2.2-2, "Aging management review Results – Reactor Core Isolation Cooling System." The applicant amended the LRA to include these revised tables. Therefore, the staff's concern described in RAI 2.3.2.2-1 is resolved.

2.3.2.2.3 Conclusion

The staff reviewed the LRA, UFSAR, boundary drawings, RAI responses, and revised LRA tables to determine whether the applicant failed to identify any components within the scope of license renewal. In addition, the staff's review determined whether the applicant failed to identify any components subject to an AMR. On the basis of its review, the staff concludes that the applicant has appropriately identified reactor core isolation cooling system mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the reactor core isolation cooling system components subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.2.3 Core Spray System

2.3.2.3.1 Summary of Technical Information in the Application

LRA Section 2.3.2.3 describes the CSS, which, as part of the overall emergency core cooling system, is designed to provide cooling to the reactor core only when the RV pressure is low, as for a large-break loss-of-coolant accident (LOCA). However, when operating with the automatic depressurization system, the effective CSS core cooling capability extends to all break sizes as the automatic depressurization system rapidly reduces the RV pressure to the CSS operating range. The CSS contains safety-related components relied upon to remain functional during and following DBEs. The failure of nonsafety-related SSCs in the CSS potentially could prevent the satisfactory accomplishment of a safety-related function. In addition, the CSS performs functions that support fire protection and EQ. LRA Table 2.3.2-3 identifies CSS component types within the scope of license renewal and subject to an AMR.

2.3.2.3.2 Conclusion

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA, UFSAR, and applicable boundary drawings, the staff concludes that applicant has appropriately identified the CSS system mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system components subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.2.4 High Pressure Coolant Injection System

2.3.2.4.1 Summary of Technical Information in the Application

LRA Section 2.3.2.4 describes the HPCI system, which consists of a steam-driven turbine-pump unit, valves, and piping that can deliver water from the CST or from the suppression pool to the RV via one of the feedwater lines. The HPCI system contains safety-related components relied upon to remain functional during and following DBEs. The failure of nonsafety-related SSCs in the HPCI system potentially could prevent the satisfactory accomplishment of a safety-related function. In addition, the HPCI system performs functions that support fire protection, ATWS, SBO, and EQ. LRA Table 2.3.2-4 identifies HPCI system component types within the scope of license renewal and subject to an AMR.

2.3.2.4.2 Staff Evaluation

The staff reviewed LRA Section 2.3.2.4 and UFSAR Section 6.3.2.2.1 using the evaluation methodology described in SER Section 2.3 and the guidance in SRP-LR Section 2.3. The staff's review identified areas where additional information was necessary to complete the review of the applicant's scoping and screening results. The applicant responded to the staff's RAIs as discussed below.

In RAI 2.3.2.4-1, dated October 24, 2007, the staff noted that in boundary drawing LR-M-156-1, the drive shaft from the HPCI turbine to the HPCI pump was shown in-scope, however, the drive shaft between the HPCI pump and booster pump was not. The staff requested that the applicant clarify whether the drive shafts were in-scope, thus, requiring an AMR and; if excluded, provide justification.

In its response to RAI 2.3.2.4-1, dated November 14, 2007, the applicant stated:

> The highlighting of the drive shaft between the HPCI pump and booster pump on boundary drawing LR-M-156-1 was inadvertently omitted. The entire drive shaft is within the scope of license renewal. The highlighting has been corrected to show this drive shaft highlighted in green. The unit 2 boundary drawing, LR-M-2156-1 shows the correct highlighting.
>
> The drive shafts and gearbox between the HPCI booster pump and the HPCI pump and the drive shafts between the HPCI pump and the HPCI turbine are within the scope of license renewal. The drive shafts and gear box are considered to be active components and therefore are not subject to aging management review.

This was a highlighting omission on a boundary drawing and no changes to the LRA are required.

The staff confirmed that the applicant has submitted revised boundary drawing LR-M-156-1.

Based on its review, the staff finds the applicant's response to RAI 2.3.2.4-1 acceptable because the applicant clarified that the highlighting of the drive shaft between the HPCI pump and booster pump was in error and the drive shaft is in-scope. The staff confirms that the applicant has submitted a corrected boundary drawing LR-M-156-1. Therefore, the staff's concern described in RAI 2.3.2.4-1 is resolved.

2.3.2.4.3 Conclusion

The staff reviewed the LRA, UFSAR, boundary drawings (original and revised), and RAI responses to determine whether the applicant failed to identify any components within the scope of license renewal. In addition, the staff's review determined whether the applicant failed to identify any components subject to an AMR. On the basis of its review, the staff concludes that the applicant has appropriately identified the HPCI system mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the HPCI system components subject to an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1) and therefore, the response is acceptable.

2.3.2.5 Containment and Suppression System

2.3.2.5.1 Summary of Technical Information in the Application

LRA Section 2.3.2.5 describes the containment and suppression system, which maintains the structural and functional integrity of the primary containment during and following a design-basis LOCA. The system also monitors suppression pool level, pressure, and temperature and provides for suppression pool cleanup. The containment and suppression system contains safety-related components relied upon to remain functional during and following DBEs. The failure of nonsafety-related SSCs in the containment and suppression system potentially could prevent the satisfactory accomplishment of a safety-related function. In addition, the containment and suppression system performs functions that support fire protection, ATWS, SBO, and EQ. LRA Table 2.3.2-5 identifies containment and suppression system component types within the scope of license renewal and subject to an AMR.

2.3.2.5.2 Staff Evaluation

The staff reviewed LRA Section 2.3.2.5 and UFSAR Section 6.2.1 using the evaluation methodology described in SER Section 2.3 and the guidance in SRP-LR Section 2.3. The staff's review identified areas where additional information was required to complete the scoping and screening results. The applicant responded to the staff's RAIs as discussed below.

In RAI 2.3.2.5-1 dated July 25, 2007, the staff noted that on boundary drawing LR-M-157, Sheet 4, one-inch valve 157011 at penetration X-234A and one-inch valve 157023 at penetration X-232A, which belong to suppression pool level monitoring system, are shown as not within the scope of license renewal. The staff requested that the applicant provide justification for the exclusion of these valves from the scope of license renewal. If these valves

are within the scope of license renewal, in accordance with 10 CFR 54.4(a), and subject to an AMR in accordance with 10 CFR 54.21(a)(1), the staff requested that the applicant update the LRA by providing the applicable information in the appropriate LRA sections, tables, and boundary drawings.

In its response to RAI 2.3.2.5-1, dated August 23, 2007, the applicant stated:

> Boundary drawing LR-M-157 Sheet 4 contained an error related to highlighting. Valve 157011 at penetration X-234A and valve 157023 at penetration X-232A are both in-scope and subject to aging management review, but they were inadvertently not highlighted. Both valves have been highlighted in green on the revised boundary drawing LR-M-157 Sheet 4, included as Attachment 1.
>
> In the course of addressing this RAI, it was also noticed that the highlighting at penetration X-90D for one-inch line HCB-112 was slightly different from the highlighting for the other pipelines at penetrations X-90A and X-90D. The short length of piping between valve 157077 and the penetration should have been highlighted. This piping is in-scope and subject to aging management review, but was inadvertently not highlighted. This piping has been highlighted in green on the revised boundary drawing LR-M-157 Sheet 4, included as Attachment 1.
>
> No changes to the LRA are required as valves 157011 and 157023 are addressed in Table 2.3.2-5, and the material/environment combinations for the valve bodies are addressed in Table 3.2.2-5. The additional piping component associated with one-inch line HCB-112 belongs to the Containment Atmosphere Control System. No changes to the LRA are required as the piping is included in Table 2.3.2-6 and the material/environment combinations for the piping are addressed in Table 3.2.2-6.

Based on its review, the staff finds the applicant's response to RAI 2.3.2.5-1 acceptable because the applicant clarified that the that one-inch valve 157011 at penetration X-234A and one-inch valve 157023 at penetration X-232A are within the scope of license renewal and were inadvertently not highlighted. The staff confirms that the applicant has provided revised boundary drawing LR-M-157, Sheet 4, with correct highlighting. Therefore, the staff's concern described in RAI 2.3.2.5-1 is resolved.

In RAI 2.3.2.5-2, dated July 25, 2007, the staff noted that LRA Section 2.3.2.5, "Containment and Suppression System" under "License Renewal Drawings" lists boundary drawings LR-M-151 Sheet 1, and LR-M-155 Sheet 1 for Unit 1, and LR-M-2151 Sheet 1, and LR-M-2155, Sheet 1 for Unit 2. The staff requested that the applicant clarify which functions or items shown in these boundary drawing belong to the containment and suppression system.

In its response to RAI 2.3.2.5-2, dated August 23, 2007, the applicant stated:

> The evaluation boundaries of the Containment and Suppression System that are shown on drawing LR-M-151 Sheet 1 for Unit 1 (LR-M-2151 Sheet 1 for Unit 2) are within the Non Safety Affecting Safety (NSAS) boundaries highlighted in magenta and extend from valve 151089 in zone B-1 for Unit 1 (valve 251088 in zone B-1 for Unit 2) through four-inch pipeline HBD-173 (4-inch HBD-273 for

Unit 2) and continuing on drawing LR-M-157 Sheet 1 for Unit 1 (LR-M2157 Sheet 1 for Unit 2). Components within these boundaries, subject to aging management review, are included as piping and piping components with a structural integrity function, as listed in Table 2.3.2-5 in LRA Section 2.3.2.5.

The evaluation boundaries of the Containment and Suppression System that are shown on drawing LR-M-155 Sheet 1 for Unit 1 (LR-M-2155 Sheet 1 for Unit 2) extend from penetrations X-219A and X-219B in zone G-3/H-3 to and including level switches LSH-E41-1N015A & B for Unit 1 (E41-2N015A & B for Unit 2) and continuing to drawing LR-M-157 Sheet 8 for Unit 1 (LR-M-2157 Sheet 8 for Unit 2). Components within these boundaries, subject to aging management review, include condensing pots, piping, tubing, and valve bodies, all of which are listed in Table 2.3.2-5 in LRA Section 2.3.2.5 with a pressure boundary function.

Based on the discussion above, no changes to the LRA are required.

Based on its review, the staff finds the applicant's response to RAI 2.3.2.5-2 acceptable because the applicant clarified which components are parts of the containment and suppression system. Therefore, the staff's concern described in RAI 2.3.2.5-2 is resolved.

2.3.2.5.3 Conclusion

The staff reviewed the LRA, UFSAR, boundary drawings (original and revised), and RAI responses to determine whether the applicant failed to identify any components within the scope of license renewal. In addition, the staff's review determined whether the applicant failed to identify any components subject to an AMR. On the basis of its review, the staff concludes that the applicant has appropriately identified the containment and suppression system mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the containment and suppression system components subject to an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1) and therefore, the response is acceptable.

2.3.2.6 Containment Atmosphere Control System

2.3.2.6.1 Summary of Technical Information in the Application

LRA Section 2.3.2.6 describes the containment atmosphere control (CAC) system, which is designed to control the concentration of hydrogen within the primary containment following a LOCA. The CAC system contains safety-related components relied upon to remain functional during and following DBEs. The failure of nonsafety-related SSCs in the CAC system potentially could prevent the satisfactory accomplishment of a safety-related function. In addition, the CAC system performs functions that support fire protection, SBO, and EQ. LRA Table 2.3.2-6 identifies CAC system component types within the scope of license renewal and subject to an AMR.

2.3.2.6.2 Staff Evaluation

The staff reviewed LRA Section 2.3.2.6 and UFSAR Section 6.2.5 using the evaluation methodology described in SER Section 2.3 and the guidance in SRP-LR Section 2.3. The

staff's review identified areas where additional information was required to complete the scoping and screening results. The applicant responded to the staff's RAIs as discussed below.

In RAI 2.3.2.6-1, dated July 25, 2007, the staff noted that LRA Section 2.3.2.6 identifies the Combustible Gas Control System described in UFSAR Section 6.2.5 as Containment Atmosphere Control System for license renewal. The description and functions of Containment Atmospheric Control System as described in LRA Section 2.3.2.6 is not consistent with the description given in UFSAR Section 6.2.5 for Units 1 and 2. According to UFSAR Section 6.2.5.2, the combustible gas control depends on the following functions and subsystems:

(a) Hydrogen mixing
(b) Hydrogen and oxygen monitoring system
(c) Hydrogen recombiner system
(d) Containment hydrogen purge system
(e) Containment nitrogen inerting system

The LRA Section 2.3.2.6 does not mention the Containment Nitrogen Inerting System which maintains the primary containment inerted with nitrogen during power operation, with oxygen concentration not to exceed 4% by volume. The staff requested the applicant either add the description of Containment Nitrogen Inerting System in LRA Section 2.3.2.6 or add another section to the LRA describing this system and its license renewal function.

In its response to RAI 2.3.2.6-1, dated August 23, 2007, the applicant stated:

> While FSAR Section 6.2.5 identifies containment nitrogen inerting as a function of the combustible gas control system, identified as Containment Atmosphere Control in the LRA, nitrogen inerting is not an engineered safety feature (ESF) function.
>
> The Nitrogen and Hydrogen System is described in LRA Section 2.3.3.16. As stated in Section 2.3.3.16, a nonsafety-related portion of this system is identified as in-scope based on the scoping criteria of 10 CFR 54.4(a)(2). This is illustrated on license renewal drawings LR-M-157 Sheet 1 for Unit 1 and LR-M-2157 Sheet 1 for Unit 2 at zone C-8 by the piping and components shown in magenta.
>
> The piping and components related to the function of containment nitrogen inerting and makeup that are highlighted in green on LR-M-157 Sheet 1 and LR-M-2157 Sheet 1 have a safety-related function to provide primary containment isolation and maintain containment integrity. These components are addressed in LRA Section 2.3.2.6 as in-scope based on the scoping criteria of 10 CFR 54.4(a)(1) because they support either the functional or structural integrity of the primary containment. Both LRA Sections 2.3.3.16 and 2.3.2.6 reference drawings LR-M-157 Sheet 1 and LR-M-2157 Sheet 1 which depict the in-scope portions of the Nitrogen and Hydrogen System and the Containment Atmosphere Control System.
>
> Based on a teleconference between PPL and the NRC Staff on July 10, 2007, revisions discussed for LRA Sections 2.3.2.5 and 2.3.2.6 are provided in

Attachments 2 and 3. The revisions to both attachments consist of added text which is shown in *bold italics.*

Based on its review, the staff finds the applicant's response to RAI 2.3.2.6-1 acceptable because the applicant clarified what is included in the containment and suppression system. The staff confirms that the applicant has provided revised LRA Sections 2.3.2.5 and 2.3.2.6. Therefore, the staff's concern described in RAI 2.3.2.6-1 is resolved.

In RAI 2.3.2.6-2, dated July 25, 2007, the staff noted that UFSAR Table 6.2-12, "Containment Penetration Data," shows the 24-inch butterfly valve HV15722 as a containment isolation safety-related valve located at drywell penetration X-25. This valve located in zone C-5 of boundary drawing LR-M-157 Sheet No. 1 is shown as not within the scope of license renewal. The staff requested that applicant provide justification for the exclusion of this valve from the scope of license renewal. If this valve is within the scope of license renewal, in accordance with 10 CFR 54.4(a), and subject to an AMR in accordance with 10 CFR 54.21(a)(1), the staff requested that the applicant update the LRA by providing the applicable information in the appropriate LRA sections, tables, and boundary drawings.

In its response, dated August 23, 2007, the applicant stated:

> Boundary drawing LR-M-157 Sheet 1 contained an error related to highlighting. Valve 157022 and the short length of piping between the valve and penetration X-25 are in-scope and subject to aging management review, but they were inadvertently not highlighted. The valve and the piping have been highlighted in green on the revised boundary drawing LR-M-157 Sheet 1, included as Attachment 4.
>
> No changes to the LRA are required as the valve and piping are included Table 2.3.2-6 and the material/environment combinations for the valve and piping are addressed in Table 3.2.2-6.

Based on its review, the staff finds the applicant's response to RAI 2.3.2.6-2 acceptable because the applicant clarified that valve 157022 and the short length of piping between the valve and penetration X-25 are in-scope and subject to an AMR. The staff confirms that the applicant has provided a revised boundary drawing LR-M-157, Sheet 1. Therefore, the staff's concern described in RAI 2.3.2.6-2 is resolved.

In RAI 2.3.2.6-3, dated July 25, 2007, the staff noted that LRA Section 2.3.2.6, "Containment Atmosphere Control System," under the heading "License Renewal Drawings," lists LR-M-157, Sheets 6 and 7 for Unit 1, and LR-M-2157, Sheets 6 and 7 for Unit 2. These boundary drawings provide containment radiation monitoring details that appear to not have any item described in LRA Section 2.3.2.6. The staff requested that the applicant provide justification for listing these boundary drawings in LRA Section 2.3.2.6. If any of the system components in these boundary drawings belong to the LRA Section 2.3.2.6, the staff requested that the applicant provide a list of these components and revise LRA Table 2.3.2-6, as required. (Note that suppression pool level and temperature functions are covered in the containment and suppression system in LRA Section 2.3.2.5, which lists these boundary drawings under "License Renewal Drawings" and the containment radiation monitoring system is covered in LRA Section 2.3.3.18, which lists these under the heading "License Renewal Drawing").

In its response to RAI 2.3.2.6-3, dated August 23, 2007, the applicant stated:

> The Containment Radiation Monitoring (CRM) Panels (1C291A/B for Unit 1 and 2C291A/B for Unit 2) and all components within them (shown on drawings LR-M-157 Sheets 6 and 7 for Unit 1 and LR-M-2157 Sheets 6 and 7 for Unit 2) are within the evaluation boundaries of the Process and Area Radiation Monitoring System. In accordance with the guidance provided in NEI 95-10 Appendix B, radiation monitors are considered to be active components and, therefore, not subject to aging management review. This conclusion is presented, along with a description of the Process and Area Radiation Monitoring System and reference to the above mentioned drawings, in LRA Section 2.3.3.18.
>
> Drawings LR-M-157 Sheets 6 and 7 for Unit 1 (LR-M-2157 Sheets 6 and 7 for Unit 2) are also included in LRA Section 2.3.2.6 because components that are within the evaluation boundaries of the Containment Atmosphere Control (CAC) System are depicted. The CAC System evaluation boundaries extend from penetrations X-5 and X-91A for Unit 1 (X-5 and X-31B for Unit 2) to the pipe-to-tubing interface at CRM Panels 1C291A/B for Unit 1 (2C291A/B for Unit 2), and include the piping and valve bodies. The piping and valve bodies are evaluated in LRA Section 2.3.2.6, and the tubing is evaluated with the Process and Area Radiation Monitoring System in LRA Section 2.3.3.18.
>
> Based on the discussion above, no changes to the LRA are required.

Based on its review, the staff finds the applicant's response to RAI 2.3.2.6-3 acceptable because the applicant clarified that LR-M-157 Sheets 6 and 7 contain components that are in the CAC system; thus, boundary drawing LR-M-157 Sheets 6 and 7 are listed in LRA Section 2.3.2.6. Therefore, the staff's concern described in RAI 2.3.2.6-3 is resolved.

In RAI 2.3.2.6-4, dated July 25, 2007, the staff noted that LRA Section 2.3.2.6, "Containment Atmosphere Control System," under the heading "License Renewal Drawings," lists LR-M-157 Sheet 8 for Unit 1, and LR-M-2157 Sheet 8 for Unit 2. These boundary drawings provide details of suppression pool level and pressure monitoring that appears to not have any items described in LRA Section 2.3.2.6. The staff requested that the applicant provide justification for listing the above boundary drawings in LRA Section 2.3.2.6. If any of the system components in these boundary drawings belong to the LRA Section 2.3.2.6, the staff requested that the applicant provide a list of these components and revise LRA Table 2.3.2-6, as required. (Note that suppression pool level and temperature functions are covered in the containment and suppression system in LRA Section 2.3.2.5, which lists these boundary drawings under the heading "License Renewal Drawings").

In its response to RAI 2.3.2.6-4, dated August 23, 2007, the applicant stated:

> All tubing and valve bodies associated with level transmitters LT-15775A and LT-25775A, as shown on drawings LR-M-157 Sheet 8 and LR-M-2157 Sheet 8, respectively, are within the evaluation boundaries of the Containment and Suppression System and are listed in Table 2.3.2-5 in LRA Section 2.3.2.5. All

other components that are shown on drawings LR-M-157 Sheet 8 and LR-M-2157 Sheet 8 are within the evaluation boundaries of the Containment Atmosphere Control (CAC) System and are listed in Table 2.3.2-6 in LRA Section 2.3.2.6 (tubing and valve bodies).

Based on the discussion above, no changes to the LRA are required.

Based on its review, the staff finds the applicant's response to RAI 2.3.2.6-4 acceptable because the applicant provided a list of components in LR-M-157, Sheet 8 and LR-M-2157, Sheet 8 that are in the CAC system. Therefore, the staff's concern described in RAI 2.3.2.6-4 is resolved.

In RAI 2.3.2.6-5, dated July 25, 2007, the staff noted boundary drawing LR-M-157, Sheet 1, zone F-3, at primary containment penetration X-221A, shows the piping component at the upstream side of valve 157201 as not within the scope for license renewal. The staff requested that the applicant provide justification for the exclusion of this piping component from the scope of license renewal. If this component is within the scope of license renewal, in accordance with 10 CFR 54.4(a), and subject to an AMR, in accordance with 10 CFR 54.21(a)(1), the staff requested that the applicant update the LRA by providing the applicable information in the appropriate LRA sections, tables, and boundary drawings.

In its response to RAI 2.3.2.6-5, dated August 23, 2007, the applicant stated:

Boundary drawing LR-M-157 Sheet 1 contained an error related to highlighting. Valve 157201 at penetration X-221A has a two-inch by one-inch reducer that is in-scope and subject to aging management review, but it was inadvertently not highlighted. The reducer has been highlighted in green on the revised boundary drawing LR-M-157 Sheet 1, included as Attachment 4.

No changes to the LRA are required as the reducer is included in Table 2.3.2-6 and the material/environment combinations for the reducer are addressed in Table 3.2.2-6.

Based on its review, the staff finds the applicant's response to RAI 2.3.2.6-5 acceptable because the applicant has clarified that boundary drawing LR-M-157, Sheet 1, contained a highlighting error regarding valve 157201 at penetration X-221A. The staff confirms that the applicant has submitted revised boundary drawing LR-M-157 Sheet 1. Therefore, the staff's concern described in RAI 2.3.2.6-5 is resolved.

2.3.2.6.3 Conclusion

The staff reviewed the LRA, UFSAR, boundary drawings (original and revised), and RAI responses to determine whether the applicant failed to identify any components within the scope of license renewal. In addition, the staff's review determined whether the applicant failed to identify any components subject to an AMR. On the basis of its review, the staff concludes that the applicant has appropriately identified CAC system mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the CAC system components subject to an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1) and therefore, the response is acceptable.

2.3.2.7 Standby Gas Treatment System

2.3.2.7.1 Summary of Technical Information in the Application

LRA Section 2.3.2.7 describes the SBGT common to both units. The system is designed for two purposes: (1) to exhaust filtered air from the Reactor Building to maintain a negative pressure in the affected volumes following secondary containment isolation for a spent fuel handling accident or for a LOCA and (2) to filter the exhausted air to remove radioactive particulates and both radioactive and nonradioactive forms of iodine to limit offsite dose. The SGTS contains safety-related components relied upon to remain functional during and following DBEs. In addition, the SGTS performs functions that support EQ. LRA Table 2.3.2-7 identifies SGTS component types within the scope of license renewal and subject to an AMR.

2.3.2.7.2 *Conclusion*

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA, UFSAR, and applicable boundary drawings, the staff concludes that applicant has appropriately identified the SBGT system mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system components subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.3 Auxiliary Systems

In LRA Section 2.3.3, the applicant identified the auxiliary systems SCs subject to an AMR for license renewal. The applicant described the supporting SCs of the auxiliary systems in the following LRA sections:

- 2.3.3.1 Building drains nonradioactive system
- 2.3.3.2 Containment instrument gas system
- 2.3.3.3 Control rod drive hydraulics system
- 2.3.3.4 Control structure chilled water system
- 2.3.3.5 Control structure HVAC systems
- 2.3.3.6 Cooling tower system
- 2.3.3.7 Diesel fuel oil system
- 2.3.3.8 Diesel generator buildings HVAC systems
- 2.3.3.9 Diesel generator system
- 2.3.3.10 Domestic water system
- 2.3.3.11 Emergency service water system
- 2.3.3.12 Engineered safeguards service water pumphouse HVAC system
- 2.3.3.13 Fire protection system
- 2.3.3.14 Fuel pool cooling and cleanup system and fuel pools and auxiliaries
- 2.3.3.15 Neutron monitoring system
- 2.3.3.16 Nitrogen and hydrogen system
- 2.3.3.17 Primary containment atmosphere circulation system
- 2.3.3.18 Process and area radiation monitoring system
- 2.3.3.19 Radwaste liquid system
- 2.3.3.20 Radwaste solids handling system
- 2.3.3.21 Raw water treatment system
- 2.3.3.22 Reactor building chilled water system

- 2.3.3.23 Reactor building closed cooling water system
- 2.3.3.24 Reactor building HVAC system
- 2.3.3.25 Reactor nonnuclear instrumentation system
- 2.3.3.26 Reactor water cleanup system
- 2.3.3.27 RHR service water system
- 2.3.3.28 Sampling system
- 2.3.3.29 Sanitary drainage system
- 2.3.3.30 Service air system
- 2.3.3.31 Service water system
- 2.3.3.32 Standby liquid control system
- 2.3.3.33 Turbine building closed cooling water system

Auxiliary Systems Generic Requests for Additional Information

As part of the staff's review, the following RAIs identified instances of boundary drawing errors where the continuation notation for piping from one boundary drawing to another boundary drawing could not be identified or was incorrect:

- RAI 2.3.3.14-1
- RAI 2.3.3.14-2
- RAI 2.3.3.14-11
- RAI 2.3.3.27-1
- RAI 2.3.3.27-2
- RAI 2.3.3.31-2

In its response, dated October 18, 2007, the applicant noted these were typographical errors and submitted revised the boundary drawings.

Based on its review, the staff finds the applicant's responses to these RAIs acceptable because the applicant revised the boundary drawings to correct the errors. Therefore, the staff's concerns described in the RAIs noted above are resolved.

2.3.3.1 Building Drains Nonradioactive System

2.3.3.1.1 Summary of Technical Information in the Application

LRA Section 2.3.3.1 describes the building drains nonradioactive system operating throughout the plant. The failure of nonsafety-related SSCs in the building drains nonradioactive system potentially could prevent the satisfactory accomplishment of a safety-related function. LRA Table 2.3.3-1 identifies building drains nonradioactive system component types within the scope of license renewal and subject to an AMR.

2.3.3.1.2 Conclusion

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA, UFSAR, and applicable boundary drawings, the staff concludes that applicant has appropriately identified the building drains nonradioactive system mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system components subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.3.2 Containment Instrument Gas System

2.3.3.2.1 Summary of Technical Information in the Application

LRA Section 2.3.3.2 describes the containment instrument gas system, which provides filtered, dry, oil-free instrument gas to the pneumatic devices located inside the drywell and suppression chamber. The failure of nonsafety-related SSCs in the containment instrument gas system potentially could prevent the satisfactory accomplishment of a safety-related function. In addition, the containment instrument gas system performs functions that support fire protection, SBO, and EQ. LRA Table 2.3.3-2 identifies containment instrument gas system component types within the scope of license renewal and subject to an AMR.

2.3.3.2.2 Conclusion

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA, UFSAR, and applicable boundary drawings, the staff concludes that applicant has appropriately identified the containment instrument gas system mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system components subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.3.3 Control Rod Drive Hydraulics System

2.3.3.3.1 Summary of Technical Information in the Application

LRA Section 2.3.3.3 describes the control rod drive hydraulic system (CRDHS), which controls gross changes in core reactivity by incrementally positioning neutron-absorbing control rods within the reactor core in response to manual control signals initiated by the reactor manual control system. The CRDHS also must shut down the reactor quickly (scram) in response to manual or automatic signals in emergency situations by rapidly inserting withdrawn control rods into the core. The CRDHS contains safety-related components relied upon to remain functional during and following DBEs. The failure of nonsafety-related SSCs in the CRDHS potentially could prevent the satisfactory accomplishment of a safety-related function. In addition, the CRDHS performs functions that support fire protection, ATWS, and EQ. LRA Table 2.3.3-3 identifies CRDHS component types within the scope of license renewal and subject to an AMR.

2.3.3.3.2 Conclusion

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA, UFSAR, and applicable boundary drawings, the staff concludes that applicant has appropriately identified the CRDHS mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system components subject to an aging management review in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.3.4 Control Structure Chilled Water System

2.3.3.4.1 Summary of Technical Information in the Application

LRA Section 2.3.3.4 describes the control structure chilled-water system, which supplies chilled water to the cooling coils in the control room floor cooling unit, computer room floor cooling unit, and control structure heating and ventilation unit. The CSCW System also provides chilled water to the emergency cooling coils in the Unit 1 emergency switchgear and load center room air handling units. The control structure chilled-water system contains safety-related components relied upon to remain functional during and following DBEs. The failure of nonsafety-related SSCs in the control structure chilled-water system potentially could prevent the satisfactory accomplishment of a safety-related function. In addition, the control structure chilled-water system performs functions that support EQ. LRA Table 2.3.3-4 identifies control structure chilled-water system component types within the scope of license renewal and subject to an AMR.

2.3.3.4.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.4, UFSAR Section 9.2.12.1, and the licensing renewal boundary drawings using the evaluation methodology described in SER Section 2.3 and the guidance in SRP-LR Section 2.3. The staff's review identified areas in which additional information was necessary to complete the review of the applicant's scoping and screening results. The applicant responded to the staff's RAIs as discussed below.

In RAIs 2.3.3.4-1, 2.3.3.4-2, and 2.3.3.4-3, dated August 27, 2007, the staff noted instances where boundary drawings identified portions of piping as within the scope of license renewal that are continued on other boundary drawings, where the piping is not shown to be within the scope of license renewal on the continuation boundary drawings. The staff requested that the applicant clarify why the continuations are not within the scope of license renewal.

In its response to RAIs 2.3.3.4-1, 2.3.3.4-2, and 2.3.3.4-3, dated October 18, 2007; the applicant stated that the subject piping was within the scope of license renewal. The applicant submitted revised boundary drawings to reflect the piping as being within the scope of licensing renewal.

Based on its review of the applicant's revised boundary drawings, the staff finds the applicant's response to RAIs 2.3.3.4-1, 2.3.3.4-2, and 2.3.3.4-3 acceptable because the applicant has clarified that the piping in question was within the scope of license renewal and has made the appropriate revisions to the subject boundary drawings. Therefore, the staff's concerns described in RAIs 2.3.3.4-1, 2.3.3.4-2, and 2.3.3.4-3 are resolved.

In RAI 2.3.3.4-4, dated August 27, 2007, the staff noted that the safety-related control structure H/V unit cooling coils were within the scope of license renewal, pursuant to 10 CFR 54.4(a)(1). However, these cooling coils were omitted from LRA Table 2.3.3-4 for components subject to an AMR. The staff requested that the applicant explain why these cooling coils are not included in LRA Table 2.3.3-4.

In its response, dated October 18, 2007, the applicant stated:

> The control structure H/V units 0V103A and 0V103B, including cooling coils 0E146A1 through B2 are within the scope of license renewal and are subject to AMR. Based on PPL's scoping methodology, these cooling coils have been scoped with the control structure HVAC systems and are included in LRA Section 2.3.3.5 and Table 2.3.3-5.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.4-4 acceptable because the applicant adequately explained that the AMR for the cooling coils in question is covered in LRA Section 2.3.3.5 and Table 2.3.3-5. Therefore, the staff's concern described in RAI 2.3.3.4-4 is resolved.

In RAIs 2.3.3.4-5 and 2.3.3.4-6, dated August 27, 2007, the staff noted that the safety-related control room floor recirculation unit cooling coils were within the scope of license renewal in accordance with 10 CFR 54.4(a)(1) criterion. However, these cooling coils were omitted from LRA Table 2.3.3-4 for components subject to an AMR. The staff requested that the applicant explain why these cooling coil components are not included in LRA Table 2.3.3-4.

In its response to RAIs 2.3.3.4-5 and 2.3.3.4-6, dated October 18, 2007, the applicant stated:

> The control room floor recirculation units 0V117A and 0V117B, including cooling coils 0E151A1 through B2, are within the scope of license renewal and are subject to AMR. Based on PPL's scoping methodology, these cooling coils have been scoped with the Control Structure HVAC Systems and are included in LRA Section 2.3.3.5 and Table 2.3.3-5.

Based on its review, the staff finds the applicant's response to RAIs 2.3.3.4-5 and 2.3.3.4-6 acceptable because the applicant explained that the cooling coils in question are covered in LRA Section 2.3.3.5 and Table 2.3.3-5. Therefore, the staff's concern described in RAIs 2.3.3.4-5 and 2.3.3.4-6 is resolved.

2.3.3.4.3 Conclusion

The staff reviewed the LRA, UFSAR, RAI responses, and boundary drawings to determine whether the applicant failed to identify any components within the scope of license renewal. In addition, the staff's review determined whether the applicant failed to identify any components subject to an AMR. On the basis of its review, the staff concludes the applicant has appropriately identified the control structure chilled-water system mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the control structure chilled-water system mechanical components subject to an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1) and therefore, the response is acceptable.

2.3.3.5 Control Structure Heating, Ventilation, and Air Conditioning (HVAC) Systems

2.3.3.5.1 Summary of Technical Information in the Application

LRA Section 2.3.3.5 describes the control structure HVAC systems. The control structure HVAC systems contain safety-related components relied upon to remain functional during and following DBEs. The failure of nonsafety-related SSCs in the control structure HVAC system potentially could prevent the satisfactory accomplishment of a safety-related function. In addition, the control structure HVAC systems perform functions that support EQ. LRA Table 2.3.3-5 identifies control structure HVAC systems component types within the scope of license renewal and subject to an AMR.

2.3.3.5.2 Conclusion

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA, UFSAR, and applicable boundary drawings, the staff concludes that applicant has appropriately identified the control structure HVAC systems mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system components subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.3.6 Cooling Tower System

2.3.3.6.1 Summary of Technical Information in the Application

LRA Section 2.3.3.6 describes the single-loop cooling tower system consisting of a hyperbolic natural draft cooling tower, cooling tower basin, blowdown and makeup water systems, and chemical and blowdown treatment systems. The cooling tower system dissipates both latent heat from the main condenser and sensible heat from the service water system (SWS). The cooling tower system performs functions that support fire protection. LRA Table 2.3.3-6 identifies cooling tower system component types within the scope of license renewal and subject to an AMR.

2.3.3.6.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.6, UFSAR Sections 9.2.1 and 10.4.5, and the licensing renewal boundary drawings using the evaluation methodology described in SER Section 2.3 and the guidance in SRP-LR Section 2.3. The staff's review identified areas in which additional information was necessary to complete the review of the applicant's scoping and screening results. The applicant responded to the staff's RAIs as discussed below.

In RAI 2.3.3.6-1, dated August 27, 2007, the staff noted that one of the stated purposes of the cooling tower system is to supply water to the fire protection system and therefore, complies with the scoping criteria of 10 CFR 54.4(a)(3). Boundary drawings LR-M-115-1, LR-M-2115-1, and LR-M-109-1 show supply lines from the cooling tower basin to the fire pumps within the scope of license renewal, with a pressure boundary intended function. However, connected piping is not within the scope of license renewal up to the first isolation valve, where it connects to the SW and circulating water pumps. The staff requested that the applicant explain why these sections of pipe and components are not within scope for license renewal.

In its response to RAI 2.3.3.6-1, dated October 18, 2007, the applicant stated:

> The highlighted piping depicts the supply path for water from the cooling tower basins to the fire protection pumps. This supply path meets the criteria of 10 CFR 54.4(a)(3) for fire protection. Inclusion of the connected piping up to the service water and circulating water pump isolation valves in the scope of license renewal is not necessary to ensure that the intended function is maintained.
>
> As described in Section 2.3.3.6 of the LRA, each cooling tower basin contains 6,000,000 gallons of water, and is capable of meeting the largest expected water demands of the fire protection system. As described in Section 4.1 of the Fire Protection Review Report (FPRR), the largest single (fire protection) demand can be satisfied by one fire pump, rated at 2500 gpm. Operability of the fire suppression water supply is controlled in accordance with the SSES Technical Requirements Manual (TRM). The TRM ensures at least one flow path capable of taking suction from any two designated water supplies and an available supply of water, from either the Unit 1 or Unit 2 cooling tower basin or the clarified water storage tank, with a minimum volume of 300,000 gallons. Due to the large volume available from a single cooling tower basin, in relation to the fire protection demand, inclusion of the connected piping up to the service water and circulating water pump isolation valves is not necessary to ensure this secondary supply of fire protection water.
>
> As the fire suppression water supply is maintained operable the connected sections of piping will not affect the intended function of the Cooling Tower System. Therefore, the subject piping is not included within the scope of license renewal.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.6-1 acceptable because the applicant has clarified that the highlighted piping depicts the supply path for water from the cooling tower basins to the fire protection pumps and is the total piping required for compliance with 10 CFR 54.4(a)(3) for fire protection. The staff reviewed the UFSAR and the Fire Protection Review Report and confirms the applicant's statement. The staff also confirms that there are no hypothetical failures resulting from system interdependencies that would affect this piping identified in the CLB and none has been previously experienced. Therefore, the staff's concern described in RAI 2.3.3.6-1 is resolved.

In RAI 2.3.3.6-2, dated August 27, 2007, the staff noted that one of the stated purposes of the cooling tower system is to supply water to the fire protection system and therefore, complies with the scoping criteria of 10 CFR 54.4(a)(3). Boundary drawings LR-M-115-1, LR-M-2115-1, and LR-M-109-1 show supply lines from the cooling tower basin to the fire pumps as within the scope of license renewal, with a pressure boundary intended function. However, boundary drawing LR-M-2115-1, location A4, and the continuation onto boundary drawing LR-M-2109-1, location D1, shows the supply line to the SWS is not within the scope of license renewal. The staff requested that the applicant explain why these sections of pipe and components are not within scope of license renewal.

In its response to RAI 2.3.3.6-2, dated October 18, 2007, the applicant stated:

> The highlighted piping depicts the supply path for water from the cooling tower basins to the fire protection pumps. This supply path meets the criteria of 10 CFR 54.4(a)(3) for fire protection.
>
> As described in response to RAI 2.3.3.6-1, each cooling tower basin contains a large volume (6,000,000 gallons) of water available for fire protection. This secondary volume is significantly more than is required for fire suppression since the largest single (fire protection) demand can be satisfied by one fire pump, rated at 2500 gpm. As such, the volume contained in the connected piping up to the service water and circulating water pump isolation valves is inconsequential to the fire water supply and only the path from the cooling tower basin to the fire pumps is required for the intended function. Therefore, the path is included in the license renewal evaluation boundary but the connected piping to service water and circulating water pump isolation valves are not.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.6-2 acceptable because the applicant has clarified that the highlighted piping depicts the supply path for water from the cooling tower basins to the fire protection pumps and is the total piping required for compliance with 10 CFR 54.4(a)(3) for fire protection. The staff's review of the UFSAR and Fire Protection Review Report confirms the applicant's clarification. The staff also confirms that there are no hypothetical failures resulting from system interdependencies that would affect this piping identified in the current licensing bases and none has been previously experienced. Therefore, the staff's concern described in RAI 2.3.3.6-2 is resolved.

2.3.3.6.3 Conclusion

The staff reviewed the LRA, UFSAR, RAI responses, and boundary drawings to determine whether the applicant failed to identify any components within the scope of license renewal. In addition, the staff's review determined whether the applicant failed to identify any components subject to an AMR. On the basis of its review, the staff concludes the applicant has appropriately identified the cooling tower system mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the control cooling tower system mechanical components subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1) and therefore, the response is acceptable.

2.3.3.7 Diesel Fuel Oil System

2.3.3.7.1 Summary of Technical Information in the Application

LRA Section 2.3.3.7 describes the diesel fuel oil system, which stores onsite and delivers fuel oil to the DGs for at least seven days of operation. The diesel fuel oil system contains safety-related components relied upon to remain functional during and following DBEs. The failure of nonsafety-related SSCs in the diesel fuel oil system potentially could prevent the satisfactory accomplishment of a safety-related function. In addition, the diesel fuel oil system performs functions that support fire protection, ATWS, and SBO. LRA Table 2.3.3-7 identifies diesel fuel oil system component types within the scope of license renewal and subject to an AMR.

2.3.3.7.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.7, UFSAR Section 9.5.4, and the licensing renewal boundary drawings using the evaluation methodology described in SER Section 2.3 and the guidance in SRP-LR Section 2.3. The staff's review identified areas in which additional information was necessary to complete the review of the applicant's scoping and screening results. The applicant responded to the staff's RAIs as discussed below.

In RAI 2.3.3.7-1, dated August 27, 2007, the staff noted that the injector housing is a component for the diesel fuel oil system that is usually included within the scope of license renewal and subject to an AMR. The impulse pumps shown on boundary drawings LR-M-134-1, location E5, and LR-M-134-7, location A2, are not shown within the scope of license renewal and the impulse pump housing is not listed in LRA Table 2.3.3-7 for components subject to an AMR. The staff requested that the applicant explain why the impulse pumps and fuel injector housings are not within the scope of license renewal and not included in LRA Table 2.3.3-7 as a component type subject to AMR.

In its response to RAI 2.3.3.7-1, dated October 18, 2007, the applicant stated that a re-evaluation of the fuel injection pumps determined that these pumps are subject to an AMR. LRA Tables 2.3.3-7 and 3.3.2-7 were amended to include the fuel injection pumps. The applicant explained that the fuel injectors are mounted in the engine cylinder and considered active components; therefore, the fuel injectors are not subject to AMR.

The staff finds the applicant's response to RAI 2.3.3.7-1 acceptable because the applicant has amended the LRA to add the fuel injection pump housing as a component type subject to AMR and has adequately explained why the fuel injectors are not a component type subject to AMR. Therefore, the staff's concern described in RAI 2.3.3.7-1 is resolved.

In RAI 2.3.3.7-2, dated August 27, 2007, the staff noted that the DG day tank flame arrestors shown on boundary drawings LR-M-134-1, location F8, and LR-M-134-7, location A8, are within the scope of license renewal, but are not included in LRA Table 2.3.3-7 for component types subject to an AMR. The flame arrestor is typically a component type subject to an AMR. The flame arrestors are shown within the scope of license renewal for different reasons on these two boundary drawings. The staff requested that the applicant explain why the flame arrestors are shown within the scope of license renewal, but not included in LRA Table 2.3.3-7, and why the flame arrestors are shown within the scope of license renewal for different reasons.

In its response to RAI 2.3.3.7-2, dated October 18, 2007, the applicant stated in part:

> As shown on license renewal drawings LR-M-134-1 and LR-M-134-7-4, the vent line piping for the diesel fuel oil day tanks is within the scope of license renewal.
>
> The vent lines for day tanks for diesels A-D on drawing LR-M-134-1 are shown as cross-hatched, which indicates a safety-related process line per the legend drawing LR-M-100-2. This is supported by the HBC line designation which indicates that the piping is classified as ASME Section III Class 3. Therefore, the vent lines are within the scope of license renewal and are highlighted in green per LR-M-100-4 Note A2.

The flame arrestors on the A-D diesel day tank vent lines on drawing LR-M-134-1 are not classified as safety-related. Drawing LR-M-134-1 has been revised to include the flame arrestors within the scope of license renewal per the criteria of 10 CFR 54.4(a)(2).

The vent lines for the E diesel day tank on drawing LR-M-134-7 are nonsafety-related but are seismically qualified. This is supported by the HBD line designation which indicates that the piping is classified as ANSI B31.1.0. FSAR Table 3.2-1 supports the determination that the day tank vent lines are not safety-related. Per FSAR Section 9.5.4.3, the diesel generator fuel oil system is Seismic Category I. Therefore, the vent lines are within the scope of license renewal and are highlighted in pink (magenta) per LR-M-100-4 Note A2 up to the point where they exit the diesel generator building as they have the potential for spatial interaction with safety-related components. The boundary is extended through the end of the vent piping for the day tank, including the flame arrestor.

The vent piping and flame arrestors perform a structural integrity function and are evaluated under the component type of "piping and piping components." In PPL's response to RAI 2.1-3, LRA Table 2.3.3-7 was amended to include a line item for piping and piping components which perform a structural integrity function. The PPL response to RAI 2.1-3, (Reference 3), also amended LRA Table 3.3.2-7 to include the aging management evaluation for carbon steel piping and piping components subject to an internal ventilation environment and an external outdoor air environment. No further changes to LRA Table 2.3.3-7 or Table 3.3.2-7 are required in response to this RAI.

The staff confirms that the applicant has submitted revised boundary drawings LR-M-134-1 and LR-M-134-7 and also a revision to Note 0361 in LRA Section 3.3 to address the response to this RAI.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.7-2 acceptable because the applicant satisfactorily explained why in-scope flame arrestors are not included in LRA Table 2.3.3-7 and why flame arrestors are shown within the scope of license renewal for different reasons. The staff confirms that the applicant has made appropriate revisions to boundary drawings LR-M-134-1 and LR-M-134-7 and added plant-specific Note 0361 to the LRA. Therefore, the staff's concern described in RAI 2.3.3.7-2 is resolved.

In RAI 2.3.3.7-3, dated August 27, 2007, the staff noted that DG fuel oil storage tank flame arrestors are shown on boundary drawings LR-M-120-1, locations B3, D3, E3, and G3, and LR-M-120-2, location F3 to C3. The flame arrestors are not shown within the scope of license renewal. Flame arrestors are typically included within the scope of license renewal because they are classified as a component subject to an AMR within the pressure boundary for the diesel fuel oil tanks. The staff requested that the applicant explain why the flame arrestors are not within the scope of license renewal.

In its response to RAI 2.3.3.7-3, dated October 18, 2007, the applicant stated:

As shown on license renewal drawings LR-M-120-1 and LR-M-120-2, the vent line piping and the associated flame arrestors for the diesel fuel oil storage tanks are not within the scope of license renewal. The vent lines extend from the top of

the storage tank within the buried vault to above ground where the piping is goose-necked and provided with flame arrestors. The vent piping is located above the fuel oil level within the storage tanks and therefore does not provide a pressure boundary function.

The vent lines for the diesel fuel oil storage tanks on drawing LR-M-120-1 and LR-M-120-2 are nonsafety-related but are seismically qualified. This is supported by the HBD line designation which indicates that the piping is classified as ANSI B31.1.0. FSAR Table 3.2-1 supports the determination that the storage tank vent lines are not safety-related. Per FSAR Section 9.5.4.3, the diesel generator fuel oil system is Seismic Category I.

The flame arrestors on the diesel storage tank vent lines are not classified as safety-related. FSAR Section 9.5.4.2 states for the fuel oil storage tank vent line that if the above grade section of the vent is damaged, it would not render the fuel oil storage tank inoperable. This determination also applies to the flame arrestors located above grade on the vent piping. The flame arrestors do not perform a license renewal intended function. In addition, the vent line and flame arrestor do not provide any support for the safety-related tank to which they are attached. Therefore, the flame arrestors on the diesel fuel oil storage tank vent lines are not within the scope of license renewal.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.7-3 acceptable because the applicant satisfactorily explained why these diesel fuel oil tank vent lines and flame arrestors are not within the scope of license renewal. Therefore, the staff's concern described in RAI 2.3.3.7-3 is resolved.

In RAI 2.3.3.7-4, dated August 27, 2007, the staff noted that the DG storage tank manhole covers shown in boundary drawing LR-M-120-1, locations B2, D2, F3, and G3, are not shown within the scope of license renewal. The staff requested that the applicant explain why the manhole covers are not shown within the license renewal scope boundary.

In its response to RAI 2.3.3.7-4, dated October 18, 2007, the applicant stated:

The diesel generator storage tank manholes and covers shown on drawing LR-M-120-1 are within the scope of license renewal. A highlighting error resulted in the manholes and covers on drawing LR-M-120-1 not being indicated as within the scope of license renewal.

The manholes and covers are considered to be part of the pressure boundary of the storage tanks. This is reflected by the highlighting of the manholes and covers for the E diesel generator storage tank on drawing LR-M-120-2.

No changes are required to Table 2.3.3-7 or Table 3.3.2-7, the manholes are included in the line item for "Tanks (0T527A-E, 0T528A-E)." The component types are therefore subject to aging management review and have been evaluated with the storage tanks.

The staff confirms that the applicant has submitted revised boundary drawing LR-M-120-1.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.7-4 acceptable because the applicant has clarified that the manhole covers are within the scope of license renewal and has made the appropriate revisions to boundary drawing LR-M-120-1. Therefore, the staff's concern described in RAI 2.3.3.7-4 is resolved.

In RAI 2.3.3.7-5, dated August 27, 2007, the staff noted that boundary drawing LR-M-120-1, locations B7, D7, E7, and G7, indicate that there are manhole covers on top of the DG day tanks A, B, C, and D. However, boundary drawing LR-M-134-1, location F8, does not show a manhole cover on the top of DG day tanks A, B, C, and D. The staff requested that the applicant explain whether or not there are manhole covers on the four tanks and whether there are manhole covers on these tanks, explain why they are not shown on boundary drawing LR-M-134-1 and why they are not within the scope of license renewal.

In its response to RAI 2.3.3.7-5, dated October 18, 2007, the applicant stated:

> As stated in FSAR Section 9.5.4.2, a manhole is provided on each diesel generator fuel oil day tank for inspection. The manholes are depicted on license renewal drawing LR-M-120-1 due to space limitations on drawing LR-M-134-1. The dashed lines for tanks 0T528 A, B, C, and D on drawing LR-M-120-1 indicate that the components are represented on another drawing (LR-M-134-1). The manholes and covers associated with the diesel generator fuel oil day tanks on LR-M-120-1 are solid lines indicating that they are represented on drawing LR-M-120-1.
>
> It was determined that the diesel generator day tank manholes and covers shown on drawing LR-M-120-1 should be shown as within the scope of license renewal. The manholes and covers are part of the pressure boundary of the storage tanks.
>
> No changes are required to Table 2.3.3-7 or Table 3.3.2-7. The manholes and covers for the diesel generator day tank shown in drawing LR-M-134-7 are shown within the license renewal evaluation boundary. The component types are therefore subject to aging management review and have been evaluated with the tanks.

The staff confirms that the applicant has submitted revised boundary drawing LR-M-120-1.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.7-5 acceptable because the applicant: (a) clarified that the manhole covers are within the scope of license renewal, (b) explained why the manhole covers were not shown on boundary drawing LR-M-134-7, and (c) made the appropriate revisions to boundary drawing LR-M-120-1. Therefore, the staff's concern described in RAI 2.3.3.7-5 is resolved.

In RAI 2.3.3.7-6, dated August 27, 2007, the staff noted that boundary drawing LR-M-134-7, location A6, indicates that there is a manhole cover on top of the DG day tank E and that it is within the scope of license renewal. The staff requested that the applicant explain why the manhole cover is not listed in LRA Table 2.3.3-7 for components subject to an AMR.

In its response to RAI 2.3.3.7-6, dated October 18, 2007, the applicant stated:

> The manhole and cover depicted on license renewal drawing LR-M-134-7 is within the scope of license renewal. The manhole and cover are considered to be an integral part of the tank component. Therefore, the "Tanks (0T527A-E, 0T528A-E)" entry in Table 2.3.3-7 includes the associated manholes and covers. The manhole and cover perform the same pressure boundary function as the tank.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.7-6 acceptable because the applicant has explained that the manholes and covers are within the scope of license renewal and are an integral part of the tank component type listed in LRA Table 2.3.3-7. Therefore, the staff's concern described in RAI 2.3.3.7-6 is resolved.

2.3.3.7.3 Conclusion

The staff reviewed the LRA, UFSAR, RAI responses, and boundary drawings to determine whether the applicant failed to identify any components within the scope of license renewal. In addition, the staff's review determined whether the applicant failed to identify any components subject to an AMR. On the basis of its review, the staff concludes the applicant has appropriately identified the diesel fuel oil system mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the control diesel fuel oil system mechanical components subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1) and therefore, the response is acceptable.

2.3.3.8 Diesel Generator Building HVAC Systems

2.3.3.8.1 Summary of Technical Information in the Application

LRA Section 2.3.3.8 describes the diesel generator (DG) building HVAC systems, which maintain a suitable environment for the DGs during all modes of operation. The DG buildings HVAC systems contain safety-related components relied upon to remain functional during and following DBEs. In addition, the DG buildings HVAC systems perform functions that support fire protection. LRA Table 2.3.3-8 identifies DG buildings HVAC systems component types within the scope of license renewal and subject to an AMR.

2.3.3.8.2 Conclusion

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA, UFSAR, and applicable boundary drawings, the staff concludes that the applicant has appropriately identified the DG building HVAC systems mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system components subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.3.9 Diesel Generator System

2.3.3.9.1 Summary of Technical Information in the Application

LRA Section 2.3.3.9 describes the DGs system consisting of five DGs, only four of which can be aligned to the safety-related load groups. The DGs system contains safety-related components relied upon to remain functional during and following DBEs. The failure of nonsafety-related SSCs in the DGs system potentially could prevent the satisfactory accomplishment of a safety-related function. In addition, the DGs system performs functions that support fire protection, ATWS, SBO, and EQ. LRA Table 2.3.3-9 identifies DGs system component types within the scope of license renewal and subject to an AMR.

2.3.3.9.2 Conclusion

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA, UFSAR, and applicable boundary drawings, the staff concludes that applicant has appropriately identified the DG system mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system components subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.3.10 Domestic Water System

2.3.3.10.1 Summary of Technical Information in the Application

LRA Section 2.3.3.10 describes the domestic water system, which provides cold and hot water acceptable for human consumption to plumbing fixtures for the entire plant. The failure of nonsafety-related SSCs in the domestic water system potentially could prevent the satisfactory accomplishment of a safety-related function. LRA Table 2.3.3-10 identifies domestic water system component types within the scope of license renewal and subject to an AMR.

2.3.3.10.2 Conclusion

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA, and UFSAR, the staff concludes that applicant has appropriately identified the domestic water system mechanical component types within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system component types subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.3.11 Emergency Service Water System

2.3.3.11.1 Summary of Technical Information in the Application

LRA Section 2.3.3.11 describes the ESW system consisting of two loops, each designed to supply simultaneously 100 percent of the ESW requirements to both units and to the common emergency DGs. The ESW system contains safety-related components relied upon to remain functional during and following DBEs. The failure of nonsafety-related SSCs in the ESW system potentially could prevent the satisfactory accomplishment of a safety-related function. In addition, the ESW system performs functions that support fire protection, ATWS, SBO, and EQ.

LRA Table 2.3.3-11 identifies ESW system component types within the scope of license renewal and subject to an AMR.

2.3.3.11.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.11, UFSAR Section 9.2.5, and the licensing renewal boundary drawings using the evaluation methodology described in SER Section 2.3 and the guidance in SRP-LR Section 2.3. The staff's review identified areas in which additional information was necessary to complete the review of the applicant's scoping and screening results. The applicant responded to the staff's RAIs as discussed below.

In RAI 2.3.3.11-1, dated August 27, 2007, the staff noted that boundary drawings LR-M-186-3 and LR-M-186-4 depict ESW piping to and from the ESW bundles (OS117A2 and OS117B2). LRA Section 2.3.3.11, "Emergency Service Water System," paragraph titled "Drawings" does not include LR-M-186-3 or LR-M-186-4 for Unit 1, as applicable boundary drawings. The staff requested that the applicant clarify that ESW piping to and from the ESW bundles (OS117A2 and OS117B2) is within the ESW system and whether boundary drawings LR-M-186-3 and LR-M-186-4 are applicable references in LRA Section 2.3.3.11.

In its response to RAI 2.3.3.11-1, dated October 18, 2007, the applicant stated in part:

> The ESW piping to and from the ESW bundles (0S117A2 and 0S117B2) shown on LR-M-186-3 and LR-M-186-4, respectively, is within the scope of license renewal and subject to AMR. This ESW piping to and from the ESW bundles is scoped as part of the Control Structure Chilled Water System, rather than as part of ESW, and is included in LRA Section 2.3.3.4 and associated Table 2.3.3-4. Therefore, drawings LR-M-186-3 and LR-M-186-4 are not applicable references for LRA Section 2.3.3.11.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.11-1 acceptable because the applicant has clarified that the piping in question is within the scope of license renewal as part of the control structure chilled water system rather than the ESW system. Therefore, the staff's concern described in RAI 2.3.3.11-1 is resolved.

In RAI 2.3.3.11-2, dated August 27, 2007, the staff noted that LRA Table 2.3.3-11, "Emergency Service Water System Components Subject to Aging Management Review," does not contain flexible connectors as a component type subject to AMR. The staff requested that the applicant explain why the flexible connectors are not listed as components subject to an AMR in LRA Table 2.3.3-11.

In its response to RAI 2.3.3.11-2, dated October 18, 2007, the applicant stated in part that the room unit coolers listed in RAI 2.3.3.11-2:

> ...are in the scope of license renewal and are subject to AMR. The flexible connections associated with each unit cooler are scoped in the same system as the unit cooler itself, not in the ESW system. Based on PPL's scoping methodology, these unit coolers, including the flexible connections associated with them, are all scoped with the Reactor Building HVAC System. The flexible connections are included in LRA Section 2.3.3.24 and the associated Table 2.3.3-23.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.11-2 acceptable because the applicant has clarified that the flexible connections in question are within the scope of license renewal and subject to AMR, but are part of the RB HVAC system rather than the ESW system. Therefore, the staff's concern described in RAI 2.3.3.11-2 is resolved.

2.3.3.11.3 Conclusion

The staff reviewed the LRA, UFSAR, RAI responses, and boundary drawings to determine whether the applicant failed to identify any components within the scope of license renewal. In addition, the staff's review determined whether the applicant failed to identify any components subject to an AMR. On the basis of its review, the staff concludes the applicant has appropriately identified the emergency SWS mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the emergency SWS mechanical components subject an AMR in accordance with the requirements of 10 CFR 54.21(a)(1) and therefore, the response is acceptable.

2.3.3.12 Engineered Safeguards Service Water Pumphouse HVAC System

2.3.3.12.1 Summary of Technical Information in the Application

LRA Section 2.3.3.12 describes the ESSW pumphouse HVAC system, which maintains a suitable environment in the pumphouse for the emergency service water (ESW) and RHRSW system pumps and their appurtenances. The ESSW pumphouse HVAC system contains safety-related components relied upon to remain functional during and following DBEs. In addition, the ES SW pumphouse HVAC system performs functions that support fire protection. LRA Table 2.3.3-12 identifies ES SW pumphouse HVAC system component types within the scope of license renewal and subject to an AMR.

2.3.3.12.2 Conclusion

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA, UFSAR, and applicable boundary drawings, the staff concludes that applicant has appropriately identified the ESSW pumphouse HVAC system mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system components subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.3.13 Fire Protection System

2.3.3.13.1 Summary of Technical Information in the Application

LRA Section 2.3.3.13 describes the fire protection system, which minimizes both the probability and consequences of postulated fires. The fire protection system contains nonsafety-related components relied upon to remain functional during and following DBEs. The failure of nonsafety-related SSCs in the fire protection system potentially could prevent the satisfactory accomplishment of a safety-related function. In addition, the fire protection system performs functions that support fire protection. LRA Table 2.3.3-13 identifies fire protection system component types within the scope of license renewal and subject to an AMR.

2.3.3.13.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.13, UFSAR Section 9.5.1, the Fire Protection Review Report and the following fire protection CLB documents, using the evaluation methodology described in SER Section 2.3 and the guidance in SRP-LR Section 2.3:

- NUREG-0776, "Safety Evaluation Report Related to the Operation of Susquehanna Steam Electric Station, Units 1 and 2," April 1981
- NUREG-0776, Supplement No. 1, June 1981
- NUREG-0776, Supplement No. 2, September 1981
- NUREG-0776, Supplement No. 3, July 1982
- NUREG-0776, Supplement No. 4, November 1982
- NUREG-0776, Supplement No. 6, March 1984
- Safety Evaluation of Fire Protection Report, August 9, 1989
- Safety Evaluation of Revision 4 to the Fire Protection Review Report, March 29, 1993
- Safety Evaluation of Fire Protection Program Issues, Safe-Shutdown Methodology and Analysis of Associated Circuits dated October 21, 1997
- Safety Evaluation of the Licensees' Amendment No. 177, June 24, 1989

In conducting its review, the staff evaluated the system functions described in the LRA and UFSAR in accordance with the requirements of 10 CFR 54.4(a), to verify that the applicant had not omitted from the scope of license renewal any components with intended functions pursuant to 10 CFR 54.4(a). The staff then reviewed those components the applicant identified as being within the scope of license renewal to verify that the applicant had not omitted any passive or long-lived components subject to an AMR in accordance with 10 CFR 54.21(a)(1).

The staff also reviewed the applicant's commitments to 10 CFR 50.48, "Fire protection" (*i.e.*, approved fire protection program), using the applicant's commitment documents to the Branch Technical Position (BTP) Auxiliary and Power Conversion Systems Branch (APCSB) 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants," May 1, 1976, and Appendix A to BTP APCSB 9.5-1, August 23, 1976, documented in the Fire Protection Review Report.

The staff's review of LRA Section 2.3.3.13 identified areas in which additional information was necessary to complete the review of the applicant's scoping and screening results. The applicant responded to the staff's RAIs as discussed below.

In RAI 2.3.3.13-1, dated June 22, 2007, the staff noted the LRA boundary drawing LR-M-122, Sheet No. 1, "Fire Pumphouse, North & South Gatehouse & Security Control Center Buildings," shows the jockey pump and associated components as not within the scope of license renewal (i.e., not colored in green). SER Section 9.5.1.1 (NUREG-0776), dated April 1981, states that a separate jockey pump automatically maintains the yard fire main pressure. The jockey pump and its associated components appear to have fire protection intended functions required for compliance with 10 CFR 50.48, pursuant to 10 CFR 54.4(a)(3). The staff requested that the applicant verify whether the jockey pump and its associated components are within the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR, in accordance with 10 CFR 54.21(a)(1) and; if excluded, provide justification.

In its response to RAI 2.3.3.13-1, dated July 24, 2007, the applicant stated in part:

> The jockey fire pump and associated components, shown on LRA boundary drawing LR-M-122, Sheet 1, are not in the scope of license renewal and, therefore, are not subject to an AMR. The jockey pump does not have fire protection intended functions required for compliance with 10 CFR 50.48.

In evaluating the applicant's response to RAI 2.3.3.13-1, the staff found it was incomplete and that review of LRA Section 2.3.3.13 could not be completed. The staff notes the applicant's statement that the jockey pump does not have fire protection intended functions required for the compliance with 10 CFR 50.48. However, the staff finds this statement contrary to the applicant's fire protection commitment to BTP APCSB 9.5-1, Appendix A, documented in SER Section 9.5.1.1 (April 1981), which is used as the CLB. The commitment states in part, "a separate jockey pump automatically maintains yard main pressure from 105 to 125 psi. The fire pumps start automatically on low header pressure."

The applicant indicated in its response to RAI 2.3.3.13-1 that the jockey pump in question, was not within the scope of license renewal because the jockey pump is not required to function to suppress a fire or supply required fire protection water. Therefore, the applicant used criteria pursuant to 10 CFR 54.4(a)(2) to exclude the jockey pump. Since there is no adverse effect due to the jockey pump failure, the applicant excludes this component on that basis, and has neglected the fact that this component is relied upon to comply with 10 CFR 50.48 (pursuant to the CLB), as stated in 10 CFR 54.4(a)(3).

The staff held a telephone conference with the applicant on October 3, 2007, to discuss information necessary to resolve its concern in RAI 2.3.3.13-1. During the teleconference, the staff explained that the scope of SSCs required for compliance with 10 CFR 50.48 and 10 CFR Part 50, Appendix A, General Design Criteria (GDC) 3, goes beyond preserving the ability to maintain safe-shutdown in the event of a fire. The staff stated that exclusion of fire protection SSCs, on the basis that the intended function is not required for the protection of safe-shutdown equipment or safety-related equipment, is not acceptable, whether the SSC is required for compliance with 10 CFR 50.48.

The applicant's CLB demonstrates that, in accordance with GDC 3, this component was credited to meet the guidance of BTP APCSB 9.5-1, Appendix A. Therefore, the jockey pump in question should not be excluded from the scope of license renewal. In addition, this component should not be excluded on the basis that it is not required to function to suppress a fire, without factoring in the CLB, nor is it required for compliance with 10 CFR 50.48.

By letter dated October 24, 2007, the applicant responded in part that "Based on discussion with the NRC, the jockey fire pump and associated components, shown on LRA boundary drawing LR-M-122, Sheet 1, have been included within the scope of license renewal, and are subject to an AMR."

The staff confirms that the applicant has submitted revised boundary drawing LR-M-122-1 and has amended LRA Tables 2.3.3-13 and 3.3.2-13 to include the jockey fire pump and associated components as within the scope of license renewal and subject to an AMR.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.13-1 acceptable because the applicant has committed to meet the CLB based on the guidance of Appendix A of BTP APCSB 9.5-1. The staff is adequately assured that the jockey pump and associated components used for the fire suppression will be appropriately considered during aging management activities. Therefore, the staff's concern described is RAI 2.3.3.13-1 is resolved.

In RAI 2.3.3.13-2, dated June 22, 2007, the staff noted the following LRA boundary drawings show fire protection system components as not within the scope of license renewal (*i.e.*, not colored in green):

- LR-M-122 Sheet 1, "Fire Pumphouse, North & South Gatehouse & Security Control Center Buildings," shows Diesel Oil Day Tank (0T508) vent line and the fill cap-assembly line, piping, fittings, and drains as out of scope (i.e., not colored in green)
- LR-M-122 Sheet 2, "Turbine Bldg. (TB), Control Structure and Radwaste Building," shows several fire suppression systems and components in TB for Units 1 and 2 as out of scope (i.e., not colored in green)
- LR-M-122 Sheet 3, "Reactor Bldg., Standby D G, River Intake Structure Service and Admin. Bldg. & Circ. Water Pumphouse " shows several fire suppression systems and components in TB for Units 1 and 2, as out of scope (i.e., not colored in green)
- LR-M-122 Sheet 4, "Carbon Dioxide System," shows several components as out of scope (i.e., not colored in green)

The staff requested that the applicant verify whether the above fire suppression systems and components are within the scope of license renewal, in accordance with 10 CFR 54.4(a) and subject to an AMR, in accordance with 10 CFR 54.21(a)(1) and; if not, provide justification for the exclusion.

In its response to RAI 2.3.3.13-2, dated July 24, 2007, the applicant stated:

> LR-M-122 Sheet 1
> The Diesel Oil Day Tank (0T508) vent line and the fill cap-assembly line, piping, fittings, and drains have no license renewal function, are not in license renewal scope and are not subject to AMR. These vent and fill lines, as well as the return (drain) line from the diesel engine to the tank, are above the tank's normal oil level and the tank is vented to atmosphere. As described in the FPRR, the tank contains enough diesel fuel oil for 8 hours of operation in accordance with NFPA 20. Failure of these components will not create a leakage path that would drain the tank and will not prevent the diesel fire pump from accomplishing its Appendix R function.
>
> The components that do have a license renewal intended function in support of the diesel engine driven fire pump, the day tank, tubing and flexible connections, as well as the drain line and valve for the day tank, are in the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1), as listed
> in LRA Table 2.3.3-13 and shown (highlighted in green) on LRA drawing LR-M-122 Sheet 1.

LR-M-122 Sheet 2
As stated in LRA Section 2.1.1.2.2, no components in the TB either perform a safety function or would prevent a safety-related function from occurring. With few exceptions, there are no fire suppression systems or components in the TB that are credited with protection of safety-related or safe shutdown equipment.

LRA Section 2.1.1.3.1 discusses scoping of the fire protection system to achieve and maintain safe shutdown; that is features required for fire protection of safety-related equipment and any system function that were included in, or provide necessary support for, one or more of the three (3) safe shutdown paths credited for compliance with Appendix R. SSCs that perform an intended function for fire protection are included in the scope of license renewal. These include certain hose stations (1/2HR-101 and 1/2HR-156) and sprinkler systems (e.g., DS-0 15, PA-091, PA-092, and PA-1/26 1), which are shown as being located in the TB on LRA drawing LR-M-122 Sheet 2, and are credited with protection of control structure and transformer yard components. Section 3.7.3.5 and 3.7.3.2 of the Technical Requirements Manual (TRM) identify the fire hose stations and the spray and sprinkler systems, respectively, that are credited for safety-related and safe-shutdown protection.

Except for the header piping and components and those suppression systems and components discussed above, the remaining suppression systems and components in the TB are not credited for safety-related or safe-shutdown fire protection. Therefore, except as indicated above and on LRA Drawing LR-M-122 Sheet 2, the fire suppression systems and components located in the TB are not in license renewal scope and are not subject to an AMR.

LR-M-122 Sheet 3
As described above in response to the question on LR-M-122, Sheet 2, the suppression systems and components that are credited for safety-related and safe-shutdown protection are in the scope of license renewal. This includes fire hydrant FH-104, which is credited with protection of diesel generator building components, and suppression station DS-014, which is credited for protection of a transformer adjacent to the Circ. Water Pumphouse. Except as noted, neither the Turbine Building, Circ. Water Pumphouse nor River Intake Structure facilities contain safety-related equipment nor equipment relied upon by the safe shutdown analysis. The applicant stated that, therefore, except as noted above, the fire suppression systems and components in these structures do not satisfy the requirements of 10 CFR 54.4, are not in license renewal scope and are not subject to an AMR.

LR-M-122 Sheet 4
While it is briefly mentioned in NUREG-0776 Section 9.5.1.3, the generator purge portion of the carbon dioxide system is not credited with safety-related or safe-shutdown protection. As such, there are two pipe sections in the lower, left hand comer of drawing LR-M-122, Sheet 4, that are not in the scope of license renewal. The "fill line" and the "equalizing line" for generator purge are isolated from the CO_2 storage tank by normally closed valves and do not have a license renewal function. The applicant stated that, therefore, neither portion of the

piping and associated components is in license renewal scope (*i.e.*, is not highlighted in green).

Valves PSV02269, PSV02270, PSV02271 and the piping between those valves and valve 022978 have conservatively been highlighted green as in-scope and subject to an AMR. The piping is carbon steel and the valves are bronze. In addition the piping from valve 022979 through 0CB650 is in-scope and subject to an AMR, but was inadvertently not highlighted. Both portions of pipe have been highlighted green on the revised boundary drawing in the attachment to this letter. No changes to the LRA are required as the material/environment combinations of this additional highlighting are already covered in Table 3.3.2-13.

In evaluating the applicant's response to RAI 2.3.3.13-2, the staff found it was incomplete and that review of LRA Section 2.3.3.13 could not be completed. The applicant explained in its response that the fire protection SSCs in question are not credited for safety-related and safe-shutdown. Exclusion of fire protection SSCs on the basis that its intended function is not required for the protection of safe-shutdown equipment or safety-related equipment is not acceptable, whether that SSC is required for compliance with 10 CFR 50.48 (*i.e.*, required to meet Appendix A to BTP APSCB 9.5-1). Therefore, the staff concludes that these components should be included within the scope of license renewal and subject to an AMR. The staff held a telephone conference with the applicant on October 3, 2007, to discuss information necessary to resolve the staff's concern described in RAI 2.3.3.13-2.

The staff explained that the scope of fire protection SSCs discussed above were excluded on the basis that they were not "protecting" safety-related or safe-shutdown equipment, even though they were accepted for compliance with the provisions of Appendix A to BTP APSCB 9.5-1. Furthermore, the scoping requirements of 10 CFR 54.4 states that SSCs are included in-scope, which demonstrate compliance with 10 CFR 50.48. Therefore, if the SSCs were installed in compliance with 10 CFR 50.48, then they should be included within the scope of license renewal.

The staff finds that the applicant's analysis of fire protection regulation does not completely capture the fire protection SSCs required for compliance with 10 CFR 50.48. The scope of SSCs required for compliance with 10 CFR 50.48 and GDC 3 goes beyond preserving the ability to maintain safe-shutdown in the event of a fire. GDC 3 states in part, that "fire detection and fighting systems of appropriate capacity and capability shall be provided and designed to minimize the adverse effects of fires on structures, systems, and components important to safety." Furthermore, the general requirements provided in GDC 3 to "minimize the adverse effects of fires on SSCs important to safety" are stated to provide a general level of protection which is afforded to all systems, not only where required to prevent a loss of safe-shutdown capability. 10 CFR 50.48(a) states that "each operating nuclear power plant must have a fire protection plan that satisfies Criterion 3 of Appendix A of this part." The term "important to safety" encompasses a broader scope of equipment beyond safety-related and safe-shutdown. Though there is a focus on the protection of safety-related equipment or safe-shutdown equipment, this does not imply that there is an exclusion of any equipment which protects nonsafety-related equipment. For example, in accordance with 10 CFR 50.48, some portions of suppression systems may be required in plant areas where a fire could result in the release of radioactive materials to the environment, even if no safety-related or safe-shutdown equipment is located in that particular fire area.

In its response, dated October 24, 2007, the applicant stated, in part, that in LRA boundary drawing LR-M-122, Sheet 1, "The Diesel Oil Day Tank (0T508) vent line and the fill cap-assembly line, piping, fittings, and drains have no license renewal function, are not in license renewal scope and are not subject to AMR." Further, the applicant stated that the LRA boundary drawings LR-M-122, Sheet 2 and LR-M-122, Sheet 3 (Turbine Building, Circ. Water Pumphouse, and River Intake Structure fire suppression systems and components) in question were for loss prevention and insurance purposes. Turbine Building fire suppression systems do not protect safety-related equipment, nor are addressed in PPL's response to BTP APSCB 9.5-1, Revision 0, Appendix A, and are not credited in the 10 CFR Part 50, Appendix R safe-shutdown analysis.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.13-2 acceptable because the applicant has adequately explained that the fire suppression systems and components in question are not credited for 10 CFR 50.48 and GDC 3. The staff confirms that these fire water suppression systems are for property protection and for loss prevention. The staff determines that the applicant correctly excluded the fire suppression systems and components in question on the basis that they are not required for compliance with 10 CFR 50.48. The staff notes the applicant's interpretation of these components as active (short-lived components), which necessarily will result in more vigorous oversight of the condition and performance of the components. The applicant concurs. Further, the staff notes that the applicant has considered certain fire protection systems and components as only required to protect nonsafety-related equipment and; thus, satisfies requirements of the plant insurance carrier. The staff concludes that these fire protection systems and components were correctly excluded from the scope of license renewal and from being subject to an AMR. Therefore, the staff's concerns described in RAI 2.3.3.13-2 are resolved.

In RAI 2.3.3.13-3, dated June 22, 2007, the staff stated that SER Section 9.5.1.2 (NUREG-0776, dated April 1981), listed sprinkler and standpipe systems provided in the plant areas for fire suppression activities. These systems were installed in the following areas:

- Reactor Core Isolation Cooling Pump Room
- High Pressure Coolant Injection Pump Room
- Heating, Ventilation, and Air-Conditioning Filter Rooms
- Railroad Airlock
- Control Building Auxiliary Rooms
- Condenser Area
- Reactor Feed Pump Turbine
- Turbine Central Area
- Turbine Condenser Gallery
- Turbine Hydro Control Power Room
- North Railroad Bay
- Turbine Condenser Mezzanine
- Diesel Engine Fire Pump Room
- Lower Cable Spreading Room (CSR)
- Upper CSR
- RFP Turbine Room
- Diesel Generator Building
- Charcoal Filters
- Standby Gas Treatment Filters

- Emergency Outside Air Filters
- Centrifuge & Conditioner
- Turbine Pump Area
- Turbine Hydro Seal Oil Unit
- Turbine Lube Oil Area
- Turbine Motor Generator Area
- Turbine Filter Room
- Turbine Moisture Separation Area
- Radwaste Tank Vent Filter Room
- Radwaste Auxiliary Rooms
- Radwaste Controlled Zone Shop

The staff requested that the applicant verify whether the sprinkler and standpipe systems installed in the above areas of the plant are within the scope of license renewal, in accordance with 10 CFR 54.4(a) and subject to an AMR, in accordance with 10 CFR 54.21(a)(1) and; if excluded, provide justification.

In its response to RAI 2.3.3.13-3, dated July 24, 2007, the applicant stated:

> The fire sprinkler and standpipe systems installed in the locations noted by this RAI are listed in two groups below. The first group includes those systems which are in the scope of license renewal and subject to an AMR. The second group includes those systems that are not within the scope of license renewal and are not subject to an AMR, for which justification is provided.
>
> The sprinkler and standpipe systems for the following areas are in the license renewal scope, and are subject to an AMR. The fire protection components associated with these systems are addressed in the LRA in Sections 2.3.3.13, 3.3.2.1.13, Tables 2.3.3-13 and 3.3.2-13. In addition, the table below lists the boundary drawing, with coordinates, on which the related sprinkler and/or standpipe is shown as in-scope (highlighted in green).

Location	LRA Drawing (Coordinates)
Reactor Core Isolation Cooling Pump Room	LR-M-122, Sheet 3 (B4, B5)
High Pressure Coolant Injection Pump Room	LR-M-122, Sheet 3 (C4, B5)
Heating, Ventilation, and Air-Conditioning Filter Rooms	LR-M-122, Sheets 3 (A4, B4, A5, B5)
Railroad Airlock	LR-M-122, Sheet 3 (D5)
Control Building Auxiliary Rooms	LR-M-122, Sheet 2 (F4, F5)
Lower Cable Spreading Room (CSR)	LR-M-122, Sheet 2 (F3, F5)
Upper CSR	LR-M-122, Sheet 2 (F3, F6)

Diesel Generator Building	LR-M-122, Sheet 3 (C8, D8, E7)
Charcoal Filters	LR-M-122, Sheet 3 (A4, B4, A5, B5)
Standby Gas Treatment Filters	LR-M-122, Sheet 2 (G6), LR-VC-175, Sheet 3
Emergency Outside Air Filters	LR-M-122, Sheet 2 (G6), LR-VC-178, Sheet 1

The sprinkler and standpipe systems for the following areas are not in the license renewal scope and are not subject to an AMR. Except for the diesel engine fire pump room, these sprinkler and standpipe systems are located in the TB and the radwaste building. Consistent with the guidelines of Appendix A to BTP APSCB 9.5-1, the diesel engine driven and motor driven fire pumps are located in rooms separated by a three hour fire wall. In particular, the diesel engine driven fire pump is located in a room enclosed by three hour fire rated walls, doors, and duct penetrations; whereas the motor driven fire pump is located in the main pump room with the service water pumps and circulating water pumps. This area (fire area A-I) has a low combustible loading. The sprinkler and standpipe systems in following areas do not protect safety-related equipment and are not credited in the Appendix R safe shutdown analysis:

- Condenser Area
- Reactor Feed Pump Turbine
- Turbine Central Area
- Turbine Condenser Gallery
- Turbine Hydro Control Power Room
- North Railroad Bay
- Turbine Condenser Mezzanine
- Diesel Engine Fire Pump Room
- PFP Turbine Room*
- Centrifuge & Conditioner
- Turbine Pump Area
- Turbine Hydro Seal Oil Unit
- Turbine Lube Oil Area
- Turbine Motor Generator Area
- Turbine Filter Room
- Turbine Moisture Separation Area
- Radwaste Tank Vent Filter Room
- Radwaste Auxiliary Rooms
- Radwaste Controlled Zone Shop

Evaluated as the "Reactor Feed Pump (RFP) Turbine Room"

In evaluating the applicant's response to RAI 2.3.3.13-3, the staff found that it was incomplete and that review of LRA Section 2.3.3.13 could not be completed. The staff notes the applicant's explanation that the sprinkler and standpipe systems in the areas listed above do not support SSES post-fire safe-shutdown requirements. The staff finds the applicant's explanation contrary to the April 1981 SSES fire protection SER, as the CLB. The staff held a telephone conference

with the applicant on October 3, 2007, to discuss information necessary to resolve the staff's concern described in RAI 2.3.3.13-3. During the teleconference, the staff noted that the applicant had committed to satisfy BTP APCSB 9.5-1, Appendix A, Regulatory Position A.4, "Fire Suppression Systems," by providing certain equipment for the fire protection program that is also considered "important to safety."

The staff found that the applicant's analysis of fire protection regulations does not completely capture the fire protection SSCs required for compliance with 10 CFR 50.48. The scope of SSCs required for compliance to 10 CFR 50.48 and GDC 3 goes beyond preserving the ability to maintain safe-shutdown in the event of a fire. GDC 3 states in part, that "fire detection and fighting systems of appropriate capacity and capability shall be provided and designed to minimize the adverse effects of fires on structures, systems, and components important to safety." Furthermore, the general requirements provided in GDC 3 to "minimize the adverse effects of fires on SSCs important to safety" are stated to provide a general level of protection which is afforded to all systems, not only where required to prevent a loss of safe-shutdown capability." 10 CFR 50.48(a) states that "each operating nuclear power plant must have a fire protection plan that satisfies Criterion 3 of Appendix A of this part."

The term "important to safety" encompasses a broader scope of equipment than safety-related and safe-shutdown equipment. Though there is a focus on the protection of safety-related equipment or safe-shutdown equipment, this does not imply that there is an exclusion of any equipment which protects nonsafety-related equipment. For example, in accordance with 10 CFR 50.48, some portions of suppression systems may be required in plant areas where a fire could result in the release of radioactive materials to the environment, even if no safety-related or safe-shutdown equipment is located in that particular fire area.

In its response dated October 24, 2007, the applicant stated that as identified in RAI 2.3.3.13-3, sprinkler and standpipe systems in the Condenser Area, Turbine Central Area, Turbine Condenser Gallery, Turbine Hydro Control Power Room, North Railroad Bay, Turbine Condenser Mezzanine, Diesel Engine Fire Pump Room, Turbine Pump Area, Turbine Filter Room, Turbine Moisture Separation Area, Radwaste Tank Vent Filter Room, Radwaste Auxiliary Rooms, and Radwaste Controlled Zone Shop are not within the scope of license renewal. The applicant verified that these systems are used for property protection. The applicant further stated that these sprinkler and standpipe systems do not protect safety-related equipment, are not addressed in PPL's response to Appendix A to BTP APSCB 9.5-1, nor are they credited in the 10 CFR Part 50, Appendix R safe-shutdown analysis.

In addition, the applicant stated that after further review, the sprinkler and standpipe systems for the Turbine Building areas, Reactor Feed Pump Turbine (RFP Lube Oil Reservoir), PFP Turbine Room (RFP Turbine Room), Centrifuge & Conditioner (Lube Oil Conditioner Room), Turbine Hydro Seal Oil Unit (Hydrogen Seal Oil Unit), Turbine Lube oil Area (Turbine Lube oil Reservoir), and Turbine Motor Generator Area (Turbine generator bearings) are included in the Fire Protection Review Report for SSES. They also are included in the response to Appendix A to BTP APSCB 9.5-1, because they protect areas containing combustible liquid.

The staff confirmed that the applicant has provided revised boundary drawings LF-M-122-2, -11, -12, -13 and -14.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.13-3 acceptable because the applicant has explained that the sprinkler and standpipe systems listed below are

not required for compliance with fire protection regulations. The staff determines that the following fire water suppression systems are for property protection and for loss prevention:

- Condenser Area
- Turbine Central Area
- Turbine Condenser Gallery
- Turbine Hydro Control Power Room
- North Railroad Bay
- Turbine Condenser Mezzanine
- Diesel Engine Fire Pump Room
- Turbine Pump Area
- Turbine Filter Room
- Turbine Moisture Separation Area
- Radwaste Tank Vent Filter Room
- Radwaste Auxiliary Rooms
- Radwaste Controlled Zone Shop

The staff concludes that sprinkler and standpipe systems are correctly excluded from the scope of license renewal and from being subject to an AMR. In addition, the staff finds that the applicant has committed to include the following sprinkler and standpipe systems within the scope for the license renewal and subject to an AMR:

- Reactor Feed Pump Turbine (RFP Lube Oil Reservoir)
- PFP Turbine Room (RFP Turbine Room)
- Centrifuge & Conditioner (Lube Oil Conditioner Room)
- Turbine Hydro Seal Oil Unit (Hydrogen Seal Oil Unit)
- Turbine Lube oil Area (Turbine Lube oil Reservoir)
- Turbine Motor Generator Area (Turbine generator bearings)

The staff is adequately assured that the above sprinkler and standpipe systems for fire suppression will be appropriately considered during aging management activities. Therefore, the staff's concern described is RAI 2.3.3.13-3 is resolved.

In RAI 2.3.3.13-4, dated June 22, 2007, the staff stated that SER Section 9.5.1.3 (NUREG-0776, dated April 1981), describes the low-pressure carbon dioxide (CO_2) fire extinguishing systems for electrical equipment rooms, generator purging, concealed floor and ceiling spaces. This SER section also discusses self-contained Halon 1301 fire extinguishing systems for power generation complex modules. The staff noted that the total flooding CO_2 fire extinguishing systems for electrical equipment rooms, generator purging, concealed floor and ceiling spaces and self-contained Halon 1301 fire extinguishing systems for power generation complex modules do not appear in LRA Section 2.3.3.13 as being in the scope of the license renewal and subject to an AMR.

The staff requested that the applicant verify whether the CO_2 fire extinguishing systems for electrical equipment rooms, generator purging, concealed floor and ceiling spaces and Halon 1301 fire extinguishing systems for power generation complex modules are within the scope of license renewal, in accordance with 10 CFR 54.4(a) and subject to an AMR, in accordance with 10 CFR 54.21(a)(1) and; if excluded, provide justification.

In its response to RAI 2.3.3.13-4, dated July 24, 2007, the applicant stated:

> The CO_2 and Halon fire extinguishing systems are in the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21 (a)(1). "Spray nozzles, CO_2 and Halon" and "Tank, low pressure CO_2 storage tank (0T102)" are explicitly listed in LRA Table 2.3.3-13 and are subject to an AMR. These suppression systems also include piping, tubing, valve bodies, and bolting, which are also listed in LRA Table 2.3.3-13 as subject to an AMR.
>
> As shown on LRA drawing LR-M-122, Sheet 4, "Fire Protection Carbon Dioxide Systems," normally closed valves isolate the generator purging portion of the CO_2 extinguishing system from the storage tank. The storage tank, attached piping, and isolation valves are within the scope of license renewal and subject to an AMR, as described above. The remainder of the generator purging portion of the CO_2 fire extinguishing system is not in the scope of license renewal. The CO_2 fire extinguishing systems for safety-related and safe-shutdown system protection include those in the electrical equipment rooms and floor and ceiling spaces (concealed) of the control room. In addition, Power Generation Control Complex (PGCC) modules are provided with self-contained Halon 1301 fire extinguishing systems as described in Section 4.9 of the FPRR, Revision 15, and in Section 9.5.1.3 of NUREG-0776, dated April 1981. These systems are self-contained in the individual modules and, as such, are not shown on an LRA drawing.

In evaluating the applicant's response, the staff found that it was incomplete and that review of LRA Section 2.3.3.13 could not be completed. The staff noted the applicant's explanation that the CO_2 and Halon 1301 fire extinguishing systems are within the scope of license renewal, in accordance with 10 CFR 54.4(a) and subject to an AMR, pursuant to 10 CFR 54.21(a)(1). The staff also noted that a part of the generator purging portion of the CO_2 extinguishing system is not within the scope of license renewal. The staff further noted that the Power Generation Control Complex (PGCC) modules are provided with self-contained Halon 1301 fire extinguishing systems.

The applicant indicated in its response to RAI 2.3.3.14-4 that the CO_2 and Halon fire extinguishing system in question is within the scope of license renewal, but a portion of the CO_2 system was not highlighted on LRA boundary drawing LR-M-122, Sheet 4. This resulted in the staff holding a telephone conference with the applicant on October 3, 2007, to discuss information necessary to resolve its concern described in RAI 2.3.3.13-4. During the teleconference, the staff asked the applicant to explain why a portion of the CO_2 system was not highlighted on LRA boundary drawing LR-M-122, Sheet 4. Further, the staff requested that the applicant verify whether the PGCC modules self-contained Halon 1301 fire extinguishing systems are within the scope of license renewal, in accordance with 10 CFR 54.4(a) and subject to an AMR, in accordance with 10 CFR 54.21(a)(1).

The applicant clarified that a portion of the CO_2 system for the generator purging system is not within the scope of license renewal, because a malfunction of that portion of the system will not prevent the CO_2 fire extinguishing system from accomplishing its 10 CFR Part 50, Appendix R function. The staff determines that the portion of the CO_2 system in question could not affect the actuation of the CO_2 system, and was correctly excluded from the scope of license renewal

and is not subject to an AMR. The staff also determines that the applicant has considered the PGCC self-contained Halon 1301 units as active components and therefore, excluded them from the scope of license renewal and subject to an AMR. Therefore, the staff's concern described in RAI 2.3.3.13-4 is resolved.

In RAI 2.3.3.13-5, dated June 22, 2007, the staff noted that the LRA Table 2.3.3-13 excludes several types of fire protection components that appear in the April 1981 SER (NUREG-0776) for SSES, and/or the applicant's Fire Protection Review Report. These components are listed below:

- Hose stations
- Spray nozzles (water, CO2/Halon 1301)
- Dikes for oil spill confinement
- Floor drains and curbs for fire-fighting water
- Filter housing
- Strainer housing
- Heater housing
- Chamber housing
- Actuator housing
- Pipe supports
- Halon storage bottles
- Water storage tanks
- Buried outside diesel fuel storage tanks
- Heat exchanger (bonnet)
- Turbocharger
- Lubricating oil collecting system components (reactor coolant pump)
- Engine intake and exhaust silencers/muffler (diesel driven fire pump)
- Manual smoke removal systems and their associated components (control structure including CSRs)

The staff requested that the applicant verify whether the components listed above should be included in LRA Table 2.3.3.13 and: if excluded, provide justification.

In its response to RAI 2.3.3.13-5, dated July 24, 2007, the applicant stated in part:

> Fire protection system components that provide safety-related and safe-shutdown system protection (i.e., that are required for compliance with 10 CFR 50.48) are in the scope of license renewal and subject to an AMR unless justification is provided otherwise.
>
> With certain exceptions, the components listed above do not need to be included in LRA Table 2.3.3-13 in that they are already included in the table (as clarified

below), included in a separate LRA Table excluded from the scope of license renewal or not subject to an AMR. Each type of component listed above is addressed in the following table. The corresponding LRA location is identified for components subject to an AMR and justification is provided, as applicable.

The applicant provided a table as part of its response that identified:

> ...certain components of the Fire Protection System were incorrectly omitted from Section 2.3.3.13 and subsequent portions of the LRA. These components are attached to and support the function of the diesel engine driven fire pump (0P511), shown on LRA drawing LR-M-122, Sheet 1. For the most part, these supporting components are not shown on the boundary drawing. An evaluation was performed to determine the extent of this condition...

Based on this evaluation, the applicant identified additional components as being subject to an AMR. In addition, the applicant amended the applicable boundary drawings and the LRA to include the applicable components.

In evaluating the applicant's response to RAI 2.3.3.13-5, the staff found that it was incomplete and review of LRA Section 2.3.3.13 could not be completed. The staff noted that although the applicant states that it considered some components to be included in other line items, the descriptions of the line items in the LRA do not specifically list all the components. Further, the applicant has committed to interpret some components (*e.g.*, hose stations, curbs for fire fighting water, and pipe supports), as included in "Bulk Commodity" in LRA Table 2.4-10.

The applicant included the following items within the scope of license renewal and subject to an AMR, because of their intended functions as part of the pressure boundary:

- filter bodies
- heater housing
- muffler
- heat exchanger (oil cooler) shell and end cover
- heat exchanger (oil cooler) tubes
- pump casing (diesel fuel oil)
- pump casing (diesel lubricating oil)
- pump casing (diesel cooling water)
- tank (oil pan)
- turbocharger casing

The applicant explained that only components with an intended function other than "pressure boundary" are listed separately from the line item. Because the applicant has committed to interpret these components as included in the line item and the intended function is as a pressure boundary only, the staff is adequately assured that these components will be appropriately considered during plant aging management activities.

The staff found that the actuator housing and turbocharger were not included in the line item descriptions in the LRA. The staff confirms the applicant's interpretation of these components as active, which necessarily will result in more vigorous oversight of the condition and performance of the components. However, the staff disagreed with the applicant that the spray nozzles for fire hoses are considered to be integral to the fire hose, and the applicant's

evaluation that fire hose nozzles are not subject to an AMR. The staff determines that the fire hose nozzle function is not pressure tested like hoses and therefore, should be considered as a passive component and subject to an AMR, in accordance with 10 CFR 54.21(a)(1). The staff noted that LRA Table 2.3.3-13 identified nozzles as within the scope of license renewal and subject to an AMR. Based on its review, the staff is adequately assured that the applicant will appropriately consider fire hose nozzles during plant aging management activities.

The applicant stated that the auxiliary boilers for SSES are electric and do not have fuel oil tanks and therefore, do not require dikes. The staff believes that the turbine lube oil reservoir room, hydraulic control power room, and lube oil centrifuge and conditioner room may contain dikes for oil spill confinement and requested that the applicant verify whether the dikes for oil spill confinement are above areas that are in-scope, in accordance with 10 CFR 54.4(a) and subject to an AMR, pursuant to 10 CFR 54.21(a)(1).

During the conference call on October 3, 2007, and by letter dated October 24, 2007, the applicant stated that the LRA does not distinguish dikes for oil spill containment from flood curbs. Flood curbs are within the scope of license renewal and subject to an AMR, addressed as a bulk commodity, and listed in LRA Table 2.4-10.

Based on its review, the staff finds the applicant's response acceptable. The applicant stated that LRA does not distinguish dikes for oil spill containment from flood curbs. Flood curbs are within the scope of license renewal and subject to an AMR and included as a bulk commodity in LRA Section 2.4.10, Table 2.4-10. Because the applicant has committed to interpret dikes for oil spill containment as included in the "flood curbs" line item, with the intended function only being that of pressure boundary, the staff is adequately assured the dikes for oil spill containment will be appropriately considered during plant aging management activities.

The applicant stated that the Halon cylinders are stamped DOT and are considered consumables that are replaced periodically and therefore, not subject to an AMR. The staff disagreed with the applicant interpretation of consumables and noted that SRP-LR, Table 2.1-5, listed tanks as passive components. The staff believes that Halon tanks are part of the Halon fire extinguishment system and therefore, should be within the scope of license renewal, in accordance with 10 CFR 54.4(a) and subject to an AMR, pursuant to 10 CFR 54.21(a)(1).

During the conference call on October 3, 2007 and by letter dated October 24, 2007, the applicant stated that the SSES Halon cylinders are relatively small spheres, approximately 12 inches in diameter. The technical requirements manual TRS 3.7.3.4.1 for Units 1 and 2, directs the applicant to perform periodic weight and pressure verifications of Halon cylinders. These inspections are implemented under plant procedures 9SM-113-014, SM-113-015, SM-213-014, and SM-213-015 and include inspection of the Halon cylinders for any sign of damage and deterioration. These inspection activities collectively fall under the category of condition monitoring and determine whether the Halon cylinders are at the end of their qualified lives. The staff determined that SRP-LR, Table 2.1-3, page 2.1-15 under "consumable," item "(d)," allows for the exclusion of these components from and AMR, due to required condition monitoring activities.

Although in other license renewal reviews, components similar to the Halon cylinders are considered to be passive and, therefore, included in the scope of license renewal and subject to an AMR, the staff confirms the applicant's interpretation of this component as active. On a plant-specific basis, the applicant has excluded Halon cylinders from an AMR, pursuant to

10 CFR 54.21(a)(1)(ii). The staff also confirms that the applicant has routinely monitored Halon cylinders based on performance or condition criteria specified in Technical Requirements Manual (TRS) 3.7.3.4.1 of the TRM, thus, ensuring that the cylinders maintain their intended function.

Because the applicant has interpreted the Halon cylinders as part of an active component (condition monitoring to determine whether the Halon cylinders are at the end of their qualified lives) the staff concludes that the component was correctly excluded from the scope of license renewal and is not subject to an AMR.

Further, the staff requested that the applicant verify whether following line items listed in the above table are in-scope, in accordance with 10 CFR 54.4(a) and subject to an AMR, in accordance with 10 CFR 54.21(a)(1):

- Filter housing
- Strainer housing
- Actuator housing

During the conference call on October 3, 2007 and by letter dated October 24, 2007, the applicant stated that filter and actuator housings are within the scope of license renewal, in accordance with 10 CFR 54.4(a) and subject to an AMR pursuant to 10 CFR 54.21(a)(1). The filter and actuator housings are listed in LRA Table 2.3.3-13. The strainer has dual intended functions; namely, the strainer housing performs the pressure boundary function and the strainer internals provide the filtration function.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.13-5 acceptable because the applicant has adequately explained its interpretation of the component characterization. The staff confirms the applicant's interpretation of this component as active, which necessarily will result in more vigorous oversight of the condition and performance of the component. The staff is adequately assured that these components will be appropriately considered as within the scope of license renewal and subject to an AMR. Therefore, the staff's concerns described in RAI 2.3.3.13-5 are resolved.

In RAI 2.3.3.13-6, dated June 22, 2007, the staff noted that in LRA Section 2.3.3.13, the applicant discussed requirements for the fire water supply system, but does not mention trash racks and traveling screens for the fire pump suction water supply. Trash racks and traveling screens are located upstream of the fire pump suctions to remove any major debris from the fresh or raw water. Trash racks and traveling screens are necessary to remove debris from and prevent clogging of the fire protection water supply system. Trash racks and traveling screens are typically considered as passive and long-lived components. Both trash racks and traveling screens are located in a fresh or raw water and/or air environment and are typically constructed of carbon steel. Carbon steel located in a fresh or raw water environment or water and/or air environment is subject to loss of material, pitting, crevice formation, microbiologically influenced corrosion, and fouling. The staff requested that the applicant explain the apparent exclusion of the trash racks and traveling screens located upstream of the fire pump suctions from the scope of license renewal, in accordance with 10 CFR 54.4(a) and subject to an AMR, in accordance with 10 CFR 54.21(a)(1).

In its response to RAI 2.3.3.13-6, dated July 24, 2007, the applicant stated:

> As described in LRA Section 2.3.3.13, System Description, Water Supplies, the primary source of fire protection water is the Clarified Water Storage Tank, addressed in LRA Section 2.3.3.21, and the second and third sources are the basins of hyperbolic natural draft cooling towers for Units 1 and 2, addressed in LRA Section 2.3.3.6. Accordingly, the fire pumps at SSES are horizontal, centrifugal type pumps as described in FPRR Section 4.1, rather than vertical wet pit pumps, and do not take suction from an open bay. Since the pumps do not take suction from a natural source or bay, trash racks and traveling screens are neither required nor installed at SSES.
>
> Boundary drawings LR-M-115, Sheet 1 and LR-M-2115, Sheet 1, which are identified in LRA Section 2.3.3.6, show the outlet screens for the cooling tower basin in the scope of license renewal (highlighted green). As described in LRA Section 2.4.9.6, LRA Table 2.4-9, and LRA Table 3.5.2-9, the Cooling Tower Basin Outlet Screens are in license renewal scope and are subject to an AMR as structural commodities. They are constructed of stainless steel and are fixed screens.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.3-6 acceptable because the applicant adequately described that the intended function supporting the fire pump suction supply is accomplished from the water storage tank and basins of the hyperbolic natural draft cooling towers for Units 1 and 2. The fire pumps at SSES do not take suction from a natural source or bay, therefore, trash racks and traveling screens are not required. In addition, the staff confirms that the applicant has placed cooling tower basin outlet screens within the scope of license renewal and subject to an AMR, as structural commodities. Therefore, the staff's concern described in RAI 2.3.3.13-6 is resolved.

2.3.3.13.3 Conclusion

The staff reviewed the LRA, UFSAR, LRA boundary drawings (original and revised), and RAI responses to determine whether the applicant failed to identify any components within the scope of license renewal. In addition, the staff's review determined whether the applicant failed to identify any components subject to an AMR. On the basis of its review, the staff concludes the applicant has appropriately identified the fire protection system and components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the fire protection mechanical components subject an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1) and therefore, the response is acceptable.

2.3.3.14 Fuel Pool Cooling and Cleanup System and Fuel Pools and Auxiliaries

2.3.3.14.1 Summary of Technical Information in the Application

LRA Section 2.3.3.14 describes the fuel pool cooling and cleanup system (FPCCS) system and fuel pools and auxiliaries that cool the fuel storage pool water by transferring decay heat of the irradiated fuel through heat exchangers to the SWS. The FPCCS and fuel pools and auxiliaries contain safety-related components relied upon to remain functional during and following DBEs. The failure of nonsafety-related SSCs in the SSCs in the FPCCS and fuel pools and auxiliaries

could prevent satisfactory performance of a safety-related function. LRA Table 2.3.3-14 identifies FPCCS and fuel pools and auxiliaries component types within the scope of license renewal and subject to an AMR.

2.3.3.14.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.14, UFSAR Sections 9.1.3 and 9.1.2, and the licensing renewal boundary drawings using the evaluation methodology described in SER Section 2.3 and the guidance in SRP-LR Section 2.3. The staff's review of LRA Section 2.3.3.14 identified areas in which additional information was necessary to complete the review of the applicant's scoping and screening results. In addition to RAIs 2.3.3.14-1, 2.3.3.14-2, and 2.3.3.14-11 related to boundary drawing continuation errors described in LRA Section 2.3.3, the applicant responded to the staff's RAIs as discussed below.

In RAI 2.3.3.14-3, dated August 27, 2007, the staff noted that boundary drawing LR-M-154-1, locations C3, C6, and C9, show the boundary (pursuant to 10 CFR 54.4(a)(2)) at the top of the fuel pool filter demineralizers. Though not within the scope of license renewal, two-inch vent pipes are shown exiting the top of the filter demineralizers and going to the vent header two-inch HBD-87 piping, which also is not within scope of licensing renewal. Boundary drawing LR-M-154-1, location A1, shows a continuation from the out-of-scope vent header two-inch HBD-87 piping to boundary drawing LR-M-166-2, location A2, where the two-inch HBD-87 piping is shown within the scope of license renewal. The staff requested that the applicant explain why the two-inch vent piping and two-inch HBD-87 vent header piping are not within the scope of license renewal.

In its response to RAI 2.3.3.14-3, dated October 18, 2007, the applicant stated in part:

> License renewal Note E on drawing LR-M-166-2 states that component vents routed to a tank are considered to potentially contain liquid and are included in the evaluation boundaries.
>
> The vent piping from the fuel pool filter demineralizers on drawing LR-M-154-1 up to the vent header and continuing onto drawing LR-M-166-2 at location A2 and to the connection to the fuel pool backwash receiving tank is within the scope of license renewal per the criteria of 10 CFR 54.4(a)(2). The drawings were revised to highlight the piping [as 10 CFR 54.4(a)(2)].

Because the components being added are addressed under the "piping and piping components" line item in LRA Table 2.3.3-14, the applicant stated that no changes are required to this table.

The applicant further stated that the LRA:

> ...was amended to address the materials for the components added to the scope of license renewal per this response. The internal environment for the carbon and stainless steel vent piping is evaluated as a ventilation environment. In addition it was noted that there is carbon steel piping subject to the treated water environment. Evaluation of that piping was also added to LRA Table 3.3.2-14.

The staff confirms that the applicant has submitted revised boundary drawings LR-M-154-1 and LR-M-166-2, and has revised LRA Table 3.3.2-14.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.14-3 acceptable because the applicant has clarified that the piping in question is within the scope of license renewal and has made appropriate revisions to boundary drawings LR-M-154-1 and LR-M-166-2 and LRA Table 3.3.2-14. Therefore, the staff's concern described in RAI 2.3.3.14-3 is resolved.

In RAI 2.3.3.14-4, dated August 27, 2007, the staff noted that boundary drawing LR-M-153-2, location F4, shows the continuation of one-inch HBD piping to boundary drawing LR-M-161-1, location E1, which is within the scope of license renewal, pursuant to 10 CFR 54.4(a)(2). Boundary drawing LR-M-153-2 did not provide the complete pipe identification number. Review of the continuation boundary drawing LR-M-161-1, location E1, did not show the one-inch HBD piping specifically identified or show the continuation of the in-scope piping from boundary drawing LR-M-153-2. The staff requested that the applicant provide additional information to include the complete one-inch HBD pipe identification number on boundary drawings LR-M-153-2 and LR-M-161-1 and explain why the continuation of the in-scope boundary from boundary drawing LR-M-153-2 is not shown as within the scope of license renewal on boundary drawing LR-M-161-1.

In its response, dated October 18, 2007, the applicant stated:

> The continuation of the one-inch HBD drain line from the refueling bellows area of the primary containment on drawing LR-M-153-2 is included in the listing of sources draining to the drywell equipment drain tank on drawing LR-M-161-1, location E1. The line from LR-M-153-2, location F4, is addressed by the listing "Bellows Drain (M-153)."
>
> The subject 1-inch drain line on LR-M-153-2 that continues to LR-M-161-1 should not be highlighted as within the scope of license renewal for 10 CFR 54.4(a)(2) because it is located inside containment where the equipment is designed to get wet. Drawing LR-M-153-2 was revised to reflect this change.

The staff confirms that the applicant has submitted revised boundary drawing LR-M-153-2.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.14-4 acceptable because the applicant has clarified that the piping in question on boundary drawing LR-M-1-153-2 is not within the scope of license renewal and has made appropriate revisions to boundary drawing LR-M-153-2. Therefore, the staff's concern described in RAI 2.3.3.14-4 is resolved.

In RAI 2.3.3.14-5, dated August 27, 2007, the staff noted that boundary drawings LR-M-153-2, location F5, shows the continuation of two-inch HBD-1052 piping to boundary drawing LR-M-161-1, location E1, which is within the scope of license renewal, pursuant to 10 CFR 54.4(a)(2). Review of the continuation boundary drawing LR-M-161-1, location E1, did not show the two-inch HBD-1052 piping specifically identified or show the continuation of the in-scope piping from boundary drawing LR-M-153-2. The staff requested that the applicant provide additional information that indicates where the two-inch HBD-1052 pipe continuation is located on boundary drawing LR-M-161-1 and explain why the continuation of the in-scope

boundary from boundary drawing LR-M-153-2 is not shown as within the scope of license renewal on boundary drawing LR-M-161-1.

In its response to RAI 2.3.3.14-5, dated October 18, 2007, the applicant stated:

> The continuation of the 2" HBD-1052 drain line from the refueling bellows area of the primary containment on drawing LR-M-153-2 is included in the listing of sources draining to the drywell equipment drain tank on drawing LR-M-161-1 at location E1. The line from LR-M-153-2 at location F5 is addressed by the listing "Bellows Drain (M-153)."
>
> The subject two-inch drain line on LR-M-153-2 that continues to LR-M-161-1 should not be highlighted as within the scope of license renewal for 10 CFR 54.4(a)(2) because it is located inside containment where the equipment is designed to get wet.

The staff confirms that the applicant has submitted revised boundary drawing LR-M-153-2.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.14-5 acceptable because the applicant has clarified that the piping in question on boundary drawing LR-M-1-153-2 is not within the scope of license renewal and has made appropriate revisions to boundary drawing LR-M-153-2. Therefore, the staff's concern described in RAI 2.3.3.14-5 is resolved.

In RAI 2.3.3.14-6, dated August 27, 2007, the staff noted that boundary drawing LR-M-2153-2, location F4, shows the continuation of one-inch HBD piping to boundary drawing LR-M-2161-1, location F1, which is within the scope of license renewal, pursuant to 10 CFR 54.4(a)(2). The LR-M-2153-2 boundary drawing did not provide the complete pipe identification number. Review of the continuation boundary drawing LR-M-2161-1, location F1, did not show the one-inch HBD piping specifically identified or show the continuation of the in-scope piping from boundary drawing LR-M-2153-2. The staff requested that the applicant provide additional information that includes the complete one-inch HBD pipe identification number on boundary drawings LR-M-2153-2 and LR-M-2161 and explain why the continuation of the in-scope boundary from boundary drawing LR-M-2153-2 is not shown as within the scope of license renewal on boundary drawing LR-M-2161.

In its response to RAI 2.3.3.14-6, dated October 18, 2007, the applicant stated in part:

> The continuation of the one-inch HBD drain line from the refueling bellows area of the primary containment on drawing LR-M-2153-2 is included in the listing of sources draining to the drywell equipment drain tank on drawing LR-M-2161-1, location F1. The line from LR-M-2153-2 at location F4 is addressed by the listing "Bellows Leakage Drain (M-2153)."
>
> The subject one-inch drain line on LR-M-2153-2 that continues to LR-M-2161-1 should not be highlighted as within the scope of license renewal for 10 CFR 54.4(a)(2) because it is located inside containment where the equipment is designed to get wet. Refer to LRA Section 2.1.1.2.2 and the enclosed response to RAI 2.3.3.23-3 for an explanation.

The staff confirms that the applicant has submitted revised boundary drawing LR-M-2153-2.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.14-6 acceptable because the applicant has clarified that the piping in question on boundary drawing LR-M-1-2153-2 is not within the scope of license renewal and has made appropriate revisions to boundary drawing LR-M-2153-2. Therefore, the staff's concern described in RAI 2.3.3.14-6 is resolved.

In RAI 2.3.3.14-7, dated August 27, 2007, the staff noted that boundary drawing LR-M-2153-2, location F5, shows the continuation of two-inch HBD-2052 piping to boundary drawing LR-M-2161-1, location F1, which is within the scope of license renewal, pursuant to 10 CFR 54.4(a)(2). Review of the continuation boundary drawing LR-M-2161-1, location F1, did not show the two-inch HBD-2052 piping specifically identified or show the continuation of the in-scope piping from boundary drawing LR-M-2153-2. The staff requested that the applicant provide additional information that indicates where the two-inch HBD-2052 piping continuation is located on boundary drawing LR-M-2161-1 and explain why the continuation of the in-scope boundary from boundary drawing LR-M-2153-2 is not shown as within the scope of license renewal on boundary drawing LR-M-2161-1.

In its response to RAI 2.3.3.14-7, dated October 18, 2007, the applicant stated in part:

> The continuation of the 2 inch HBD-2052 drain line from the refueling bellows area of the primary containment on drawing LR-M-2153-2 is included in the listing of sources draining to the drywell equipment drain tank on drawing LR-M-2161-1 at location F1. The line from LR-M-2153-2 at location F5 is addressed by the listing "Bellows Leakage Drain (M-2153)."
>
> The subject 2 inch drain line on LR-M-2153-2 that continues to LR-M-2161-1 should not be highlighted [as 10 CFR 54(a)2)]. This drain line is located inside primary containment where the equipment is designed to get wet. Refer to LRA Section 2.1.1.2.2 and the enclosed response to RAI 2.3.3.23-3 for an explanation.

The staff confirms that the applicant has submitted revised boundary drawing LR-M-2153-2.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.14-7 acceptable because the applicant has clarified that the piping in question on boundary drawing LR-M-1-2153-2 is not within the scope of license renewal and has made appropriate revisions to boundary drawing LR-M-2153-2. Therefore, the staff's concern described in RAI 2.3.3.14-7 is resolved.

In RAI 2.3.3.14-8, dated August 27, 2007, the staff noted that boundary drawing LR-M-153-2 shows six weirs with screens at locations D1, D2, D3, D5, and D6 at the ends of four-inch HCD-143 piping; diffusers at locations E2 and E6 at the ends of six-inch HCD-158 piping, and location E9 at the end of six-inch HCD-3023 piping; and a grate at location F9 at the start of six-inch HCD-3024 piping that are within the scope of license renewal, pursuant to 10 CFR 54.4(a)(2). Boundary drawing LR-M-2153-2 shows six weirs with screens at locations D1, D2, D3, D5, and D6 at the ends of four-inch HCD-243 piping; diffusers at locations E2 and E6 at the ends of six-inch HCD-258 piping; and grates at location E3 at the start of three-inch HBC-220 piping that are within the scope of license renewal, pursuant to 10 CFR 54.4(a)(2).

None of these component types are listed in LRA Table 2.3.3-14 for components subject to an AMR. The staff requested that the applicant explain why these component types are not included in LRA Table 2.3.3-14.

In its response to RAI 2.3.3.14-8, dated October 18, 2007, the applicant stated in part:

> The weirs (with screens) and diffusers on drawing LR-M-153-2 all perform a structural integrity function. As such, they are evaluated as component type "piping and piping components", which is included with a structural integrity function in LRA Table 2.3.3-14. The grate at location F9 is embedded in the floor of the shipping cask storage pit does not have the potential for affecting safety-related components through spatial interaction and therefore does not meet the criteria of 10 CFR 54.4(a)(2). Drawing LR-M-153-2 has been revised to indicate that the grate at location F9 is not within the scope of license renewal.
>
> The weirs (with screens) and diffusers on drawing LR-M-2153-2 all perform a structural integrity function. As such, they are evaluated as component type "piping and piping components", which is included with a structural integrity function in LRA Table 2.3.3-14.
>
> The piping within the primary containment, including the grates at location E3, was removed from the scope of license renewal on drawing LR-M-2153-2. Refer to LRA Section 2.1.1.2.2 and the enclosed response to RAI 2.3.3.23-3 for the explanation.

The staff confirms that the applicant has submitted revised boundary drawing LR-M-153-2.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.14-8 acceptable because the applicant has explained that the components in question are included as a component type within "piping and piping components" in LRA Table 2.3.3-14 and that boundary drawing LR-M-153-2 was revised because the grate at location F9 is not in-scope. Therefore, the staff's concern described in RAI 2.3.3.14-8 is resolved.

In RAI 2.3.3.14-9, dated August 27, 2007, the staff noted that boundary drawing LR-M-153-2 shows grates at locations E1, E3, E5, E6, E7, E8, E9, and F9, with only the F9 grate at the start of 6" HCD-3024 piping shown within the scope of licensing renewal. Boundary drawing LR-M-2153-2 shows grates at locations E1, E3, E5, E6, E7, and E8, with only two of the E3 grates at the start of three-inch HBC-120 piping shown within the scope of license renewal. All of the grates are shown located at the entrance to the drain piping within the scope of license renewal, pursuant to 10 CFR 54.4(a)(2). The staff requested that the applicant explain why some grates are within the scope of license renewal and some are not, when they all flow into piping that is within the scope of licensing renewal.

In its response to RAI 2.3.3.14-9, dated October 18, 2007, the applicant stated in part:

> Based on the response to RAI 2.3.3.14-8, drawing LR-M-153-2 has been revised to indicate the grate at location F9 at the start of six-inch HCD-3024 piping as not within the scope of license renewal. This change was based on the grate being embedded in the floor of the shipping cask storage pit; therefore, not having the

potential for affecting safety-related components through spatial interaction and not meeting the criteria of 10 CFR 54.4(a)(2).

The piping within the primary containment, including the grates at location E3, was removed from the scope of license renewal on drawing LR-M-2153-2. Refer to LRA Section 2.1.1.2.2 and the enclosed response to RAI 2.3.3.23-3 for the explanation. Note that revised boundary drawing LR-M-2153-2 was prepared in response to RAI 2.3.3.14-11.

All of the grates are embedded in concrete and therefore do not have the potential for affecting safety-related components through spatial interaction. Therefore, the grates do not meet the criteria of 10 CFR 54.4(a)(2) and are not within the scope of license renewal.

The staff confirms that the applicant has submitted revised boundary drawing LR-M-2153-2.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.14-9 acceptable because the applicant has explained that all the grate components in question are not within the scope of license renewal, since they are embedded in concrete and that boundary drawing LR-M-2153-2 was revised to indicate that none of the grates are within the scope of license renewal. Therefore, the staff's concern described in RAI 2.3.3.14-9 is resolved.

In RAI 2.3.3.14-10, dated August 27, 2007, the staff noted that boundary drawing LR-M-153-2, location E3, shows two grates, which are identified as not within the scope of license renewal, that drain into three-inch HBC-120 piping that is within the scope of license renewal, pursuant to 10 CFR 54.4(a)(2). Boundary drawing LR-M-2153-2, also at location E3, shows essentially the same two grates, which are identified as within the scope of license renewal, that drain into three-inch HBC-220 piping within the scope of license renewal, pursuant to 10 CFR 54.4(a)(2) and also draining to the liquid radwaste system. The staff requested that the applicant explain why there is a difference of grate scope classification between Unit 1 and Unit 2, when the grates essentially have the same location, piping size, function, and destination.

In its response to RAI 2.3.3.14-10, dated October 18, 2007, the applicant stated in part:

> The piping within the primary containment, including the grates at location E3 on drawing LR-M-2153-2, was removed from the scope of license renewal. This change to drawing LR-M-2153-2 was identified as Revision 1. The basis for the removal of the piping within primary containment on drawings LR-M-153-2 and LR-M-2153-2 from the scope of license renewal was that safety-related components inside containment are designed for a harsh environment, including spray, and are not plausible targets for spatial interaction. The subject components are not connected to safety-related piping. Refer to LRA Section 2.1.1.2.2 and the enclosed response to RAI 2.3.3.23-3 for the explanation.

The staff confirms that the applicant has submitted revised boundary drawings LR-M-153-2 and LR-M-2153-2.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.14-10 acceptable because the applicant has explained that all piping and grate components in question were

removed from the scope of license renewal, and that boundary drawings LR-M-2153-1 and LR-M-2153-2 were appropriately revised. Therefore, the staff's concern described in RAI 2.3.3.14-10 is resolved.

In RAI 2.3.3.14-12, dated August 27, 2007, the staff noted that boundary drawing LR-M-2153-1, location F6, shows orifice FE 25234 highlighted in green, indicating that it is within the scope of license renewal, pursuant to 10 CFR 54.4(a)(1). Boundary drawing LR-M-153-1, location F6, orifice FE 15324 is highlighted in pink, indicating that it is within the scope of license renewal, pursuant to 10 CFR 54.4(a)(2). The staff requested that the applicant explain why different scoping criterion was used for the Unit 1 versus Unit 2 orifices.

In its response to RAI 2.3.3.14-12, dated October 18, 2007, the applicant stated in part that:

> Orifice FE 15324, like FE 25324, is a Q-Class component (i.e., safety-related) and therefore meets the scoping criteria of 10 CFR 54.4(a)(1). The highlighting error on LR-M-153-1 was revised to include orifice FE15324 as within the scope of license renewal for criteria 10 CFR 54.4(a)(1).

The staff confirms that the applicant has submitted revised boundary drawing LR-M-153-1.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.14-12 acceptable because the applicant has clarified that the orifices in question are both within the scope of license renewal, pursuant to 10 CFR 54.4(a)(1) and has revised boundary drawing LR-M-153-1. Therefore, the staff's concern described in RAI 2.3.3.14-12 is resolved.

In RAI 2.3.3.14-13, dated August 27, 2007, the staff noted that boundary drawings LR-M-153-1, location C6 and boundary drawing LR-M-2153, location C3, show 10-inch HBC-114/214 within the scope of license renewal, pursuant to 10 CFR 54.4(a)(2), as nonsafety-related for spatial interaction. The piping numbering system of boundary drawing LR-M-100 indicates that these piping components are American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section III, Class 3. ASME Code, Section III, Class 3 components typically are safety-related and fall within the scope of license renewal, pursuant to 10 CFR 54.4(a)(1). The staff also noted other similar occurrences on these boundary drawings. The staff requested that the applicant explain why portions of ASME Code, Section III, Class 3 components on boundary drawings LR-M-153/2153-1 are not safety-related and why they are not within the scope of license renewal, pursuant to 10 CFR 54.4(a)(1).

In its response to RAI 2.3.3.14-13, dated October 18, 2007, the applicant stated:

> The FSAR Table 3.2-1 under the Fuel Pool Cooling and Cleanup System, shows that the principal construction code for the piping downstream of valve 1(2)53001 (10" HBC-114/214) is ASME Section III, Class 3. The same table shows that this piping is not within the scope of 10 CFR 50, Appendix B. Hence, the pipe is ASME III, Class 3, but is not safety-related. Reference LR-M-100-2 at E3, PPL's drawing convention is to "cross-hatch" pipelines that are safety-related. The lack of "cross-hatching" indicates that HBC-114/214, as well as other similar instances of ASME Section III pipes, are not safety-related.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.14-13 acceptable because the applicant has verified that UFSAR Table 3.2-1 shows that this piping is not within

the scope of 10 CFR Part 50, Appendix B and is not safety-related. Therefore, the staff's concern described in RAI 2.3.3.14-13 is resolved.

2.3.3.14.3 Conclusion

The staff reviewed the LRA, UFSAR, RAI responses, and boundary drawings to determine whether the applicant failed to identify any components within the scope of license renewal. In addition, the staff's review determined whether the applicant failed to identify any components subject to an AMR. On the basis of its review, the staff concludes the applicant has appropriately identified the fuel pool cooling and cleanup system and fuel pools and auxiliaries mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the FPCCS and fuel pools and auxiliaries mechanical components subject to an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1) and therefore, the response is acceptable.

2.3.3.15 Neutron Monitoring System

2.3.3.15.1 Summary of Technical Information in the Application

LRA Section 2.3.3.15 describes the neutron monitoring system (NMS). The NMS contains safety-related components relied upon to remain functional during and following DBEs. In addition, the NMS performs functions that support ATWS and EQ. LRA Table 2.3.3-15 identifies NMS component types within the scope of license renewal and subject to an AMR.

2.3.3.15.2 Conclusion

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA, UFSAR, and applicable boundary drawings, the staff concludes that applicant has appropriately identified the NMS mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system components subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.3.16 Nitrogen and Hydrogen System

2.3.3.16.1 Summary of Technical Information in the Application

LRA Section 2.3.3.16 describes the nitrogen and hydrogen system, which provides gaseous nitrogen for containment makeup and hydrogen for cooling the main generator during normal plant operation. The failure of nonsafety-related SSCs in the nitrogen and hydrogen system potentially could prevent the satisfactory accomplishment of a safety-related function. Although connected to safety-related components for makeup and purge of the nitrogen in containment, no nitrogen and hydrogen system mechanical components are subject to an AMR.

2.3.3.16.2 Conclusion

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA, and UFSAR, the staff concludes that applicant has appropriately identified the nitrogen and hydrogen system mechanical component types within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system

component types subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.3.17 Primary Containment Atmosphere Circulation System

2.3.3.17.1 Summary of Technical Information in the Application

LRA Section 2.3.3.17 describes the primary containment atmosphere circulation system. The primary containment atmosphere circulation system contains safety-related components relied upon to remain functional during and following DBEs. In addition, the primary containment atmosphere circulation system performs functions that support EQ. LRA Table 2.3.3-16 identifies primary containment atmosphere circulation system component types within the scope of license renewal and subject to an AMR.

2.3.3.17.2 Conclusion

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA, UFSAR, and applicable boundary drawings, the staff concludes that applicant has appropriately identified the primary containment atmosphere circulation system mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system components subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.3.18 Process and Area Radiation Monitoring System

2.3.3.18.1 Summary of Technical Information in the Application

LRA Section 2.3.3.18 describes the process and area radiation monitoring system, which monitors releases of radioactive material in the plant gaseous and liquid process and effluent streams to detect, alarm, indicate, and generate appropriate automatic actions to control releases exceeding predetermined limits. The process and area radiation monitoring system contains safety-related components relied upon to remain functional during and following DBEs. The failure of nonsafety-related SSCs in the process and area radiation monitoring system potentially could prevent the satisfactory accomplishment of a safety-related function. In addition, the process and area radiation monitoring system performs functions that support EQ. LRA Table 2.3.3-17 identifies process and area radiation monitoring system component types within the scope of license renewal and subject to an AMR.

2.3.3.18.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.18, UFSAR Sections 7.6 and 11.5, and the license renewal boundary drawings using the methodology described in SER Section 2.3 and the guidance in SRP-LR Section 2.3. The staff's review identified an area in which additional information was necessary to complete the review of the applicant's scoping and screening results. The applicant responded to the staff's RAIs as discussed below.

In a phone call with the applicant on November 19, 2008, the staff requested clarification of information contained in the license renewal boundary drawings. LRA Section 2.3.3.18 lists the license renewal boundary drawings that depict components of the process and area radiation monitoring system (RMS). During its review of drawing LR-M-178, Sheet 1, the staff was unable

to discern the components that were part of the process and area RMS. The applicant was able to identify components AN07801 and FE07801, in this drawing, as the parts of the process and area RMS and in-scope for their pressure boundary function, only.

In RAI 2.3.3.18-1, dated December 3, 2008, the staff noted that the process and area RMS was composed of a number of subsystems identified in the UFSAR for SSES. These subsystems include both safety-related and nonsafety-related systems. The LRA did not specifically address the scoping and screening results for each of the subsystems listed in the UFSAR. The staff requested that the applicant clarify the scoping and screening of each subsystem and provide drawing locations for subsystem components, if applicable.

In its response to RAI 2.3.3.18-1, dated December 12, 2008, the applicant stated that the following subsystems were within the scope of license renewal:

- Standby Gas Treatment Vent Duct Exhaust RMS
- Standby Gas Treatment Vent Stack Exhaust Monitor and Sample RMS
- Refueling Floor Wall Duct Exhaust RMS
- Refueling Floor High Exhaust Duct RMS
- Railroad Access Exhaust Duct RMS
- Outside Air Intake Duct (Influent) RMS
- Service Water Discharge/Supplemental Decay Heat Removal RMS
- Main Steamline RMS
- RHR Service Water RMS
- Reactor Building Closed Cooling Water RMS
- Primary Containment Atmospheric Monitoring
- Primary Containment RMS (High Range)

The staff confirms that the applicant's response also provided the screening results for the in-scope components of each of these systems.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.18-1 acceptable because the applicant has clarified with sufficient detail, its scoping and screening review of the subsystems that make up the process and area RMS. Therefore, the staff's concern described in RAI 2.3.3.18-1 is resolved.

2.3.3.18.3 *Conclusion*

The staff reviewed the LRA, UFSAR, RAI response, and boundary drawings to determine whether the applicant failed to identify any components within the scope of license renewal. In addition, the staff's review determined whether the applicant failed to identify any components subject to an AMR. On the basis of its review, the staff concludes the applicant has appropriately identified the process and area RMS components within scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the process and area RMS components subject to an AMR review, in accordance with the requirements of 10 CFR 54.21(a)(1) and therefore, the response is acceptable.

2.3.3.19 Radwaste Liquid System

2.3.3.19.1 Summary of Technical Information in the Application

LRA Section 2.3.3.19 describes the radwaste liquid system, which collects, processes, stores, and monitors, for reuse and disposal, the radioactive liquid wastes generated by plant operation. The radwaste liquid system contains safety-related components relied upon to remain functional during and following DBEs. The failure of nonsafety-related SSCs in the radwaste liquid system potentially could prevent the satisfactory accomplishment of a safety-related function. In addition, the radwaste liquid system performs functions that support EQ. LRA Table 2.3.3-18 identifies radwaste liquid system component types within the scope of license renewal and subject to an AMR.

2.3.3.19.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.19, UFSAR Section 11.2, and the licensing renewal boundary drawings using the evaluation methodology described in SER Section 2.3 and the guidance in SRP-LR Section 2.3. The staff's review identified areas in which additional information was necessary to complete the review of the applicant's scoping and screening results. The applicant responded to the staff's RAIs as discussed below.

In RAI 2.3.3.19-1, dated August 27, 2007, the staff noted that boundary drawings LR-M-161-2 and LR-M-2161-2, locations C1 to E1, provide a list of items (components, drains, vents, etc.) that are contained in a non-boundary continuation box that interfaces directly with two four-inch XBD pipelines within the scope of license renewal. The list does not show details about the boundary drawing, sheet, and location numbers for the listed items in order to review and evaluate the license renewal scope boundaries. The staff requested that the applicant identify these license renewal boundaries.

In its response to RAI 2.3.3.19-1, dated October 18, 2007, the applicant stated:

> The boxes on LR-M-161-2 and LR-M-2161-2 do not represent specific components and are not highlighted. The boxes represent that numerous drain lines from the listed systems and drawings are coming together into the lines continued from the box. Most of the piping making up the drain lines coming into the "box" is embedded in the building's floor and wall concrete. As the concrete forms a tight seal around the embedded drain line, spatial interaction is not reasonable for embedded piping. Therefore, the embedded portions of the drain lines coming into the box are not subject to AMR. The portions of these drain lines not embedded in concrete are within the scope of license renewal, are subject to AMR and are included in LRA Section 2.3.3.19 and Table 2.3.3.18, as "Piping and Piping Components" with the intended function of "Structural Integrity." The piping from the box is addressed on LR-M-161-2 and LR-M-2161-2, the liquid radwaste drawings.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.19-1 acceptable because the applicant has adequately explained how the boxes on boundary drawings LR-M-161-2 and LR-M-2161-2 do not represent components and why they are not in-scope. The applicant further clarified that portions of pipelines are in concrete to prevent spatial interaction and therefore, are not subject to an AMR, while those pipe sections not embedded in

concrete are subject to AMR and are included in LRA Section 2.3.3.19 and Table 2.3.3.18. Therefore, the staff's concern described in RAI 2.3.3.19-1 is resolved.

In RAI 2.3.3.19-2, dated August 27, 2007, the staff noted that boundary drawings LR-M-161-1 and LR-M-2161-1, locations E5 and F5, and boundary drawings LR-M-161-2 and LR-M-2161-2, locations A4, B4, C4, D4, E4, E5, E3, F3, G3, and H3, show drum traps (*e.g.*, P-25-6, P-29-6, etc.) within the scope of license renewal. However, the drum trap is not included in LRA Table 2.3.3-19 as a component subject to an AMR. The staff requested that the applicant explain why the drum traps are not included in LRA Table 2.3.3-19.

In its response to RAI 2.3.3.19-2, dated October 18, 2007, the applicant stated:

> As stated in LRA Section 2.1.2.1.3, screening of mechanical components for nonsafety affecting safety (NSAS) considerations was performed on a commodity group basis. The commodity group of "piping and piping components" includes all in-line piping components except for major equipment such as tanks and heat exchangers.
>
> The components identified on the Radwaste Liquid System drawings as drum traps are evaluated as the component type of "cleanout" and are included in the Table 2.3.3-19 line item "Piping and piping components – cleanouts and pump casings (1/2P225A/B)."

Based on its review, the staff finds the applicant's response to RAI 2.3.3.19-2 acceptable because the applicant has verified that PPL evaluates drum traps as a line item in the commodity group of "piping and piping components – cleanouts and pump casings" that is included in LRA Table 2.3.3-19. Therefore, the staff's concern described in RAI 2.3.3.19-2 is resolved.

In RAI 2.3.3.19-3, dated August 27, 2007, the staff noted that boundary drawings LR-M-161-1 and LR-M-2161-1, location H8 show a cooling coil in the RB sump that is connected to two-inch JBD-139 and two-inch JBD-140 piping that is shown within the scope of license renewal. However, the cooling coil is not included within the scope of license renewal. The staff requested that the applicant explain why the cooling coil is not within the scope of license renewal.

In its response to RAI 2.3.3.19-3, dated October 18, 2007, the applicant stated:

> The cooling coil does not perform a safety-related function; therefore, is not in-scope for criterion 10 CFR 54.4(a)(1). The cooling coil is completely enclosed within the reactor building sump and, therefore, can not have any spatial interaction with safety-related equipment and the sump itself does not perform a safety-related function. Thereby the cooling coil is not in-scope for criterion 10 CFR 54.4(a)(2). The coil does not support any of the regulated event functions and, therefore, the cooling coil is not in-scope for criterion 10 CFR 54.4(a)(3).

Based on its review, the staff finds the applicant's response to RAI 2.3.3.19-3 acceptable because the applicant has verified that the cooling coil is not within the scope of license renewal for license renewal because: (a) it does not perform a safety-related function, (b) it cannot have any spatial interaction with safety-related equipment, and (c) the coil does not support any of the regulated event functions. Therefore, the staff's concern described in RAI 2.3.3.19-3 is resolved.

In RAI 2.3.3.19-4, dated August 27, 2007, the staff noted that boundary drawing LR-M-2161-2, location B1, shows a continuation from demineralized water distribution on boundary drawing LR-M-118-2, location C2. The staff was unable to find boundary drawing LR-M-118-2 in the LRA-provided boundary drawing package. The only boundary drawing found from demineralized water distribution was LR-M-118-3, which included the correct continuation from location C2 to boundary drawing LR-M-2161-2, location B1. The staff requested that the applicant clarify that boundary drawing LR-M-118-3, rather than boundary drawing LR-M-118-2, was the correct continuation boundary drawing to boundary drawing LR-M-2161-2 at location B1.

In its response to RAI 2.3.3.19-4, dated October 18, 2007, the applicant stated that the continuation from boundary drawing LR-M-2161-2, at location B1 should be to boundary drawing LR-M-118-3 at location C2.

The staff confirms that the applicant has corrected and submitted revised boundary drawing LR-M-2161-2.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.19-4 acceptable because the applicant has revised the continuation arrow on boundary drawing LR-M-2161-2 to refer to the correct boundary drawing LR-M-118-3, location C2. Therefore, the staff's concern described in RAI 2.3.3.19-4 is resolved.

In RAI 2.3.3.19-5, dated August 27, 2007, the staff noted that boundary drawings LR-M-161-1 and -2161-1, locations B3 and G3, show nonsafety-related to safety-related piping components at penetrations X72A and X72B. LRA Section 2.1.1.2.2, "Spatial Failures of Nonsafety-Related SSCs," page 2.1-8 states in part: "With respect to nonsafety-related piping that is directly connected to safety-related piping, the seismic Category I design requirements are extended to the first seismic restraint beyond the defined boundaries." The staff requested that the applicant provide additional information showing the location of the seismic restraint for the nonsafety-related three-inch HBD-157/257 connected to the safety-related three-inch HBB-119/219 piping, which is within the license renewal boundary.

In its response to RAI 2.3.3.19-5, dated October 18, 2007, the applicant stated:

> PPL's response to RAI 2.1-3, part b, (Reference 3), identified nonsafety-related (NSR) piping and components, inside primary containment and connected to safety-related (SR) piping and components, that are required to remain intact to ensure the structural integrity of the attached SR piping and components. The 3" HBD-155/255 line connected to SR containment penetration X-72B and the 3" HBD-157/257 line connected to penetration X-72A are not highlighted. The penetrations themselves serve as anchor points, and the HBD lines inside the

drywell are not within the boundaries of the seismic analyses that contain the containment boundary valves.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.19-5 acceptable because the applicant has verified that containment penetrations serve as anchor points and the HBD lines inside the drywell are not within the boundaries of the seismic analyses. Therefore, the staff's concern described in RAI 2.3.3.19-5 is resolved.

2.3.3.19.3 Conclusion

The staff reviewed the LRA, UFSAR, RAI responses, and boundary drawings (originals and revised) to determine whether the applicant failed to identify any components within the scope of license renewal. In addition, the staff's review determined whether the applicant failed to identify any components subject to an AMR. On the basis of its review, the staff concludes the applicant has appropriately identified the radwaste liquid system mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the radwaste liquid system mechanical components subject to an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1), and therefore, the response is acceptable.

2.3.3.20 Radwaste Solids Handling System

2.3.3.20.1 Summary of Technical Information in the Application

LRA Section 2.3.3.20 describes the radwaste solids handling system, which controls, collects, handles, processes, packages, and temporarily stores prior to offsite shipping, the wet waste sludge generated by the liquid waste management system, the reactor water cleanup system, fuel pool cleanup system, the condensate cleanup system, and the condensate filtration system. The failure of nonsafety-related SSCs in the radwaste solids handling system potentially could prevent the satisfactory accomplishment of a safety-related function. LRA Table 2.3.3-19 identifies radwaste solids handling system component types within the scope of license renewal and subject to an AMR.

2.3.3.20.2 Conclusion

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA and UFSAR, the staff concludes that applicant has appropriately identified the radwaste solids handling system mechanical component types within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system component types subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.3.21 Raw Water Treatment System

2.3.3.21.1 Summary of Technical Information in the Application

LRA Section 2.3.3.21 describes the raw water treatment system, which includes a clarified water storage tank that is the primary source of water for the fire protection system. The raw water treatment system performs functions that support fire protection. LRA Table 2.3.3-20 identifies raw water treatment system component types within the scope of license renewal and subject to an AMR.

2.3.3.21.2 Conclusion

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA and UFSAR the staff concludes that applicant has appropriately identified the raw water treatment system mechanical component types within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system component types subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.3.22 Reactor Building Chilled Water System

2.3.3.22.1 Summary of Technical Information in the Application

LRA Section 2.3.3.22 describes the RB chilled water system, which supplies chilled water during normal plant operation to coolers in various areas of the reactor building (including the Unit 1 and Unit 2 emergency switchgear and load center rooms) and drywell and to the reactor recirculation pump motor coolers. The RB chilled water system contains safety-related components relied upon to remain functional during and following DBEs. The failure of nonsafety-related SSCs in the RB chilled water system potentially could prevent the satisfactory accomplishment of a safety-related function. In addition, the RB chilled water system performs functions that support EQ. LRA Table 2.3.3-21 identifies RB chilled water system component types within the scope of license renewal and subject to an AMR.

2.3.3.22.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.22, UFSAR Section 9.2.12.3, and the licensing renewal boundary drawings using the evaluation methodology described in SER Section 2.3 and the guidance in SRP-LR Section 2.3. The staff's review identified an area in which additional information was necessary to complete the review of the applicant's scoping and screening results. The applicant responded to the staff's RAI as discussed below.

In RAI 2.3.3.22-1, dated August 27, 2007, the staff noted boundary drawings LR-M-187-2 and LR-M-2187-2 show several one-inch lines and associated isolation valves as not within the scope of license renewal. These lines are directly connected to the RB chilled water system lines that are within the scope of license renewal. The staff requested that the applicant explain why the sections of pipe and components are not within the scope of license renewal.

In its response to RAI 2.3.3.22-1, dated October 18, 2007, the applicant stated:

> PPL's response to RAI 2.1-3, (Reference 3), identified nonsafety-related (NSR) piping and components, inside primary containment and connected to safety-related (SR) piping and components, that are required to remain intact to ensure the structural integrity of the attached SR piping and components. The identified nonsafety-related piping and components are in-scope for license renewal based on the criteria of 10 CFR 54.4(a)(2). The scoping determination for the nonsafety-related piping and components is based upon review of the governing piping design analyses. The in-scope portion of the nonsafety-related piping extends from the nonsafety-related -to-safety-related interface to the analytical boundaries of the piping analysis which contains the SR piping and components.

As part of the response to RAI 2.1-3, boundary drawings LR-M-187-2, Revision 1 and LR-M-2187-2, Revision 1 were included to show the revised evaluation boundaries. The piping and valves that are highlighted in pink (magenta) and identified with a reference to LR NOTE D are in-scope for the 10 CFR 54.4(a)(2) function discussed above.

The nonsafety-related piping and valves identified by this RAI are not included in the piping analyses which include the SR valves HV18792B2/HV28792B2, HV18792B1/HV28792B1, HV18782A2/HV28782A2, HV18782A1/HV28782A1, HV18792A2/HV28792A2, HV18792A1/HV28792A1, HV18782B2/HV28782B2, HV18782B1/HV28782B1. The piping and valves are not included in the analyses because they are small diameter branch lines extending from large diameter headers. In the governing piping analyses, small diameter branch lines, such as vents and drains, may be decoupled from the analysis of the headers. This is an acceptable piping design practice that is employed when it is determined that the small diameter branch lines do not significantly affect the loads and stresses on a large diameter header. Therefore, in all cases, the applicable piping analyses, which are part of the current design basis, support the conclusion that the nonsafety-related piping and valves identified by this RAI are not required to remain intact to ensure the structural integrity of the safety-related valves.

As discussed in LRA Section 2.1.1.2.2, and further discussed in the response to RAI 2.3.3.23-3, nonsafety-related piping inside containment is not required to satisfy the 10 CFR 54.4(a)(2) criteria for spatial considerations since the SR equipment inside containment is designed for all potential spatial interactions. Therefore, the nonsafety-related piping and valves identified by this RAI are not in-scope for any criteria of 10 CFR 54.4(a)(2).

The staff confirms that the applicant has submitted revised boundary drawings LR-M-187-2 and LR-M-2187-2.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.22-1 acceptable because the applicant has clarified that the nonsafety-related piping sections inside containment and in question are not within the scope of license renewal because they are outside the analytical boundaries of the piping analysis, and that the safety-related equipment inside containment is designed for all potential spatial interactions. Therefore, the staff's concern described in RAI 2.3.3.22-1 is resolved.

2.3.3.22.3 Conclusion

The staff reviewed the LRA, UFSAR, RAI response, and boundary drawings (original and revised) to determine whether the applicant failed to identify any components within the scope of license renewal. In addition, the staff's review determined whether the applicant failed to identify any components subject to an AMR. On the basis of its review, the staff concludes the applicant has appropriately identified the RB chilled water system mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the RB chilled water system mechanical components subject to an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1) and therefore, the response is acceptable.

2.3.3.23 Reactor Building Closed Cooling Water System

2.3.3.23.1 Summary of Technical Information in the Application

LRA Section 2.3.3.23 describes the reactor building closed-cooling water (RBCCW) system, which provides cooling water in the reactor and radwaste buildings to nonsafety-related equipment that could carry radioactive fluids or that requires a clean water supply to minimize long-term corrosion. The RBCCW system contains safety-related components relied upon to remain functional during and following DBEs. The failure of nonsafety-related SSCs in the RBCCW system potentially could prevent the satisfactory accomplishment of a safety-related function. In addition, the RBCCW system performs functions that support EQ. LRA Table 2.3.3-22 identifies RBCCW system component types within the scope of license renewal and subject to an AMR.

2.3.3.23.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.23, UFSAR Section 9.2.2, and the licensing renewal boundary drawings using the evaluation methodology described in SER Section 2.3 and the guidance in SRP-LR Section 2.3. The staff's review identified areas in which additional information was necessary to complete the review of the applicant's scoping and screening results. The applicant responded to the staff's RAIs as discussed below.

In RAI 2.3.3.23-1, dated August 27, 2007, the staff noted boundary drawings LR-M-113-1 and LR-M-2113-1, locations A&B2, A&B3, and A&B4, show RBCCW supply and return to pump seal heat exchangers within the scope of license renewal; however, the RBCCW supply and return piping to the motor bearing coils are not shown within the scope of license renewal. The staff requested that the applicant explain why the piping upstream and/or downstream, including valves 113012, 213012, 113009, 213009, 113017, and 113020, is not within the scope of license renewal. Additionally, the applicant was asked to explain why the sensing lines and root valves connected to the piping bounded by these isolation valves are not within the scope of license renewal.

In its response to RAI 2.3.3.23-1, dated October 18, 2007, the applicant stated in part:

> PPL's response to RAI 2.1-3, part b, sent to the NRC via PLA-6177 dated April 17, 2007, identified nonsafety-related (NSR) piping and components, inside primary containment and connected to safety-related (SR) piping and components, that are required to remain intact to ensure the structural integrity of the attached SR piping and components. The identified nonsafety-related piping and components are in-scope for license renewal based on the criteria of 10 CFR 54.4(a)(2). The scoping determination for the nonsafety-related piping and components is based upon review of the governing piping design analyses. The in-scope portion of the nonsafety-related piping extends from the nonsafety-related -to-safety-related interface to the analytical boundaries of the piping analysis which contains the safety-related piping and components.
>
> As part of the response to RAI 2.1-3, boundary drawings LR-M-113-1, Revision 1 and LR-M-2113-1, Revision 1 were included to show the revised evaluation boundaries. The piping and valves that are highlighted in pink (magenta) and

identified with a reference to "SEE LR NOTE C" are in-scope for the 10 CFR 54.4(a)(2) function discussed above.

The nonsafety-related piping and valves identified by this RAI are not included in the piping analyses which include the safety-related valves HV11345, HV11346, HV21345, and HV21346. The piping and valves are not included in the analyses for one of two possible reasons: 1) the piping and valves are located on the unanalyzed side of a physical pipe support anchor which defines the boundary of the analysis, or 2) the piping and valves are part of small diameter branch lines extending from the 3" HBD-129/229 and 3" HBD-130/230 headers. In the governing piping analyses, the small diameter branch lines, including vents and drains, may be decoupled from the analysis of the headers. This is an acceptable piping design practice that is employed when it is determined that the small diameter branch lines do not significantly affect the loads and stresses on a large diameter header. Therefore, in all cases, the applicable piping analyses, which are part of the current design basis, support the conclusion that the nonsafety-related piping and valves identified by this RAI are not required to remain intact to ensure the structural integrity of the safety-related valves HV11345, HV11346, HV21345, and HV21346.

As discussed in LRA Section 2.1.1.2.2, and further discussed in the response to RAI 2.3.3.23-3, nonsafety-related piping inside containment is not required to satisfy the 10 CFR 54.4(a)(2) criteria for spatial considerations since the safety-related equipment inside containment is designed for all potential spatial interactions. Therefore, the nonsafety-related piping and valves identified by this RAI are not in-scope for any criteria of 10 CFR 54.4(a)(2).

The staff confirms that the applicant has submitted revised boundary drawings LR-M-113-1 and LR-M-2113-1.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.23-1 acceptable because the applicant has clarified that the nonsafety-related piping sections inside containment and in question are not within the scope of license renewal, because they are outside the analytical boundaries of the piping analysis. Therefore, the staff's concern described in RAI 2.3.3.23-1 is resolved.

In RAI 2.3.3.23-2, dated August 27, 2007, the staff noted boundary drawing LR-M-113-1 and LR-M-2113-1 show several one-inch lines and associated isolation valves not within the scope of license renewal. These lines are directly connected to RBCCW main lines that are within the scope of license renewal. The staff requested that the applicant explain why these listed sections of pipe and components are not within the scope of license renewal.

In its response to RAI 2.3.3.23-2, dated October 18, 2007, the applicant stated in part:

The RBCCW piping discussed in this RAI is shown on boundary drawings LR-M-113-1 and LR-M-2113-1. The reference to drawing LR-M-2143-1 in the first sentence of the RAI is considered to be a typographical error.

PPL's response to RAI 2.1-3, part b, sent to the NRC via PLA-6177 dated April 17, 2007, identified nonsafety-related (NSR) piping and components, inside

primary containment and connected to safety-related (SR) piping and components, that are required to remain intact to ensure the structural integrity of the attached safety-related piping and components. The identified nonsafety-related piping and components are in-scope for license renewal based on the criteria of 10 CFR 54.4(a)(2). The scoping determination for the nonsafety-related piping and components is based upon review of the governing piping design analyses. The in-scope portion of the nonsafety-related piping extends from the nonsafety-related -to-safety-related interface to the analytical boundaries of the piping analysis which contains the safety-related piping and components.

As part of the response to RAI 2.1-3, boundary drawings LR-M-113-1, Revision 1 and LR-M-2113-1, Revision 1 were included to show the revised evaluation boundaries. The piping and valves that are highlighted in pink (magenta) and identified with a reference to "SEE LR NOTE C" are in-scope for the 10 CFR 54.4(a)(2) function discussed above.

The nonsafety-related piping and valves identified by this RAI are not included in the piping analyses which include the safety-related valves HV11345, HV11346, HV21345, and HV21346. The piping and valves are not included in the analyses for one of two possible reasons: 1) the piping and valves are located on the unanalyzed side of a physical pipe support anchor which defines the boundary of the analysis, or 2) the piping and valves are part of small diameter branch lines extending from the 3" HBD-129/229 and 3" HBD-130/230 headers. In the governing piping analyses, the small diameter branch lines, including vents and drains, may be decoupled from the analysis of the headers. This is an acceptable piping design practice that is employed when it is determined that the small diameter branch lines do not significantly affect the loads and stresses on a large diameter header. Therefore, in all cases, the applicable piping analyses, which are part of the current design basis, support the conclusion that the nonsafety-related piping and valves identified by this RAI are not required to remain intact to ensure the structural integrity of the safety-related valves HV11345, HV11346, HV21345, and HV21346.

As discussed in LRA Section 2.1.1.2.2, and further discussed in the response to RAI 2.3.3.23-3, nonsafety-related piping inside containment is not required to satisfy the 10 CFR 54.4(a)(2) criteria for spatial considerations since the safety-related equipment inside containment is designed for all potential spatial interactions. Therefore, the nonsafety-related piping and valves identified by this RAI are not in-scope for any criteria of 10 CFR 54.4(a)(2).

The staff confirms that the applicant has submitted revised boundary drawings LR-M-113-1 and LR-M-2113-1.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.23-2 acceptable because the applicant has clarified that the nonsafety-related piping sections inside containment and in question are not within the scope of license renewal, because they are outside the analytical boundaries of the piping analysis. Therefore, the staff's concern described in RAI 2.3.3.23-2 is resolved.

In RAI 2.3.3.23-3, dated August 27, 2007, the staff noted boundary drawing LR-M-113-1, license renewal Note B states, "Safety-Related components inside containment (designed for harsh environment) are not plausible targets for spatial interaction." The staff requested that the applicant provide additional information to support the implausibility of safety-related components within containment being impacted by failure of nonsafety-related systems.

In its response to RAI 2.3.3.23-3, dated October 18, 2007, the applicant stated:

> FSAR Sections 3.6.1.1 and 3.11.1 state that essential systems and equipment required to mitigate the consequences of a design-basis accident, or to affect a safe shutdown of the reactor, are designed to remain functional after exposure to the applicable accident environmental conditions and are qualified for service in harsh environments, including spray and/or steam. As such, the safety-related components in the primary containment are designed to remain functional for conditions that bound any potential leakage, spray, or flooding and the corresponding environmental effects (e.g., elevated temperatures and pressures), and are not reasonable targets for spatial interaction, upon failure of nonsafety-related components in that structure. Also, based on FSAR Sections 3.6.1.2 – 3.6.2, safety-related components inside containment are protected from the effects of pipe whip and/or jet impingement (from a high-energy line failure) by separation, barriers or pipe whip restraints. The portions of high-energy piping that are inside containment are all safety-related and in the scope of license renewal based on 10 CFR 54.4(a)(1) scoping criterion. Therefore, nonsafety-related mechanical components inside the containment do not have a plausible potential for failure to impair or prevent the accomplishment of a safety-related SSC's intended function.
>
> As such, they do not satisfy 10 CFR 54.4(a)(2), scoping criterion and are not within the scope of license renewal.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.23-3 acceptable because the applicant has provided additional information to support the Note B statement concerning the implausibility of safety-related components within containment being impacted by failure of nonsafety-related systems. Therefore, the staff's concern described in RAI 2.3.3.23-3 is resolved.

In RAI 2.3.3.23-4, dated August 27, 2007, the staff noted boundary drawing LR-M-113-1, location B2, refers to Note C which states "Highlighted nonsafety-related piping is within analytical boundaries of the seismic analyses for the attached safety-related components." Given the placement of the note and the highlighting approach, it is unclear as to what specific components and/or piping is addressed by Note C. The staff requested that the applicant clarify which specific components and/or piping is within the analytical boundaries of the seismic analyses.

In its response to RAI 2.3.3.23-4, dated October 18, 2007, the applicant stated:

> As discussed in the responses to RAIs 2.3.3.23-1 and 2.3.3.23-2 above, the evaluation boundaries of the nonsafety-related piping and components inside containment are based upon the analytical boundaries of the governing piping design analyses. The in-scope portion of the nonsafety-related piping extends

from the nonsafety-related -to-safety-related interface to the analytical boundaries of the piping analysis which contains the safety-related piping and components.

LR Note "C" applies to all of the pink (magenta)-highlighted piping and valves inside the primary containment that are part of the HBD-129 and HBD-130 pipelines. The highlighted piping and valves are required to remain intact to ensure the structural integrity of the attached safety-related piping and components and are, therefore, in-scope for license renewal based on the criteria of 10 CFR 54.4(a)(2).

The note to "SEE LR NOTE C" on drawings LR-M-113-1 and LR-M-2113-1 at location B2 should be closer to the 4" HBD-130 and 4" HBD-230 lines in location B1. This would then be similar to the "SEE LR NOTE C" beside the 4" HBD-129 and 4" HBD-229 lines in location B3 of the drawings.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.23-4 acceptable because the applicant has clarified which components and/or piping is within the analytical boundaries of the seismic analyses, per Note C. Therefore, the staff's concern described in RAI 2.3.3.23-4 is resolved.

In RAI 2.3.3.23-5, dated August 27, 2007, the staff noted boundary drawing LR-M-143-2, locations E7 and E8 show RBCCW three-inch supply to pump seal heat exchangers upstream of a three-inch to two-inch reducer as being within the scope of license renewal. The RBCCW piping and components downstream of the reducer are not within the scope of license renewal. The distinction is unclear between the in-scope piping upstream of the reducer and the out-of-scope piping downstream of the reducer. The staff requested that the applicant explain why the piping downstream of the three to two-inch reducer is not within the scope of license renewal.

In its response, dated October 18, 2007, the applicant stated:

As discussed in the responses to RAIs 2.3.3.23-1 and 2.3.3.23-2 above, the evaluation boundaries of the nonsafety-related piping and components inside containment are based upon the analytical boundaries of the governing piping design analyses. The in-scope portion of the nonsafety-related piping extends from the nonsafety-related -to-safety-related interface to the analytical boundaries of the piping analysis which contains the safety-related piping and components.

The analytical boundary associated with the piping analysis that includes the safety-related containment boundary valve HV11346 ends at the 3"-to-2" reducer at the end of the run of 3" HBD-129 piping on LR-M-143-2 at location E7. Since the piping downstream of the reducer is not part of the piping analysis that includes valve HV11346, it is not required to remain intact to ensure the structural integrity of the safety-related valve. Therefore, it is not within the scope of license renewal based on the criteria of 10 CFR 54.4(a)(2).

Based on its review, the staff finds the applicant's response to RAI 2.3.3.23-5 acceptable because the applicant has clarified that the nonsafety-related piping sections inside containment and in question are not within the scope of license renewal because they are outside the analytical boundaries of the piping analysis. Therefore, the staff's concern described in RAI 2.3.3.23-5 is resolved.

In RAI 2.3.3.23-6, dated August 27, 2007, the staff noted boundary drawing LR-M-143-2, location E8, shows RBCCW three-inch supply to pump seal heat exchangers upstream of a three-inch to two-inch reducer as being within scope of license renewal. The same section of piping identified in Unit 2 and shown on boundary drawing LR-M-2143-2, is identified as not within the scope of license renewal. The reason for this difference in RBCCW system scope between Unit 1 and Unit 2 is unclear. The staff requested that the applicant explain why boundary locations for these sections of piping are defined differently between Units 1 and 2.

In its response to RAI 2.3.3.23-6, dated October 18, 2007, the applicant stated

> As discussed in the response to RAI 2.3.3.23-5 above, the evaluation boundaries of the nonsafety-related piping and components inside containment are based upon the analytical boundaries of the governing piping design analyses. The in-scope portion of the nonsafety-related piping extends from the nonsafety-related -to-safety-related interface to the analytical boundaries of the piping analysis which contains the safety-related piping and components.
>
> The analytical boundary associated with the Unit 1 piping analysis that includes the safety-related containment boundary valve HV11346 ends at the 3"-to-2" reducer at the end of the run of 3" HBD-129 piping on LR-M-143-2 at location E7. The analytical boundary associated with the Unit 2 piping analysis that includes the safety-related containment boundary valve HV21346 ends at a point just downstream of valve 213008 on the 3" HBD-229 piping on LR-M-2113-1 at location B2. Thus, the pink-(magenta) highlighted boundary for the Unit 2 RBCCW line ends at valve 213008, which correctly reflects the analytical boundary as the evaluation boundary for license renewal.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.23-6 acceptable because the applicant has clarified that the nonsafety-related piping sections inside containment and in question are not within the scope of license renewal, because they are outside the analytical boundaries of the piping analysis. Therefore, the staff's concern described in RAI 2.3.3.23-6 is resolved.

In RAI 2.3.3.23-7, dated August 27, 2007, the staff noted boundary drawing LR-M-143-2, locations E7 and E8 show RBCCW supply to pump seal heat exchangers pipe section three-inch HBD-129 within the scope of license renewal. The RBCCW pump seal heat exchangers return line identified as three-inch HBD-130 is not within scope for license renewal on boundary drawing LR-M-143, but identified as within the scope of license renewal on boundary drawing LR-M-113, locations A2 and A4. It is unclear why three-inch HBD-129, on boundary drawing LR-M-143 is within scope for license renewal, whereas three-inch HBD-130 on boundary drawing LR-M-143 is not within the scope of license renewal. The staff requested that the applicant explain why the return piping from the RBCCW pump seal heat exchangers is not within the scope of license renewal.

In its response to RAI 2.3.3.23-7, dated October 18, 2007, the applicant stated:

> As discussed in the response to RAI 2.3.3.23-5 above, the evaluation boundaries of the nonsafety-related piping and components inside containment are based

upon the analytical boundaries of the governing piping design analyses. The in-scope portion of the nonsafety-related piping extends from the nonsafety-related -to-safety-related interface to the analytical boundaries of the piping analysis which contains the safety-related piping and components.

The analytical boundaries associated with the piping analysis that includes the safety-related containment boundary valve HV11345 end just upstream of FE11343A and FE11343B on the 3" HBD-130 piping on LR-M-113-1 at locations A2 and A4. The analytical boundary does not encompass any components shown on LR-M-143-2. Thus, the pink-highlighted boundary ends just upstream of the FE's on LR-M-113-1 and is not continued to any piping represented on LR-M-143-2. The highlighting provides an accurate representation of all piping and piping components that are within the boundaries of the piping analysis and, therefore, within the scope of license renewal.

Since the 3" HBD-130 piping shown on LR-M-143-2 at location E8 is beyond the analytical boundary of the piping analysis that includes valve HV11345, it is not required to remain intact to ensure the structural integrity of the safety-related valve, and, therefore, it is not within the scope of license renewal based on the criteria of 10 CFR 54.4(a)(2).

Based on its review, the staff finds the applicant's response to RAI 2.3.3.23-7 acceptable because the applicant has clarified that the nonsafety-related piping sections inside containment and in question are not within the scope of license renewal, because they are outside the analytical boundaries of the piping analysis. Therefore, the staff's concern described in RAI 2.3.3.23-7 is resolved.

2.3.3.23.3 Conclusion

The staff reviewed the LRA, UFSAR, RAI responses, and boundary drawings to determine whether the applicant failed to identify any components within the scope of license renewal. In addition, the staff's review determined whether the applicant failed to identify any components subject to an AMR. On the basis of its review, the staff concludes the applicant has appropriately identified the RBCCW system mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the RBCCW system mechanical components subject to an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1), and therefore, the response is acceptable.

2.3.3.24 Reactor Building HVAC System

2.3.3.24.1 Summary of Technical Information in the Application

LRA Section 2.3.3.24 describes the reactor building (RB) HVAC system, which during normal plant operation serves three ventilation zones. In addition to ventilating three separate zones during normal plant operation, the RB HVAC system also serves during DBA conditions, various air cooling systems. The RB HVAC system contains safety-related components relied upon to remain functional during and following DBEs. The failure of nonsafety-related SSCs in the RB HVAC system potentially could prevent the satisfactory accomplishment of a safety-related function. In addition, the RB HVAC system performs functions that support fire protection and

EQ. LRA Table 2.3.3-23 identifies RB HVAC system component types within the scope of license renewal and subject to an AMR.

2.3.3.24.2 Conclusion

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA, UFSAR, and applicable boundary drawings, the staff concludes that applicant has appropriately identified the RB HVAC system mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system components subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.3.25 Reactor Nonnuclear Instrumentation System

2.3.3.25.1 Summary of Technical Information in the Application

LRA Section 2.3.3.25 describes the reactor non-nuclear instrumentation (NIS) system, which consists of the instrumentation for operation of the nuclear boiler for normal power generation, shutdown and refueling operations, and transient and accident conditions. The reactor non-NIS system contains safety-related components relied upon to remain functional during and following DBEs. In addition, the reactor non-NIS system performs functions that support fire protection, ATWS, SBO, and EQ. LRA Table 2.3.3-24 identifies reactor non-NIS system component types within the scope of license renewal and subject to an AMR.

2.3.3.25.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.25 and UFSAR Sections 6.2 and 7.0 using the evaluation methodology described in SER Section 2.3 and the guidance in SRP-LR Section 2.3.

During its review, the staff evaluated the system functions described in the LRA and UFSAR to verify that the applicant has not omitted from the scope of license renewal any components with intended functions, pursuant to 10 CFR 54.4(a). The staff then reviewed those components that the applicant has identified as within the scope of license renewal to verify that the applicant has not omitted any passive and long-lived components subject to an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1).

In RAI 2.3.3.25-1, dated October 24, 2007, the staff requested that the applicant provide additional information regarding boundary drawing LR-M-123-12, which depicts multiple "insulated couplings or unions." The staff also asked the applicant to clarify how these components are included in LRA Table 2.3.3-24 for components subject to an AMR, as a pressure boundary and; if excluded, provide justification.

In its response to RAI 2.3.3.25-1, dated November 14, 2007, the applicant stated:

> Boundary drawing LR-M-123-12 contains the component type "insulated couplings or unions." The couplings and unions on LR-M-123-12 that are within the scope of license renewal are those that contains fluids and are located in the Reactor Building, therefore having the potential for spatial interaction with safety-related components. These components are nonsafety-related and meet the scoping criteria of 10 CFR 54.4(a)(2).

In accordance with PPL's scoping methodology, those components are included within the evaluation boundary of the Sampling System instead of the Reactor Non-nuclear Instrumentation System. As described in LRA Section 2.1.2.1.3, in-line components that are in-scope for 10 CFR 54.4(a)(2), which would include "insulated couplings or unions," are evaluated on a commodity group basis as piping and piping components. The insulated couplings and unions are included in LRA Section 2.3.3.28, Sampling System, and were identified as subject to aging management review in Table 2.3.3-27 under the component type "Piping and Piping Components." The couplings and unions that are subject to aging management review perform an intended function of Structural Integrity.

No changes to the LRA or boundary drawings were required per this response.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.25-1 acceptable because the applicant has provided the requested clarification that these components were included in LRA Section 2.3.3.28 and in Table 2.3.3-27, as components subject to an AMR. Therefore, the staff's concern described in RAI 2.3.3.25-1 is resolved.

2.3.3.25.3 Conclusion

The staff reviewed the LRA, UFSAR, boundary drawings, and RAI response to determine whether the applicant failed to identify any SSCs within the scope of license renewal. In addition, the staff's review determined whether the applicant failed to identify any components subject to an AMR. On the basis of its review, the staff concludes that the applicant has adequately identified the reactor non-NIS components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the reactor non-NIS components subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1) and therefore, the response is acceptable.

2.3.3.26 Reactor Water Cleanup System

2.3.3.26.1 Summary of Technical Information in the Application

LRA Section 2.3.3.26 describes the reactor water cleanup (RWCU) system, which continuously purifies the reactor water. The RWCU system contains safety-related components relied upon to remain functional during and following DBEs. The failure of nonsafety-related SSCs in the RWCU system potentially could prevent the satisfactory accomplishment of a safety-related function. In addition, the RWCU system performs functions that support fire protection, ATWS, and EQ. LRA Table 2.3.3-25 identifies RWCU system component types within the scope of license renewal and subject to an AMR.

2.3.3.26.2 Conclusion

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA, UFSAR, and applicable boundary drawings, the staff concludes that applicant has appropriately identified the RWCU system mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system components subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.3.27 Residual Heat Removal Service Water System

2.3.3.27.1 Summary of Technical Information in the Application

LRA Section 2.3.3.27 describes the RHRSW System, which is a safety-related system that is designed to provide a reliable source of cooling water to support RHR system operation and for post-accident core and containment flooding. The RHRSW system contains safety-related components relied upon to remain functional during and following DBEs. The failure of nonsafety-related SSCs in the RHRSW system potentially could prevent the satisfactory accomplishment of a safety-related function. In addition, the RHRSW system performs functions that support fire protection, ATWS, and EQ. LRA Table 2.3.3-26 identifies RHRSW system component types within the scope of license renewal and subject to an AMR.

2.3.3.27.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.27, UFSAR Section 9.2.6, and the licensing renewal boundary drawings using the evaluation methodology described in SER Section 2.3 and the guidance in SRP-LR Section 2.3. The staff's review identified areas in which additional information was necessary to complete the review of the applicant's scoping and screening results. In addition to RAIs 2.3.3.27-1 and 2.3.3.27-2 related to boundary drawing continuation errors discussed in SER Section 2.3.3, the applicant responded to the staff's RAIs as discussed below.

In RAI 2.3.3.27-3, dated August 27, 2007, the staff noted that boundary drawing LR-M-2112-1, location F7 depicts pipe sections downstream of PSV21213B and PSV21212B that are not within the scope of license renewal. However, similar components downstream of PSV21213A and PSV21212A are within the scope of license renewal. the staff requested that the applicant explain why these nonsafety-related piping and components connected to safety-related components downstream of PSV21213B and PSV21212B are not within the scope of license renewal.

In its response to RAI 2.3.3.27-3, dated October 18, 2007, the applicant stated:

> The pipe sections downstream of PSV21213B and PSV21212B, labeled as going to "LRW", are within the scope of license renewal based on 10 CFR 54.4(a)(2) as nonsafety-related for spatial interaction and are subject to AMR. The highlighting was inadvertently missed and these two pipe sections have been highlighted in Revision 1 to drawing LR-M-2112-1. Since this is a highlighting omission, and the materials and environments are already included in LRA Section 2.3.3.27, no LRA changes are needed.

The staff confirms that the applicant has submitted revised boundary drawing LR-M-2112-1.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.27-3 acceptable because the applicant has clarified that these pipe sections are within scope of license renewal and has revised the applicable boundary drawings. Therefore, the staff's concern described in RAI 2.3.3.27-3 is resolved.

In RAI 2.3.3.27-4, dated August 27, 2007, the staff noted that boundary drawing LR-M-112-2, Revision 1, locations D3 and D8 show RHRSW piping from three-inch JRD-31 and three-inch JRD-32 to the vault sump and to valves 012040 and 012041, respectively, as not within the scope of license renewal. The staff requested that the applicant explain why these sections of piping are not within the scope of license renewal.

In its response to RAI 2.3.3.27-4, dated January 3, 2008, the applicant stated:

> The three-inch pipe lines JRD-31 and JRD-32 have been abandoned in place. These pipe sections do not contain any fluid that could interact with surrounding equipment. These three-inch lines are in-scope because they are connected to and provide structural support for the connected safety-related piping. The one-inch piping and the valves 012031, 013030, 012038, and 012041 that are connected to the three-inch pipe lines JRD-31 and JRD-32 do not provide any structural support function for the three-inch JRD-31 and JRD-32 piping or the safety-related piping connected to the three-inch pipe lines JRD-31 and JRD-32. Therefore, neither the one-inch piping nor the associated valves are within the scope of license renewal for license renewal.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.27-4 acceptable because the applicant has clarified that this piping does not contain any fluid that could interact with surrounding equipment and that the one-inch lines and valves off of three-inch JRD-31 and three-inch JRD-32 do not provide any structural support function. Therefore, the staff's concern described in RAI 2.3.3.27-4 is resolved.

2.3.3.27.3 Conclusion

The staff reviewed the LRA, UFSAR, RAI responses, and boundary drawings (original and revised) to determine whether the applicant failed to identify any components within the scope of license renewal. In addition, the staff's review determined whether the applicant failed to identify any components subject to an AMR. On the basis of its review, the staff concludes the applicant has appropriately identified the RHRSW system mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the RHRSW system mechanical components subject to an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1) and therefore, the response is acceptable.

2.3.3.28 Sampling System

2.3.3.28.1 Summary of Technical Information in the Application

LRA Section 2.3.3.28 describes the sampling system, which monitors the operation of plant equipment for information needed to make operational decisions. The failure of nonsafety-related SSCs in the sampling system potentially could prevent the satisfactory accomplishment of a safety-related function. LRA Table 2.3.3-27 identifies sampling system component types within the scope of license renewal and subject to an AMR.

2.3.3.28.2 Conclusion

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA, UFSAR, and applicable boundary drawings, the staff concludes that the applicant has appropriately identified the sampling system mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system components subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.3.29 Sanitary Drainage System

2.3.3.29.1 Summary of Technical Information in the Application

LRA Section 2.3.3.29 describes the sanitary drainage system (SDS), which collects liquid wastes from all plumbing fixtures of the plant outside restricted access areas. The drain lines were designed to accommodate fire protection system design flow when actuated. The failure of nonsafety-related SSCs in the SDS potentially could prevent the satisfactory accomplishment of a safety-related function. LRA Table 2.3.3-28 identifies SDS component types within the scope of license renewal and subject to an AMR.

2.3.3.29.2 Conclusion

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA and UFSAR, the staff concludes that applicant has appropriately identified the SDS mechanical component types within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system component types subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.3.30 Service Air System

2.3.3.30.1 Summary of Technical Information in the Application

LRA Section 2.3.3.30 describes the service air system (SAS), which provides compressed air for service air outlets located throughout the plant and a backup system for instrument air. The failure of nonsafety-related SSCs in the SAS potentially could prevent the satisfactory accomplishment of a safety-related function. LRA Table 2.3.3-29 identifies SAS component types within the scope of license renewal and subject to an AMR.

2.3.3.30.2 Conclusion

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA, UFSAR, and applicable boundary drawings, the staff concludes that the applicant has appropriately identified the SAS mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system components subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.3.31 Service Water System

2.3.3.31.1 Summary of Technical Information in the Application

LRA Section 2.3.3.31 describes the SWS, which removes heat from heat exchangers in the control structure and turbine, reactor, and radwaste buildings, and transfers it to the cooling towers where it is dissipated. The failure of nonsafety-related SSCs in the SWS potentially could prevent the satisfactory accomplishment of a safety-related function. LRA Table 2.3.3-30 identifies SWS component types within the scope of license renewal and subject to an AMR.

2.3.3.31.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.31, UFSAR Section 9.2.1.2, and the licensing renewal boundary drawings using the evaluation methodology described in SER Section 2.3 and the guidance in SRP-LR Section 2.3. The staff's review identified areas in which additional information was necessary to complete the review of the applicant's scoping and screening results. In addition to RAI 2.3.3.31-2 related to boundary drawing continuation errors discussed in LRA Section 2.3.3, the applicant responded to the staff's RAIs as discussed below.

In RAI 2.3.3.31-1, dated August 27, 2007, the staff noted that boundary drawing LR-M-110-1, locations G2 and G3 show pipe tunnel coolers (1A, 1B, 1C, and 1D), that are not within the scope of license renewal. The staff requested that the applicant explain why the pipe tunnel coolers are not within the scope of license renewal.

In its response to RAI 2.3.3.31-1, dated October 18, 2007, the applicant stated:

> The pipe tunnel coolers (1A, 1B, 1C, and 1D) are within the scope of license renewal under criteria 10 CFR 54.4(a)(2). The components which are subject to aging management review are those that may contain a liquid and have the potential for spatial interaction. Therefore, the channels/heads for the unit coolers are subject to aging management review. The pipe tunnel unit cooler channels/head are addressed as components of the Reactor Building HVAC System and are included in LRA Table 2.3.3-23 under the line item "Unit coolers, drain pans, drain piping, channels/heads" with an intended function of structural integrity.

The staff confirms that the applicant has submitted revised boundary drawing LR-M-110-1 to indicate that pipe tunnel coolers (1A, 1V, 1C, and 1D) are within the scope of license renewal.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.31-1 acceptable because the applicant has clarified that the pipe tunnel coolers are within the scope of license renewal and subject to AMR. The staff confirms that the applicant has revised the boundary drawing to reflect this change. Therefore, the staff's concern described in RAI 2.3.3.31-1 is resolved.

In RAI 2.3.3.31-3, dated August 27, 2007, the staff noted boundary drawing LR-M-2110-1, locations G2 and G3 show pipe tunnel coolers (2A, 2B, 2C, and 2D) that are within the scope of license renewal. LRA Table 2.3.3-30, "Service Water System Components Subject to Aging Management Review," does not list coolers as a component subject to an AMR. The staff

requested that the applicant explain why these pipe tunnel coolers are not included in LRA Table 2.3.3-30.

In its response to RAI 2.3.3.31-3, dated October 18, 2007, the applicant stated:

> Pipe Tunnel Coolers (2A, 2B, 2C, and 2D), shown on drawing LR-M-2110-1 at G2 and G3, are within the scope of license renewal and are subject to AMR. Based on PPL's scoping methodology, these cooling coils have been scoped as part of the Reactor Building HVAC Systems and are included, based on 10 CFR 54.4(a)(2), in LRA Section 2.3.3.24 and associated Table 2.3.3-23. These pipe tunnel coolers are included on LRA page 2.3-99 as part of the last line item of Table 2.3.3-23, with a component type of "Unit Coolers, drain pans, drain piping, channels/heads" with an intended function of "Structural Integrity."

Based on its review, the staff finds the applicant's response to RAI 2.3.3.31-3 acceptable because the applicant has clarified that the pipe tunnel coolers are within the scope of license renewal and subject to AMR. Therefore, the staff's concern described in RAI 2.3.3.31-3 is resolved.

2.3.3.31.3 Conclusion

The staff reviewed the LRA, UFSAR, boundary drawings, and RAI responses to determine whether the applicant failed to identify any components within the scope of license renewal. In addition, the staff's review determined whether the applicant failed to identify any components subject to an AMR. On the basis of its review, the staff concludes the applicant has appropriately identified the SWS mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the SWS mechanical components subject to an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1) and therefore, the response is acceptable.

2.3.3.32 Standby Liquid Control System

2.3.3.32.1 Summary of Technical Information in the Application

LRA Section 2.3.3.32 describes the SLC system, an independent, diverse backup to the control rod drive system. The SLC system function is to inject a neutron-absorbing solution into the reactor to achieve and maintain sub-criticality if control rods cannot be inserted manually. The SLC system contains safety-related components relied upon to remain functional during and following DBEs. The failure of nonsafety-related SSCs in the SLC system potentially could prevent the satisfactory accomplishment of a safety-related function. In addition, the SLC system performs functions that support ATWS and EQ. LRA Table 2.3.3-31 identifies SLC system component types within the scope of license renewal and subject to an AMR.

2.3.3.32.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.32 and UFSAR Section 9.3.5 using the evaluation methodology described in SER Section 2.3 and the guidance in SRP-LR Section 2.3. The staff's review identified areas in which additional information was necessary to complete the

review of the applicant's scoping and screening results. The applicant responses to the staff's RAIs as discussed below.

In RAI 2.3.3.32-1, dated October 24, 2007, the staff noted boundary drawing LR-M-148-1 shows the ventilation lines from the test tanks and storage tanks as not within the scope of license renewal. The staff requested that the applicant clarify whether the lines are within the scope of license renewal and subject to an AMR and; if excluded, provide justification.

In its response to RAI 2.3.3.32-1, dated November 14, 2007, the applicant stated:

> The standby liquid control test tank (1/2T203) and ventilation line are nonsafety-related. The test tank provides support for nonsafety-related piping attached to safety-related piping and is therefore within the scope of license renewal. The ventilation line for the test tank is not attached to safety-related piping and does not contain a fluid that could cause a spatial interaction with safety-related equipment. Therefore, the test tank ventilation line is not within the scope of license renewal.
>
> The standby liquid control storage tank (1/2T204) is safety-related. Further evaluation has been determined that the ventilation line for the storage tank should be within the scope of license renewal and subject to AMR. The ventilation line is evaluated as part of the storage tank pressure boundary and is therefore addressed under the "Tanks, SLC storage tanks (1/2T204)" in Table 2.3.3-31. The evaluation for the storage tank in Table 3.3.2-31 encompasses the vent line. No changes to the LRA were required.

The staff confirms that the applicant has submitted revised boundary drawings LR-M-148-1 and LR-M-2148-1.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.32-1 acceptable because the applicant has justified not including the test tank ventilation line within the scope of license renewal and has identified the ventilation line for the standby liquid control storage tank as within the scope of license renewal and subject to an AMR. Therefore, the staff's concern described in RAI 2.3.3.31-3 is resolved.

In RAI 2.3.3.32-2, dated October 24, 2007, that staff noted boundary drawing LR-M-148-1 shows what appears to be a hatch on the SLC storage tank (1/2T204). It was unclear to the staff whether the hatch and closure mechanism were included as part of the tank. The staff requested that the applicant clarify whether the tank hatches and closure mechanisms are within the scope of license renewal and subject to an AMR. Also, the staff requested that the applicant revise LRA Table 2.3.3-31, as necessary, to reflect its response or explain under what component they were included.

In its response to RAI 2.3.3.32-2, dated November 14, 2007, the applicant stated:

> The SLC storage tank hatches shown on boundary drawings LR-M-148-1 and LR-M-2148-1 are within the scope of license renewal. The highlighting of the hatches on drawings LR-M-148-1 and LR-M-2148-1 was inadvertently omitted.

The hatches, including the closure mechanisms, are considered to be part of the pressure boundary of the storage tanks. The hatches are included in the line item "Tanks, SLC storage tanks (1/2T204)" in LRA Table 2.3.3-31 as subject to AMR. The closure mechanisms are included in the line item "Bolting" in LRA Table 2.3.3-31 as subject to AMR. No changes to the LRA were required.

The staff confirms that the applicant has revised boundary drawings LR-M-148-1 and LR-M-2148-1.

2.3.3.32.3 Conclusion

The staff reviewed the LRA, UFSAR, drawings (original and revised), and RAI responses to determine whether the applicant failed to identify any components within the scope of license renewal. In addition, the staff's review determined whether the applicant failed to identify any components subject to an AMR. On the basis of its review, the staff concludes the applicant has appropriately identified the SLC system mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the SLC mechanical components subject to an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1) and therefore, the response is acceptable.

2.3.3.33 Turbine Building Closed Cooling Water System

2.3.3.33.1 Summary of Technical Information in the Application

LRA Section 2.3.3.33 describes the TB closed cooling water (TBCCW) system, which is a closed-loop cooling system that transfers heat from miscellaneous turbine plant components to the SWS through the TBCCW heat exchangers. The failure of nonsafety-related SSCs in the TBCCW system potentially could prevent the satisfactory accomplishment of a safety-related function. LRA Table 2.3.3-32 identifies TBCCW system component types within the scope of license renewal and subject to an AMR.

2.3.3.33.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.33, UFSAR Section 9.2.3, and the licensing renewal boundary drawings using the evaluation methodology described in SER Section 2.3 and the guidance in SRP-LR Section 2.3. The staff's review identified an area in which additional information was necessary to complete the review of the applicant's scoping and screening results. The applicant responded to the staff's RAI as discussed below.

In RAI 2.3.3.33-1 dated August 27, 2007, the staff noted that the TBCCW system was determined to meet the scoping criteria pursuant to 10 CFR 54.4(a)(2) to maintain the integrity of nonsafety-related piping components required to support the safety-related functional boundary of the SWS. This is shown in SWS boundary drawings LR-M-109-2 and LR-M-2109-2. However, boundary drawings defining the license renewal boundaries and components subject to an AMR were not provided. The staff requested that the applicant provide boundary drawings or documentation for the TBCCW system licensing renewal boundaries and components identified in LRA Section 2.3.3.33.

In its response dated October 18, 2007, the applicant stated:

> The only components in-scope for the TBCCW system are the heat exchanger shell (including channels/heads), connected piping and bolting which provide a nonsafety affecting safety anchor for the Emergency Service Water System. The TBCCW components within the scope of license renewal (highlighted pink (magenta)) are depicted on Service Water System boundary drawings LR-M-109-2 and on LR-M-2109-2 which best illustrates the connection to the Emergency Service Water System Piping 4" HRC-114/214 and 4" HRC-134/234.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.33-1 acceptable because the applicant has clarified that the TBCCW components within the scope of license renewal are adequately identified in SWS boundary drawings. Therefore, the staff's concern described in RAI 2.3.3.33-1 is resolved.

2.3.3.33.3 Conclusion

The staff reviewed the LRA, UFSAR, RAI response, and boundary drawings (original and revised) to determine whether the applicant failed to identify any components within the scope of license renewal. In addition, the staff's review determined whether the applicant failed to identify any components subject to an AMR. On the basis of its review, the staff concludes the applicant has appropriately identified the TBCCW system mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the TBCCW system mechanical components subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1) and therefore, the response is acceptable.

2.3.4 Steam and Power Conversion Systems

LRA Section 2.3.4 identifies the steam and power conversion systems SCs subject to an AMR for license renewal. The applicant described the supporting SCs of the steam and power conversion systems in the following LRA sections:

- 2.3.4.1 Auxiliary boiler system
- 2.3.4.2 Bypass steam system
- 2.3.4.3 Condensate transfer and storage system
- 2.3.4.4 Condenser and air removal system
- 2.3.4.5 Feedwater system
- 2.3.4.6 Main steam system
- 2.3.4.7 Main turbine system
- 2.3.4.8 Makeup demineralizer system
- 2.3.4.9 Makeup transfer and storage system
- 2.3.4.10 Reactor feed pump turbines system
- 2.3.4.11 Refueling water transfer and storage system

2.3.4.1 Auxiliary Boiler System

2.3.4.1.1 Summary of Technical Information in the Application

LRA Section 2.3.4.1 describes the auxiliary boiler (AB) system, which has two boilers that supply steam to various plant processes. The failure of nonsafety-related SSCs in the AB

system potentially could prevent the satisfactory accomplishment of a safety-related function. LRA Table 2.3.4-1 identifies AB system component types within the scope of license renewal and subject to an AMR.

2.3.4.1.2 Conclusion

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA, and UFSAR, the staff concludes that the applicant has appropriately identified the AB system mechanical component types within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system component types subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.4.2 Bypass Steam System

2.3.4.2.1 Summary of Technical Information in the Application

LRA Section 2.3.4.2 describes the bypass steam system, which bypasses MS directly to the condenser to control reactor pressure under certain normal operating conditions. The failure of nonsafety-related SSCs in the bypass steam system potentially could prevent the satisfactory accomplishment of a safety-related function. LRA Table 2.3.4-2 identifies bypass steam system component types within the scope of license renewal and subject to an AMR.

2.3.4.2.2 Conclusion

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA, and UFSAR, the staff concludes that the applicant has appropriately identified the bypass steam system mechanical component types within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system component types subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.4.3 Condensate Transfer and Storage System

2.3.4.3.1 Summary of Technical Information in the Application

LRA Section 2.3.4.3 describes the condensate transfer and storage (CTS) system, which consists of an atmospheric condensate storage tank for each unit, two condensate transfer pumps, a common atmospheric refueling water storage tank for both units, and two refueling water pumps. The failure of nonsafety-related SSCs in the CTS system potentially could prevent the satisfactory accomplishment of a safety-related function. The CTS system also performs functions that support fire protection, ATWS, and SBO. LRA Table 2.3.4-3 identifies CTS system component types within the scope of license renewal and subject to an AMR.

2.3.4.3.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.3, UFSAR Section 9.2.10, and the licensing renewal boundary drawings using the evaluation methodology described in SER Section 2.3 and the guidance in SRP-LR Section 2.3. The staff's review identified areas in which additional information was necessary to complete the review of the applicant's scoping and screening results. The applicant responded to the staff's RAIs as discussed below.

In RAIs 2.3.4.3-1 and 2.3.4.3-2, dated August 27, 2007, the staff noted instances where certain piping was shown within the scope of license renewal on one boundary drawing but shown not within the scope of license renewal when continued on another boundary drawing.

The staff requested that the applicant explain why the sections of pipe in question are not within the scope of license renewal on both boundary drawings.

In its response to RAIs 2.3.4.3-1 and 2.3.4.3-2, dated October 18, 2007, the applicant corrected the inconsistency by clarifying what portion of the piping is within the scope of license renewal.

The staff confirms that the applicant has submitted corrected boundary drawings which highlight sections of piping that are within the scope of license renewal.

Based on its review, the staff finds the applicant's response to the RAIs 2.3.4.3-1 and 2.3.4.3-2 acceptable because the applicant has clarified that the piping in question is within the scope of license renewal and subject to AMR and has revised the affected boundary drawings to identify the license renewal boundaries. Therefore, the staff's concern described in RAIs 2.3.4.3-1 and 2.3.4.3-2 is resolved.

In RAI 2.3.4.3-3, dated August 27, 2007, the staff noted boundary drawing LR-M-118-3, location A7, shows demineralized water piping 4-inch JCD-59 as not within the scope of license renewal. Its continuation on boundary drawing LR-M-108-1, location C10, is shown as within the scope of license renewal. The staff requested that the applicant explain why this section of pipe is not within the scope of license renewal.

In its response to RAI 2.3.4.3-3, dated October 18, 2007, the applicant stated in part:

> The inconsistency in highlighting the portion of piping 4" JCD-59 located on LR-M-108-2 at C10 was identified during a previous drawing review and the highlighting has been corrected. The portion of 4" JCD-59 that is within the scope of license renewal and subject to AMR extends from condensate storage tank 0T522B, shown on LR-M-108-1 at B8, back to the penetration from the turbine building, shown at C9. The portion upstream of that penetration, back to the continuation arrow from "M-118-3 A7", shown at C10, is in the turbine building and therefore, as described in LRA Section 2.1.1.2.2, is not within the scope of license renewal. The portion of JCD-59 between the continuation arrow and the penetration from the turbine building should not have been highlighted. 4" JCD-59, from and including the continuation arrow on LR-M-108-1 at C10 to the penetration at C9, is no longer highlighted.

The staff confirms that the applicant has submitted revised boundary drawing LR-M-108-1.

Based on its review, the staff finds the applicant's response to RAI 2.3.4.3-3 acceptable because the applicant has clarified that the piping within the TB is not within the scope of license renewal and has revised boundary drawing LR-M-108-1. Therefore, the staff's concern described in RAI 2.3.4.3-3 is resolved.

In RAI 2.3.4.3-4, dated August 27, 2007, the staff noted boundary drawing LR-M-108-1, location B2, includes license renewal Note C regarding RWST 0T501. It states, "Refueling

Water Storage Tank could flood the adjacent condensate storage area containing safety-related instruments." The tank is shown within the scope of license renewal; however, none of the piping penetrations or piping connected to the tank is within the scope of license renewal. The staff requested that the applicant explain why piping penetrations and connected piping are not within the scope of license renewal.

In its response to RAI 2.3.4.3-4, dated October 18, 2007, the applicant stated:

> The refueling storage area and Unit 1 condensate storage area are located outdoors and surrounded by walls that form a common berm/retention basin. The berm/retention basin is designed to retain the total volume of water contained in both the refueling water storage tank (RWST) and the Unit 1 CST if both tanks rupture simultaneously. The basin includes a sump along the west wall, near the RWST, and the safety-related SCs in the condensate storage area (i.e., level instrumentation associated with HPCI/RCIC supply) are located in the southeast corner, with the CST between them and the RWST and associated piping. As such, spray or leakage from the RWST and associated piping in the storage areas will not impair or prevent the accomplishment of a safety-related function, but would drain to the sump. However, rupture of the RWST would flood the retention basin to a level that could, conservatively, result in spatial interaction with the safety-related SCs in the condensate storage area.

Based on its review, the staff finds the applicant's response to RAI 2.3.4.3-4 acceptable because the applicant has clarified that a berm and/or retention basin is designed to retain the total volume of water contained in both the RWST and the Unit 1 CST, if both tanks simultaneously rupture. Therefore, the staff's concern described in RAI 2.3.4.3-4 is resolved.

In RAI 2.3.4.3-5, dated August 27, 2007, the staff noted boundary drawing LR-M-108-1, locations G6 and H6, shows condensate transfer pump discharge lines as being within the scope of license renewal; however, the recirculation lines, two-inch HCD-13, between check valves 008043 and 008053 and four-inch HCD-13 are shown as not within the scope of license renewal. The staff requested that the applicant explain why these pipe sections are not within the scope of license renewal.

In its response to RAI 2.3.4.3-5, dated October 18, 2007, the applicant stated:

> The condensate transfer pumps and the associated discharge lines are within the scope of license renewal because they are required to supply the ECCS and RCIC keep fill system to prevent water hammer whenever operation of these systems is initiated for mitigation of fire and station blackout events, thus meeting the scoping criteria of 10 CFR 54.4(a)(3). However, the flowpath from the condensate transfer pumps back to the condensate storage tank (0T522A) is not required to support this (a)(3) function. It has also been determined that failure of this flowpath will not prevent the accomplishment of an (a)(1) function, as it is not connected to nor located near safety-related SSCs.

Based on its review, the staff finds the applicant's response to RAI 2.3.4.3-5 acceptable because the applicant has clarified that the piping in question is not required to support the fire protection function for SBO events, pursuant to 10 CFR 54.4(a)(3). Therefore, the staff's concern described in RAI 2.3.4.3-5 is resolved.

In RAI 2.3.4.3-6, dated August 27, 2007, the staff noted boundary drawing LR-M-108-1, location H5, shows piping one-inch HCD-9 from six-inch HCD-9 to valve 008051 as being not within the scope of license renewal. The staff requested that the applicant explain why this section of pipe is not within the scope of license renewal.

In its response to RAI 2.3.4.3-6, dated October 18, 2007, the applicant stated the one-inch HCD-9 piping from the six-inch HCD-9 piping line to valve 008051 is within the scope of license renewal. The staff confirms that the applicant has submitted revised boundary drawing LR-M-108-1 placing this piping within the scope of license renewal, in accordance with 10 CFR 54.4(a)(3).

Based on its review, the staff finds the applicant's response to RAI 2.3.4.3-6 acceptable because the applicant has clarified that the subject piping is within the scope of license renewal and subject to an AMR and has revised boundary drawing LR-M-108-1 to identify the revised license renewal boundary. Therefore, the staff's concern described in RAI 2.3.4.3-6 is resolved.

2.3.4.3.3 Conclusion

The staff reviewed the LRA, UFSAR, RAI responses, and boundary drawings (original and revised) to determine whether the applicant failed to identify any components within the scope of license renewal. In addition, the staff's review determined whether the applicant failed to identify any components subject to an AMR. On the basis of its review, the staff concludes the applicant has appropriately identified the CTS system mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the CTS system mechanical components subject to an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1) and therefore, the response is acceptable.

2.3.4.4 Condenser and Air Removal System

2.3.4.4.1 Summary of Technical Information in the Application

LRA Section 2.3.4.4 describes the condenser and air removal system. The failure of nonsafety-related SSCs in the condenser and air removal system potentially could prevent the satisfactory accomplishment of a safety-related function. LRA Table 2.3.4-4 identifies condenser and air removal system component types within the scope of license renewal and subject to an AMR.

2.3.4.4.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.4, UFSAR Sections 10.4.1 and 10.4.2, and the licensing renewal boundary drawings using the evaluation methodology described in SER Section 2.3 and the guidance in SRP-LR Section 2.3. The staff's review identified an area in which additional information was necessary to complete the review of the applicant's scoping and screening results. The applicant responded to the staff's RAI as discussed below.

In RAI 2.3.4.4-1, dated August 27, 2007, the staff noted that boundary drawing LR-M-141-1 (2141-1), location E9 shows this line highlighted in green as it exits the steam tunnel and enters the TB. However, the downstream line is not highlighted on LR-M-105-2 (2105-2), location B1,

where it connects to condenser [shell 1A penetration 88]. The staff requested that the applicant explain why these pipe sections and components are not within scope for license renewal.

In its response to RAI 2.3.4.4-1, dated October 18, 2007, the applicant stated that the piping in question, four-inch EAD-114 on boundary drawing LR-M-105-2, from continuation arrow M-141-1 E9 located at B1 to HP condenser [shell-1A, penetration 88] is within the scope of license renewal and is subject to AMR. The staff confirms that the applicant has submitted revised boundary drawings LR-M-105-2 and LR-M-2105-2 that show this piping within the scope of license renewal, pursuant to 10 CFR 54.4(a)(1).

Based on its review, the staff finds the applicant's response to RAI 2.3.4.4-1 acceptable because the applicant has clarified that the piping in question is within the scope of license renewal and subject to AMR and has submitted two revised boundary drawings that identify the license renewal boundaries. Therefore, the staff's concern described in RAI 2.3.4.4-1 is resolved.

2.3.4.4.3 Conclusion

The staff reviewed the LRA, UFSAR, RAI response, and boundary drawings (original and revised) to determine whether the applicant failed to identify any components within the scope of license renewal. In addition, the staff's review determined whether the applicant failed to identify any components subject to an AMR. On the basis of its review, the staff concludes the applicant has appropriately identified the condenser and air removal system mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the condenser and air removal system mechanical components subject to an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1) and therefore, the response is acceptable.

2.3.4.5 Feedwater System

2.3.4.5.1 Summary of Technical Information in the Application

LRA Section 2.3.4.5 describes the feedwater system (FWS), which supplies high-purity, preheated feedwater to the RV at the flow and pressure required to maintain the desired RV water level throughout the entire operating range from startup to full load to shutdown. The FWS contains safety-related components relied upon to remain functional during and following DBEs. The failure of nonsafety-related SSCs in the FWS potentially could prevent the satisfactory accomplishment of a safety-related function. In addition, the FWS performs functions that support fire protection, ATWS, SBO, and EQ. LRA Table 2.3.4-5 identifies FWS component types within the scope of license renewal and subject to an AMR.

2.3.4.5.2 Conclusion

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA, UFSAR, and applicable boundary drawings, the staff concludes that the applicant has appropriately identified the FWS mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system components subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.4.6 Main Steam System

2.3.4.6.1 Summary of Technical Information in the Application

LRA Section 2.3.4.6 describes the MSS, which transports high-pressure steam generated in the RPV to the main turbine through four MS lines, each line with a main stop and turbine control valve. The MSS contains safety-related components relied upon to remain functional during and following DBEs. The failure of nonsafety-related SSCs in the MSS potentially could prevent the satisfactory accomplishment of a safety-related function. In addition, the MSS performs functions that support fire protection, ATWS, SBO, and EQ. LRA Table 2.3.4-6 identifies MSS component types within the scope of license renewal and subject to an AMR.

2.3.4.6.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.6, UFSAR Section 10.3, and the licensing renewal boundary drawings using the evaluation methodology described in SER Section 2.3 and the guidance in SRP-LR Section 2.3. The staff's review identified areas in which additional information was necessary to complete the review of the applicant's scoping and screening results. The applicant responded to the staff's RAIs as discussed below.

In RAI 2.3.4.6-1, dated August 27, 2007, the staff noted that the boundary drawings LR-M-141-1, LR-M-101-1, LR-M-101-3 and LR-M-2141-1, LR-M-2101-1, LR-M-2101-3 show several ASME Code Section III, Class 2 lines that are identified within scope of license renewal but are not shown as safety-related, in accordance with the notation legend on boundary drawing LR-M-100-4, Note A2. The staff requested that the applicant clarify whether these lines are within the scope of license renewal, pursuant to 10 CFR 54.4(a) (1) and; if not, provide an explanation.

In its response to RAI 2.3.4.6-1, dated October 18, 2007, the applicant stated:

> The piping noted in this RAI on license renewal drawings LR-M-141-1, LR-M-101-1, and LR-M-101-3 includes the 4 main steam lines from the outermost isolation valves to the turbine stop valves, 24" DBB-101, 102, 103 & 104, and the turbine bypass lines, 24"DBB-105 and 18" DBB-105. License renewal boundary drawings LR-M-2141-1, LR-M-2101-1, LR-M-2101-3 include 24" DBB-201, 202, 203 & 204, and the turbine bypass lines, 24" DBB-205 and 18" DBB-205. Reference LR-M-100-2 at E3, PPL's drawing convention is to "cross-hatch" pipelines that are safety-related. Note, the lack of "cross-hatching" indicates that these lines are not safety-related.
>
> As stated in FSAR Section 10.3.1, Design Bases, the main steam supply system has no safety-related function, but is designed to supply required steam to the turbine generator and bypass steam to the condenser. FSAR Section 10.3.2 states the main steam piping is designed to ASME Section III Class 2. FSAR Table 3.2-1 classifies the main steam piping beyond the outermost isolation valve to the turbine stop valves as ASME Section III, Class 2, but shows that this piping is not within the scope of 10 CFR 50 Appendix B.
>
> FSAR Section 10.4.4 likewise notes the bypass system has no safety-related function and the piping is designed in accordance with ASME Section III, Class 2.

> Therefore, as indicated in the FSAR, the main steam piping, through to the main stop valves and to the bypass valve chest is designed as ASME Section III, Class 2, but is not classified as safety-related.

Based on its review, the staff finds the applicant's response to RAI 2.3.4.6-1 acceptable because the applicant has clarified that the piping in question is nonsafety-related and within the scope of license renewal, pursuant to 10 CFR 54.4(a)(2) and in agreement with UFSAR Sections 10.3.1 and 10.4.4. Therefore, the staff's concern described in RAI 2.3.4.6-1 is resolved.

In RAI 2.3.4.6-2, dated August 27, 2007, the staff noted that the boundary drawings LR-M-141-1, and LR-M-2141-1, locations A-7 upstream of 141F029A and 241F029A show sections of ASME Code Section III, Class 3 pipe as within scope of license renewal for nonsafety-related spatial effects, in accordance with 10 CFR 54.4(a)(2) and as described in boundary drawing LR-M-100, Note A2 on Sheet 4. Since ASME Code Class 3 components are described in RG 1.26, Quality Group C as safety-related, the staff requested that the applicant explain why these sections of pipe are not within the scope of license renewal, pursuant to 10 CFR 54.4(a)(1).

In its response to RAI 2.3.4.6-2, dated October 18, 2007, the applicant stated in part:

> FSAR Table 3.2-1 under the "Nuclear Boiler System" heading indicates the air supply check valves and the piping downstream of the air supply check valves is safety-related. The piping upstream of the air supply check valves is not safety-related and has no safety-related function. The short section of stainless steel piping attached to the air supply check valve allows use of an insulating flange to connect two different materials. A portion of the nonsafety-related piping upstream of the check valve is in-scope as it contains an anchor that provides support for the safety-related valve and is thus within the scope of license renewal based on 10 CFR 54.4(a)(2), and subject to AMR.

The staff confirms that the applicant has submitted revised boundary drawings LR-M-141-1 and LR-M-214-1.

Based on its review, the staff finds the applicant's response to RAI 2.3.4.6-2 acceptable because the applicant has clarified that the piping in question is nonsafety-related and within the scope of license renewal, pursuant to 10 CFR 54.4(a)(2) and is in agreement with UFSAR Table 3.2-1. Therefore, the staff's concern described in RAI 2.3.4.6-2 is resolved.

In RAI 2.3.4.6-3, dated August 27, 2007, the staff noted that the boundary drawing LR-M-101-1, locations A6, C6, E6, F6, and G-2, and LR-M-2101-1, locations A6, C6, E6, F6, and G-2 show one-inch instrumentation pipes and the first normally open manual isolation valve within the scope of license renewal. Boundary drawing LR-M-100, Sheet 4, Note A2 suggests that the intended function of these pipes is pressure boundary. However, the connecting downstream piping is not shown as within the scope of license renewal. Since failure of the downstream pipe will have the same effect as failure of the in-scope piping, the staff requested that the applicant explain why the downstream piping also is not included within the scope of license renewal.

In its response to RAI 2.3.4.6-3, dated October 18, 2007, the applicant stated:

> The main stop valves on license renewal drawings LR-M-101-1 and LR-M-2101-1 form the boundary associated with providing an alternate pathway for main steam isolation valve (MSIV) leakage, as described in LRA Section 2.3.4.6. The MSIV Leakage Isolated Condenser Treatment Method (ICTM) directs any leakage through a closed MSIV to the main condenser. This is a nonsafety-related function in accordance with 10 CFR 54.4(a)(2).
>
> The intended function is to provide a flow path rather than a pressure boundary. Therefore, the ICTM boundary is established at the first isolation valve associated with instrumentation for the stop valves, drip legs, and sensing lines in order to depict the boundaries of the path. Flow is not expected in the instrument lines and any leakage from the instrument lines would be inconsequential to the overall volume available for hold-up and plate-out of fission products.

Based on its review, the staff finds the applicant's response to RAI 2.3.4.6-3 acceptable because the applicant has clarified that the intended function of the piping in question is to provide a flow path rather than a pressure boundary. Therefore, the staff's concern described in RAI 2.3.4.6-3 is resolved.

In RAI 2.3.4.6-4, dated August 27, 2007, the staff noted that the boundary drawing LR-M-101-1, locations B-8, D-8, E-8, and G-8, and LR-M-2101-1, locations B-8, D-8, E-8, and G-8, show the 28-inch lines as nonsafety-related and are considered within the scope of license renewal for spatial effects. However, no portion of the nonsafety-related lines connecting the 28-inch lines to control valve MS lead drain is shown as within the scope of license renewal for the same spatial effects. The staff requested that the applicant explain why these lines are not included within the scope of license renewal, in accordance with the requirements of 10 CFR 54.4(a)(2).

In its response to RAI 2.3.4.6-4, dated October 18, 2007, the applicant stated:

> LRA Section 2.3.4.7, Main Turbine, states that the High Pressure (HP) Turbine Casing and associated bolting are in-scope. The HP Turbine Casing and bolting are in-scope because they provide structural support (anchor to plant structure) for Main Steam System piping extending from the reactor building into the turbine building. As such, the casing of the HP turbine has the potential for interaction (connected to) with safety-related components and is in-scope based on 10 CFR 54.4(a)(2). Because the HP Turbine Casing serves as an anchor, the Main Steam System piping is brought into scope based on the seismic analysis boundary extending all the way back to the containment penetration. The small branch piping off the Main Steam System was not included in the seismic evaluation of the Main Steam piping because this piping is non-Q and by specification, Bechtel Specification M406, Piping Stress Analysis for SSES, Section 5.11) it is too small to have a significant effect. Also, refer to boundary drawing LR-M-101-1, LR Note D which addresses anchors for pipelines less than 2 ½" in diameter. In addition, the Main Steam System small branch piping is not

in-scope due to spatial interaction (wetting, spray, leakage, flooding) based on SSES LRA Section 2.1.1.2.2.

Based on its review, the staff finds the applicant's response to RAI 2.3.4.6-4 acceptable because the applicant has verified that the small branch piping off the MSS was not included in the seismic evaluation of the MS piping because this piping is non-Q and was not included in the piping stress analysis. Therefore, the staff's concern described in RAI 2.3.4.6-4 is resolved.

In RAI 2.3.4.6-5, dated August 27, 2007, the staff noted that the boundary drawing LR-M-101-1, locations B-7, C-7, E-7, and F-7, and LR-M-2101-1, locations B-7, C-7, E-7, and F-7, show CV-1, CV-2, CV-3, and CV-4 as nonsafety-related and within the scope of license renewal, pursuant to 10 CFR 54.4(a)(2). There are several nonsafety-related lines that are connected to the CV-1, CV-2, CV-3, and CV-4 valve pressure boundaries; however, no portion of these connecting lines are shown as within the scope of license renewal. The staff requested that the applicant explain why these lines are not included within the scope of license renewal, in accordance with the requirements of 10 CFR 54.4(a)(2).

In its response to RAI 2.3.4.6-5, dated October 18, 2007, the applicant stated:

> LRA Section 2.3.4.7, Main Turbine, states that the High Pressure (HP) Turbine Casing and associated bolting are in-scope. The HP Turbine Casing and bolting are in-scope because they provide structural support (anchor to plant structure) for Main Steam System piping extending from the reactor building into the turbine building. As such, the casing of the HP turbine has the potential for interaction (connected to) with safety-related components and is in-scope based on 10 CFR 54.4(a)(2). Because the HP Turbine Casing serves as an anchor, the Main Steam System piping is brought into scope based on the seismic analysis boundary extending all the way back to the containment penetration. The small branch piping off the Main Steam System was not included in the seismic evaluation of the Main Steam piping because this piping is non-Q and by specification, Bechtel Specification M406, Piping Stress Analysis for SSES, Section 5.11, it is too small to have a significant effect. Also, refer to boundary drawing LR-M-101-1, LR Note "D" which addresses anchors for pipelines less than 2 ½" in diameter. In addition, the Main Steam System small branch piping is not in-scope due to spatial interaction (wetting, spray, leakage, flooding) based on SSES LRA Section 2.1.1.2.2.

Based on its review, the staff finds the applicant's response to RAI 2.3.4.6-5 acceptable because the applicant has verified that the small branch piping off the MSS was not included in the seismic evaluation of the MS piping because this piping is non-Q and was not included in the piping stress analysis. Therefore, the staff's concern described in RAI 2.3.4.6-5 is resolved.

In RAI 2.3.4.6-6, dated August 27, 2007, the staff noted that the boundary drawings LR-M-141-1 and LR-M-2141-1, Revision 1, location C-8, show piping downstream of normally closed manual isolation valves 141010A and 241010A as ASME Code Section III, Class 2 pipe. However, this piping is identified as within the scope for license renewal as a nonsafety-related pipe, pursuant to 10 CFR 54.4(a)(2). The staff requested that the applicant explain why these sections of pipe are not within the scope of license renewal, in accordance with 10 CFR 54.4(a)(1).

In its response to RAI 2.3.4.6-6, dated October 18, 2007, the applicant stated:

> As stated in FSAR Section 10.3.1, Design Bases, the main steam supply system has no safety-related function, but is designed to supply required steam to the turbine generator and bypass steam to the condenser. FSAR Section 10.3.2 states the main steam piping is designed to ASME Section III Class 2. FSAR Table 3.2-1 classifies the main steam piping beyond the outermost isolation valve to the turbine stop valves, including the piping to and the normally closed isolation valves 141010A and 241010A, as ASME Section III, Class 2, but shows that this piping is not within the scope of 10 CFR 50 Appendix B.
>
> FSAR Section 10.4.4 likewise notes the bypass system has no safety-related function and the piping is designed in accordance with ASME Section III, Class 2.
>
> The piping downstream of normally closed manual isolation valves 141010A and 241010A is ASME Section III Class 2 pipe, and has no safety-related function. Therefore, this piping does not meet 10 CFR 54.4(a)(1) scoping criteria. This piping could contain water and is therefore within the scope of license renewal based on 10 CFR 54.4(a)(2), due to the potential for spatial interaction.

Based on its review, the staff finds the applicant's response to RAI 2.3.4.6-6 acceptable because the applicant has clarified that the piping in question is nonsafety-related and within the scope of license renewal, pursuant to 10 CFR 54.4(a)(2) and is in agreement with UFSAR Table 3.2-1 and Section 10.4.4. Therefore, the staff's concern described in RAI 2.3.4.6-6 is resolved.

In RAI 2.3.4.6-7, dated August 27, 2007, the staff noted that the boundary drawings LR-M-141-1, and LR-M-2141-1, Revision 1, locations C-7 and F-7 show piping downstream of normally closed manual isolation valves 14138A/24138A, 14101A/24101A, and 14101B/24101B that appear to be ASME Code Section III, Class 2 pipe. However, these piping components are identified within the scope of license renewal as nonsafety-related, pursuant to 10 CFR 54.4(a)(2). The staff requested that the applicant explain why these sections of pipe are not within the scope of license renewal, in accordance with 10 CFR 54.4(a)(1).

In its response to RAI 2.3.4.6-7, dated October 18, 2007, the applicant stated:

> As stated in FSAR Section 10.3.1, Design Bases, the main steam supply system has no safety-related function, but is designed to supply required steam to the turbine generator and bypass steam to the condenser. FSAR Section 10.3.2 states the main steam piping is designed to ASME Section III Class 2. FSAR Table 3.2-1 classifies the main steam piping beyond the outermost isolation valve to the turbine stop valves, including the piping to and the normally closed isolation valves 14138A/24138A, 14101A/24101A, and 14101B/24101B, as ASME Section III Class 2, but shows that this piping is not within the scope of 10 CFR 50 Appendix B.
>
> FSAR Section 10.4.4, likewise, notes the bypass system has no safety-related function and the piping is designed in accordance with ASME Section III Class 2.

The piping downstream of normally closed manual isolation valves 14138A/24138A, 14101A/24101A, and 14101B/24101B is ASME Section III Class 2 pipe, and has no safety-related function. Therefore, this piping does not meet 10 CFR 54.4(a)(1) scoping criteria. This piping could contain water and is therefore within the scope of license renewal based on 10 CFR 54.4(a)(2), due to the potential for spatial interaction.

Based on its review, the staff finds the applicant's response to RAI 2.3.4.6-7 acceptable, because the applicant has clarified that the piping in question is nonsafety-related and within the scope of license renewal, pursuant to 10 CFR 54.4(a)(2) and is in agreement with UFSAR Table 3.2-1 and Section 10.4.4. Therefore, the staff's concern described in RAI 2.3.4.6-7 is resolved.

In RAI 2.3.4.6-8, dated August 27, 2007, the staff noted that boundary drawings LR-M-141-1 and LR-M-2141-1, locations A-7 show the nonsafety-related (line class JDD) ANSI B31.1 piping connected to safety-related (line class HCC) ASME Code Section III, Class 3 piping not within the scope of license renewal. In LRA Section 2.1.1.2.2, "Spatial Failures of Nonsafety-Related SSCs," Page 2.1-8 the applicant states in part: "With respect to nonsafety-related piping that is directly connected to safety-related piping, the seismic Category I design requirements are extended to the first seismic restraint beyond the defined boundaries." The staff requested that the applicant provide the location of the license renewal boundary (seismic restraint) for the nonsafety-related piping connected to the safety-related piping.

In its response to RAI 2.3.4.6-8, dated October 18, 2007, the applicant verified that the seismic anchor is located between the check valve and insulating flange.

Based on its review, the staff finds the applicant's response to RAI 2.3.4.6-8 acceptable because the applicant has verified the location of the seismic anchor. Therefore, the staff's concern described in RAI 2.3.4.6-8 is resolved.

2.3.4.6.3 Conclusion

The staff reviewed the LRA, UFSAR, RAI responses, and boundary drawings (original and revised) to determine whether the applicant failed to identify any components within the scope of license renewal. In addition, the staff's review determined whether the applicant failed to identify any components subject to an AMR. On the basis of its review, the staff concludes the applicant has appropriately identified the MSS mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the MSS mechanical components subject to an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1) and therefore, the response is acceptable.

2.3.4.7 Main Turbine System

2.3.4.7.1 Summary of Technical Information in the Application

LRA Section 2.3.4.7 describes the main turbine system (MTS), which consists of one double-flow, high-pressure turbine and three double-exhaust flow, low-pressure turbines. The failure of nonsafety-related SSCs in the MTS potentially could prevent the satisfactory accomplishment of

a safety-related function. LRA Table 2.3.4-7 identifies MTS component types within the scope of license renewal and subject to an AMR.

2.3.4.7.2 Conclusion

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA, UFSAR, and applicable boundary drawings, the staff concludes that the applicant has appropriately identified the MTS mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system components subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.4.8 Makeup Demineralizer System

2.3.4.8.1 Summary of Technical Information in the Application

LRA Section 2.3.4.8 describes the makeup demineralizer system, which provides an adequate supply of demineralized water for the plant operating requirements. The failure of nonsafety-related SSCs in the makeup demineralizer system potentially could prevent the satisfactory accomplishment of a safety-related function. LRA Table 2.3.4-8 identifies makeup demineralizer system component types within the scope of license renewal and subject to an AMR.

2.3.4.8.2 Conclusion

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA, and UFSAR, the staff concludes that the applicant has appropriately identified the makeup demineralizer system mechanical component types within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system component types subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.4.9 Makeup Transfer and Storage System

2.3.4.9.1 Summary of Technical Information in the Application

LRA Section 2.3.4.9 describes the makeup transfer and storage system, which provides demineralized water makeup to various plant services from the makeup demineralizer system. The failure of nonsafety-related SSCs in the makeup transfer and storage system potentially could prevent the satisfactory accomplishment of a safety-related function. LRA Table 2.3.4-9 identifies makeup transfer and storage system component types within the scope of license renewal and subject to an AMR.

2.3.4.9.2 Conclusion

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA, and UFSAR, the staff concludes that the applicant has appropriately identified the makeup transfer and storage system mechanical component types within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system component types subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.4.10 Reactor Feed Pump Turbines System

2.3.4.10.1 Summary of Technical Information in the Application

LRA Section 2.3.4.10 describes the reactor feed pump turbines system, which is driven by variable-speed, multistage turbines that receive steam from either the MS cross-connection header or the crossover piping downstream of the moisture separators. The reactor feed pump turbines system performs functions that support fire protection. The only components of the reactor feed pump turbines system within the scope of license renewal are the reactor feed pump turbine low-pressure and high-pressure stop valves. The valve bodies and their internal pilot valves and oil piping/tubing perform no passive intended function. Therefore, there are no reactor feed pump turbines system components subject to an AMR.

2.3.4.10.2 Conclusion

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA, UFSAR, and applicable boundary drawings, the staff concludes that the applicant has appropriately identified the reactor feed pump turbines system mechanical components within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system components subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.3.4.11 Refueling Water Transfer and Storage System

2.3.4.11.1 Summary of Technical Information in the Application

LRA Section 2.3.4.11 describes the refueling water transfer and storage system, which stores the water that fills the reactor wells and dryer-separator pools of either Unit 1 or 2. During refueling operations, water inventory is transferred from the storage tank to the reactor wells and dryer-separator pools. The failure of nonsafety-related SSCs in the refueling water transfer and storage system potentially could prevent the satisfactory accomplishment of a safety-related function. LRA Table 2.3.4-10 identifies refueling water transfer and storage system component types within the scope of license renewal and subject to an AMR.

2.3.4.11.2 Conclusion

Based on the results of the staff evaluation discussed in Section 2.3 and on a review of the LRA, and UFSAR, the staff concludes that the applicant has appropriately identified the SDS mechanical component types within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the system component types subject to an AMR in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.4 Scoping and Screening Results: Structures

This section documents the staff's review of the applicant's scoping and screening results for structures. Specifically, this section discusses:

- Primary containment
- Reactor building
- ESSW pumphouse and spray pond

- CWPH and water treatment building
- Control structure
- DG A, B, C, and D building
- DG E building
- Turbine building
- Yard structures
- Bulk commodities

In accordance with the requirements of 10 CFR 54.21(a)(1), the applicant must list passive, long-lived SCs within the scope of license renewal and subject to an AMR. To verify that the applicant properly implemented its methodology, the staff's review focused on the implementation results. This focus allowed the staff to confirm that there were no omissions of structures and components that meet the scoping criteria and are subject to an AMR.

The staff's evaluation of the information in the LRA was the same for all structures. The objective was to determine whether the applicant has identified, in accordance with 10 CFR 54.4, components and supporting structures for structures that appear to meet the license renewal scoping criteria. Similarly, the staff evaluated the applicant's screening results to verify that all passive, long-lived SCs were subject to an AMR, in accordance with 10 CFR 54.21(a)(1).

In its scoping evaluation, the staff reviewed the applicable LRA sections and drawings, focusing on components that have not been identified as within the scope of license renewal. The staff reviewed relevant licensing basis documents, including the UFSAR, for each structure to determine whether the applicant has omitted from the scope of license renewal components with intended functions pursuant to 10 CFR 54.4(a). The staff also reviewed the licensing basis documents to determine whether the LRA specified all intended functions in accordance with 10 CFR 54.4(a). The staff requested additional information to resolve any lack of clarity, omissions or discrepancies identified.

After its review of the scoping results, the staff evaluated the applicant's screening results. For those SCs with intended functions, the staff sought to determine whether (a) the functions are performed with moving parts or a change in configuration or properties or (b) the SCs are subject to replacement after a qualified life or specified time period, as described in 10 CFR 54.21(a)(1). For those meeting neither of these criteria, the staff sought to confirm that these SCs were subject to an AMR, as required by 10 CFR 54.21(a)(1). The staff requested additional information to resolve any lack of clarity, omissions or discrepancies identified.

The staff's review of the introductory scoping portion of LRA Section 2.4 identified areas in which additional information was necessary to complete the review of the applicant's scoping and screening results and determine whether the applicant properly applied the scoping criteria of 10 CFR 54.4(a). The applicant responded to the staff's RAIs as discussed below.

In RAI 2.4-1, dated August 3, 2007, the staff noted that LRA Section 2.4, fourth paragraph, first sentence, stated that the major structures included within the scope of license renewal were as listed therein. Pursuant to 10 CFR 54.4, all structures (including major structures) that perform an intended function stated in 10 CFR 54.4(a) are required to be included within the scope of license renewal. The staff requested that the applicant to: (a) confirm that the in-scope structures and structure categories listed in LRA Section 2.4 are all inclusive; (b) clarify the language used in that section of the LRA, "The major structures in the scope..."; and (c) include

any remaining structures that may be within the scope of license renewal and provide corresponding scoping, screening and AMR results.

In its response to RAI 2.4-1, dated August 28, 2007, the applicant stated:

> The in-scope structures and structure categories listed in Section 2.4 are all inclusive of the in-scope License Renewal structures required by 10 CFR 54.4 for SSES. The term "major" was used to categorize the structures to be addressed in different sections of the SSES LRA. All in-scope structures for SSES are listed in the LRA with the Yard Structures category encompassing all the miscellaneous in-scope Yard Structures identified in Section 2.4.9. The in-scope Yard Structures are:
>
> - Clarified Water Storage Tank Foundation
> - Condensate Storage Tank Foundation and Retention Basin (Units 1 and 2)
> - Diesel Generator Fuel Oil Storage Tanks 'A, B, C, D & E' Foundations and Vaults
> - Refueling Water Storage Tank Foundation (Unit 1)
> - Station Blackout component foundations and structures (Startup Transformers T-10 and T-20 and associated disconnect switches, Engineered Safeguards Systems (ESS) Transformers)
> - Cooling Tower Basins (Units 1 and 2)
> - Duct banks, manholes, valve vaults, instrument pits, piping trenches
>
> The first sentence in the fourth paragraph of the license renewal application (LRA) Section 2.4 "Scoping and Screening Results: Structures" is revised in *bold italics* as shown in Attachment 1 of the applicant's letter dated August 28, 2007, to read as follows:
>
> "The structures in the scope of license renewal are the:"

Based on its review, the staff finds the applicant's response to RAI 2.4-1 acceptable because the applicant has clarified that the structures listed as within the scope of license renewal are all inclusive and has accordingly revised the language in LRA Section 2.4, fourth paragraph, first sentence. Therefore, the staff's concern described in RAI 2.4-1 is resolved.

In RAI 2.4-2, dated August 3, 2007, the staff noted that UFSAR Section 3.8.4 describes the radwaste building as a safety-related non-seismic Category 1 structure. UFSAR Page 3.8-45 states that the reinforced concrete walls and floor and the concrete block masonry walls meet structural as well as radiation shielding requirements. LRA Sections 2.3.3.19 and 2.3.3.20 include the radwaste liquid system and the radwaste solids handling system within the scope of license renewal and subject to an AMR. LRA Section 2.3.3.20, first paragraph states that all radwaste solids handling system equipment serves both reactor units and is located in the radwaste building. However, LRA Table 2.2-3 excludes the radwaste building from the scope of license renewal. Since the above mentioned in-scope systems are located inside the radwaste

building, the staff requested that the applicant confirm whether this would bring the radwaste building within the scope of license renewal and subject to an AMR and; if so, include the radwaste building in the LRA and describe its scoping, screening and AMR results. If the radwaste building is excluded, provide the technical basis for the exclusion.

In its response to RAI 2.4-2, dated August 28, 2007, the applicant stated:

> The FSAR Section 3.8.4, title heading is a hold-over from earlier versions of the FSAR, listing of the Radwaste Building as a Safety-Related structure is inconsistent with the reduced quality group classification described in FSAR Table 3.2-1. A Condition Report (CR 893711) has been issued to rectify the FSAR text.
>
> The Radwaste Building is not in the scope of License Renewal at SSES, or subject to aging management review, since it does not contain in-scope components and does not perform an intended function. As shown in FSAR Table 3.2-1, the Radwaste Building and associated components have a Safety Class of "Other," the definition of which is shown in FSAR Section 3.2.3.4. As described in Notes 22 and 31 of FSAR Table 3.2-1, a lower quality group classification, associated construction codes and seismic category were *determined to be appropriate for Radwaste Treatment Systems (and building)* as a result of analysis per Regulatory Guides 1.26 and 1.29, which demonstrated that the site boundary dose would not exceed .5 Rem due to a loss of effluent from system components. This quality group classification conforms to Quality Group D (Augmented) as defined in NRC Branch Technical Position ETSB 11-1.
>
> Table 2.3.3-18 of the LRA identifies the piping, valves, and piping components (e.g., cleanouts and pump casings) of the Radwaste Liquid System that are in the scope of License Renewal and subject to aging management review. These components provide containment isolation or are nonsafety-related components that are required to maintain integrity to prevent spatial interaction with, or support for attached, safety-related components. These components are located in the Reactor Building or Control Structure, as shown on the LR drawings listed in LRA Section 2.3.3.19 (e.g. LR-M-161 Sheet 2), and not in the Radwaste Building. With respect to the Radwaste Solids Handling System, the system description in LRA Section 2.3.3.20 identifies that only the system tanks and associated piping and piping components in the Reactor Building, as shown on drawings LR-M-154, Sheet 1 and LR-M-166, Sheets 1 and 2 are in-scope and subject to aging management review as identified in LRA Table 2.3.3-19.

Based on its review, the staff finds the applicant's response to RAI 2.4-2 acceptable because the applicant has verified that the safety-related description of the radwaste building in UFSAR Section 3.8.4 was in error and has appropriately revised the FSAR text. The staff confirms that the applicant has also verified that its analysis of the radwaste treatment systems (and building), pursuant to RGs 1.26 and 1.29, demonstrated that the site boundary dose would not exceed 0.5 rem due to a loss of effluent from system components. The applicant clarified that the components of the radwaste liquid system and the radwaste solids handling system, described in LRA Sections 2.3.3.19 and 2.3.3.20, that are included within the scope of license renewal and subject to an AMR, are located in the RB or control structure and not in the radwaste building. Since the radwaste building does not serve an intended function pursuant to

10 CFR 54.4(a), the staff agrees with the applicant's conclusion that the radwaste building is not within the scope of license renewal. Therefore, the staff's concerns described in RAI 2.4-2 are resolved.

Based on the applicant's response to RAIs 2.4-1 and 2.4-2, the staff finds that the applicant's list of structures within the scope of license renewal, in the introductory part of LRA Section 2.4, is all inclusive.

2.4.1 Primary Containment

2.4.1.1 *Summary of Technical Information in the Application*

In LRA Section 2.4.1, the applicant describes the primary containments, which are GE BWR, Mark II (over/under) type seismic Category I structures. The primary containment is an enclosure for the RV, the reactor coolant recirculation loops, and branch connections of the RCS. Essential elements of the primary containment are the drywell, the suppression chamber that stores a large volume of water, the drywell floor separating the drywell and the suppression chamber, the connecting vent pipe system between the drywell and the suppression chamber, isolation valves, the vacuum relief system, the containment cooling systems, and other service equipment. Primary containment takes the form of a truncated cone over a cylinder, with the drywell in the upper conical section and the suppression chamber in the lower cylindrical section. These two sections comprise a structurally-integrated, reinforced concrete pressure vessel, lined with welded steel plate and with a steel domed head for closure at the top of the drywell. The drywell floor is a reinforced concrete slab, structurally connected to the containment wall.

The primary containment contains safety-related components relied upon to remain functional during and following DBEs. In addition, the primary containment performs functions that support SBO.

LRA Table 2.4-1 identifies primary containment component types within the scope of license renewal and subject to an AMR:

- containment liner
- containment wall
- control rod drive removal hatch
- drywell floor
- drywell floor liner
- drywell head (includes manhole and double gaskets)
- drywell sumps
- foundation
- penetrations
- permanent drywell shielding
- personnel airlock and equipment hatches
- reactor pedestal
- reactor pedestal liner
- reactor shield doors (includes hinged doors and removable plugs)
- reactor shield wall
- reactor shield wall inner and outer plates
- reactor vessel thermal insulation

- refueling bellows
- refueling seal plate
- refueling seal lead shield plates
- seismic truss and seismic stabilizer
- structural steel: beams, columns, plates, and trusses
- suppression chamber
- suppression chamber access hatches
- suppression chamber columns
- suppression chamber liner

The intended functions of the primary containment component types within the scope of license renewal include:

- spray shield or curb to direct flow
- thermal expansion, seismic separation, or both
- flood protection barrier
- SBO or DBA heat sink
- missile barrier
- safety-related equipment shelter or protection
- shielding against radiation
- pressure boundary or essentially leak-tight barrier in postulated design-basis events to protect public health and safety
- structural or functional support to safety-related components
- structural support to nonsafety-related components whose failure could prevent satisfactory accomplishment of required safety functions
- structural or functional support required for any of the 10 CFR 54.4(a)(3) regulated events

2.4.1.2 Staff Evaluation

The staff reviewed LRA Section 2.4.1 and UFSAR Sections 3.8.1 through 3.8.3, using the evaluation methodology described in SER Section 2.4 and the guidance in SRP-LR Section 2.4.

During its review, the staff evaluated the structural component functions described in the LRA and UFSAR to verify that the applicant has not omitted from the scope of license renewal any SCs with intended functions, pursuant to 10 CFR 54.4(a). The staff then reviewed those SCs that the applicant has identified as within the scope of license renewal to verify that the applicant has not omitted any passive and long-lived SCs subject to an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff's review of LRA Section 2.4.1 identified areas in which additional information was necessary to complete the review of the applicant's scoping and screening results, and determine whether the applicant properly applied the scoping criteria of 10 CFR 54.4(a) and the screening criteria of 10 CFR 54.21(a)(1). The applicant responded to the staff's RAIs as discussed below.

In RAI 2.4.1-1, dated August 3, 2007, the staff noted LRA Table 2.4-1 lists the drywell head (the term "Drywell Head Assembly" used in the UFSAR is more appropriate) as a primary containment component type subject to an AMR. The staff was not clear from Tables 2.4-1 and 2.4-10 whether: (a) the mating flange bolts that secure the head to the lower flange; (b) the manhole bolts; and (c) the double rubber gaskets that help prevent loss of joint leak-tightness at the head-to-lower flange connection and at the manhole, are included within the scope of license renewal and subject to an AMR. The staff requested that the applicant confirm whether these components are within the scope of license renewal and if they were not included as a result of an oversight, provide a description of their scoping, screening and an AMR. If these components are excluded from the scope of license renewal, provide the technical basis for the exclusion.

In its response to RAI 2.4.1-1, dated August 28, 2007, the applicant stated:

> The mating flange bolts that secure the Drywell Head to the lower flange; the manhole bolts that secure the Manhole to the Drywell Head; and the gaskets that help prevent loss of joint leak-tightness at the Drywell Head to lower flange connection and at the manhole to Drywell Head are included in the scope of License Renewal for SSES and subject to aging management review. The manhole and gaskets are considered as part of the host component "Drywell Head" and are included under Component Type "Drywell Head" in Table 2.4-1. The mating flange bolts and the manhole bolts are included under Component Type "Anchor bolts (ASME Class 1, 2, 3 and MC supports bolting)" in Table 2.4-10.
>
> Table 2.4-1 specific component type and Table 3.5.2-1 specific component/commodity are revised as shown in *bold italics* in Attachment 2 (of the applicant's response letter dated August 28, 2007) to describe the component type as: Drywell head *(drywell head assembly includes manhole and double gaskets)*

Based on its review, the staff finds the applicant's response to RAI 2.4.1-1 acceptable because the applicant has clarified that the mating flange bolts, the manhole, the manhole bolts and the gaskets of the drywell head assembly are included in the scope of license renewal and subject to an AMR. The applicant verified that the manhole and gaskets are considered as part of the host component "Drywell head" and are included under component type "Drywell head" in LRA Table 2.4-1. The applicant revised the drywell head component type description in LRA Tables 2.4-1 and 3.5.2-1 to read: Drywell head *(drywell head assembly includes manhole and double gaskets)*. The staff confirms that the mating flange bolts and the manhole bolts are included under component type "Anchor bolts (ASME Code Class 1, 2, 3 and MC supports bolting)" in LRA Table 2.4-10. Table 2.4-10 of the LRA has an abbreviation, among others, of "SSR" in the intended function column against the component type "Anchor bolts (ASME Code Class 1, 2, 3 and MC supports bolting)" which is intended to include components that provide structural or functional support to safety-related equipment (see LRA Table 2.0-1 for the definition of intended function abbreviated as "SSR") and, therefore, include the mating flange bolts and the manhole bolts of the drywell head assembly. Therefore, the staff's concern described in RAI 4.2.1-1 is resolved.

In RAI 2.4.1-2, the staff noted LRA Table 2.4-1 lists penetrations (mechanical and electrical, primary containment boundary), as components subject to an AMR. This does not seem to include the penetrations through the reactor shield wall with hinged doors or removable plugs that facilitate piping (i.e., feedwater, reactor recirculation, recirculation inlet, etc.) connections to the RV which provide access for in-service inspection (see UFSAR Section 3.8.3.1.3 and drawings C-1932 Sheets 3 & 5). The staff requested that the applicant confirm whether these penetrations and their doors and/or plugs are within the scope of license renewal and subject to an AMR and if they were not included as a result of an oversight, provide a description of their scoping, screening and AMR. If they are excluded from the scope of license renewal, provide the technical basis for the exclusion.

In its response to RAI 2.4.1-2, dated August 28, 2007, the applicant stated:

> The penetrations through the Reactor Shield Wall with hinged doors or removable plugs are in the scope of License Renewal for SSES and subject to aging management review. These penetrations are included under Component Type "Penetrations (Mechanical and Electrical, non Primary Containment boundary)" in Table 2.4-10. The Reactor Shield Wall hinged doors/removable plugs are in the scope of License Renewal for SSES and subject to aging management review. These doors/plugs are included under Component Type "Reactor shield doors" in Table 2.4-1.
>
> Table 2.4-1 specific component type and Table 3.5.2-1 specific component/commodity are revised as shown in *bold italics* in Attachment 3 (of the applicant's response letter dated August 28, 2007) to describe the component type as: Reactor shield doors *(includes hinged doors and removable plugs)*.

Based on its review, the staff finds the applicant's response to RAI 2.4.1-2 acceptable because the applicant has confirmed that the penetrations through the reactor shield wall are included within the scope of license renewal and subject to an AMR, and are included under the component type "Penetrations (Mechanical and Electrical, non Primary Containment boundary)" in LRA Table 2.4-10. The staff confirms that these penetrations are part of the non-primary containment boundary and appropriately belong in LRA Table 2.4-10. The applicant also verified that the reactor shield wall hinged doors and removable plugs also are within the scope of license renewal and subject to an AMR, and are included under the component type "Reactor shield doors" in LRA Table 2.4-1. The applicant revised the corresponding component type description in LRA Tables 2.4-1 and 3.5.2-1 to read: Reactor shield doors *(includes hinged doors and removable plugs)*. Therefore, the staff's concerns described in RAI 2.4.1-2 are resolved.

In RAI 2.4.1-3, the staff noted LRA Section 2.4.1 and Table 2.4-1 list access hatches (equipment hatch, personnel airlock, suppression chamber access hatches, and the control rod drive removal hatch) as primary containment components subject to an AMR. The staff is unclear from LRA Tables 2.4-1 and 2.4-10 whether the flange double-gaskets, hatch locks, hinges and closure mechanisms that help prevent loss of sealing and/or leak-tightness for these listed hatches are included within the scope of license renewal and subject to an AMR. The staff requested that the applicant confirm whether these components are within the scope of license renewal, and if they were not included as a result of an oversight, please provide a

description of their scoping, screening and AMR. If they are excluded from the scope of license renewal, provide the technical basis for the exclusion.

In its response to RAI 2.4.1-3, dated August 28, 2007, the applicant stated:

> The Component Types "Control rod drive (CRD) removal hatch," "Personnel airlock and equipment hatches" and "Suppression chamber access hatches" in Table 2.4-1 include the flange gaskets, hatch locks, hinges and closure mechanisms. These subcomponents (flange gaskets, hatch locks, hinges and closure mechanisms) are considered as part of the host component and are in the scope of License Renewal for SSES and subject to aging management review. Under the Discussion column for LRA Table Items 3.5.1-16 and 3.5.1-17 these subcomponents are listed as part of the host component.

Based on its review, the staff finds the applicant's response to RAI 2.4.1-3 acceptable because the applicant has clarified that the flange gaskets, hatch locks, hinges and closure mechanisms are included as subcomponents considered as part of the corresponding host components (the access hatches) and are within the scope of license renewal and subject to an AMR. The applicant also clarified that in the discussion column for LRA Table 3.5.1-16 and 3.5.1-17, these subcomponents are listed as part of the host component. The staff determines that these subcomponents can be considered as part of the host components within the scope of license renewal and subject to an AMR. Therefore, the staff's concern described in RAI 2.4.1-3 is resolved.

In RAI 2.4.1-4, the staff noted, based on information in LRA Section 2.4.1 and Tables 2.4-1 and 2.4-10, it is not clear whether all drywell pipe restraints and/or whip restraints are within the scope of license renewal. The staff requested that the applicant confirm whether these components are within the scope of license renewal, and if they were not included as a result of an oversight, please provide a description of their scoping, screening and AMR. If they are covered somewhere else in the LRA, please indicate the location, and if they are excluded from the scope of license renewal, provide the technical basis for the exclusion.

In its response to RAI 2.4.1-4, dated August 28, 2007, the applicant stated:

> The drywell pipe restraints/whip restraints are in the scope of License Renewal for SSES and subject to aging management review. These pipe restraints/whip restraints are included under Component Type "HELB barriers" in Table 2.4-10. HELB barriers provide jet impingement protection to various in-scope components. HELB barriers include pipe whip restraints, jet impingement shields or plate barriers, and crushable energy absorbers.
>
> Table 2.4-10 specific component type and Table 3.5.2-10 specific component/commodity are revised as shown in *bold italics* in Attachment 4 (of the applicant's response letter dated August 28, 2007) to describe the component type as: HELB barriers *(includes pipe restraints, whip restraints, jet impingement shields/plate barriers, and crushable energy absorbers)*.

Based on its review, the staff finds the applicant's response to RAI 2.4.1-4 acceptable because the applicant has clarified that the drywell pipe restraints and/or whip restraints are within the scope of license renewal and subject to an AMR. The drywell pipe restraints and/or whip

restraints are included under component type "HELB barriers" in LRA Table 2.4-10, since HELB barriers provide jet impingement protection to various in-scope components. The applicant further clarified that HELB barriers include pipe whip restraints, jet impingement shields or plate barriers, and crushable energy absorbers. The staff confirms that the applicant has appropriately revised the component type description in LRA Tables 2.4-10 and 3.5.2-10. Therefore, the staff's concern described in RAI 2.4.1-3 is resolved.

In RAI 2.4.1-5, the staff noted LRA Section 2.4.1, Page 2.4-5 states that the suppression chamber vent pipe system is evaluated as a mechanical component in LRA Section 2.3.2.5. LRA Table 2.3.2-5 includes downcomers and piping and piping components as component types subject to an AMR. It is not clear whether the vent pipe support assemblies and downcomer (vent) pipe bracing system (see drawing C-1932 Sheet 4 and UFSAR Figure 6.2-56) are included within the scope of license renewal and subject to an AMR. The staff requested that the applicant state whether these components are within the scope of license renewal and subject to an AMR, and if they were not included as a result of an oversight, provide a description of their scoping, screening, and AMR. If these components are excluded from the scope of license renewal, provide the technical basis for the exclusion.

In its response to RAI 2.4.1-5, dated August 28, 2007, the applicant stated:

> The suppression chamber vent pipe system supports are in the scope of License Renewal for SSES and subject to aging management review. These supports are included under Component Type "Component and piping supports (Class 1, 2, 3 and MC)" in Table 2.4-10.

Based on its review, the staff finds the applicant's response to RAI 2.4.1-5 acceptable because the applicant has verified that the vent pipe system supports are within the scope of license renewal and subject to an AMR, and are included under the component type "Component and piping supports (Class 1, 2, 3 and MC)" in LRA Table 2.4-10. The staff determines that the vent system supports are appropriately classified and described in the LRA Table 2.4-10. Therefore, the staff's concern described in RAI 2.4.1-5 is resolved.

2.4.1.3 Conclusion

The staff reviewed the LRA, UFSAR, RAI responses, and related structural components to determine whether the applicant failed to identify any SSCs within the scope of license renewal. The staff finds no such omissions. In addition, the staff's review determined whether the applicant failed to identify any SCs subject to an AMR. The staff finds no such omissions. On the basis of its review, the staff concludes that the applicant has adequately identified the primary containment SCs within the scope of license renewal, as required by 10 CFR 54.4(a), and those subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2 Reactor Building

2.4.2.1 Summary of Technical Information in the Application

In LRA Section 2.4.2, the applicant described the RB, a seismic Category I structure that encloses the primary containment, and provides secondary containment when the primary containment is in service during power operation and also serves as containment during reactor refueling and maintenance operations when the primary containment is open. It houses the

auxiliary systems of the nuclear steam supply system, new fuel storage vaults, the refueling facility, and equipment essential to the safe reactor shutdown. The RB consists of the following major structural components: (a) foundation mat, (b) walls, (c) floors, (d) superstructure, and (e) refueling floor.

The RB contains safety-related components relied upon to remain functional during and following DBEs. In addition, the RB performs functions that support fire protection, ATWS, and SBO.

LRA Table 2.4-2 identifies RB component types within the scope of license renewal and subject to an AMR:

- blowout panels
- cranes, including bridge and trolley, rails, and girders
- exterior precast concrete panels (above grade)
- exterior walls (above grade)
- exterior walls (below grade)
- floor decking
- foundations
- fuel shipping cask storage pool gates
- fuel shipping cask storage pool liner
- masonry block walls
- metal siding
- new fuel racks
- new fuel storage vault
- new fuel storage vault watertight covers
- permanent reactor building shielding
- reactor well and steam dryer and separator storage pool gates
- reactor well and steam dryer and separator storage pool liners
- reactor well shield plugs
- reinforced concrete: girders, walls, floors, and ceilings
- roof decking
- spent fuel pool gates
- spent fuel pool liners
- spent fuel pool racks
- spent fuel rack neutron absorbers
- structural steel: beams, columns, plates, and trusses
- sump liners
- sumps

The intended functions of the RB component types within the scope of license renewal include:

- thermal expansion, seismic separation, or both
- rated fire barrier to confine or retard fire spread in adjacent plant areas
- flood protection barrier
- shielding against high-energy line breaks
- missile barrier

- pipe whip restraint
- safety-related equipment shelter or protection
- shielding against radiation
- pressure boundary or essentially leak-tight barrier in postulated design-basis events to protect public health and safety
- structural or functional support to safety-related components
- structural support to nonsafety-related components whose failure could prevent satisfactory accomplishment of required safety functions
- structural or functional support required for any of the 10 CFR 54.4(a)(3) regulated events

2.4.2.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2 and UFSAR Section 3.8.4 using the evaluation methodology described in SER Section 2.4 and the guidance in SRP-LR Section 2.4.

During its review, the staff evaluated the structural component functions described in the LRA and UFSAR to verify that the applicant has not omitted from the scope of license renewal any SCs with intended functions, pursuant to 10 CFR 54.4(a). The staff then reviewed those SCs that the applicant has identified as within the scope of license renewal to verify that the applicant has not omitted any passive and long-lived SCs subject to an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1).

During its review of the LRA Section 2.4.2, the staff identified areas in which additional information was necessary to complete the evaluation of the applicant's scoping and screening results for structures. Therefore, the staff issued RAIs concerning the specific issues, to determine whether the applicant properly applied the scoping criteria pursuant to 10 CFR 54.4(a) and the screening criteria in accordance with 10 CFR 54.21(a)(1). The following discussion describes the staff's RAIs related to LRA Section 2.4.2 and the corresponding applicant responses.

In RAI 2.4.2-1, dated August 3, 2007, the staff noted LRA Table 2.4-2 lists "Reinforced concrete: walls, floors, and ceilings," within the RB, as a component type subject to an AMR. The staff requested that the applicant confirm whether the two reinforced concrete girders (see last paragraph of UFSAR Page 3.8-41) supporting the refueling facility within the Reactor Building are within the scope of license renewal and subject to an AMR and; if so, revise the LRA table, accordingly. If they are not within the scope of license renewal, provide the technical basis for the exclusion.

In its response to RAI 2.4.2-1, dated August 28, 2007, the applicant stated:

> The two reinforced concrete girders that support the refueling facility within the Reactor Building are in the scope of License Renewal for SSES and subject to aging management review. They are considered floor beams/walls for the refueling pools and are integral to the Reactor Building concrete structure. The reinforced concrete girders are included under Component Type "Reinforced concrete: walls, floors, and ceilings" in Table 2.4-2.

> Table 2.4-2 specific component type and Table 3.5.2-2 specific component/commodity are revised as shown in bold italics in Attachment 5 (of the applicant's response letter dated August 28, 2007) to describe the component type as:
>
> Reinforced concrete: girders, walls, floors, and ceilings

Based on its review, the staff finds the applicant's response to RAI 2.4.2-1 acceptable because the applicant has verified that the two reinforced concrete girders supporting the refueling floor girders facility within the RB are within the scope of license renewal and subject to an AMR. The applicant further verified that these components are integral to the RB concrete structure and are included under component type "Reinforced concrete: walls, floors, and ceilings" in the LRA Table 2.4-2. The staff confirms that the applicant has revised the component type description in LRA Tables 2.4-2 and 3.5.2-2 to read as: "Reinforced concrete: girders, walls, floors, and ceilings." Therefore, the staff's concern described in RAI 2.4.2-1 is resolved.

In RAI 2.4.2-2, dated August 3, 2008, the staff noted LRA Table 2.4-2 lists "Reactor well shield plugs," within the RB, as a component type subject to an AMR. It was not clear to the staff whether the spent fuel pool plugs and dryer/separator pool plugs (see drawing C-1932 Sheet 5) are included within the scope of license renewal. The staff requested that the applicant confirm that these components are within the scope of license renewal and subject to an AMR and; if so, revise the LRA table, accordingly. If they are not within the scope of license renewal, provide the technical basis for the exclusion.

In its response to RAI 2.4.2-2, dated August 28, 2007, the applicant stated:

> The plugs that separate the Reactor Well and the Spent Fuel Storage Pool and the plugs that separate the Reactor Well and the Steam Dryer and Separator Storage Pool are in the scope of License Renewal for SSES and subject to aging management review. These plugs are included under Component Types "Spent fuel pool gates" and "Reactor well and steam dryer and separator storage pool gates" in Table 2.4-2. These slot plugs are concrete enclosed in welded stainless steel.
>
> Table 2.4-2 specific component type and Table 3.5.2-2 specific component/commodity are revised as shown in bold italics in Attachment 6 (of the applicant's response letter dated August 28, 2007) to describe the component types as:
>
> Reactor well and steam dryer and separator storage pool gates *(includes steam dryer / separator pool plugs*" and "Spent fuel pool gates *(includes spent fuel pool plugs)*

Based on its review, the staff finds applicant's response to RAI 2.4.2-2 acceptable because the applicant has verified that the plugs that separate the reactor well and the spent fuel storage pool and the plugs that separate the reactor well and the steam dryer and separator storage pool are within the scope of license renewal and subject to an AMR. The applicant further verified that these plugs are included under component types "Spent fuel pool gates" and "Reactor well and steam dryer and separator storage pool gates" in the LRA Table 2.4-2. The

staff confirms that the applicant has appropriately revised the component type descriptions in LRA Table 2.4-2 to include these plugs. Therefore, the staff's concern described in RAI 2.4.2-2 is resolved.

In RAI 2.4.2-3, dated August 3, 2008, the staff noted LRA Tables 2.4-2, 2.4-4, 2.4-6, 2.4-7, and 2.4-8, list "Cranes, including bridge and trolley, rails, and girders," within the respective structures, as a component type subject to an AMR. It is not clear to the staff which cranes have been included within the scope of license renewal and whether all relevant subcomponents ("...including bridge and trolley, rails, and girders") have been screened as items subject to an AMR. The staff requested that the applicant (a) identify the specific cranes in each of these structures that are included within the above component type as within the scope of license renewal and subject to an AMR and those that are excluded and; if excluded, provide the technical basis for the exclusion; (b) confirm whether fasteners and rail hardware associated with this component type are within the scope of license renewal and subject to an AMR and; if not, provide the technical basis for the exclusion and; (c) verify whether there are any other hoists and lifting devices (*e.g.* reactor coolant pump lifting slings, lifting rigs, etc.) that should be included within the scope of license renewal and subject to an AMR and; if so, include these components in the LRA tables and provide the associated scoping, screening and an AMR results.

In its response to RAI 2.4.2-3, dated August 28, 2007, the applicant stated:

> For SSES all material handling equipment specified in the response to NUREG-0612, Control of Heavy Loads, is in the scope of License Renewal for SSES and subject to an AMR. (Refer to SSES Unit 1 Control of Heavy Loads - Phase 1 - Safety Evaluation Report from NRC to PPL (August 2, 1983) and SSES Unit 2 Control of Heavy Loads - Phase 1 - Safety Evaluation Report from NRC to PPL (November 22, 1983). In addition, other monorails, hoists and miscellaneous cranes within License Renewal in-scope structures are also in the scope of License Renewal for SSES and subject to an AMR. Relevant subcomponents ("...including bridge and trolley, rails, and girders") are in the scope of License Renewal for SSES and subject to an AMR. These subcomponents are included under Component Type "Cranes, including bridge and trolley, rails, and girders" in Tables 2.4-2, 2.4-4, 2.4-6, 2.4-7, and 2.4-8.
>
> Fasteners and rail hardware associated are in the scope of License Renewal for SSES and subject to an AMR. These fasteners and rail hardware included under Component Type "Anchorage / Embedments and Anchor Bolts" in Table 2.4-10.
>
> Lifting devices (e.g. lifting slings, lifting rigs, etc.) are tools/rigging that are not within License Renewal scope at SSES.
>
> All the cranes, monorails, hoists and miscellaneous cranes within the in-scope License Renewal SSES structures are in the scope of License Renewal for SSES and subject to an AMR.
>
> The following is a list of License Renewal in-scope Cranes, Monorails, Hoists and Miscellaneous Cranes for SSES.

SSES Cranes and Monorails, Hoists (NUREG-0612)	
Building	**Description**
Reactor	Reactor Building Crane
Reactor	Refueling Platform
Diesel Generator A to E	Diesel Generator Bridge Cranes
Monorails, Hoists and Miscellaneous Cranes	
Reactor	Recirculation Pump Hoist
Reactor	RHR Heat Exchanger Hoists
Reactor	HPCI Hoist
Reactor	Core Spray Pump & Cooling Water Heat Exchanger Hoists
Reactor	Equipment Shaft Crane
Reactor	Reactor Building Concrete Shielding Block Hoists
Reactor	Drywell Equipment Hatch Hoist
Primary Containment	Drywell Main Steam Relief Valve Hoist
Primary Containment	Main Steam Isolation Valve Hoist
SSES Monorails, Hoists and Miscellaneous Cranes (Not within NUREG-0612)	
Building	**Description**
Circulating Water Pumphouse	Circulating Water Pump Bridge Crane
Turbine	220 Ton Overhead Cranes
Various in-scope structures	Miscellaneous monorails/hoists within in-scope structures

Based on its review, the staff finds the applicant's response to RAI 2.4.2-3 acceptable because the applicant has verified that all material handling equipment specified in the response to NUREG-0612, "Control of Heavy Loads," is within the scope of license renewal and subject to an AMR. In addition, other monorails, hoists and miscellaneous cranes within in-scope structures are also within the scope of license renewal and subject to an AMR. The applicant also verified that:

- Relevant subcomponents ("...including bridge and trolley, rails, and girders") are within the scope of license renewal and subject to an AMR, and are included under component type "Cranes, including bridge and trolley, rails, and girders" in LRA Tables 2.4-2, 2.4-4, 2.4-6, 2.4-7, and 2.4-8.
- All the cranes, monorails, hoists and miscellaneous cranes within the in-scope structures are within the scope of license renewal and subject to an AMR and are tabulated in a comprehensive list of in-scope cranes, monorails, hoists and miscellaneous cranes for SSES.
- Fasteners and rail hardware associated are within the scope of license renewal and subject to an AMR, and are included under component type "Anchorage / Embedments and Anchor Bolts" in LRA Table 2.4-10.

- Lifting devices (e.g. lifting slings, lifting rigs, etc.) are tools/rigging and not within the scope of license renewal.

The staff confirms that lifting devices such as slings and rigs are not within the scope of license renewal, since they are tools/rigging and do not serve an intended function pursuant to 10 CFR 54.4(a), are not passive nor long-lived, and are routinely inspected and replaced as needed. The staff finds that the applicant has appropriately applied the scoping criteria pursuant to 10 CFR 54.4(a) and screening criteria in accordance with 10 CFR 54.21(a)(1) and has identified all the cranes and associated subcomponents that are within the scope of license renewal and subject to an AMR. Therefore, the staffs concerns described in RAI 2.4.2-3 are resolved.

2.4.2.3 Conclusion

The staff reviewed the LRA, UFSAR, RAI responses, and related structural components to determine whether the applicant failed to identify any SSCs within the scope of license renewal. The staff finds no such omissions. In addition, the staff's review determined whether the applicant failed to identify any SCs subject to an AMR. The staff finds no such omissions. On the basis of its review, the staff concludes that the applicant has adequately identified the RB SCs within the scope of license renewal, as required by 10 CFR 54.4(a), and those subject to an AMR, as required by 10 CFR 54.21(a)(1). The staff notes that RAI 2.4.2-3, the applicant's response, and the staff's evaluation of the response also apply to the staff's evaluation of LRA Sections 2.4.2, 2.4.4, 2.4.6, 2.4.7, and 2.4.8.

2.4.3 Engineered Safeguards Service Water Pumphouse and Spray Pond

2.4.3.1 Summary of Technical Information in the Application

In LRA Section 2.4.3, the applicant described the ESSW pumphouse and spray pond, both seismic Category I structures. The ESSW pumphouse contains the ESW and RHRSW pumps and the weir and discharge conduit for the spray pond. It is a two-story reinforced concrete structure on a mat foundation. The first level of the structure is below grade with the following major compartments: (a) pump intake chambers, (b) overflow weir, and (c) discharge header compartments. Pumps, valving, and electrical switchgear are in the second level of the structure at grade. HVAC equipment is located on a steel-framed mezzanine level. A mezzanine floor supports the heating and ventilating equipment. The ESSW pumphouse consists of the following major structural components: (a) foundation mat, (b) floors, (c) roof, (d) walls, and (e) chambers.

The spray pond (ultimate heat sink) provides cooling water to support operation of the ESW and RHRSW systems during system testing, normal shutdown, and accident conditions. The ultimate heat sink can provide sufficient cooling water without makeup to the spray pond for at least 30 days, to permit simultaneous safe-shutdown and cool-down of both reactor units and can maintain them in a safe-shutdown condition. The spray pond can provide enough cooling water without makeup for a design-basis LOCA in one unit with the simultaneous shutdown of the other for 30 days, assuming a concurrent safe-shutdown earthquake, single failure, and loss of offsite power. The spray pond consists of the following major structural components: (a) spray pond liner, (b) spillway, (c) spray system, and (d) earthen embankment. The ESSW pumphouse and spray pond contain safety-related components relied upon to remain functional

during and following DBEs. In addition, the ESSW pumphouse and spray pond perform functions that support fire protection, ATWS, and SBO.

LRA Table 2.4-3 identifies ESSW pumphouse and spray pond component types within the scope of license renewal and subject to an AMR:

- bulkhead closure plates
- bulkhead fixed screens
- bulkhead screen guides
- earthen embankment
- exterior walls (above grade)
- exterior walls (below grade)
- foundations
- masonry block walls
- overflow weir and chamber
- pump intake chambers
- reinforced concrete: walls, floors, and ceilings
- roof and floor decking
- roof slabs
- spray pond emergency spillway
- spray pond liner
- spray pond riser concrete encasements
- structural steel: beams, columns, plates, and trusses
- trash racks
- sumps

The intended functions of the ESSW pumphouse and spray pond component types within the scope of license renewal include:

- rated fire barrier to confine or retard fire spread in adjacent plant areas
- flood protection barrier
- SBO or DBA heat sink
- missile barrier
- safety-related equipment shelter or protection
- plant shutdown cooling water source
- structural or functional support to safety-related components
- structural support to nonsafety-related components whose failure could prevent satisfactory accomplishment of required safety functions
- structural or functional support required for any of the 10 CFR 54.4(a)(3) regulated events

2.4.3.2 Staff Evaluation

The staff reviewed LRA Section 2.4.3 and UFSAR Sections 3.8.4 and 9.2.7 using the evaluation methodology described in SER Section 2.4 and the guidance in SRP-LR Section 2.4.

During its review, the staff evaluated the structural component functions described in the LRA and UFSAR to verify that the applicant has not omitted from the scope of license renewal any SCs with intended functions, pursuant to 10 CFR 54.4(a). The staff then reviewed those SCs that the applicant has identified as within the scope of license renewal to verify that the applicant has not omitted any passive and long-lived SCs subject to an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1).

2.4.3.3 Conclusion

The staff reviewed the LRA, UFSAR, and related structural components to determine whether the applicant failed to identify any SSCs within the scope of license renewal. The staff finds no such omissions. In addition, the staff's review determined whether the applicant failed to identify any SCs subject to an AMR. The staff finds no such omissions. On the basis of its review, the staff concludes that the applicant has adequately identified the ES SW pumphouse and spray pond SCs within the scope of license renewal, as required by 10 CFR 54.4(a), and those subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.4 Circulating Water Pumphouse and Water Treatment Building

2.4.4.1 Summary of Technical Information in the Application

In LRA Section 2.4.4, the applicant described the CWPH and water treatment building, which is not a seismic Category I structure. The water treatment building is attached to the CWPH, which contains electric and diesel-driven fire-water pumps separated by a structural fire barrier. The water treatment building contains no equipment within the scope of license renewal but shares with the CWPH a common wall, foundation, and roof, the structural components of which are within the scope of license renewal, but not the remainder of the water treatment building. The CWPH and water treatment building consist of the following major structural components: (a) foundation mat, (b) floors, (c) walls, and (d) roof.

The CWPH and water treatment building perform functions that support fire protection.

LRA Table 2.4-4 identifies CWPH and water treatment building component types within the scope of license renewal and subject to an AMR:

- battery racks
- cranes, including bridge and trolley, rails, and girders
- exterior precast concrete panels (above grade)
- exterior walls (above grade)
- exterior walls (below grade)
- floor decking
- foundations
- masonry block walls
- metal siding
- reinforced concrete: walls, floors, and ceilings
- roof decking
- structural steel: beams, columns, plates, and trusses
- sumps

The intended functions of the CWPH and water treatment building component types within the scope of license renewal include:

- rated fire barrier to confine or retard fire spread in adjacent plant areas
- flood protection barrier
- safety-related equipment shelter or protection
- structural or functional support required for any of the 10 CFR 54.4(a)(3) regulated events

2.4.4.2 Staff Evaluation

The staff reviewed LRA Section 2.4.4 using the evaluation methodology described in SER Section 2.4 and the guidance in SRP-LR Section 2.4.

During its review, the staff evaluated the structural component functions described in the LRA and UFSAR to verify that the applicant has not omitted from the scope of license renewal any SCs with intended functions, pursuant to 10 CFR 54.4(a). The staff then reviewed those SCs that the applicant has identified as within the scope of license renewal to verify that the applicant has not omitted any passive and long-lived SCs subject to an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff notes that RAI 2.4.2-3, the applicant's response and staff evaluation in LRA Section 2.4.2 (regarding the "cranes" component type) also applies to this LRA Section 2.4.4.

2.4.4.3 Conclusion

The staff reviewed the LRA, UFSAR, RAI responses, and related structural components to determine whether the applicant failed to identify any SSCs within the scope of license renewal. The staff finds no such omissions. In addition, the staff's review determined whether the applicant failed to identify any SCs subject to an AMR. The staff finds no such omissions. On the basis of its review, the staff concludes that the applicant has adequately identified the CWPH and water treatment building SCs within the scope of license renewal, as required by 10 CFR 54.4(a), and those subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.5 Control Structure

2.4.5.1 Summary of Technical Information in the Application

In LRA Section 2.4.5, described the control structure, a seismic Category I structure that houses the control room, the cable spreading rooms, computer and relay room, the battery room, heating and ventilation equipment room, off-gas treatment room, and the control room visitors' gallery. The control structure consists of the following major structural components: (a) foundation mat, (b) walls, (c) floors and roof, and (d) power generation control complex. The control structure contains safety-related components relied upon to remain functional during and following DBEs. In addition, the control structure performs functions that support fire protection, ATWS, and SBO.

LRA Table 2.4-5 identifies control structure component types within the scope of license renewal and subject to an AMR:

- battery racks
- control room ceiling
- exterior walls (above grade)
- exterior walls (below grade)
- floor decking
- foundations
- masonry block walls
- power generation control complex flooring
- reinforced concrete: walls, floors, and ceilings
- roof slabs
- structural steel: beams, columns, plates, and trusses

The intended functions of the control structure component types within the scope of license renewal include:

- thermal expansion, seismic separation, or both
- rated fire barrier to confine or retard fire spread in adjacent plant areas
- flood protection barrier
- missile barrier
- safety-related equipment shelter or protection
- shielding against radiation
- pressure boundary or essentially leak-tight barrier in postulated design-basis events to protect public health and safety
- structural or functional support to safety-related components
- structural support to nonsafety-related components whose failure could prevent satisfactory accomplishment of required safety functions
- structural or functional support required for any of the 10 CFR 54.4(a)(3) regulated events

2.4.5.2 Staff Evaluation

The staff reviewed LRA Section 2.4.5 and UFSAR Section 3.8.4 using the evaluation methodology described in SER Section 2.4 and the guidance in SRP-LR Section 2.4.

During its review, the staff evaluated the structural component functions described in the LRA and UFSAR to verify that the applicant has not omitted from the scope of license renewal any SCs with intended functions, pursuant to 10 CFR 54.4(a). The staff then reviewed those SCs that the applicant has identified as within the scope of license renewal to verify that the applicant has not omitted any passive and long-lived SCs subject to an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1).

2.4.5.3 Conclusion

The staff reviewed the LRA, UFSAR, and related structural components to determine whether the applicant failed to identify any SSCs within the scope of license renewal. The staff finds no such omissions. In addition, the staff's review determined whether the applicant failed to identify any SCs subject to an AMR. The staff finds no such omissions. On the basis of its review, the staff concludes that the applicant has adequately identified the control structure SCs within the scope of license renewal, as required by 10 CFR 54.4(a), and those subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.6 Diesel Generator A, B, C, and D Building

2.4.6.1 Summary of Technical Information in the Application

In LRA Section 2.4.6, the applicant described the Diesel Generator (DG) A, B, C, and D building, a seismic Category I structure housing DGs A, B, C, and D, which are essential for safe shutdown of the plant. The DGs are separated from each other by concrete walls. A concrete overhang on the east side of the building serves as an air intake plenum. A concrete plenum for diesel exhaust is on the roof. The DG A, B, C and D building consists of the following major structural components: (a) foundation mat, (b) walls, and (c) floors and roof.

The DG A, B, C, and D building contains safety-related components relied upon to remain functional during and following DBEs. In addition, the building performs functions that support fire protection and SBO.

LRA Table 2.4-6 identifies DG A, B, C, and D building component types within the scope of license renewal and subject to an AMR:

- cranes, including bridge and trolley, rails, and girders
- diesel generator exhaust plenums
- diesel generator intake plenums
- exterior precast concrete panels (above grade)
- exterior walls (above grade)
- exterior walls (below grade)
- floor decking
- foundations
- masonry block walls
- metal siding
- reinforced concrete: walls, floors, and ceilings
- roof slabs
- structural steel: beams, columns, plates, and trusses
- sumps

The intended functions of the DG A, B, C, and D building component types within the scope of license renewal include:

- thermal expansion, seismic separation, or both
- rated fire barrier to confine or retard fire spread in adjacent plant areas

- flood protection barrier
- missile barrier
- safety-related equipment shelter or protection
- structural or functional support to safety-related components
- structural support to nonsafety-related components whose failure could prevent satisfactory accomplishment of required safety functions
- structural or functional support required for any of the 10 CFR 54.4(a)(3) regulated events

2.4.6.2 Staff Evaluation

The staff reviewed LRA Section 2.4.6 and UFSAR Section 3.8.4 using the evaluation methodology described in SER Section 2.4 and the guidance in SRP-LR Section 2.4.

During its review, the staff evaluated the structural component functions described in the LRA and UFSAR to verify that the applicant has not omitted from the scope of license renewal any SCs with intended functions, pursuant to 10 CFR 54.4(a). The staff then reviewed those SCs that the applicant has identified as within the scope of license renewal to verify that the applicant has not omitted any passive and long-lived SCs subject to an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1).

During its review of the LRA Sections 2.4.6 and 2.4.7, the staff identified areas in which additional information was necessary to complete the evaluation of the applicant's scoping and screening results for structures. Therefore, the staff issued RAIs concerning the specific issues, to determine whether the applicant properly applied the scoping criteria pursuant to 10 CFR 54.4(a) and the screening criteria in accordance with 10 CFR 54.21(a)(1). The following discussion describes the staff's RAIs related to the LRA Sections 2.4.6 and 2.4.7 and the corresponding applicant responses.

The staff notes that RAI 2.4.2-3, the applicant's response and staff evaluation in LRA Section 2.4.2 (regarding the "cranes" component type) also applies to this LRA Section 2.4.6.

In RAI 2.4.6-1, dated August 3, 2007, the staff noted LRA Tables 2.4-6 and 2.4-7 list the components of the DG A, B, C, D, and E buildings that are subject to an AMR. The staff requested that the applicant confirm that the DG pedestals are components requiring an AMR and are included in the referenced LRA tables and; if not, provide the technical basis for the exclusion.

In its response to RAI 2.4.6-1, dated August 28, 2007, the applicant stated:

> Diesel Generator Pedestals are an integral part of the Diesel Generator building concrete structure and are in the scope of License Renewal for SSES and subject to aging management review. The Diesel Generator Pedestals are included under Component Type "Reinforced concrete: walls, floors, and ceilings" in Table 2.4-6 and Table 2.4-7.

Based on its review, the staff finds the applicant's response to RAI 2.4.6-1 acceptable because the applicant has verified that the DG pedestals are an integral part of the DG building concrete

structure, within the scope of license renewal, subject to an AMR, and included under component type "Reinforced concrete: walls, floors, and ceilings" in LRA Tables 2.4-6 and 2.4-7. Since the pedestals are an integral part of the DG building concrete floor, staff finds that the applicant has appropriately included the DG pedestals under the component type "Reinforced concrete: walls, floors, and ceilings." Therefore, the staff's concern described in RAI 2.4.6-1 is resolved. The staff notes that RAI 2.4.6-1, the applicant's response, and the above staff evaluation also applies to the LRA Section 2.4.7.

2.4.6.3 Conclusion

The staff reviewed the LRA, UFSAR, RAI responses, and related structural components to determine whether the applicant failed to identify any SSCs within the scope of license renewal. The staff finds no such omissions. In addition, the staff's review determined whether the applicant failed to identify any SCs subject to an AMR. The staff finds no such omissions. On the basis of its review, the staff concludes that the applicant has adequately identified the DG A, B, C, and D building SCs within the scope of license renewal, as required by 10 CFR 54.4(a), and those subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.7 Diesel Generator E Building

2.4.7.1 Summary of Technical Information in the Application

In LRA Section 2.4.7, the applicant described the DG E building, a seismic Category I structure that houses DG E, which replaces one of the A, B, C, and D DGs. Openings for air intake and diesel exhaust are flush with the north and south exterior walls, respectively. Interior plenums are for missile protection. The DG E building consists of the following major structural components: (a) foundation mat, (b) walls, and (c) floors and roof.

The DG E building contains safety-related components relied upon to remain functional during and following DBEs. In addition, the DG E building performs functions that support fire protection and SBO.

LRA Table 2.4-7 identifies DG E building component types within the scope of license renewal and subject to an AMR:

- battery racks
- cranes, including bridge and trolley, rails, and girders
- diesel generator exhaust plenums
- diesel generator intake plenums
- exterior walls (above grade)
- exterior walls (below grade)
- foundations
- metal siding
- reinforced concrete: walls, floors, and ceilings
- roof slabs
- sumps

The intended functions of the DG E building component types within the scope of license renewal include:

- rated fire barrier to confine or retard fire spread in adjacent plant areas
- flood protection barrier
- missile barrier
- safety-related equipment shelter or protection
- structural or functional support to safety-related components
- structural support to nonsafety-related components whose failure could prevent satisfactory accomplishment of required safety functions
- structural or functional support required for any of the 10 CFR 54.4(a)(3) regulated events

2.4.7.2 Staff Evaluation

The staff reviewed LRA Section 2.4.7 and UFSAR Section 3.8.4 using the evaluation methodology described in SER Section 2.4 and the guidance in SRP-LR Section 2.4.

During its review, the staff evaluated the structural component functions described in the LRA and UFSAR to verify that the applicant has not omitted from the scope of license renewal any SCs with intended functions, pursuant to 10 CFR 54.4(a). The staff then reviewed those SCs that the applicant has identified as within the scope of license renewal to verify that the applicant has not omitted any passive and long-lived SCs subject to an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff notes that RAI 2.4.2-3, applicant's response, and the staff evaluation in LRA Section 2.4.2 (regarding the "cranes" component type) also applies to LRA Section 2.4.7.

The staff also notes that RAI 2.4.6-1 (regarding DG pedestals), the applicant's response, and the staff evaluation of the same in LRA Section 2.4.6 applies to LRA Section 2.4.7.

2.4.7.3 Conclusion

The staff reviewed the LRA, UFSAR, RAI responses, and related structural components to determine whether the applicant failed to identify any SSCs within the scope of license renewal. The staff finds no such omissions. In addition, the staff's review determined whether the applicant failed to identify any SCs subject to an AMR. The staff finds no such omissions. On the basis of its review, the staff concludes that the applicant has adequately identified the DG E building SCs within the scope of license renewal, as required by 10 CFR 54.4(a), and those subject to an AMR, as required by 10 CFR 54.21(a)(1)

2.4.8 Turbine Building

2.4.8.1 Summary of Technical Information in the Application

In LRA Section 2.4.8, the applicant described the Turbine Building (TB), not a seismic Category I structure, which is divided into two units with an expansion joint separating them. It houses two

in-line turbine generator units and the following auxiliary equipment: condensers, condensate pumps, moisture separators, air ejectors, feedwater heaters, reactor feed pumps, motor generator sets for reactor recirculation pumps, recombiners, interconnecting piping and valves, and switchgears. (Note: The basement elevation (656 feet) of the TB is an area accessed through the TB; with walls, floor, and foundation belonging to the control structure, but not part of the control structure pressurization envelope.) The TB consists of the following major structural components: (a) foundation mat, (b) walls, (c) floors and roof, (d) MS tunnel, and (e) turbine generator pedestals

The failure of nonsafety-related SSCs in the TB potentially could prevent the satisfactory accomplishment of a safety-related function. The TB also performs functions that support fire protection and SBO.

LRA Table 2.4-8 identifies TB component types within the scope of license renewal and subject to an AMR:

- blowout panels
- cranes, including bridge and trolley, rails, and girders
- exterior precast concrete panels (above grade)
- exterior walls (above grade)
- exterior walls (below grade)
- floor decking
- foundations
- main steam tunnels
- masonry block walls
- metal siding
- reinforced concrete: walls, floors, and ceilings
- roof decking
- shield plugs
- structural steel: beams, columns, plates, and trusses
- sump liners
- sumps
- turbine generator pedestals
- turbine generator pedestal structural bearing pads

The intended functions of the TB component types within the scope of license renewal include:

- thermal expansion, seismic separation, or both
- rated fire barrier to confine or retard fire spread in adjacent plant areas
- flood protection barrier
- missile barrier
- *safety-related equipment shelter or protection*
- shielding against radiation
- pressure boundary or essentially leak-tight barrier in postulated design-basis events to protect public health and safety
- *structural or functional support to safety-related components*

- structural support to nonsafety-related components whose failure could prevent satisfactory accomplishment of required safety functions
- structural or functional support required for any of the 10 CFR 54.4(a)(3) regulated events

2.4.8.2 Staff Evaluation

The staff reviewed LRA Section 2.4.8 and UFSAR Section 3.8.4 using the evaluation methodology described in SER Section 2.4 and the guidance in SRP-LR Section 2.4.

During its review, the staff evaluated the structural component functions described in the LRA and UFSAR to verify that the applicant has not omitted from the scope of license renewal any SCs with intended functions, pursuant to 10 CFR 54.4(a). The staff then reviewed those SCs that the applicant has identified as within the scope of license renewal to verify that the applicant has not omitted any passive and long-lived SCs subject to an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1).

During its review of the LRA Sections 2.4.8, the staff identified areas in which additional information was necessary to complete the evaluation of the applicant's scoping and screening results for structures. Therefore, the staff issued RAIs concerning the specific issues, to determine whether the applicant properly applied the scoping criteria pursuant to 10 CFR 54.4(a) and the screening criteria in accordance with 10 CFR 54.21(a)(1). The following discussion describes the staff's RAIs related to the LRA Section 2.4.8 and the corresponding applicant responses.

The staff notes that RAI 2.4.2-3, applicant response, and the staff evaluation in LRA Section 2.4.2 (regarding the "cranes" component type) also applies to LRA Section 2.4.6.

In RAI 2.4.8-1, dated August 3, 2007, the staff noted LRA Table 2.4-8 lists the components of the TB that are subject to an AMR. The staff requested that the applicant confirm whether the pipe tunnels at the foundation level for the off-gas piping (see third paragraph under the title "Turbine Building" on page 3.8-44 of the UFSAR and drawing A-11 Sheet 1) are within the scope of license renewal, subject to an AMR, and included in the referenced LRA table, and; if not, provide the technical basis for the exclusion.

In its response to RAI 2.4.8-1, dated August 28, 2007, the applicant stated:

> The pipe tunnels at the foundation level for the off-gas piping are an integral part of the Turbine building concrete structure and in the scope of License Renewal for SSES and subject to aging management review. The pipe tunnels are included under Component Type "Reinforced concrete: walls, floors, and ceilings" in Table 2.4-8.

Based on its review, the staff finds the applicant's response to RAI 2.4.8-1 acceptable because the applicant has verified that the pipe tunnels at the foundation level for the off-gas piping are an integral part of the TB concrete structure, within the scope of license renewal, and subject to an AMR. The staff confirms that the applicant has included these pipe tunnels under component type "Reinforced concrete: walls, floors, and ceilings" in LRA Table 2.4-8. Therefore, the staff's concern described in RAI 2.4.8-1 is resolved.

2.4.8.3 Conclusion

The staff reviewed the LRA, UFSAR, RAI responses, and related structural components to determine whether the applicant failed to identify any SSCs within the scope of license renewal. The staff finds no such omissions. In addition, the staff's review determined whether the applicant failed to identify any SCs subject to an AMR. The staff finds no such omissions. On the basis of its review, the staff concludes that the applicant has adequately identified the TB SCs within the scope of license renewal, as required by 10 CFR 54.4(a), and those subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.9 Yard Structures

2.4.9.1 Summary of Technical Information in the Application

LRA Section 2.4.9.1 describes the yard structures, which include:

- clarified water storage tank foundation
- condensate storage tank foundation and retention basin
- DG fuel oil storage tank A, B, C, D, and E foundations and vaults
- refueling water storage tank foundation
- SBO component foundations and structures in the yard (startup transformers T-10 and T-20 and associated disconnect switches, engineered safeguards systems transformers, and transmission towers)
- cooling tower basins
- duct banks, manholes, valve vaults, instrument pits, and piping trenches in the yard
- 230kV and 500kV switchyard SBO component foundations and structures located outside the security fence

The clarified water storage tank foundation is not a seismic Category I structure. The 500,000-gallon clarified water storage tank in the yard is the primary water source for fire protection with a standpipe in the tank which reserves 300,000 gallons of the stored water for fire protection. The tank is also a source of domestic water to the plant site. The clarified water storage tank foundation is a reinforced concrete slab that supports the tank bottom resting on an oiled sand pad.

The condensate storage tank foundation and retention basin are not seismic Category I structures. The condensate storage tanks are the preferred water sources for the HPCI and RCIC pumps for both operating and testing and they supply water to the core spray pumps for testing. Each condensate storage tank maintains a minimum storage of 135,000 gallons to serve HPCI and RCIC pumps during plant operation by standpipes and locked closed valves on all other lines. The condensate storage tank foundation supporting the tank is a reinforced concrete slab approximately 3 feet thick. Waterstops are in construction joints abutting the retention basin slab. The condensate storage tank bottom rests on an oiled sand pad.

The DG fuel oil storage tank A, B, C, D, and E foundations and vaults are seismic Category I structures. There are four 50,000-gallon nominal capacity fuel oil storage tanks for DGs A, B, C and D and one 80,000-gallon nominal capacity fuel oil storage tank for DG E. The DG A, B, C, and D tanks are underground adjacent to the DG building. The DG E tank is underground adjacent to the DG E building. Diesel generator fuel oil storage tanks A, B, C and D share a common reinforced concrete slab foundation. Diesel generator fuel oil storage tank E has its own reinforced concrete slab foundation. The concrete tank foundation slab for DG fuel oil storage tanks A, B, C and D is approximately 2 feet 6 inches thick. The concrete tank foundation slab for DG fuel oil storage tank E is approximately 5 feet thick. Each tank has a concrete vault from grade to tank connection for access, maintenance, inspection, repair, and missile protection of the connection. The vault cover at grade level is steel plate.

The refueling water storage tank foundation is not a seismic Category I structure. One 680,000-gallon refueling water storage tank common to both units stores the water that fills the reactor well and dryer separator pool of either Unit 1 or 2. The refueling water storage tank foundation supporting the tank is a reinforced concrete slab approximately 3 feet thick. Waterstops are in construction joints abutting the retention basin slab. The refueling water storage tank bottom rests on an oiled sand pad.

The SBO component foundations and structures in the yard (startup transformers T-10 and T-20, disconnect switches, engineered safeguards systems transformers, and transmission towers) are not seismic Category I structures. Startup transformers T-10 and T-20, associated disconnect switches (motor-operated Air Break Switches 1R105 and 2R105) and transmission towers provide an offsite alternating current source for recovery from an SBO regulated event. The startup transformers and disconnect switches, as well as the engineered safeguards systems transformers, are supported by reinforced concrete pads. The disconnect switches are supported by steel frame structures and the transmission conductors are supported by tapered steel transmission towers and related foundations.

The cooling tower basins are not seismic Category I structures. The basins are designed to be completely watertight with a capacity of six million gallons of water. Secondary sources of water for the plant's two main automatic fire pumps, the two cooling tower basins have a minimum depth of 7 feet 6 inches and the top of each is approximately 2 feet above the finished grade. The cooling tower basins are constructed of reinforced concrete. Their foundations are situated on bedrock.

Duct banks, manholes, valve vaults (including the spray pond valve vault), instrument pits, and piping trenches are routed in the yard for physical support and shelter for in-scope mechanical components (*e.g.*, piping and valves) and in-scope electrical components (*e.g.*, electric cables and conduits). The duct banks, manholes, valve vaults, instrument pits, and piping trenches are seismic Category I when they support or contain safety-related equipment, but not equipment required for regulated events.

The T-10 230kV switchyard and the SSES 230kV switchyard SBO component foundations and structures are located outside the security fence. The dead end structure and breakers (2S and 2T) support supplying power from the T-10 230kV switchyard to the 13.8kV bus 10 providing offsite AC sources for recovery from an SBO. The dead end structure and breakers (2T and 2W) support supplying power from the 230kV switchyard to the 13.8kV bus 20 providing offsite AC sources for recovery from an SBO. The dead end structures and breakers (2S & 2T and 2T

& 2W) are supported by reinforced concrete foundations. The control cubicles support/protect the circuitry and controls.

The 500kV switchyard SBO component foundations and structures are located outside the security fence. The 230kV dead end structure, the 230kV capacitive-coupled voltage transformer and line trap, the 230kV switch, the 230kV current transformer, and the 230kV breaker and control cubicle support supplying power from the 500kV switchyard to the 13.8kV bus 20 providing offsite AC sources for recovery from an SBO. The 230kV dead end structure, 230kV capacitive-coupled voltage transformer and line trap, 230kV switch, 230kV current transformer, and 230kV breaker are supported by reinforced concrete foundations and/or steel piles.

The yard structures contain safety-related components relied upon to remain functional during and following DBEs. The failure of nonsafety-related SSCs in the SSCs in the yard structure potentially could prevent the satisfactory accomplishment of a safety-related function. In addition, the yard structures perform functions that support fire protection, ATWS, and SBO. The yard structures also include structural components located outside the security fence that are associated with SBO offsite power recovery pursuant to the guidance in the SRP-LR.

LRA Table 2.4-9 identifies yard structures component types within the scope of license renewal and subject to an AMR:

- Battery racks (SBO)
- condensate storage tank retention basins
- cooling tower basic outlet screen guides
- cooling tower basin outlet screens
- cooling tower basin outlet structures
- cooling tower basins
- diesel generator fuel oil tank foundations
- diesel generator fuel oil tank vaults
- disconnect switch/capacitive-coupled voltage transformer and line trap/switch/current transformer/breaker support structures (SBO)
- duct banks
- manhole covers
- manholes
- masonry block walls (SBO)
- metal siding (SBO)
- outdoor tank foundations: condensate storage tank, clarified water storage tank, refueling water storage tank
- piles (500 kV switchyard) (SBO)
- piping trenches
- raised flooring (includes support system (SBO)

- roof decking
- reinforced concrete (floors) (SBO)
- structural steel: beams, columns, plates, and trusses (includes welds and bolt connections) (SBO)
- transformer/disconnect switch/capacitive-coupled voltage transformer and line trap/switch/current transformer/breaker/control cubicle foundations (SBO)
- transmission towers and dead end structures (SBO)
- trenches (SBO cables)
- valve vault and instrument pit hatches
- valve vaults and instrument pits

The intended functions of the yard structures component types within the scope of license renewal include:

- flood protection barrier
- missile barrier
- safety-related equipment shelter or protection
- structural or functional support to safety-related components
- structural support to nonsafety-related components whose failure could prevent satisfactory accomplishment of required safety functions
- structural or functional support required for any of the 10 CFR 54.4(a)(3) regulated events

2.4.9.2 Staff Evaluation

The staff reviewed LRA Section 2.4.9, revised LRA Section 2.4.9 from SBO Scope Addition PLA-6362 dated May 7, 2008, revised LRA Section 2.4.9 from SBO Scope Addition PLA-6413 dated August 29, 2008, and UFSAR Sections 9.2.8.2, 9.2.10, and 9.5.4, using the evaluation methodology described in SER Section 2.4 and the guidance in SRP-LR Section 2.4.

During its review, the staff evaluated the structural component functions described in the LRA and UFSAR to verify that the applicant has not omitted from the scope of license renewal any SCs with intended functions, pursuant to 10 CFR 54.4(a). The staff then reviewed those SCs that the applicant has identified as within the scope of license renewal to verify that the applicant has not omitted any passive and long-lived SCs subject to an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1).

2.4.9.3 Conclusion

The staff reviewed the LRA, LRA SBO Scope Addition PLA-6362, LRA SBO Scope Addition PLA-6413, UFSAR, and related structural components to determine whether the applicant failed to identify any SSCs within the scope of license renewal. The staff finds no such omissions. In addition, the staff's review determined whether the applicant failed to identify any SCs subject to an AMR. The staff finds no such omissions. On the basis of its review, the staff concludes

that the applicant has adequately identified the yard structures SCs within the scope of license renewal, as required by 10 CFR 54.4(a), and those subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.10 Bulk Commodities

2.4.10.1 Summary of Technical Information in the Application

In LRA Section 2.4.10, the applicant described the bulk commodities, structural component groups that support in-scope structures and mechanical/electrical systems (*e.g.*, anchorages, embedments, instrument panels, racks, cable trays, conduits, fire seals, fire doors, hatches, monorails, equipment and component supports) for multiple SSCs, and share material and environment properties which allow a common program or inspection to manage their aging effects.

The bulk commodities contain safety-related components relied upon to remain functional during and following DBEs. The failure of nonsafety-related SSCs in the SSCs in the bulk commodities potentially could prevent the satisfactory accomplishment of a safety-related function. In addition, bulk commodities perform functions that support fire protection, ATWS, and SBO.

LRA Table 2.4-10 identifies bulk commodities component types within the scope of license renewal and subject to an AMR:

- concrete components
- elastomeric components
- fire barrier commodities
- insulating materials
- steel and other metals
- threaded fasteners

The intended functions of the bulk commodities component types within the scope of license renewal include:

- thermal expansion, seismic separation, or both
- rated fire barrier to confine or retard fire spread in adjacent plant areas
- flood protection barrier
- shielding against high-energy line breaks
- insulation to reduce heat transfer
- moisture absorption prevention and thermal insulation physical support
- missile barrier
- safety-related equipment shelter or protection
- shielding against radiation
- pressure boundary or essentially leak-tight barrier in postulated design-basis events to protect public health and safety

- structural or functional support to safety-related components
- structural support to nonsafety-related components whose failure could prevent satisfactory accomplishment of required safety functions
- structural or functional support required for any of the 10 CFR 54.4(a)(3) regulated events

2.4.10.2 Staff Evaluation

The staff reviewed LRA Section 2.4.10 and the UFSAR using the evaluation methodology described in SER Section 2.4 and the guidance in SRP-LR Section 2.4.

During its review, the staff evaluated the structural component functions described in the LRA and UFSAR to verify that the applicant has not omitted from the scope of license renewal any SCs with intended functions, pursuant to 10 CFR 54.4(a). The staff then reviewed those SCs that the applicant has identified as within the scope of license renewal to verify that the applicant has not omitted any passive and long-lived SCs subject to an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1).

During its review of LRA Sections 2.4.10, the staff identified areas in which additional information was necessary to complete the evaluation of the applicant's scoping and screening results for structures. Therefore, the staff issued RAIs concerning the specific issues, to determine whether the applicant properly applied the scoping criteria, pursuant to 10 CFR 54.4(a) and the screening, in accordance with 10 CFR 54.21(a)(1). The following discussion describes the staff's RAIs related to LRA Section 2.4.10 and the corresponding applicant responses.

In RAI 2.4.10-1, dated August 3, 2007, the staff noted Sections 2.4.1 thru 2.4.9 state that the structural commodities for these respective structures are addressed in the bulk commodities evaluation in LRA Section 2.4.10. LRA Table 2.4-10 lists the bulk commodities components subject to an AMR in categories based on the material of the component type. This LRA Table does not identify the specific structures addressed in LRA Sections 2.4.1 thru 2.4.9 in which these individual component types are located. The staff requested that the applicant add a column to LRA Table 2.4-10 listing the structure(s) in which each bulk commodity component type is located, and clearly state whether the intent of the LRA Table is identify every occurrence (all inclusive) for which these component types, in each of the applicable structures, are within the scope of license renewal and subject to an AMR. In addition, the staff requested that the applicant specifically identify those component types which are within the scope of license renewal and subject to an AMR and those that are not and; if excluded, provide technical justification for the exclusion. Also, the staff requested that the applicant confirm and address whether or not there are any Lubrite sliding support bearings and/or surfaces within the scope of license renewal and subject to an AMR, and whether these components will be included in LRA Table 2.4-10.

In its response to RAI 2.4.10-1, dated August 28, 2007, the applicant stated:

> As stated in Section 2.4.10, the Bulk Commodities common to SSES in-scope License Renewal structures are listed in Table 2.4-10. They are common to multiple SSCs and share material and environment properties which allow a common program or inspection to manage their aging effects. Commodities

unique to a specific structure are included in the review of that structure (Sections 2.4.1 through 2.4.9). All commodities within the SSES in-scope License renewal structures are in-scope and are subject to aging management review and are listed in Table 2.4-10. Commodities classified as Bulk Commodities typically have no unique component identification number. Therefore, a comprehensive listing of components and location is not feasible. LRA Table 3.5.2-10 describes and indicates Aging Management Programs for the components listed in Section 2.4.10.

There are no in-scope License Renewal Lubrite sliding support bearings/surfaces at SSES.

Based on its review, the staff finds the applicant's response to RAI 2.4.10-1 acceptable because the applicant has verified that the bulk commodities common to in-scope license renewal structures are listed in LRA Table 2.4-10, are common to multiple SSCs, and share material and environment properties which allow a common program or inspection to manage their aging effects. The applicant also verified that commodities unique to a specific structure are included in the review of that structure (LRA Sections 2.4.1 through 2.4.9); and that all commodities not unique to a specific structure are within the scope of license renewal, subject to an AMR, and listed in LRA Table 2.4-10. The applicant stated that a comprehensive listing of components and location is not feasible, since these commodities have no unique component identification number. Since the applicant basically stated that the commodities listed in LRA Table 2.4-10 include "all" bulk commodities in the in-scope structures that are not uniquely identified in LRA Sections 2.4.1 through 2.4.9, the staff finds that the applicant's list of common bulk commodities in LRA Table 2.4-10 is all-inclusive of those in the in-scope structures described in LRA Sections 2.4.1 through 2.4.9. The staff confirms that the applicant also has verified that there are no Lubrite sliding support bearings and/or surfaces at SSES within the scope of license renewal. Therefore, the staff's concerns described in RAI 2.4.10-1 are resolved.

In RAI 2.4.10-2, dated August 3, 2007, the staff noted based on information provided in LRA Table 2.4-10, that it could not specifically identify the insulation and insulation jacketing included within the scope of license renewal nor the specific subsets of insulation and insulation jacketing included in LRA Table 2.4-10. It was also unclear to the staff whether insulation and jacketing on the RV, RCS, MS system, and FWS have been included. In order to help complete its screening review for insulation and insulation jacketing, the staff requested that the applicant provide the following information:

(a) Identify the structures and structural components designated within the scope of license renewal that have insulation and/or insulation jacketing, and identify their location in the plant. Identify locations of the thermal insulation that serves an intended function in accordance with 10 CFR 54.4(a)(2) and describe the scoping and screening results of thermal insulation and provide technical basis for its exclusion from the scope of license renewal.

(b) For insulation and insulation jacketing materials associated with item (a) above that do not require aging management, submit the technical basis for this conclusion, including plant-specific operating experience.

(c) For insulation and insulation jacketing materials associated with item (a) above that require aging management, indicate the applicable LRA sections that identify the AMPs credited to managing aging.

In its response to RAI 2.4.10-2, dated August 28, 2007, the applicant stated:

> The component type "Reactor vessel thermal insulation" is in the scope of License Renewal for SSES and subject to aging management review as listed in LRA Table 2.4-1. Insulation for Reactor Coolant, Main Steam, and Feedwater System components in the scope of License Renewal is also in-scope at SSES and subject to aging management review as listed in LRA Table 2.4-10 under Component Types "Insulation" and "Insulation jacketing."
>
> (a) LRA Section 2.1.2.6 describes the treatment of insulation, including the identification of the various materials, indication of scope, and evaluation of degradation potential. Thermal insulation provides nonsafety-related insulating characteristics and personnel protection for both safety-related and nonsafety-related mechanical components that contain fluid (liquid or steam).
>
> Piping and equipment insulation is not classified as safety-related and has the intended function to maintain its structural integrity for nonsafety affecting safety (NSAS) considerations, in accordance with 10 CFR 54.4(a)(2), if located in a structure that contains safety-related equipment and components. Insulating materials (insulation and insulation jacketing) that function to limit heat transfer or are required to maintain their structural integrity are in the scope of License Renewal at SSES and subject to aging management review.
>
> Similar to numerous structural components that are not uniquely identified, for which a comprehensive listing of components and location is not feasible, the various in-scope insulation and insulation jacketing materials are addressed as bulk commodities.
>
> (b) Aging management reviews have determined that no aging management is required for insulation and insulation jacketing materials associated with item (a).
>
> As described in LRA Section 2.1.2.6, only stainless steel reflective metal or stainless steel jacketed insulation is used inside containment. In other structures, aluminum or aluminum jacketing is also used. Both stainless steel and aluminum insulating materials are listed in LRA Table 3.5.2-10. These metallic insulating materials are exposed to uncontrolled indoor air and no aging management is required consistent with NUREG-1801 Items VII.J-15 and V.F-2, as addressed in LRA Items 3.2.1-50 and 3.3.1-94. Furthermore, while aluminum exposed to uncontrolled indoor air is not listed in NUREG-1801 Volume II, Chapters IV or VII, stainless steel and steel exposed to uncontrolled indoor air requires no aging management as listed in item NUREG-1801 Items IV.E-2, VIII.I-10 and VIII.I-13. Similarly, in-scope metallic insulation materials for the Reactor Coolant, Main Steam and Feedwater systems do not require aging management. This was not reflected in LRA Items 3.1.1-85 or 3.4.1-41.

With respect to other evaluated insulating materials, such as calcium silicate, fiberglass, Flexible "Min-K" (ceramic), woven glass fiber, and ceramic fiber listed in LRA Table 3.5.2-10, aging management is also not required. Operating experience has not identified any age-related degradation of insulation and typical insulation problems are event driven (e.g., mechanical damage), and not considered for license renewal.

The potential for degradation of insulation is described in LRA Section 2.1.2.6. The only plausible aging effects that could result in degradation and failure, affecting the intended function or creating a potential for spatial interaction are those which may cause reaction or corrosion of barriers and coverings or that could impact the insulating materials themselves. The relevant conditions do not exist in the indoor air environment of the subject NSAS component group for the following aging effect(s) to occur:

- Loss of Material due to Corrosion – The SSES site is a location that is rural rather than industrial or coastal and the air is not salt-laden nor does it contain sufficient contaminants (e.g., sulfur) to concentrate and attack the insulation barriers/coverings.

- Loss of Material, Cracking, and/or Change in Material Properties due to ultra-violet (UV) Radiation and/or Oxidation – UV radiation and the oxidizing effects of the air may also cause deterioration of insulation barriers and coverings. However, the only insulation at SSES that is not either encapsulated in aluminum or stainless steel jacketing, or is reflective metal (stainless steel or aluminum), are for the diesel engine exhaust lines, where "Fibrefrax" cloth blanket is an acceptable alternate jacketing material, and locations that have "Temp-mat" (fiberglass blanket) or "Min-K" (ceramic fiber) insulation. Stainless steel and aluminum jacket materials are resistant to the oxidizing effect of the air, due to the passive layer and are considered impervious to ultraviolet radiation (e.g., plant lighting).

  With respect to "Temp-mat," "Min-K," and Fibrefrax (cloth coated alternative) insulation, the limited uses of these insulation types (e.g., diesel exhaust lines, pipe whip restraints, etc.) are not expected to experience sufficient UV radiation (plant lighting) exposure or ambient air oxidation to result in degradation.

- Loss of Material due to Wear – Wear (abrasion) is an applicable aging mechanism for insulation whenever there is relative movement between a surface and an insulation barrier or cover that is in contact. However, wear occurs during the performance of active functions; as a result of improper design, application, or operation; or to a very small degree with insignificant consequences.

- Degradation of Insulating Materials – The insulating materials are fabricated of calcium silicate, glass fiber, or ceramic fiber. As described in LRA Item 3.3.1-93, and others, no aging management is required for glass exposed to uncontrolled indoor air. The thermal resistance (insulating) characteristics of mass insulation systems are not expected

to naturally degrade over the course of their service life as proper selection, design and installation for the specific service and condition is assumed. Unless protective coverings of mass insulation systems are damaged, loss/degradation of insulating material is not a concern. Mass insulation systems used in nuclear plant applications typically are sealed and include a combination of insulating material and a weather barrier, vapor barrier, condensate barrier, or covering for the specific service. This outer covering (or barrier) protects mass insulation from the weather, solar/UV radiation, or atmospheric contaminants, and mechanical damage, but permits the evaporation of any moisture vapor. Furthermore, SSES operating experience supports a lack of degradation in insulating characteristics over the service life of insulation, except as the result of event-driven mechanical damage of coatings/barriers.

Details of the operating experience review and aging management review of non-metallic insulating materials are contained in auditable format and available for onsite review.

(c) There are no aging effects requiring management for any subject insulating material component group that is exposed to indoor air, in order to preclude spatial interaction with safety-related SCs, or for an intended (insulation) function credited in heating analyses.

Based on its review, the staff finds the applicant's response to RAI 2.4.10-2 acceptable because the applicant has verified that the RV insulation is within the scope of license renewal, subject to an AMR, and included under component type "Reactor vessel thermal insulation" in LRA Table 2.4-1. The applicant also verified that insulation for RCS, Main Steam system, and feedwater system components within the scope of license renewal is also within the scope of license renewal, subject to an AMR, and listed under component types "Insulation" and "Insulation jacketing," in LRA Table 2.4-10. The staff confirms that the applicant has provided a detailed review of the various insulating materials in use, the potential for degradation effects, and operating experience. The staff also confirms the applicant's conclusion that, consistent with the GALL Report, Volume II, none of the insulating material used in SSES requires any management for aging affects, because of the applicant's favorable operating experience and because these materials are exposed to an indoor air environment, only. Therefore, the staff's concerns described in RAI 2.4.10-2 are resolved.

In RAI 2.4.10-3, dated August 3, 2007, the staff noted LRA Table 2.4-10 lists "Monorails, hoists and miscellaneous cranes" as a bulk commodity component type subject to an AMR. It is not clear to the staff which specific monorails, hoists and miscellaneous cranes have been identified as within the scope of license renewal, and whether all relevant subcomponents (including bridge and trolley, rails, girders, etc.) of these in-scope items have been screened in as items requiring an AMR. The staff requested that the applicant identify the specific monorails, hoists, and cranes included within the above component type as in-scope and subject to an AMR and those that are excluded, and provide the technical basis for the decision. In addition, the staff requested that the applicant confirm whether there are any bridge and trolley, rails, and girders associated with these miscellaneous cranes and whether they are included within the scope of license renewal and subject to an AMR. The staff also requested that the applicant confirm whether fasteners and rail hardware associated with this component

type are within the scope of license renewal and subject to an AMR and; if not, provide the technical basis for the exclusion.

In its response to RAI 2.4.10-3, dated August 28, 2007, the applicant stated:

> Monorails, hoists and miscellaneous cranes within License Renewal in-scope structures are also in the scope of License Renewal for SSES and subject to an aging management review. (Refer to response to RAI 2.4.2-3 above)
>
> Relevant subcomponents (including bridge and trolley, rails, and girders) are in the scope of License Renewal for SSES and subject to aging management review. These subcomponents are included under Component Type "Monorails, hoists and miscellaneous cranes" in Table 2.4-10.
>
> Fasteners and rail hardware associated are in the scope of License Renewal for SSES and subject to aging management review. These fasteners and rail hardware included under Component Type "Anchorage / Embedments and Anchor Bolts" in Table 2.4-10.

Based on its review and the applicant's response to and staff evaluation of RAI 2.4.2-3 in SER Section 2.4.2, the staff finds the applicant's response to RAI 2.4.10-3 acceptable because the applicant has verified that all monorails, hoists and miscellaneous cranes and the relevant subcomponents are in-scope structures within the scope of license renewal and those subject to an AMR. Therefore, the staff's concern described in RAI 2.4.10-3 is resolved.

2.4.10.3 Conclusion

The staff reviewed the LRA, UFSAR, RAI responses, and related structural components to determine whether the applicant failed to identify any SSCs within the scope of license renewal. The staff finds no such omissions. In addition, the staff's review determined whether the applicant failed to identify any SCs subject to an AMR. The staff finds no such omissions. On the basis of its review, the staff concludes that the applicant has adequately identified the bulk commodities SCs within the scope of license renewal, as required by 10 CFR 54.4(a), and those subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.5 Scoping and Screening Results: Electrical and Instrumentation and Controls

This section documents the staff's review of the applicant's scoping and screening results for electrical and I&C systems. Specifically, this section discusses electrical and I&C component commodity groups

In accordance with the requirements of 10 CFR 54.21(a)(1), the applicant must list passive, long-lived SSCs within the scope of license renewal and subject to an AMR. To verify that the applicant properly implemented its methodology, the staff's review focused on the implementation results. This focus allowed the staff to confirm that there were no omissions of electrical and I&C system components that meet the scoping criteria and are subject to an AMR.

The staff's evaluation of the information in the LRA was the same for all electrical and I&C systems. The objective was to determine whether the applicant has identified, in accordance with 10 CFR 54.4, components and supporting structures for electrical and I&C systems that appear to meet the license renewal scoping criteria. Similarly, the staff evaluated the applicant's screening results to verify that all passive, long-lived components were subject to an AMR in accordance with 10 CFR 54.21(a)(1).

In its scoping evaluation, the staff reviewed the applicable LRA sections, focusing on components that have not been identified as within the scope of license renewal. The staff reviewed relevant licensing basis documents, including the UFSAR, for each electrical and I&C system to determine whether the applicant has omitted from the scope of license renewal components with intended functions pursuant to 10 CFR 54.4(a). The staff also reviewed the licensing basis documents to determine whether the LRA specified all intended functions in accordance with 10 CFR 54.4(a). The staff requested additional information to resolve any omissions or discrepancies identified.

After its review of the scoping results, the staff evaluated the applicant's screening results. For those SCs with intended functions, the staff sought to determine whether (a) the functions are performed with moving parts or a change in configuration or properties or (b) the SSCs are subject to replacement after a qualified life or specified time period, pursuant to 10 CFR 54.21(a)(1). For those meeting neither of these criteria, the staff sought to confirm that these SSCs were subject to an AMR, as required by 10 CFR 54.21(a)(1). The staff requested additional information to resolve any omissions or discrepancies identified.

2.5.1 Electrical and Instrumentation and Controls Component Commodity Groups

2.5.1.1 Summary of Technical Information in the Application

In LRA Section 2.5, the applicant described the electrical and I&C component commodity groups, which include the following:

- Non-EQ Insulated Cables and Connections
- Non-Segregated Metal-Enclosed (Phase) Bus
- High-Voltage Insulators
- Transmission Conductors and Connections

The non-EQ insulated cables and connections commodity group includes all in-scope electric power cables, control cables, and instrumentation cables and in-scope connections not addressed by the EQ program. An insulated cable is an assembly consisting of a conductor (aluminum or copper) with an insulated covering, fillers, and a jacket to cover the entire assembly; however, the insulation is the only portion subject to evaluation. Cable connectors connect the cable conductors with other cables or with motors, instruments, and a variety of electrical devices. Insulated cables and connections connect specified portions of electrical circuits to deliver voltage, current, or signals.

The nonsegregated metal-enclosed bus under review for license renewal is within its own passive enclosure and not part of any switchgear, a load center, motor control center, or other active component. According to Institute of Electrical and Electronic Engineers 100-1984, "The IEEE Standard Dictionary of Electrical and Electronics Terms," a nonsegregated phase bus is constructed with all phase conductors in a common metal enclosure without barriers (i.e., with

only air space) between the phases. Nonsegregated metal-enclosed buses connect two or more elements of electric power circuits like switchgear, transformers, switches, and other active electrical components. The license renewal review of nonsegregated metal-enclosed buses includes only the bus sections between the active electrical components. The distribution bus and the connections inside the enclosures of the active components are inspected and maintained as parts of active components and therefore excluded from any AMR. Nonsegregated metal-enclosed buses provide electrical connections to specified portions of electrical circuits to deliver voltage and current.

A high-voltage insulator is a component uniquely designed to support a high-voltage conductor physically and to separate the conductor electrically from another conductor or object. The applicant's high-voltage insulators evaluated for license renewal include those supporting and insulating high-voltage electrical components (i.e., transmission conductors and connections, particularly those for offsite power supplies). There are two basic types of insulators: (1) station post and (2) strain (or suspension) insulators. Station post insulators are large and rigid. They support stationary equipment (e.g., short lengths of transmission conductors and disconnect switches). Strain insulators are for applications where movement of the supported conductor is expected and allowed, for example, to maintain tensional support of transmission conductors between towers or other supporting structures. The high-voltage insulators within the scope of license renewal are the station post insulators and strain insulators associated with the offsite power supplies.

Transmission conductors are in the category of aluminum conductor steel-reinforced, aluminum-strand conductors wrapped around a steel core. They are uninsulated, high-voltage conductors that carry loads in plant switchyards and in distribution applications. Transmission conductor connections are cast aluminum. The sections of transmission-type conductors at SSES within the scope of license renewal are conductors associated with the offsite power supplies. The transmission conductor sections are included to follow the guidance of Revision 1 of the SRP-LR for offsite power restoration after an SBO.

LRA Table 2.5-1 identifies electrical and I&C component commodity group component types within the scope of license renewal and subject to an AMR:

- cable connections (metallic parts)
- fuse holders (insulation, metallic clamp)
- medium-voltage power cables
- metal-enclosed bus, non-segregated (bus and connections)
- metal-enclosed bus, non-segregated (enclosure assemblies)
- metal-enclosed bus, non-segregated (insulation and insulators)
- non-EQ insulated cables and connections
- non-EQ low-current instrument cables and connections
- high-voltage insulators
- transmission conductors and connections

The intended functions of the electrical and I&C component commodity group component types within the scope of license renewal include:

- electrical connection to specified electrical circuit portions for voltage, current, or signal delivery
- electrical conductor insulation and support

2.5.1.2 Staff Evaluation

The staff reviewed LRA Section 2.5 and UFSAR Sections 8.1, 8.2, and 8.3, using the evaluation methodology described in SER Section 2.5 and the guidance in SRP-LR Section 2.5.

During its review, the staff evaluated the system functions described in the LRA and UFSAR to verify that the applicant has not omitted from the scope of license renewal any components with intended functions, pursuant to 10 CFR 54.4(a). The staff then reviewed those components that the applicant has identified as within the scope of license renewal to verify that the applicant has not omitted any passive and long-lived components subject to an AMR, in accordance with the requirements of 10 CFR 54.21(a)(1).

In RAI 2.5-1 dated July 30, 2007, the staff noted that according to LRA Section 2.5, the high-voltage switchyard circuit breakers that connect to the offsite sources, the circuits connecting the startup transformers to the switchyard, and the associated components and structures are not presently included within the scope of license renewal. GDC 17 requires that electric power from the transmission network to the onsite electric distribution system be supplied by two physically independent circuits to minimize the likelihood of their simultaneous failure. In addition, the staff noted that the guidance provided by letter dated April 1, 2002, "Staff Guidance on Scoping of Equipment Relied on to Meet the Requirements of the Station Blackout Rule (10 CFR 50.63) for License Renewal (10 CFR 54.4(a)(3))," and later incorporated in SRP-LR Section 2.5.2.1.1, states:

> For purposes of the license renewal rule, the staff has determined that the plant system portion of the offsite power system that is used to connect the plant to the offsite power source should be included within the scope of the rule. This path typically includes switchyard circuit breakers that connect to the offsite system power transformers (startup transformers), the transformers themselves, the intervening overhead or underground circuits between circuit breaker and transformer and transformer and onsite electrical system, and the associated control circuits and structures. Ensuring that the appropriate offsite power system long-lived passive SSCs that are part of this circuit path are subject to an AMR will assure that the bases underlying the SBO requirements are maintained over the period of extended license.

The staff determined that the offsite power recovery path from the switchyard to the plant Class 1E safety buses, includes:

- switchyard circuit breakers that connect to the offsite power system (i.e., grid)
- offsite system power transformers

- the intervening overhead or underground circuits (i.e., cables, buses and connections, transmission conductors and connections, insulators, disconnect switches, and associated components)
- circuits between the circuit breakers and power transformers
- circuits between the power transformers and onsite electrical distribution system
- the associated control circuits and structures

The staff believes that the switchyard is part of the plant system and that the SBO recovery paths, up to the switchyard circuit breakers that connect to the offsite system power transformers, should be within the scope of license renewal, in accordance with the staff guidance in SRP-LR Section 2.5.2.1.1. The SSCs within the scope of license renewal should include a circuit breaker at transmission voltage, to ensure adequate protection of the safety bus and ensure recovery of offsite sources. The staff believes that the circuit breaker should be within the scope of license renewal because its intended function is to maintain electrical continuity. The circuit breaker maintains independence of offsite power sources, affords selective protection to minimize the probability of loss of offsite power, and reduces transients from affecting the onsite distribution system. For these reasons, a circuit breaker remains as the scoping boundary. Using a disconnect switch or other component downstream of the breaker is not consistent with the staff position for compliance with the SBO rule and is not acceptable for meeting the SBO scoping requirements for license renewal. Therefore, the staff concludes that the SBO recovery paths that should be included in the scope of license renewal is circuits up to and including the switchyard circuit breakers, at transmission voltage. Furthermore, the associated control circuits and structures for the circuit breakers also should be included within the scope of license renewal.

The staff clarified that both paths used to control the offsite circuits to the plant should be within the scope of license renewal. The staff requested that the applicant justify why these components are not within the scope of license renewal and explain, in detail, which high-voltage breakers and other components in the switchyard will be connected from the startup transformers T10 and T20 up to the offsite power system for the purpose of SBO recovery.

In its response to RAI 2.5-1, dated August 23, 2007, the applicant stated that the 230 kV equipment on the transmission system side of the motor-operated disconnects is not within the scope of license renewal because they are part of the transmission system grid and not part of the plant system. During a telephone conference, dated October 3, 2007, the staff informed the applicant that its response to RAI 2.5-1 was not acceptable because it is not consistent with staff guidance. The staff determined that the switchyard is part of the plant system and that the SBO recovery paths should be within the scope of license renewal, in accordance with the SRP-LR Section 2.5.2.1.1.

In a letter dated May 7, 2008, the applicant modified the SBO recovery paths for SSES, as shown in LRA Figure 2.5-1, "Graphical Representation of the SSES SBO License Renewal Boundary." The SSES SBO recovery paths include the transmission conductors from startup transformers T10 and T20 to circuit breakers in the switchyard as well as the circuit breakers themselves. The scoping boundary is at the transmission system side of the circuit breakers. From startup transformer T10, the scoping boundary is 230 kV circuit breakers 2T and 2S. For the SBO recovery path with startup transformer T20, the boundary is 230kV circuit breakers 2T

and 2W and also, a 230kV circuit breaker on the 230kV-500kV tie line, as shown in LRA Figure 2.5-1.

Based on its review, the staff finds the applicant's response to RAI 2.5-1 acceptable because the applicant has verified that both SBO recovery paths are within the scope of license renewal. The staff finds the applicant's response acceptable since the licensee has included switchyard circuit breakers that connect to the offsite system power transformers (startup transformers), the transformers themselves, the intervening overhead or underground circuits between circuit breaker and transformer and transformer and onsite electrical system, and the associated control circuits and structures in the scope of license renewal, in accordance with SRP-LR Section 2.5.2.1.1. The staff confirms the applicant's change from motor-operated disconnects to circuit breakers at transmission system voltage in the SBO recovery path, is consistent with the proposed SRP-LR Section 2.5.2.1.1. Therefore, the staff's concern described in RAI 2.5-1 is resolved.

In RAI 2.5-2 dated July 30, 2008, the staff requested confirmation that the control circuits and structures associated with the 230 kV circuit breakers are within the scope of license renewal, consistent with the requirements of 10 CFR 54.4(a)(3) and the guidance found in SRP-LR Sections 2.1.3.1.3 and 2.5.2.1.1.

In its response to RAI 2.5-2, dated August 29, 2008, the applicant revised the LRA to include the control circuits within the scope of license renewal.

Based on its review, the staff finds the applicant's response to RAI 2.5-2 acceptable because the applicant has revised the LRA to include the control circuits within the scope of license renewal, consistent with staff guidance. Therefore, the staff's concern described in RAI 2.5-2 is resolved.

2.5.1.3 Conclusion

The staff reviewed the LRA, USAR, and RAI responses to determine whether the applicant failed to identify any SSCs within the scope of license renewal. The staff finds no such omissions. In addition, the staff's review determined whether the applicant failed to identify any components subject to an AMR. The staff finds no such omissions. On the basis of its review, the staff concludes that the applicant has adequately identified the electrical and I&C component commodity groups components within the scope of license renewal, as required by 10 CFR 54.4(a), and those subject to an AMR, as required by 10 CFR 54.21(a)(1) and therefore is acceptable.

2.6 Conclusion for Scoping and Screening

The staff reviewed the information in LRA Section 2, "Scoping and Screening Methodology for Identifying Structures and Components Subject to AMR and Implementation Results" and determines that the applicant's scoping and screening methodology was consistent with 10 CFR 54.21(a)(1) and the staff's positions on the treatment of safety-related and nonsafety-related SSCs within the scope of license renewal and on SCs subject to an AMR is consistent with the requirements of 10 CFR 54.4 and 10 CFR 54.21(a)(1).

On the basis of its review, the staff concludes, that the applicant has adequately identified those systems and components within the scope of license renewal, as required by 10 CFR 54.4(a), and those subject to an AMR, as required by 10 CFR 54.21(a)(1).

The staff concludes that there is reasonable assurance that the applicant will continue to conduct the activities authorized by the renewed license in accordance with the CLB and any changes to the CLB in order to comply with 10 CFR 54.21(a)(1), in accordance with the Atomic Energy Act of 1954, as amended, and NRC regulations.

SECTION 3

AGING MANAGEMENT REVIEW RESULTS

This section of the safety evaluation report (SER) evaluates aging management programs (AMPs) and aging management reviews (AMRs) for Susquehanna Steam Electric Station (SSES) Units 1 and 2, by the staff of the United States (US) Nuclear Regulatory Commission (NRC) (the staff). In Appendix B of its license renewal application (LRA), PPL Susquehanna, LLC (PPL or the applicant) described the 51 AMPs that it relies on to manage or monitor the aging of passive, long-lived structures and components (SCs).

In LRA Section 3, the applicant provided the results of the AMRs for those SCs identified in LRA Section 2 as within the scope of license renewal and subject to an AMR.

3.0 Applicant's Use of the Generic Aging Lessons Learned Report

In preparing its LRA, the applicant credited NUREG-1801, Revision 1, "Generic Aging Lessons Learned (GALL) Report," dated September 2005. The GALL Report contains the staff's generic evaluation of the existing plant programs and documents the technical basis for determining where existing programs are adequate without modification, and where existing programs should be augmented for the period of extended operation. The evaluation results documented in the GALL Report indicate that many of the existing programs are adequate to manage the aging effects for particular license renewal SCs. The GALL Report also contains recommendations on specific areas for which existing programs should be augmented for license renewal. An applicant may reference the GALL Report in its LRA to demonstrate that its programs correspond to those reviewed and approved in the report.

The purpose of the GALL Report is to provide a summary of staff-approved AMPs to manage or monitor the aging of SCs subject to an AMR. If an applicant commits to implementing these staff-approved AMPs, the time, effort, and resources for LRA review will be greatly reduced, improving the efficiency and effectiveness of the license renewal review process. The GALL Report also serves as a quick reference for applicants and staff reviewers to AMPs and activities that the staff has determined will adequately manage or monitor aging during the period of extended operation.

The GALL Report identifies: (1) structures, systems, and components (SSCs), (2) SC materials, (3) environments to which the SCs are exposed, (4) the aging effects of the materials and environments, (5) the AMPs credited with managing or monitoring the aging effects, and (6) recommendations for further applicant evaluations of aging management for certain component types.

The staff's review was in accordance with Title 10, Part 54, of the *Code of Federal Regulations* (10 CFR Part 54), "Requirements for Renewal of Operating Licenses for Nuclear Power Plants," and the guidance of the Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants (SRP-LR) and the GALL Report.

In addition to its review of the LRA, the staff conducted an onsite audit of selected AMRs and associated AMPs, during the week of May 5, 2008. The onsite audits and reviews are designed to maximize efficiency of the staff's LRA review. The applicant can respond to questions, the

staff can readily evaluate the applicant's responses, the need for formal correspondence between the staff and the applicant is reduced, and the result is an improvement in review efficiency. The results of this audit were documented in the report of January 16, 2009.

3.0.1 Format of the License Renewal Application

The applicant submitted an application that follows the standard LRA format agreed to by the staff and the Nuclear Energy Institute (NEI) by letter dated April 7, 2003 (ML030990052). This revised LRA format incorporates lessons learned from the staff's reviews of the previous five LRAs, which used a format developed from information gained during a staff-NEI demonstration project conducted to evaluate the use of the GALL Report in the LRA review process.

The organization of LRA Section 3 parallels that of SRP-LR Chapter 3. LRA Section 3 presents AMR results information in the following two table types:

(1) Table 1s: Table 3.x.1 – where "3" indicates the LRA section number, "x" indicates the subsection number from the GALL Report, and "1" indicates that this table type is the first in LRA Section 3.

(2) Table 2s: Table 3.x.2-y – where "3" indicates the LRA section number, "x" indicates the subsection number from the GALL Report, "2" indicates that this table type is the second in LRA Section 3, and "y" indicates the system table number.

The content of the previous LRAs and of the SSES application is essentially the same. The intent of the revised format of the LRA was to modify the tables in LRA Section 3 to provide additional information that would assist in the staff's review. In its Table 1s, the applicant summarized the portions of the application that it considered to be consistent with the GALL Report. In its Table 2s, the applicant identified the linkage between the scoping and screening results in LRA Section 2 and the AMRs in LRA Section 3.

3.0.1.1 Overview of Table 1s

Each Table 1 compares in summary how the facility aligns with the corresponding tables in the GALL Report. The tables are essentially the same as Tables 1 through 6 in the GALL Report, except that the "Type" column has been replaced by an "Item Number" column and the "Item Number in GALL" column has been replaced by a "Discussion" column. The "Item Number" column is a means for the staff reviewer to cross-reference Table 2s with Table 1s. In the "Discussion" column the applicant provided clarifying information. The following are examples of information that might be contained within this column:

- further evaluation recommended - information or reference to where that information is located
- The name of a plant-specific program
- exceptions to GALL Report assumptions
- discussion of how the line is consistent with the corresponding line item in the GALL Report when the consistency may not be obvious
- discussion of how the item is different from the corresponding line item in the GALL Report (*e.g.*, when an exception is taken to a GALL Report AMP)

The format of each Table 1 allows the staff to align a specific row in the table with the corresponding GALL Report table row so that the consistency can be checked easily.

3.0.1.2 Overview of Table 2s

Each Table 2 provides the detailed results of the AMRs for components identified in LRA Section 2 as subject to an AMR. The LRA has a Table 2 for each of the systems or structures within a specific system grouping (*e.g.*, reactor coolant system, engineered safety features, auxiliary systems, etc.). For example, the engineered safety features group has tables specific to the core spray system, high-pressure coolant injection (HPCI) system, and residual heat removal (RHR) system. Each Table 2 consists of nine columns:

- Component Type – The first column lists LRA Section 2 component types subject to an AMR in alphabetical order.
- Intended Function – The second column identifies the license renewal intended functions, including abbreviations, where applicable, for the listed component types. Definitions and abbreviations of intended functions are in LRA Table 2.0-1.
- Material – The third column lists the particular construction material(s) for the component type.
- Environment – The fourth column lists the environments to which the component types are exposed. Internal and external service environments are indicated with a list of these environments in LRA Tables 3.0-1 and 3.0-2.
- Aging Effect Requiring Management – The fifth column lists aging effects requiring management (AERMs). As part of the AMR process, the applicant determined any AERMs for each combination of material and environment.
- Aging Management Programs – The sixth column lists the AMPs that the applicant uses to manage the identified aging effects.
- NUREG-1801 Volume 2 Item – The seventh column lists the GALL Report item(s) identified in the LRA as similar to the AMR results. The applicant compared each combination of component type, material, environment, AERM, and AMP in LRA Table 2 with the GALL Report items. If there are no corresponding items in the GALL Report, the applicant leaves the column blank or N/A in order to identify the AMR results in the LRA tables corresponding to the items in the GALL Report tables.
- Table 1 Item – The eighth column lists the corresponding summary item number from LRA Table 1. If the applicant identifies in each LRA Table 2 AMR results consistent with the GALL Report, the Table 1 line item summary number should be listed in LRA Table 2. If there is no corresponding item in the GALL Report, column eight is left blank or N/A. In this manner, the information from the two tables can be correlated.
- Notes – The ninth column lists the corresponding notes used to identify how the information in each Table 2 aligns with the information in the GALL Report. The notes, identified by letters, were developed by an NEI work group and will be used in future LRAs. Any plant-specific notes identified by numbers provide additional information about the consistency of the line item with the GALL Report.

3.0.2 Staff's Review Process

The staff conducted three types of evaluations of the AMRs and AMPs:

(1) For items that the applicant had stated were consistent with the GALL Report, the staff conducted either an audit or a technical review to determine consistency.

(2) For items that the applicant had stated were consistent with the GALL Report with exceptions, enhancements, or both, the staff conducted either an audit or a technical review of the item to determine consistency. In addition, the staff conducted either an audit or a technical review of the applicant's technical justifications for the exceptions or the adequacy of the enhancements.

The SRP-LR states that an applicant may take one or more exceptions to specific GALL AMP elements; however, any deviation from or exception to the GALL AMP should be described and justified. Therefore, the staff considers exceptions as being portions of the GALL AMP that the applicant does not intend to implement.

In some cases, an applicant may choose an existing plant program that does not meet all the program elements defined in the GALL AMP. However, the applicant may make a commitment to augment the existing program to satisfy the GALL AMP prior to the period of extended operation. Therefore, the staff considers these augmentations or additions to be enhancements. Enhancements include, but are not limited to, activities needed to ensure consistency with the GALL Report recommendations. Enhancements may expand, but not reduce, the scope of an AMP.

(3) For other items, the staff conducted a technical review to verify conformance with 10 CFR 54.21(a)(3) requirements.

Staff audits and technical reviews of the applicant's AMPs and AMRs determine whether the aging effects on SCs can be adequately managed to maintain their intended function(s) consistent with the plant's current licensing basis (CLB) for the period of extended operation, as required by 10 CFR Part 54.

3.0.2.1 Review of AMPs

For AMPs which the applicant claimed consistency with the GALL AMPs, the staff conducted either an audit or a technical review to verify the claim. For each AMP with one or more deviations, the staff evaluated each deviation to determine whether the deviation was acceptable and whether the modified AMP would adequately manage the aging effect(s) for which it was credited. For AMPs not evaluated in the GALL Report, the staff performed a full review to determine their adequacy. The staff evaluated the AMPs against the following 10 program elements defined in SRP-LR Appendix A:

(1) Scope of the Program – Scope of the program should include the specific SCs subject to an AMR for license renewal.

(2) Preventive Actions – Preventive actions should prevent or mitigate aging degradation.

(3) Parameters Monitored or Inspected – Parameters monitored or inspected should be linked to the degradation of the particular structure or component intended function(s).

(4) Detection of Aging Effects – Detection of aging effects should occur before there is a loss of structure or component intended function(s). This includes aspects such as

method or technique (*i.e.*, visual, volumetric, surface inspection), frequency, sample size, data collection, and timing of new/one-time inspections to ensure timely detection of aging effects.

(5) Monitoring and Trending – Monitoring and trending should provide predictability of the extent of degradation, as well as timely corrective or mitigative actions.

(6) Acceptance Criteria – Acceptance criteria, against which the need for corrective action will be evaluated, should ensure that the structure or component intended function(s) are maintained under all CLB design conditions during the period of extended operation.

(7) Corrective Actions – Corrective actions, including root cause determination and prevention of recurrence, should be timely.

(8) Confirmation Process – Confirmation process should ensure that preventive actions are adequate and that appropriate corrective actions have been completed and are effective.

(9) Administrative Controls - Administrative controls should provide for a formal review and approval process.

(10) Operating Experience – Operating experience of the AMP, including past corrective actions resulting in program enhancements or additional programs, should provide objective evidence to support the conclusion that the effects of aging will be adequately managed so that the SC intended function(s) will be maintained during the period of extended operation.

Details of the staff's audit evaluation of program elements (1) through (6) are documented in SER Section 3.0.3.

The staff reviewed the applicant's quality assurance (QA) program and documented its evaluations in SER Section 3.0.4. The staff's evaluation of the QA program included assessment of program element (7) "corrective actions," (8) "confirmation process," and (9) "administrative controls" program elements.

The staff reviewed the information on the "operating experience" program element and documented its evaluation in SER Section 3.0.3.

3.0.2.2 Review of AMR Results

Each LRA Table 2 contains information concerning whether or not the AMRs identified by the applicant align with the GALL Report AMRs. For a given AMR in a Table 2, the staff reviewed the intended function, material, environment, AERM, and AMP combination for a particular system component type. Item numbers in column seven of the LRA, "NUREG-1801 Volume 2 Item," correlates to an AMR combination as identified in the GALL Report. The staff also conducted onsite audits to verify these correlations. A blank or N/A in column seven indicates that the applicant was unable to identify an appropriate correlation in the GALL Report. The staff also conducted a technical review of combinations not consistent with the GALL Report. The next column, "Table 1 Item," refers to a number indicating the correlating row in Table 1.

3.0.2.3 UFSAR Supplement

Consistent with the SRP-LR for the AMRs and AMPs that it reviewed, the staff also reviewed the updated final safety analysis report (UFSAR) supplement, which summarizes the applicant's

programs and activities for managing aging effects for the period of extended operation, as required by 10 CFR 54.21(d).

3.0.2.4 Documentation and Documents Reviewed

In its review, the staff used the LRA, LRA supplements, the SRP-LR, and the GALL Report.

During the onsite audit, the staff also examined the applicant's justifications to verify that the applicant's activities and programs will adequately manage the effects of aging on SCs. The staff also conducted detailed discussions and interviews with the applicant's license renewal project personnel and others with technical expertise relevant to aging management.

3.0.3 Aging Management Programs

SER Table 3.0.3-1 presents the AMPs credited by the applicant and described in LRA Appendix B. The table also indicates the SSCs that credit the AMPs and the GALL AMP with which the applicant claimed consistency and shows the section of this SER in which the staff's evaluation of the program is documented.

Table 3.0.3-1 SSES Aging Management Programs

SSES AMP (LRA Section)	New or Existing AMP	GALL Report Comparison	GALL Report AMPs	LRA Systems or Structures That Credit the AMP	Staff's SER Section
Inservice Inspection (ISI) Program (B.2.1)	Existing	Consistent with exception	XI.M1	reactor vessel, reactor vessel internals, and reactor coolant system	3.0.3.2.1
BWR Water Chemistry Program (B.2.2)	Existing	Consistent	XI.M2	reactor vessel, reactor vessel internals, and reactor coolant system / engineered safety features / auxiliary systems / steam and power conversion systems / containments, structures, and component supports	3.0.3.1.1
Reactor Head Closure Studs Program (B.2.3)	Existing	Consistent	XI.M3	reactor vessel, reactor vessel internals, and reactor coolant system	3.0.3.1.2
BWR Vessel ID Attachment Welds Program (B.2.4)	Existing	Consistent	XI.M4	reactor vessel, reactor vessel internals, and reactor coolant system	3.0.3.1.3
BWR Feedwater Nozzle Program (B.2.5)	Existing	Consistent	XI.M5	reactor vessel, reactor vessel internals, and reactor coolant system	3.0.3.1.4
BWR CRD Return Line Nozzle Program (B.2.6)	Existing	Consistent with exception	XI.M6	reactor vessel, reactor vessel internals, and reactor coolant system	3.0.3.2.2

SSES AMP (LRA Section)	New or Existing AMP	GALL Report Comparison	GALL Report AMPs	LRA Systems or Structures That Credit the AMP	Staff's SER Section
BWR Stress Corrosion Cracking (SCC) Program (B.2.7)	Existing	Consistent	XI.M7	reactor vessel, reactor vessel internals, and reactor coolant system	3.0.3.1.5
BWR Penetrations Program (B.2.8)	Existing	Consistent with exception	XI.M8	reactor vessel, reactor vessel internals, and reactor coolant system	3.0.3.2.3
BWR Vessel Internals Program (B.2.9)	Existing	Consistent with enhancement	XI.M9	reactor vessel, reactor vessel internals, and reactor coolant system	3.0.3.2.4
Thermal Aging and Neutron Embrittlement of Cast Austenitic Stainless Steel (CASS) Program (B.2.10)	New	Consistent	XI.M13	reactor vessel, reactor vessel internals, and reactor coolant system	3.0.3.1.6
Flow-Accelerated Corrosion (FAC) Program (B.2.11)	Existing	Consistent	XI.M17	reactor vessel, reactor vessel internals, and reactor coolant system / engineered safety features / auxiliary systems / steam and power conversion systems	3.0.3.1.7
Bolting Integrity Program (B.2.12)	Existing	Consistent with exceptions and enhancement	XI.M18	reactor vessel, reactor vessel internals, and reactor coolant system / engineered safety features / auxiliary systems / steam and power conversion systems	3.0.3.2.5
Piping Corrosion Program (B.2.13)	Existing	Consistent with exceptions	XI.M20	engineered safety features / auxiliary systems	3.0.3.2.6
Closed Cooling Water Chemistry Program (B.2.14)	Existing	Consistent with exceptions	XI.M21	reactor vessel, reactor vessel internals, and reactor coolant system / auxiliary systems	3.0.3.2.7
Crane Inspection Program (B.2.15)	Existing	Consistent	XI.M23	containments, structures, and component supports	3.0.3.1.8
Fire Protection Program (B.2.16)	Existing	Consistent with exceptions	XI.M26	containments, structures, and component supports	3.0.3.2.8
Fire Water System Program (B.2.17)	Existing	Consistent with enhancements	XI.M27	engineered safety features / auxiliary systems	3.0.3.2.9
Buried Piping Surveillance Program (B.2.18)	New	Consistent with exception	XI.M28	auxiliary systems	3.0.3.2.10

SSES AMP (LRA Section)	New or Existing AMP	GALL Report Comparison	GALL Report AMPs	LRA Systems or Structures That Credit the AMP	Staff's SER Section
Condensate and Refueling Water Storage Tanks Inspection (B.2.19)	New	Consistent	XI.M29	steam and power conversion systems	3.0.3.1.9
Fuel Oil Chemistry Program (B.2.20)	Existing	Consistent with exceptions	XI.M30	auxiliary systems	3.0.3.2.11
Reactor Vessel Surveillance Program (B.2.21)	Existing	Consistent with exception	XI.M31	reactor vessel, reactor vessel internals, and reactor coolant system	3.0.3.2.12
Chemistry Program Effectiveness Inspection (B.2.22)	New	Consistent	XI.M32	engineered safety features / auxiliary systems / steam and power conversion systems	3.0.3.1.10
Cooling Units Inspection (B.2.23)	New	Consistent	XI.M32	auxiliary systems	3.0.3.1.11
Heat Exchanger Inspection (B.2.24)	New	Consistent	XI.M32	engineered safety features / auxiliary systems	3.0.3.1.12
Lubricating Oil Inspection (B.2.25)	New	Consistent	XI.M32	engineered safety features / auxiliary systems	3.0.3.1.13
Main Steam Flow Restrictor Inspection (B.2.26)	New	Consistent	XI.M32	reactor vessel, reactor vessel internals, and reactor coolant system	3.0.3.1.14
Monitoring and Collection System Inspection (B.2.27)	New	Consistent	XI.M32	auxiliary systems	3.0.3.1.15
Supplemental Piping/Tank Inspection (B.2.28)	New	Consistent	XI.M32	engineered safety features / auxiliary systems / steam and power conversion systems	3.0.3.1.16
Selective Leaching Inspection (B.2.29)	New	Consistent	XI.M33	engineered safety features / auxiliary systems / steam and power conversion systems	3.0.3.1.17
Buried Piping and Tanks Inspection Program (B.2.30)	New	Consistent with exceptions	XI.M34	auxiliary systems / steam and power conversion systems	3.0.3.2.13
Small Bore Class 1 Piping Inspection (B.2.31)	New	Consistent	XI.M35	reactor vessel, reactor vessel internals, and reactor coolant system	3.0.3.1.18

SSES AMP (LRA Section)	New or Existing AMP	GALL Report Comparison	GALL Report AMPs	LRA Systems or Structures That Credit the AMP	Staff's SER Section
System Walkdown Program (B.2.32)	Existing	Consistent with enhancements	XI.M36	reactor vessel, reactor vessel internals, and reactor coolant system / engineered safety features / auxiliary systems / steam and power conversion systems	3.0.3.2.14
Lubricating Oil Analysis Program (B.2.33)	Existing	Consistent with exception and enhancement	XI.M39	engineered safety features / auxiliary systems	3.0.3.2.15
Inservice Inspection (ISI) Program - IWE (B.2.34)	Existing	Consistent	XI.S1	containments, structures, and component supports	3.0.3.1.19
Inservice Inspection (ISI) Program - IWL (B.2.35)	Existing	Consistent	XI.S2	containments, structures, and component supports	3.0.3.1.20
Inservice Inspection (ISI) Program - IWF (B.2.36)	Existing	Consistent	XI.S3	containments, structures, and component supports	3.0.3.1.21
Containment Leakage Rate Test Program (B.2.37)	Existing	Consistent	XI.S4	containments, structures, and component supports	3.0.3.1.22
Masonry Wall Program (B.2.38)	Existing	Consistent with enhancement	XI.S5	structures, and component supports	3.0.3.2.16
Structures Monitoring Program (B.2.39)	Existing	Consistent with enhancements	XI.S6	containments, structures, and component supports / electrical and instrumentation and controls	3.0.3.2.17
RG 1.127 Water-Control Structures Inspection (B.2.40)	Existing	Consistent with enhancements	XI.S7	structures, and component supports	3.0.3.2.18
Non-EQ Electrical Cables and Connections Visual Inspection Program (B.2.41)	New	Consistent	XI.E1	electrical and instrumentation and controls	3.0.3.1.23
Non-EQ Cables and Connections Used in Low-Current Instrumentation Circuits Program (B.2.42)	New	Consistent	XI.E2	electrical and instrumentation and controls	3.0.3.1.24
Non-EQ Inaccessible Medium-Voltage Cables Program (B.2.43)	New	Consistent	XI.E3	electrical and instrumentation and controls	3.0.3.1.25

SSES AMP (LRA Section)	New or Existing AMP	GALL Report Comparison	GALL Report AMPs	LRA Systems or Structures That Credit the AMP	Staff's SER Section
Metal-Enclosed Bus Inspection Program (B.2.44)	New	Consistent	XI.E4	electrical and instrumentation and controls	3.0.3.1.26
Non-EQ Electrical Cable Connections Program (B.2.45)	New	Consistent	XI.E6	electrical and instrumentation and controls	3.0.3.1.27
Area-Based NSAS Inspection (B.2.46)	New	Plant-specific	N/A	auxiliary systems	3.0.3.3.1
Leak Chase Channel Monitoring Activities (B.2.47)	Existing	Plant-specific	N/A	structures, and component supports	3.0.3.3.2
Preventive Maintenance Activities - RCIC/HPCI Turbine Casings (B.2.48)	Existing	Plant-specific	N/A	steam and power conversion systems	3.0.3.3.3
Preventive Maintenance Activities – Main Turbine (B2.49)	Existing	Plant-Specific	N/A	engineered safety features	3.0.3.3.4
Fuse Holders Program (B.2.50)	New	Consistent with exceptions	XI.E5	electrical and instrumentation and controls	3.0.3.2.20
Fatigue Monitoring Program (B.3.1)	Existing	Consistent with enhancements	X.M1	reactor vessel, reactor vessel internals, and reactor coolant system / engineered safety features / auxiliary systems / steam and power conversion systems / containments, structures, and component supports	3.0.3.2.19
EQ Program (B.3.2)	Existing	Consistent	X.E1	electrical and instrumentation and controls	3.0.3.1.28

3.0.3.1 AMPs Consistent with the GALL Report

In LRA Appendix B, the applicant identified the following AMPs as consistent with the GALL Report:

- Boiling Water Reactor (BWR) Water Chemistry Program
- Reactor Head Closure Studs Program
- BWR Vessel Inside Diameter (ID) Attachment Welds Program
- BWR Feedwater Nozzle Program
- BWR Stress Corrosion Cracking (SCC) Program

- Thermal Aging and Neutron Embrittlement of Cast Austenitic Stainless Steel (CASS) Program
- Flow-Accelerated Corrosion (FAC) Program
- Crane Inspection Program
- Condensate and Refueling Water Storage Tanks Inspection
- Chemistry Program Effectiveness Inspection
- Cooling Units Inspection
- Heat Exchanger Inspection
- Lubricating Oil Inspection
- Main Steam Flow Restrictor Inspection
- Monitoring and Collection System Inspection
- Supplemental Piping/Tank Inspection
- Selective Leaching Inspection
- Small Bore Class 1 Piping Inspection
- Inservice Inspection (ISI) Program - IWE
- Inservice Inspection (ISI) Program - IWL
- Inservice Inspection (ISI) Program - IWF
- Containment Leakage Rate Test Program
- Non-EQ Electrical Cables and Connections Visual Inspection Program
- Non-EQ Cables and Connections Used in Low-Current Instrumentation Circuits Program
- Non-EQ Inaccessible Medium-Voltage Cables Program
- Metal-Enclosed Bus Inspection Program
- Non-EQ Electrical Cable Connections Program
- Environmental Qualification (EQ) Program

3.0.3.1.1 BWR Water Chemistry Program

Summary of Technical Information in the Application. In LRA Section B.2.2, the applicant described the existing BWR Water Chemistry Program as consistent with GALL AMP XI.M2, "Water Chemistry." The applicant stated that the BWR Water Chemistry Program is a mitigation program that manages potential aging effects for plant components in a treated water environment. The applicant also stated that the program manages loss of material and cracking through monitoring and control of relevant water chemistry parameters, such as sulfates, halogens, dissolved oxygen, and conductivity, consistent with applicable Electric Power Research Institute (EPRI) water chemistry guidelines.

Staff Evaluation. During its audit, the staff reviewed the applicant's claim of consistency with the GALL Report. The staff reviewed the applicant's AMP evaluation report for the BWR Water Chemistry Program, together with implementing procedures and supporting documentation related to the program. The staff noted that the program elements in the AMP that the applicant claimed as consistent with the GALL Report are consistent with the corresponding program

element criteria recommended in GALL AMP XI.M2, with the exception of two program element aspects which the staff determined a need for additional clarification and for which a request for additional information (RAI) was issued. The staff evaluates these aspects of the AMP in the following discussion.

In RAI B.2.2-1, item 1, dated June 23, 2008, the staff noted the following on program elements that the applicant claimed to be consistent with GALL AMP XI.M2:

> Item 1 (on "parameters monitored/inspected") - In the GALL Report, this program element refers to BWRVIP-29 (EPRI TR-103515), "BWR Water Chemistry Guidelines – 1996 Revision," or later revisions, which recommends continuous monitoring of local electrochemical corrosion potential. However, in lieu of direct electrochemical corrosion potential monitoring, the applicant currently relies on monitoring of dissolved oxygen for indication of relevant conditions for corrosion. The staff requested that the applicant provide a technical justification as to why this deviation from the EPRI guidelines is acceptable and explain why this is not considered to be an exception to the GALL Report.

In its response to RAI B.2.2-1, item 1, dated July 17, 2008, the applicant provided the following discussion:

> EPRI TR-103515 recommends continuous monitoring of local electrochemical corrosion potential (ECP) during reactor power operation (greater than 10 percent rated power) as a method to demonstrate the effectiveness of hydrogen water chemistry (HWC). EPRI TR-103515 also describes alternative techniques using predictive models to verify the effectiveness of HWC. In such instances, TR-103515 recommends models be benchmarked against ECP measurements in radiolytically identical and operationally similar applications and a correlation be developed between protective chemistry conditions, e.g., ECP, and other plant (secondary) parameters that respond to hydrogen injection and are normally continuously monitored. As described in TR-103515, secondary plant parameters such as feedwater hydrogen flow rate or concentration, normalized main steam line radiation or main steam line oxygen concentration, and reactor coolant oxygen or hydrogen concentration can be directly related to primary parameters such as ECP. The correlation between ECP and secondary parameters, such as dissolved oxygen, is essential since the useful life for the ECP probes can be less than a fuel cycle.
>
> The BWR Water Chemistry program continuously monitors reactor water for dissolved oxygen concentration and uses hydrogen injection to reduce dissolved oxygen to protective levels (equivalent to ECP of less than -230 mV SHE [standard hydrogen electrode]). ECP measurements were taken during initial implementation of HWC and correlated with secondary parameters, including dissolved oxygen. When dissolved oxygen is not available, other secondary parameter correlations may be used to determine that protection is being achieved. Therefore, since the use of dissolved oxygen in lieu of continuous monitoring of ECP is consistent with the EPRI TR-103515 guidelines, no exception to GALL is required.

In evaluating the applicant's response, the staff reviewed EPRI TR-103515-R2, Section 2.10.3, "Secondary Monitoring Parameters," and Section 5.4, "Alternate ECP Estimation Techniques." The staff confirms that the EPRI guidelines include provisions for using secondary plant parameters, such as dissolved oxygen, in lieu of continuous electrochemical corrosion potential monitoring. The EPRI guidelines state that plant-specific correlations should be developed to relate secondary parameter values to electrochemical corrosion potential measurements and can be used when direct electrochemical corrosion potential monitoring is not available.

Based on its review, the staff finds the applicant's response to RAI B.2.2-1, item 1 acceptable because the applicant has developed plant-specific correlations relating continuously monitored parameters to measured electrochemical corrosion potential values, which are consistent with the EPRI TR-103515 that is endorsed by the GALL Report, and the applicant uses those monitored parameters to control electrochemical corrosion potential at recommended protective levels. The staff determines that the applicant's response is acceptable and that this aspect of the applicant's program is consistent with the recommendations in the GALL Report. Therefore, the staff's concern described in RAI B.2.2-1, item 1 is resolved.

In RAI B.2.2-1, item 2, dated June 23, 2008, the staff noted the following on program elements that the applicant claimed to be consistent with GALL AMP XI.M2:

> Item 2 (on "monitoring and trending") - In the GALL Report, this program element refers to the EPRI water chemistry guidelines, TR-103515, or later revisions, which recommends weekly monitoring of conductivity, chlorides, and sulfate in the condensate storage tank (CST); however, the applicant currently measures conductivity, chlorides, and sulfate in the CST on a monthly basis. The staff requested that the applicant provide a technical justification as to why this deviation from the EPRI guidelines is acceptable and explain why this is not considered to be an exception to the GALL Report.

In its response to RAI B.2.2-1, item 2, dated July 17, 2008, the applicant provided the following discussion:

> EPRI TR-103515 recommends weekly monitoring of conductivity, chlorides, and sulfates in the condensate storage tank but allows for reduced monitoring if the sources of water are monitored. During normal power operation, all source water to the condensate storage tanks is routinely monitored for conductivity, chlorides, and sulfates. Therefore, the BWR Water Chemistry Program is consistent with the EPRI guidance and the monitoring frequency is not considered to be an exception to GALL.

In evaluating the applicant's response, the staff reviewed EPRI TR-103515-R2, Table B-1, "Diagnostic Parameters for Demineralized Water Storage Tank (DWST) and Condensate Storage Tank (CST)." The staff confirms that a note associated with this table states that the frequency of CST analyses may be reduced or eliminated if all source water is routinely monitored for conductivity, chlorides, and sulfates parameters. The staff noted that the applicant's response states that during normal power operation all source water to the CST is routinely monitored. The staff also noted that EPRI TR-103515-R2 states that each plant should use the guidelines to develop site-specific procedures identifying parameters to be monitored, along with recommended frequencies and limits. Because the applicant provides routine monitoring for all source water to the CST during normal power operation and the EPRI guidelines describe the monitoring frequencies as recommendations, rather than requirements,

the staff finds the reduction in CST monitoring frequency from weekly to monthly to be acceptable and to be consistent with the recommendations in EPRI TR-103515, which is endorsed by the GALL Report. On this basis, the staff finds the applicant's response to RAI B.2.2-1, item 2 to be acceptable and this aspect of the applicant's program to be consistent with the recommendations in the GALL Report.

Based on its review, and resolution of the related RAI as described above, the staff finds the applicant's BWR Water Chemistry Program consistent with the program elements of GALL AMP XI.M2 and therefore, the response is acceptable.

Operating Experience. The staff reviewed the applicant's operating experience (OE) described in LRA Section B.2.2. The applicant stated that the BWR Water Chemistry Program incorporates EPRI and Institute of Nuclear Power Operations (INPO) guideline documents as well as lessons learned from site and other utility OE. The applicant stated that the program has been and continues to be subject to internal and external assessments of the performance to identify strengths and potential adverse trends. The applicant further stated that plant-specific OE did not reveal a loss of component intended function for components exposed to reactor coolant, feedwater (FW), condensate, control rod drive (CRD) hydraulic water, or accident mitigation water (i.e., suppression pool water) that could be attributed to an inadequacy of the BWR Water Chemistry Program.

During the onsite audit, the staff reviewed the applicant's OE reports for the BWR Water Chemistry Program. The staff reviewed selected corrective action condition reports (CRs) related to the BWR Water Chemistry Program and interviewed the applicant's technical staff to confirm that the plant-specific OE did not reveal any degradation not bounded by industry experience.

The staff noted that the applicant has a history of CRs related to high sulfate levels in reactor water for a period of several days following refueling outages (RFOs), and that the applicant has undertaken root cause evaluations and programmatic changes to reduce and control the high sulfate levels. The applicant stated that there have been no component failures attributed to the transient elevation of sulfate in the reactor following refueling.

In RAI B.2.2-2, dated June 23, 2008, the staff requested that the applicant explain its activities related to understanding and mitigating this chemistry program issue, addressing the cause of the problem, corrective actions and comparisons with other BWRs having similar condensate demineralizers.

In its response to RAI B.2.2-2, dated July 17, 2008, the applicant provided the following discussion:

> The elevated sulfate levels following refueling outages were determined to be the result of operational actions, such as removing a condensate pump from service, which disturbed or upset the condensate demineralizer resin bed and allowed the cation resin, which releases sulfate and organic sulfonates, to migrate to near the outlet (bottom) of the resin bed. When the condensate demineralizers were restarted after an outage, the sulfates and sulfonates that had concentrated in the bed during the outage washed out of the cation resin at the bottom of the demineralizer bed and caused the elevated sulfate levels. The elevated sulfate levels continued for a week or two, until the excess was rinsed off the beds or new anion resin heels were added to the vessels.

PPL undertook two corrective actions to mitigate the elevated sulfate level issue. One included a change in operation of the condensate demineralizers and/or condensate pumps as they are taken out of service. The procedures were changed to bypass the condensate demineralizer so as to not upset the beds during initial startup or final shutdown of the condensate pumps. Another corrective action rinses the resin bed with demineralized water before starting the condensate demineralizer. The out of service condensate demineralizer resin bed is covered with demineralized water which is flushed to radwaste, taking any excess sulfates with it, thus mitigating the elevated sulfate level. The condensate demineralizer is placed in service after the rinse is completed.

In addition, PPL installed a condensate filtration system in the late 1990s. Since then, PPL has experienced a continually improving trend in sulfate levels, including the elevated sulfate levels following each outage. PPL maintains sulfate data as a monthly average, as reported to INPO. The data shows that monthly average sulfate levels following outages have not exceeded 5 ppb since completion of the Unit 2 outage in 2003.

These actions have resulted in monthly average sulfate levels that are typically below 2 ppb and often below 1 ppb. Comparison of SSES with other BWRs having similar filters and condensate demineralizers, based on October 2007 data, places both SSES units above the median value, but below the EPRI recommended goal of 2 ppb.

Based on the review, that staff finds the applicant's response to RAI B.2.2-2 acceptable because the applicant has verified that its OE is within the envelope of industry experience and the applicant's BWR Water Chemistry Program has demonstrated its ability to detect and correct operational problems. Therefore, the staff's concern described in RAI B.2.2-2 is resolved.

Based on this review, the staff finds that the OE for this AMP demonstrates that the applicant's BWR Water Chemistry Program is achieving its objective of mitigating loss of material due to general, crevice and pitting corrosion and cracking caused by SSC in steel and/or stainless steel exposed to treated water; and that the applicant is taking appropriate corrective actions through implementation of this program.

The staff confirms that the "operating experience" program element satisfies the criterion defined in the GALL Report and the guidance found in SRP-LR Section A.1.2.3.10. Therefore, the staff finds this program element acceptable.

UFSAR Supplement. The applicant provided the UFSAR supplement for the BWR Water Chemistry Program in LRA Section A.1.2.11. The staff notes that the UFSAR supplement's description for the BWR Water Chemistry Program conforms to the recommended UFSAR supplement for this type of program as described in the SRP-LR. The staff also notes that in LRA Table A-1, Commitment No. 2, the applicant committed to ongoing implementation of the BWR Water Chemistry Program for aging management of applicable components, during the period of extended operation.

Based on the review, the staff finds that the UFSAR supplement summary in LRA Section A.1.2.11 provides an acceptable description of the applicant's BWR Water Chemistry

Program because it is consistent with the UFSAR supplement summary description in the SRP-LR for the BWR Water Chemistry Program. The staff also finds that the information in the UFSAR supplement is an adequate summary description of the program, as required by 10 CFR 54.21(d).

Conclusion. On the basis of the review of the applicant's BWR Water Chemistry Program and the applicant's responses and resolutions of the related RAIs, the staff finds all program elements consistent with the GALL Report. The staff concludes that the applicant has demonstrated that the effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3). The staff also reviewed the UFSAR supplement for this AMP and concludes that it provides an adequate summary description of the program, as required by 10 CFR 54.21(d) and therefore is acceptable.

3.0.3.1.2 Reactor Head Closure Studs Program

Summary of Technical Information in the Application. In LRA Section B.2.3, the applicant described the existing Reactor Head Closure Studs AMP as consistent with the GALL AMP XI.M3, "Reactor Head Closure Studs." The Reactor Head Closure Studs Program provides for condition monitoring and preventive actions to manage stud cracking. The program is implemented through plant procedures based on the inspection requirements specified in the American Society of Mechanical Engineers (ASME) Code, Section XI, Subsection IWB, Table IWB 2500-1, and the preventive measures described in Regulatory Guide (RG) 1.65.

Staff Evaluation. During its audit, the staff reviewed the applicant's claim of consistency with the GALL Report. The staff reviewed the applicant's onsite documentation supporting the applicant's conclusion that the program elements are consistent with the elements in GALL AMP XI.M3.

The staff compared the elements in the applicant's program with the GALL Report program elements. The staff confirmed that the maximum reported ultimate tensile strength for the reactor head closure studs and nuts is 163.5 ksi, which is less than the 170 ksi specification cited in the GALL Report "scope of program" program element.

The staff noted that the applicant had indicated that the current scope of the program applies to the ASME Code Section XI, 1998 Edition, inclusive of the 2000 Addenda. The program description in the GALL AMP XI.M3 states that the GALL Report applies to inspection, repair, and replacement activities for ASME Code components covered in ASME Code Section XI, the 2001 Edition, inclusive of the 2003 Addenda. The staff noted that the applicant had clarified that the use of ASME Code Section XI, the 1998 Edition, inclusive of the 2000 Addenda, is consistent with the program description statement in the GALL AMP XI.M3 because the Statements of Consideration (SOC) on 10 CFR Part 54 clarifies that acceptable editions of the ASME Code Section XI are those up through the most recently endorsed edition of the Code mentioned in 10 CFR 50.55a. The staff verified that the SOC on 10 CFR Part 54 does include this clarification, and on that basis, the applicant's use of ASME Code Section XI, 1998 Edition, inclusive of the 2000 Addenda, is consistent with the Code edition mentioned in the program description of GALL AMP XI.M3. Based on this review, the staff finds the applicant's crediting of the ASME Code Section XI, 1998 edition, inclusive of the 2000 Addenda (for aging management) is consistent with the criteria in GALL AMP XI.M3.

The staff confirmed that, in LRA Commitment No. 3, the applicant has committed to the ongoing implementation of the Reactor Head Closure Stud Program for aging management of those in-scope components that the AMP is credited. The staff also confirmed that the applicant has placed this commitment in LRA A.1.2.40 for the Reactor Head Closure Stud Program.

In comparing the seven program elements in the applicant's program to those in GALL AMP XI.M3, the staff noted that the program elements for which the applicant claimed consistency with the GALL Report were consistent with the corresponding program element criteria recommended in GALL AMP XI.M3. The "operating experience" program element is discussed separately below.

Operating Experience. The staff reviewed the applicant's OE described in the LRA Section B.2.3. The applicant stated that plant-specific OE did not reveal any degradation. The staff reviewed the OE reports provided in the LRA and in the plant basis documents, the staff confirmed that the plant-specific OE reviewed did not reveal any reactor head closure stud cracking or loss of material, or any other age related degradation with the reactor pressure vessel (RPV) head studs, nuts, or washers.

The staff confirms that the "operating experience" program element satisfies the criterion defined in the GALL Report and the guidance found in SRP-LR A.1.2.3.10. Therefore, the staff finds this program element acceptable.

UFSAR Supplement. The applicant provided the UFSAR supplement summary for the Reactor Head Closure Studs Program in LRA section A.1.2.40. The staff reviewed this section and finds it acceptable because it is consistent with the corresponding program description in SRP-LR Table 3.1-2. The staff determines that the information in the UFSAR supplement is an adequate summary description of the program, as required by 10 CFR 54.21(d).

The staff confirms that, in LRA Commitment No. 3, the applicant has committed to the ongoing implementation of the Reactor Head Closure Stud Program for aging management of those in-scope components for which the AMP is credited. The staff also confirms that the applicant has placed this commitment for the Reactor Head Closure Stud Program in LRA Section A.1.2.40.

Conclusion. On the basis of the review of the applicant's Reactor Head Closure Stud Aging Management Program, the staff finds all program elements consistent with the GALL Report. The staff concludes that the applicant has demonstrated that the effects of aging will be adequately managed so that the intended functions will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3). The staff also reviewed the UFSAR supplement for this AMP and concludes that it provides an adequate summary description of the program, as required by 10 CFR 54.21(d) and therefore, is acceptable.

3.0.3.1.3 BWR Vessel Inside Diameter Attachment Welds Program

Summary of Technical Information in the Application. In LRA Section B.2.4, the applicant described the BWR Vessel ID Attachment Welds Program as an existing program that is consistent with GALL Report AMP XI.M4, "BWR Vessel ID Attachment Welds." The applicant stated that the program includes inspection and flaw evaluation, pursuant to the guidelines of the staff-approved Boiling Water Reactor Vessel and Internals Project (BWRVIP) report BWRVIP-48; and monitoring and control of reactor coolant water chemistry, pursuant to the

guidelines of BWRVIP-29. The program helps to ensure the long-term integrity and safe operation of the vessel ID attachment welds.

Staff Evaluation. During its audit, the staff reviewed the applicant's claim of consistency with the GALL Report. The staff also confirmed that the plant program contains all of the elements of the referenced GALL Report. The staff also conducted onsite interviews with the applicant to confirm these results.

The staff noted that the applicant's BWR Vessel ID Attachment Welds Program is based on the augmented inspection and flaw evaluation guideline criteria in Boiling Water Reactor Vessel and Internals Project (BWRVIP) Proprietary Topical Report No. TR-108724, "BWR Vessel and Internals Project, Vessel [Inner Diameter] ID Attachment Weld Inspection and Flaw Evaluation Guidelines (BWRVIP-48)." The staff approved the topical report to be credited for license renewal in a safety evaluation (SE) dated January 17, 2001. The approved version of the topical report is Topical Report BWRVIP-48-A.

In the SE on Topical Report BWRVIP-48-A, the staff issued three renewal applicant action items for BWR applicants crediting BWRVIP-48-A for aging management of reactor vessel (RV) ID attachment welds. The applicant provided the staff's renewal applicant action item descriptions and its responses to these actions items in LRA Appendix C, Table BWRVIP-48-A. The three action items follow:

(1) The staff's first renewal applicant action item required that applicants identify those guideline criteria aspects in BWRVIP-48-A that they might deviate from. The staff noted that the applicant would not deviate from the recommended inspection and flaw evaluation criteria provided in BWRVIP-48-A and; thus, determined that the applicant adequately addressed the staff's action item. Based on this review, the staff concludes that the applicant has adequately addressed the staff's first renewal applicant action item on BWRVIP-48-A. Therefore, this renewal applicant action item is resolved.

(2) The staff's second renewal applicant action item required that BWR applicants provide a UFSAR supplement summary description of the AMP based on the BWRVIP-48-A recommended criteria. The applicant stated that LRA Appendix A includes the UFSAR supplement for the BWR Vessel ID Attachment Welds Program. The staff confirms that the applicant has provided its UFSAR supplement summary description for the BWR Vessel ID Attachment Welds Program in LRA Section A.1.2.9. The staff's evaluation of the applicant's UFSAR supplement for this program follows later in this evaluation. Based on this review, the staff concludes that the applicant has adequately addressed the staff's second renewal applicant action item on BWRVIP-48-A. Therefore, this renewal applicant action item is resolved.

(3) The staff's third renewal applicant action item required that BWR applicants ensure that the inspection criteria in BWRVIP-48-A will not conflict with or result in changes to the plant's Technical Specifications (TSs). The applicant stated that its implementation of the inspection strategy in BWRVIP-48-A will not result in the need for any changes to the TS for either Unit 1 or Unit 2. The staff reviewed the TSs for Units 1 and 2 and confirms that, while the methods in BWRVIP-48-A may constitute alternative staff-approved inspection guidelines for the ASME Code Class 1 RV ID attachment welds, the TSs for Units 1 and 2 do not include any requirements to implement the ASME Code Section XI, ISI Programs requirements for the facility. The staff also confirms that the applicant's TSs center on operational-based, surveillance-based, and administrative

control-based TS requirements and that the ISI Program and requirements are implemented through the applicant's ASME Code Section XI, ISI Program, pursuant to 10 CFR 50.55a. Thus, based on this review, the staff concludes that the applicant has provided an adequate basis for concluding that its implementation of the guidelines in BWRVIP-48-A will not conflict with or result in any necessary changes in the TSs. Based on this review, the staff concludes that the applicant has adequately addressed the staff's third renewal applicant action item on BWRVIP-48-A. Therefore, this renewal applicant action item is resolved.

Based on its review, the staff finds the applicant's BWR Vessel Inside Diameter Attachment Welds Program consistent with the program elements of GALL AMP XI.M4 and therefore, is acceptable.

Operating Experience. The staff reviewed the applicant's OE basis document for safety significant OE relevant to the aging management of BWR Vessel ID attachment weld components. The staff noted that the applicant only provided an overall OE summary statement in the "operating experience" program element for BWR Vessel ID Attachment Weld Program and did not provide any examples of SSES-specific or generic OE demonstrating that the AMP accomplishes its intended objective. However, the staff noted that the license renewal program basis document for the BWR Vessel ID Attachment Welds Program did include the ISI outage summary reports for the Units 1 and 2 refueling and inspection outages (U1-13RIO and U2-11RIO, respectively). The staff confirmed that, in these outage summaries, the applicant did not identify any recordable flaw indications resulting from its augmented inspections of the RV ID attachment welds.

Based on this review, the staff confirms that the applicant has been implementing the inspections of its RV ID attachment welds in accordance with the ISI requirements of the ASME Code Section XI, as modified by the recommended augmented inspection criteria in Topical Report No. BWRVIP-48-A and approved in the staff's SE on BWRVIP-48-A, dated January 17, 2001. The staff finds that the applicant's RFOs and inspection reports (IRs) provide acceptable confirmation that currently there is no plant-specific OE for the RV ID attachment welds inspected during outages U1-13RIO and U2-11RIO.

The staff confirms that the OE program element satisfies the criterion defined in the GALL Report and the guidance found in SRP LR Section A.1.2.3.10. Therefore, the staff finds this program element acceptable.

UFSAR Supplement. The applicant provided an UFSAR supplement for its BWR Vessel ID Attachment Welds Program in LRA Section A.1.2.9 and Commitment No. 4 in Table A-1. The staff confirms that the UFSAR supplement summary description for the BWR Vessel ID Attachment Welds Program conforms to the staff's recommended UFSAR supplement for these type of programs as described in SRP-LR Table 3.1-2. The staff also confirms that in UFSAR Supplement Table A-1, the applicant committed (Commitment No. 4) to ongoing implementation of its BWR Vessel ID Attachment Welds Program for aging management of those Units 1 and 2 in-scope components that the AMP is credited for. Further, the staff confirms that the applicant has linked this commitment to UFSAR Supplement A.1.2.9 for the BWR Vessel ID Attachment Welds Program. Based on this review, the staff finds that UFSAR Supplement A.1.2.9, when coupled to LRA Commitment No. 4, provides an acceptable UFSAR supplement summary description of the applicant's BWR Vessel ID Attachment Welds Program. The staff determines that the information in the UFSAR supplement is an adequate summary description of the program, as required by 10 CFR 54.21(d).

Conclusion. On the basis of the audit and review of the applicant's BWR Vessel ID Attachment Welds Program, the staff finds all program elements consistent with the GALL Report. The staff concludes that the applicant has demonstrated that effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3). The staff also reviewed the UFSAR supplement for this AMP and concludes that it provides an adequate summary description of the program, as required by 10 CFR 54.21(d) and therefore, is acceptable.

3.0.3.1.4 BWR Feedwater Nozzle Program

Summary of Technical Information in the Application. In LRA Section B.2.5, the applicant described the BWR Feedwater Nozzle Program as an existing program that is consistent with GALL Report AMP XI.M5, "BWR Feedwater Nozzle." The applicant stated that this program includes enhanced ISI pursuant to ASME Code Section XI, Subsection IWB, Table IWB 2500-1 and the recommendations of report GE-NE-523-A71-0594; and system modifications to mitigate cracking.

Staff Evaluation. During its audit, the staff reviewed the applicant's claim of consistency with the GALL Report. The staff also confirmed that the plant program contains all of the elements of the referenced GALL Report. The staff conducted onsite interviews with the applicant to confirm these results.

In the "acceptance criteria" program element of the program basis document, the applicant stated that it may use acceptance criteria in staff-approved BWRVIP guideline documents as an alternative to the acceptance criteria for the FW nozzles required by the ASME Code Section XI, Subsection IWB. This is a similar statement to the one provided by the applicant in LRA B.2.1, "Inservice Inspection Program."

In RAI B.2.1-2, dated June 12, 2008, the staff requested that the applicant clarify whether proposals to use alternative BWRVIP guideline criteria in lieu of ASME Code Section XI requirements would be submitted for relief.

In its response to RAI B.2.1-2, dated July 14, 2008, the applicant stated that all proposals to use staff-approved BWRVIP guideline criteria in lieu of applicable ASME Code Section XI requirements will be submitted for staff approval as part of each 10-year ISI plan, pursuant to 10 CFR 50.55a. The staff noted that the applicant clarified that the use of the ASME Code Section XI, 1998 Edition, inclusive of the 2000 Addenda, is consistent with the program description statement in GALL AMP XI.M1 because the SOC on 10 CFR Part 54 clarifies that acceptable editions of the ASME Code Section XI are those acceptable endorsed editions of the ASME Code Section XI up through the most recently endorsed edition of the Code mentioned in 10 CFR 50.55a. The staff verified that the SOC on 10 CFR Part 54 does include this clarification, and that based on this clarification, use of the ASME Code Section XI, 1998 Edition, inclusive of the 2000 Addenda, is consistent with the Code edition mentioned in the program description of GALL AMP XI.M1. Based on this review, the staff finds the applicant's crediting of the ASME Code Section XI, 1998 Edition, inclusive of the 2000 Addenda (for aging management) is consistent with the criteria in GALL AMP XI.M1. The staff evaluated the applicant's response to this RAI in SER Section 3.0.3.2.1.

Based on the review, the staff finds the applicant's BWR Feedwater Nozzle Program consistent with the program elements of GALL AMP XI.M5 and therefore, is acceptable.

Operating Experience. The staff reviewed the applicant's OE basis document for safety significant OE relevant to the aging management of FW nozzles. The staff noted that the applicant had conducted pre-service examinations of the six Unit 1 FW nozzles and inner radii and found no indications of cracking. Subsequent inspections of the Units 1 and 2 FW nozzles resulted in no recordable indications of cracking. The staff noted that the program basis document provided OE events resulting from augmented examinations that were performed on the FW nozzles during the last refueling and inspection outage for Unit 1. Specifically, the staff noted that the applicant's augmented ultrasonic testing (UT) examinations of Unit 1 FW nozzle N4A indicated the presence of eight recordable flaw indications that were dispositioned as acceptable for further service, pursuant to ASME Code Section XI, IWB-3000. However, the applicant did not cite these flaw indications as relevant OE for this AMP.

In RAI B.2.5-1, dated June 12, 2008, the staff requested that the applicant amend the "operating experience" program element for LRA Section B.2.5 to identify cracking of the Unit 1 N4A FW nozzle as relevant OE for the AMP and to explain in detail which augmented UT reinspection frequency the applicant will use in the future for the Unit 1 FW nozzle N4A.

In its response to RAI B.2.5-1, dated July 14, 2008, the applicant amended the "operating experience" program element to state that subsequent inspections of the Units 1 and 2 FW nozzles have resulted only in one recordable indication, and consistent with industry OE and corresponding staff-approved recommendations, the inspection frequency for the FW nozzles is once per 10-year interval. The applicant also provided the following OE:

> During the fourteenth Unit 1 refueling outage in March 2006, all critical regions of the six Unit 1 feedwater nozzles were ultrasonically (UT) inspected as part of the ISI Program. No recordable indications were detected in five of the six nozzles. The UT results for Nozzle N4A indicated one recordable flaw and seven other indications that were too small to characterize as flaws. The one recordable flaw was evaluated against the criteria in ASME Section XI Table IWB 3510-1. It was determined to be acceptable for continued service, since the flaw size was less than half of that allowed by IWB-3510. This flaw indication did not represent a noticeable change from the previous inspection results. Since the flaw indication is within the acceptance criterion established in ASME Section XI, no change in the inspection frequency for the N4A or any other feedwater nozzle at SSES is required by the ISI Program or ASME Section XI.
>
> During the thirteenth Unit 2 refueling outage in March 2007, all critical regions of the six Unit 2 feedwater nozzles were ultrasonically (UT) inspected as part of the ISI Program. No recordable indications were detected in any of the six nozzles.

Based on its review, the staff finds the applicant's response to RAI B.2.5-1 acceptable because the applicant has identified the flaw indications on the FW nozzle as part of its OE input, provided the inspection frequency, and provided the results of further inspections of the Unit 1 and 2 FW nozzles, which showed no recordable indications of cracking. Therefore, the staff's concern described in RAI B.2.5-1 is resolved.

The staff confirms that the OE program element satisfies the criterion defined in the GALL Report and the guidance found in SRP LR Section A.1.2.3.10. Therefore, the staff finds this program element acceptable.

UFSAR Supplement. The applicant provided the UFSAR supplement for its BWR Feedwater Nozzle Program in LRA Section A.1.2.6, Commitment No. 5. The staff reviewed this section and finds it acceptable because it is consistent with the corresponding program description in SRP-LR Table 3.1-2. The staff also confirms that the applicant has committed to ongoing implementation of its BWR Feedwater Nozzle Program for aging management of those in-scope components for which the AMP is credited. Further, the staff confirms that the applicant has linked this commitment to UFSAR Supplement Section A.1.2.6 for the BWR Feedwater Nozzle Program.

The staff notes that the description for the applicant's BWR Feedwater Nozzle Program states that the UT methodology for the augmented inspections of the FW nozzles will be implemented in accordance with the recommendations of BWR Owners Group Topical Report No. GENE-523-71-0594. In contrast, the UFSAR supplement summary description for this AMP indicates that the augmented UT inspections of the nozzles will be implemented in accordance with the recommendations in applicable BWRVIP guidelines.

In RAI B.2.5-2, dated June 12, 2008, the staff requested that the applicant clarify which UT methodology would be used in the BWR Feedwater Nozzle Program.

In its response to RAI B.2.5-2, dated July 14, 2008, the applicant stated that the BWR Feedwater Nozzle Program is a part of the ISI Program. The applicant further stated that the ISI requirements for the FW nozzles comply with ASME Code Section XI, Subsection IWB, Table 2500-1, and staff-approved BWR Owners Group Topical Report, GENE-523-A71-0594, Revision 1, which provides guidance for inspecting the FW nozzle bore region using UT methodologies. The applicant also stated that this is consistent with GALL AMP XI.M5 and that its BWR Feedwater Nozzle Program is committed to following the GENE-523-A71-0594, Revision 1 guidelines, during the period of extended operation. The applicant amended the LRA to delete the references to BWRVIP guidelines from the LRA Section B.2.5 program description and from LRA Section A.1.2.6.

Based on its review, the staff finds the applicant's response to RAI B.2.5-2 acceptable because the applicant has sufficiently clarified that its ISI Program includes the BWR FW nozzles, and the applicant has committed to following the staff-approved GENE-523-A71-0594, Rev. 1 guidelines during the period of extended operation, which makes the program consistent with GALL AMP XI.M5. Therefore, the staff's concern described in RAI B.2.5-2 is resolved.

Based on this review, the staff finds that UFSAR Supplement Section A.1.2.6, as amended, and coupled to LRA Commitment No. 5, provides an acceptable UFSAR supplement summary description of the applicant's BWR Feedwater Nozzle Program because it is consistent with the UFSAR supplement summary guidance for BWR Feedwater Nozzle Programs in the SRP-LR.

The staff determines that the information in the UFSAR supplement is an adequate summary description of the program, as required by 10 CFR 54.21(d).

Conclusion. On the basis of the review of the applicant's BWR Feedwater Nozzle Program and the applicant's response to the staff's RAIs, the staff finds all program elements consistent with the GALL Report. The staff concludes that the applicant has demonstrated that effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3). The staff also reviewed the UFSAR supplement for this AMP and concludes that, as amended, it provides an

adequate summary description of the program, as required by 10 CFR 54.21(d) and therefore, is acceptable.

3.0.3.1.5 BWR Stress Corrosion Cracking Program

Summary of Technical Information in the Application. In LRA Section B.2.7, the applicant described the BWR Stress Corrosion Cracking (SCC) Program as an existing program that is consistent with GALL AMP XI.M7, "BWR Stress Corrosion Cracking." The applicant stated that the program includes preventive measures to mitigate intergranular stress corrosion cracking (IGSCC) and inspection and flaw evaluation to monitor IGSCC and its effects. The applicant also stated that the staff-approved BWRVIP-75 report allows for modifications of inspection scope in the Generic Letter (GL) 88-01 program.

Staff Evaluation. During its audit, the staff reviewed the applicant's claim of consistency with the GALL Report. The staff also confirmed that the plant program contains all of the elements of the referenced GALL Report. The staff conducted onsite interviews with the applicant to confirm these results.

In comparing the elements in the applicant's program to those in GALL AMP XI.M7, the staff noted that the program elements in the applicant's AMP claim of consistency with the GALL Report were consistent with the corresponding program element criteria recommended in GALL AMP XI.M7, with the exception of two program element aspects identified below that the staff determined required additional clarification.

The staff noted in the program basis document that applicant's "preventive actions" program element for the BWR SCC Program indicated that two welds scheduled for stress relief had not received a post-weld heat treatment consistent with GL 88-01 and NUREG-0313 recommendations and were unacceptable for stress relief credit by the staff. The staff also noted that the applicant identified that the plant had initiated HWC control as a basis for reducing the electro-chemical potentials of the Class 1 stainless steel welds below the potential associated with the onset of SCC.

In RAI B.2.7-1, dated June 12, 2008, the staff requested that the applicant discuss whether there is any established link between the findings identified in the staff's SE on the applicant's response to GL 88-01 and the circumferential SCC induced flaw indications detected in the Unit 1 N2J recirculation outlet nozzle safe-end weld and in the Unit 1 N1B recirculation inlet nozzle safe end weld. Specifically, the staff requested that the applicant identify whether these safe-end nozzle welds were among the Class 1 stainless steel piping welds scheduled for induction heat stress relief treatments and whether the N1B and N2J nozzle safe-end welds were the same welds that had not received the recommended post-weld heat treatments as part of this stress relief process. The staff further requested that the applicant identify the dates for initiation of HWC at Units 1 and 2.

In its response to RAI B.2.7-1, dated July 14, 2008, the applicant stated:

> The discussion in the license renewal basis document for the "preventive actions" program element for the BWR Stress Corrosion Cracking Program incorrectly stated that there are "two SI-treated welds that were not given post-weld heat treatment." The correct statement is that there are "two SI-treated welds that were not completely ultrasonically examined post-SI."

The two welds in question are identified in the PPL letter to the NRC, PLA-3263, dated October 2, 1989, as DCA1081-FW-5 and DCA1102-FW-6. These welds are piping welds on the Unit 1 Residual Heat Removal System, not the SSES Unit 1 N1B and N2J recirculation nozzle-safe end welds. And, these piping welds did, in fact, have the Induction Heating Stress Improvement Process (IHSI) performed within two years of commercial operation, consistent with the NRC Generic Letter (GL) 88-01/NUREG-0313 recommendations. However, the post-IHSI ultrasonic examination (UT) of the welds could not be performed, as required by NUREG-0313, due to the weld configuration. In PLA-3263, PPL classified these two welds as IGSCC Category G and committed to inspect the welds during the next refueling outage. In the NRC's SE on the SSES response to GL 88-01, it was the classification of these two welds as IGSCC Category G that the NRC found to be unacceptable. Subsequently, PPL inspected these welds during the Unit 1 [fifth] refueling outage in 1990, and the welds are now classified as IGSCC Category B. The Unit 1 N1B and N2J nozzle-safe end welds did not have IHSI within two years of commercial operation. As these are dissimilar metal welds, IHSI is not an appropriate stress improvement method. Instead, these welds had the Mechanical Stress Improvement Process (MSIP) applied after approximately ten years of commercial operation. There is no link between the findings identified in the NRC's SE on the PPL response to GL 88-01 and the flaw indications detected in the Unit 1 N1B and N2J recirculation nozzle safe-end welds.

The staff reviewed the applicant's response and determines that the two welds in question were on the RHR system and that those welds did receive the post-weld heat treatment. The staff further determines that the applicant's recirculation nozzle safe-end welds also received the post-weld heat treatment.

Based on its review, the staff finds the applicant's response to RAI B.2.7-1 acceptable because the applicant has adequately clarified that the welds in question have been post-weld heat treated, consistent with the GL 88-01 and NUREG-0313 recommendations, and have been appropriately classified and inspected. Therefore, the staff's concerns described in RAI B.2.7-1 are resolved.

The staff noted that staff-approved guidelines in BWRVIP Topical Report BWRVIP-75A provide the latest recommendations for augmented SCC ISIs. However, the staff noted that the applicant had only credited the BWRVIP-75A criteria for expansion of the sample size upon detection of a relevant SCC-induced flaw indication and that the applicant continued to use the recommended augmented ISI criteria in GL 88-01 and NUREG-0313 to perform the augmented ISI examinations (i.e., augmented UT examinations) of these stainless steel Class 1 pipe welds.

In RAI B.2.7-2, dated June 12, 2008, the staff requested that the applicant clarify whether the updated staff-approved guidelines in Topical Report BWRVIP-75A would be used as an option for performing other aspects of the augmented ISI Program for these ASME Code Class 1 stainless steel pipe welds; and whether the flaw acceptance criteria in staff-approved Topical Report BWRVIP-75A or Topical Report BWRVIP-14 will be used for the acceptance criteria of any crack indications that might be detected in these ASME Code Class I stainless steel pipe welds.

In its response to RAI B.2.7-2, dated July 14, 2008, the applicant stated that it does not use BWRVIP-75-A for flaw acceptance criteria, since the report contains no flaw acceptance criteria guidance. The applicant further stated that:

> ...flaw evaluation and acceptance criteria are in accordance with the ASME Code, Section XI, IWB-3640, as specified in NUREG-0313, Revision 2. PPL is committed to follow all requirements of NUREG-0313, Revision 2, except for the inspection criteria and schedule. The NRC-approved BWRVIP-14 addresses crack growth evaluation of flawed BWR shroud welds and other stainless steel internals. As part of the ASME Code flaw evaluation, a crack growth analysis is required. While PPL may use certain data and evaluation methods from BWRVIP-14 in a crack growth analysis, the evaluation and acceptance criteria will be in accordance with the ASME Code, Section XI, IWB-3640.

The staff reviewed BWRVIP-75-A, which provides the criteria and inspection schedule for different categories of welds. Because BWRVIP-75-A does not contain flaw acceptance criteria, the staff finds it acceptable to use ASME Code, Section XI, IWB-3640 for flaw evaluation and acceptance criteria, which includes the requirement of crack growth analysis because the components within the scope of this AMP are ASME Code Class 1 components. The ASME Code Section XI provides the necessary information to perform the crack growth analysis, which could be further supplemented by certain data and evaluation methods from BWRVIP-14.

Based on its review, the staff finds the applicant's response to RAI B.2.7-2 acceptable because the applicant has adequately explained why its does not use the BWRVIP-75-A as a basis for flaw acceptance, but, rather, ASME Code, Section XI, IWB-3640. Therefore, the staff's concern described in RAI B.2.7-2 is resolved.

Based on its review, the staff finds the applicant's BWR Stress Corrosion Cracking Program consistent with the program elements of GALL AMP XI.M7 and therefore, is acceptable.

Operating Experience. The staff reviewed the applicant's OE described in the license renewal basis document for the BWR Stress Corrosion Cracking Program. The staff confirmed that the applicant appropriately identified the circumferential crack indications in the Unit 1 N2J recirculation nozzle outlet safe-end weld and the Unit 1 N1B recirculation inlet nozzle safe-end weld as relevant OE for this AMP. The staff also confirmed that the applicant implemented the inspections of these stainless steel welds through an augmentation of its ISI Program and that the applicant provided the condition reports (CRs) on these events in the license renewal basis binder for the AMP.

The staff noted that the applicant also listed a CR on flaw indications in 12 small-bore Class 1 piping components as relevant OE for this AMP. The staff reviewed these CRs as part of its onsite review of the AMP. The staff determined that the CRs demonstrated that the detection of these flaw indications were the result of the non-destructive test examinations implemented through an augmentation of the applicant's ISI Program, and that the CRs indicated that the applicant had performed appropriate Code repairs of the flaw indications in the small bore nozzle welds. Based on this review, the staff found that the applicant had taken appropriate actions to address these small bore Class 1 pipe flaw indications.

Based on this review, the staff finds that: (1) the listing of relevant OE for this AMP demonstrates that the applicant's BWR Stress Corrosion Cracking Program, as implemented through an augmentation of the applicant's ISI Program, achieves its objective of

detecting relevant flaw indications (cracks) that may be induced by SCC, and (2) the applicant is taking appropriate corrective actions for recordable flaw indications detected through implementation of this program.

The staff confirms that the OE program element satisfies the criterion defined in the GALL Report and the guidance found in SRP LR Section A.1.2.3.10. Therefore, the staff finds this program element acceptable.

UFSAR Supplement. The applicant provided the UFSAR supplement for the BWR Stress Corrosion Cracking Program in LRA Section A.1.2.8, Commitment No. 7. The staff reviewed this section and finds it acceptable because it is consistent with the corresponding program description in SRP-LR Table 3.1-2. The staff also confirms that the applicant has committed (Commitment No. 7) in UFSAR Supplement Table A-1, to ongoing implementation of its BWR Stress Corrosion Cracking Program for aging management of those in-scope components for which the AMP is credited.

Based on this review, the staff finds that the UFSAR supplement summary description, when coupled with Commitment No. 7, provides an acceptable description of the applicant's BWR Stress Corrosion Cracking Program because it is consistent with UFSAR supplement summary description for Stress Corrosion Cracking Programs found in the SRP-LR.

The staff determines that the information in the UFSAR supplement is an adequate summary description of the program, as required by 10 CFR 54.21(d).

Conclusion. On the basis of its review of the applicant's BWR Stress Corrosion Cracking Program and its responses to the staff's RAIs, the staff finds all program elements consistent with the GALL Report. The staff concludes that the applicant has demonstrated that effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3). The staff also reviewed the UFSAR supplement for this AMP and concludes that it provides an adequate summary description of the program, as required by 10 CFR 54.21(d) and therefore, is acceptable.

3.0.3.1.6 Thermal Aging and Neutron Embrittlement of Cast Austenitic Stainless Steel (CASS) Program

Summary of Technical Information in the Application. In LRA Section B.2.10, the applicant described the Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS) Program as a new program that will be consistent with the program elements in GALL AMP XI.M13, "Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel." The applicant stated that the program is credited to manage loss of fracture toughness in RV internal components that are fabricated from CASS.

Staff Evaluation. During the audit, the staff reviewed the applicant's claim of consistency with the GALL Report. The staff also confirmed that the plant program contains all of the elements of the referenced GALL Report. The staff conducted onsite interviews with the applicant to confirm these results.

In comparing the elements in the applicant's program to those in GALL AMP XI.M13, the staff noted that the program elements in the applicant's AMP claim of consistency with the GALL Report were consistent with the corresponding program element criteria recommended in GALL

AMP XI.M13, with the exception of five program elements aspects identified below that the staff determined required additional clarification.

The "scope of program" program element for the Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel Program, states that the CASS RV internal components will be screened for their susceptibility to loss of fracture toughness by thermal aging embrittlement and neutron irradiation embrittlement. However, the program element does not establish which staff-approved guideline(s) or basis document(s) will be used to screen the CASS RV internal components for susceptibility to these aging phenomena. Furthermore, the staff noted an inconsistency between the applicant's "scope of program" and the "parameters monitored/inspected" program element descriptions in the license renewal basis document for the AMP. The staff noted that the applicant did not identify and distinguish between the specific parameter criteria used to screen the CASS RV internal components for reduction of fracture toughness by thermal aging embrittlement and by neutron irradiation embrittlement.

In RAI B.2.10-1, dated June 12, 2008, the staff requested (part A) that the applicant clarify which staff-approved guidance or basis document it will use for susceptibility screening for loss of fracture toughness by thermal aging embrittlement and neutron irradiation embrittlement. The staff also requested (part B) that the applicant explain the discrepancy between the "scope of program" and the "parameters monitored/inspected" program elements for specific parameters used for susceptibility screening.

In its response to RAI B.2.10-1, part A, dated July 14, 2008, the applicant amended the LRA and revised the "scope of program" element to delete the specific parameters identified and instead added the staff-approved guideline that will be used for screening. The following statement was added to LRA Section B.2.10:

> Screening for thermal aging will be based on casting method, molybdenum content, and ferrite content, in accordance with the criteria found in the May 19, 2000, letter from Christopher Grimes (NRC) to D. J. Walters (NEI), "Thermal Aging Embrittlement of Cast Austenitic Steel Components," and in EPRI Technical Report 100976, "Evaluation of Thermal Aging Embrittlement for Cast Austenitic Steel Components," January 2001. Screening for neutron embrittlement will use the fluence threshold of $1E+17$ n/cm^2 (E>1Mev).

Similarly, in response to RAI B.2.10-1 part B, the applicant deleted the specific parameters from the "parameters monitored/inspected" element and instead added the following statement to LRA Section B.2.10:

> Those components screened as susceptible to Reduction of Fracture Toughness (either due to thermal aging or neutron embrittlement) will require inspection unless it is determined by component-specific evaluations that inspection is not required. The component specific evaluation will include a mechanical loading assessment to determine the maximum tensile loading on the component. If the loading is low enough to preclude fracture, then supplemental inspection of the component is not required.

Based on its review, the staff finds the applicant's response to RAI B.2.10-1 acceptable because the applicant has correctly identified the staff-approved document it will use for susceptibility screening, and has amended the "parameters monitored/inspected" program element in the LRA that identifies how susceptible components will be inspected. The staff

determines that this action provides assurance that the applicant's program is consistent with GALL AMP XI.M13. Therefore, the staff's concern described in RAI B.2.10-1 is resolved.

The staff noted in the program basis document that the "detection of aging effects" program element indicates that the applicant may use UT as one of the inspection techniques to detect cracking in these CASS components. However, the current state-of-the-art UT inspection methods have not yet been qualified as being capable of detecting cracks in CASS materials.

In RAI B.2.10-2, dated June 12, 2008, the staff requested (part A) that the applicant clarify whether the state-of-the-art UT techniques are capable of detecting cracks in CASS materials, and; if not, verify the alternate inspection technique or method that will be implemented to monitor for cracking, if condition monitoring was chosen as the process for aging management of fracture toughness. The staff also requested (part B) that the applicant justify the basis for the "detection of aging effects" or "monitoring or trending" program elements for the AMP not crediting a supplemental flaw tolerance analysis as an alternative for managing reduction of fracture toughness in these CASS RV internal components.

In its response to RAI B.2.10-2, part A, dated July 14, 2008, the applicant acknowledged that it was not aware of any staff-approved UT techniques for detecting cracking in CASS components. The applicant stated that the statements made in the LRA were intended to preserve the option to include new examination techniques, such as UT, only if they are developed and approved in the future. The applicant further stated that at present, the enhanced visual examination (EVT-1) is the only staff-approved inspection technique, as recommended by GALL AMP XI.M13. The staff confirms that the applicant has revised the "detection of aging effects" program element to delete the phrase "including visual, ultrasonic, and surface techniques," and replaced it with "enhanced visual."

In response to part B, the applicant stated that it did not credit a supplemental flaw tolerance evaluation because the CASS RV internals covered by this program are not reactor coolant pressure boundary (RCPB) components; consequently, a classic critical flaw size analysis is not directly applicable. Once the susceptible components are identified, the applicant may perform a component-specific evaluation as discussed in the "detection of aging effects" program element in GALL AMP XI.M13. The staff confirms that the applicant has amended the LRA to include a statement in the "detection of aging effects" program element that for those components screened as susceptible to reduction of fracture toughness that a component-specific evaluation may be performed to determine whether supplemental inspection of the component is required, as discussed under the "parameters monitored or inspected" program element.

Based on its review, the staff finds the applicant's response to RAI B.2.10-2 acceptable because the applicant has adequately justified an alternate basis for managing the aging effects by performing component-specific evaluation supplemental evaluation when required. Additionally, the staff finds the applicant's response acceptable because the applicant has confirmed that it will perform enhanced visual technique examinations, by qualified personnel, consistent with the recommendations provided in the GALL Report, following procedures pursuant to ASME Code Section XI and 10 CFR Part 50, Appendix B. The staff determines that the applicant will employ these alternate methods, if, based on screening, the material is deemed susceptible and the aging effect is managed by inspection of the component. Therefore, the staff's concerns described in RAI B.2.10-2 are resolved.

The staff noted that the BWRVIP in the "scope of program" program element states (in part) that the program is credited for limited management of loss of material and reduction of fracture toughness in the RV internal components at SSES.

In RAI B.2.10-3, dated June 12, 2008, the staff requested that the applicant clarify whether it is crediting the BWRVIP as a option for managing reduction of fracture toughness in CASS RV internal components and; if so, identify the BWRVIP as an exception to the CASS Program, identify the staff-approved BWRVIP-based guideline reports that will be credited and used, and revise the UFSAR supplement, accordingly.

In its response to RAI B.2.10-3, dated July 14, 2008, the applicant clarified that as shown in LRA Table 3.1.2-2, the BWRVIP is credited for managing reduction of fracture toughness for components made of either stainless steel (non-cast) or nickel-based alloy. The applicant also stated that the BWRVIP is not credited for managing reduction of fracture toughness for any CASS RV internal components. The applicant further stated that as shown in LRA Table 3.1.2-2, the Thermal Aging and Neutron Embrittlement of Cast Austenitic Stainless Steel (CASS) Program is credited for managing reduction of fracture toughness for all CASS RV internals and therefore, there is no exception to GALL AMP XI.M13.

The staff reviewed LRA Table 3.1.2-2 for CASS components and noted that applicant has credited the Thermal Aging and Neutron Embrittlement of Cast Austenitic Stainless Steel (CASS) Program to manage the aging effect of reduction of fracture toughness for all CASS RV internal components. The staff also confirmed that the non-CASS internal components are managed by the BWRVIP.

Based on its review, the staff finds the applicant's response to RAI B.2.10-3 acceptable because the applicant has adequately clarified that the BWRVIP is credited for managing reduction of fracture toughness for components made of either stainless steel (non-cast) or nickel-based alloy, only. Therefore, the staff's concern described in RAI B.2.10-3 is resolved.

Based on its review, the staff finds the applicant's Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel Program consistent with the program elements of GALL AMP XI.M13 and therefore, is acceptable.

Operating Experience. The staff reviewed the applicant's OE described in the license renewal basis document for the Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel Program. The applicant has identified the Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS) Program as a new program for Units 1 and 2, and did not report any OE events on reduction of fracture toughness in CASS RV internal components as being relevant to the "operating experience" program element for the AMP. However, for this program, and for other new AMPs where the applicant provided no current plant-specific OE, the staff issued a generic RAI.

In RAI B.2-1, dated June 10, 2008, the staff requested that the applicant commit to provide documentation of plant-specific OE for staff review after the program has been implemented, but, prior to entering the period of extended operation.

In its response to RAI B.2.1, dated July 8, 2008, the applicant stated that OE will be gained for new AMPs described in LRA Appendix B as these programs are implemented during the period of extended operation. The applicant stated that results of tests, inspections, and other aging management activities conducted in accordance with these programs will be subject to

confirmation and corrective action elements of the Susquehanna 10 CFR Part 50, Appendix B, Quality Assurance Program. Results will be subject to staff review during regional inspections, under existing staff inspection modules. Test and inspection results that do not meet acceptance criteria will be evaluated under the Units 1 and 2 Corrective Action Program, which includes requirements to identify appropriate corrective actions and verify the effectiveness of those actions. Items entered into the SSES Corrective Action Program are available for review by the NRC Resident Inspector.

The staff noted the applicant's statement that inspection methods will be consistent with industry practices and are consistent with the "operating experience" program element for GALL AMP XI.M13. The staff also noted that regional staff site-inspections provide an opportunity for staff review and assessment of the effectiveness of the applicant's Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel Program, after the applicant has developed OE with that program. The staff concludes that the corrective action program, based on internal and external plant OE, will capture OE to support the conclusion that the effects of aging are adequately managed. On this basis, the staff finds this program element acceptable and concludes that a separate commitment is not necessary.

The staff confirms that the OE program element satisfies the criterion defined in the GALL Report and the guidance found in SRP-LR Section A.1.2.3.10. Therefore, the staff finds this program element acceptable.

UFSAR Supplement. The applicant provided the UFSAR supplement summary for the Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel Program in LRA Section A.1.2.48 and Commitment No. 10 in Table A-1. The staff reviewed this section and finds it acceptable because it is consistent with the corresponding program description in SRP-LR Table 3.1-2. The staff also confirms that the applicant has committed to implement the new Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel Program prior to entering the period of extended operation.

Based on this review, the staff finds that UFSAR Supplement Section A.1.2.48, when coupled with Commitment No. 10, provides an acceptable UFSAR supplement summary description of the applicant's Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel Program because it is consistent with the guidance in the SRP-LR for Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel Programs.

The staff determines that the information in the UFSAR supplement is an adequate summary description of the program, as required by 10 CFR 54.21(d).

Conclusion. On the basis of its review of the applicant's Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel Program and the applicant's response to the staff's RAIs, the staff finds all program elements consistent with the GALL Report. The staff concludes that the applicant has demonstrated that effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3). The staff also reviewed the UFSAR supplement for this AMP and concludes that it provides an adequate summary description of the program, as required by 10 CFR 54.21(d) and, therefore, is acceptable.

3.0.3.1.7 Flow-Accelerated Corrosion Program

Summary of Technical Information in the Application. In LRA Section B.2.11, the applicant described the Flow-Accelerated Corrosion (FAC) Program as an existing program that is consistent with the GALL Report AMP XI.M17, "Flow-Accelerated Corrosion." The applicant stated that this program follows the guidance and recommendations of EPRI Nuclear Safety Analysis Center (NSAC)-202L and combines the elements of predictive analysis, inspections (to baseline and monitor wall thinning), industry experience, station information gathering and communication, and engineering judgment to monitor and predict FAC wear rates.

Staff Evaluation. During its audit the staff reviewed the applicant's claim of consistency with the GALL Report. The staff also confirmed that the plant program contains all of the elements of the referenced GALL Report. The staff conducted onsite interviews with the applicant to confirm these results.

The staff reviewed the applicant's license renewal basis document and confirmed that the program scope includes the systems and components that could be affected by FAC. In comparing the elements in the applicant's program to those in GALL AMP XI.M17, the staff noted that the program elements in the applicant's AMP claiming consistency with the GALL Report were consistent with the corresponding program element criteria recommended in GALL AMP XI.M17, with the exception of two program element aspects identified below that the staff determined required additional clarification.

In the "scope of program" program element, the applicant identified the systems and components within the scope of this program. However, the staff noted that the carbon steel condensers (shell) from LRA Table 3.4.2-4, the condenser and air removal system; the carbon steel turbine casings from LRA Table 3.4.2-7, and the main turbine system were not included in the program element, "scope of the program." The staff further noted that the FAC Program is credited to manage the aging effect for both of these components in LRA Table 3.4.2-4 and 3.4.2-7.

In RAI B.2.11-1, dated May 30, 2008, the staff requested that the applicant confirm that these components are included in the scope of the existing FAC Program and; if not, justify why LRA Section B.2.11 is not enhanced to include these components.

In its response to RAI B.2.11-1, dated June 30, 2008, the applicant stated that the condenser and air removal system and the main turbine system are included in the scope of license renewal because they are non-related safety systems impacting safety-related systems. The condenser shell was credited as the anchor for the safety-related piping and provided a structural integrity function. However, the applicant stated that another anchor has been identified for this pipe line before it reaches the condenser. The staff determined that with the elimination of the structural integrity function, there are no aging effects that require management for the condenser shell, and the FAC Program need not be credited. Therefore, the applicant revised LRA Tables 2.3.4-4, 3.4.1, and 3.4.2-4 to remove the condenser shell from the scope of license renewal.

The applicant stated the main turbine continues to be credited for structural integrity. However, since the main turbine is not within the scope of the current FAC Program, the applicant proposes to use a plant-specific program to manage loss of material due to FAC for the HP turbine. The "Preventive Maintenance Activities – Main Turbine Casing Program" is an existing

plant-specific program proposed by the applicant. The staff's evaluation of this program is documented in SER Section 3.0.3.3.4.

The staff reviewed the applicant's response and concludes that because the applicant proposes a plant-specific program to manage the aging effect of loss of material due to FAC, the staff finds it acceptable that the applicant does not include the main turbine casing in the scope of the FAC Program.

Based on its review, the staff finds the applicant's response to RAI B.2.11-1 acceptable because the applicant has verified and the staff confirms that the condenser shell is no longer used for structural integrity to support a safety-related system and as a result, need not be within the scope of license renewal. The staff also confirms that the applicant has revised the appropriate LRA tables to remove the condenser shell from the scope of license renewal. Therefore, the staff's concern described in RAI B.2.11-1 is resolved.

In the "monitoring and trending" program element, it was not clear to the staff what criterion the applicant used to increase sample size. GALL AMP XI.M17 states that inspection results are evaluated to determine whether additional inspections are needed to assure that the extent of wall thinning is adequately determined.

In RAI B.2.11-2, dated May 30, 2008, the staff requested that the applicant explain how it expands sample size and what acceptance criterion is used for sample expansion.

In its response to RAI B.2.11-2, dated June 30, 2008, the applicant stated that the FAC Program procedure requires an inspection sample expansion "if the remaining life of an inspected component cannot be calculated to be at least one operating cycle." The applicant further stated that the remaining life calculation is based on the measured component wall thickness and the calculated wear rate. The applicant also stated that this procedure provides additional guidance when the remaining life is adequate for another operating cycle, but inspection results are other than what was expected. The applicant indicated that expanded sample inspections are specified to capture locations with the highest probability of significant wear. The applicant noted that this guidance is consistent with EPRI NSAC-202L, and requires an updated FAC analysis and additional inspections, as appropriate, if inspection results are unexpected and inconsistent with predictions.

Based on its review, the staff finds the applicant's response to RAI B.2.11-2 acceptable because the applicant has adequately explained how it expands sample size and what acceptance criterion is used for sample expansion.

The staff concludes that because this guidance ensures that if unexpected results occur, a review of the systems is performed, and sample expansion is considered to capture the locations with the highest probability of significant wear. Therefore, the staff's concern described in RAI B.2.11-2 is resolved.

Based on its review, the staff finds the applicant's FAC Program consistent with the program elements of GALL AMP XI.M17 and therefore is acceptable.

Operating Experience. The staff reviewed the applicant's OE described in LRA Section B.2.11 and interviewed the applicant's technical personnel to confirm that the plant-specific OE did not reveal any aging effects not bounded by the GALL Report. The staff also confirmed that

applicable aging effects and industry and plant-specific OE have been reviewed by the applicant and are evaluated in the GALL Report.

The staff also reviewed the applicant's "operating experience" discussion provided in the applicant's license renewal basis document for the FAC Program. The staff reviewed a sample of condition reports and confirmed that the applicant has identified FAC and implemented appropriate corrective actions. The staff noted that in the last Unit 1 and Unit 2 outages, over 120 locations in each unit were inspected and eleven additional examinations in each unit were performed as expanded scope. The applicant identified planned replacements and performed emergent replacements. The staff reviewed the results of the outages for Units 1 and 2 and confirmed that appropriate corrective actions were implemented.

Furthermore, the staff confirmed that the applicant has addressed OE identified after the issuance of the GALL Report. The staff finds that the applicant's FAC Program, with the corrective actions discussed in the LRA, has been effective in identifying, monitoring, and correcting the effects of FAC and can be expected to ensure that piping wall thickness will be maintained above the minimum required by design.

The staff confirms that the OE program element satisfies the criterion described in the GALL Report and the guidance found in SRP-LR Section A.1.2.3.10. Therefore, the staff finds this program element acceptable.

UFSAR Supplement. The applicant provided the UFSAR supplement for the FAC Program in LRA Section A1.2.20 and Commitment No. 11 in Table A-1. The staff reviewed this section and finds it acceptable because it is consistent with the corresponding program description in SRP-LR Table 3.4-2. The staff confirms that the applicant has committed to implement the FAC Program through the period of extended operation.

Based on this review, the staff determines that UFSAR Supplement Section A1.2.20 provides an acceptable UFSAR supplement summary description of the applicant's FAC Program because it is consistent with the UFSAR supplement summary description for FAC Program in the SRP-LR.

The staff determines that the information in the UFSAR supplement is an adequate summary description of the program, as required by 10 CFR 54.21(d).

Conclusion. On the basis of its review of the applicant's FAC Program and the applicant's response to the staff's RAIs, the staff finds all program elements consistent with the GALL Report. The staff concludes that the applicant has demonstrated that the effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3). The staff also reviewed the UFSAR supplement for this AMP and concludes that it provides an adequate summary description of the program, as required by 10 CFR 54.21(d) and therefore is acceptable.

3.0.3.1.8 Crane Inspection Program

Summary of Technical Information in the Application. In LRA Section B.2.15, the applicant described the existing Crane Inspection Program as consistent with GALL AMP XI.M23, "Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems." The Crane Inspection Program manages the effects of general corrosion on the crane and

trolley structural components for those cranes that are within the scope of 10 CFR 54.4, and the effects of wear on the rails in the rail system. The program utilizes guidance found in American National Standards Institute (ANSI) B30.2 "Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist)," ANSI B30.11 "Monorails and Underhung Cranes," and ANSI B30.16 "Overhead Hoists (Underhung)."

Staff Evaluation. During its audit, the staff reviewed the applicant's claim of consistency with the GALL Report. The staff confirmed that the plant program contains all of the elements of the referenced GALL Report. The staff conducted onsite interviews with the applicant to confirm these results.

In RAI B.2.15-1, dated June 30, 2008, the staff requested that the applicant explain the scope of its Crane Inspection Program. In comparing the elements in the applicant's program to those in GALL AMP XI.M23, the staff found that the applicant did not explicitly identify "the effects of wear on the rails in the rail system" in their basis document for the program element, "scope of program." It was unclear to the staff whether this item should have been identified as an exception.

In its response to RAI B.2.15-1, dated July 28, 2008, the applicant stated that although "the effects of wear on the rails in the rail system" was not explicitly identified in the program basis documents, it is indeed an aging effect which is managed by the Crane Inspection Program. The staff confirms that the applicant has revised LRA Section B.2.15 to clarify the intent of the program to specifically include wear of the crane rails.

Based on its review, the staff finds the applicant's response to RAI B.2.15-1 acceptable because the applicant has clarified that "the effects of wear on the rails in the rail system" is an aging effect which is managed by the Crane Inspection Program and has revised the LRA to clarify the intent of this AMP. Therefore, the staff's concern described in RAI B.2.15-1 is resolved.

Similarly, the staff found that the applicant did not explicitly identify "wear" in its basis document for the GALL report program element, "acceptance criteria." It is unclear to the staff whether this item should have been identified as an exception.

In RAI B.2.15-2, dated June 30, 2008, the staff requested that the applicant further explain the scope its Crane Inspection Program.

In its response to RAI B.2.15-2, dated July 28, 2008, the applicant stated that although wear of the crane rails was not explicitly identified in the GALL Report acceptance criteria program element, it is indeed an aging effect which is managed by the Crane Inspection Program. The staff confirms that the applicant has also revised LRA Section B.2.15, Crane Inspection Program to clarify the intent of the program to specifically include wear of the crane rails.

Based on its review, the staff finds the applicant's response to RAI B.2.15-2 acceptable because the applicant has clarified that "wear" is an aging effect which is managed by the SSES Crane Inspection Program and has revised the LRA to clarify the intent of this AMP. Therefore, the staff's concern described in RAI B.2.15-2 is resolved.

On the basis of its onsite review and discussions with the applicant, the staff determined that the applicant's Crane Inspection Program is implemented through SSES's procedures based on staff-approved guidance. Inspections to detect degradation are visual in nature, and are

conducted on a routine basis, which include annual inspections for the reactor building crane and refueling platform, and bi-annual inspections for the diesel generator bridge cranes. In addition, the staff noted, through review of station procedures, that some more infrequently used cranes are inspected either every two years or prior to use.

In comparing the seven program elements in the applicant's program, the staff finds that the applicant has addressed the elements in a satisfactory manner. Furthermore, the staff finds that these elements were consistent with GALL AMP XI.M23.

Operating Experience. The staff also reviewed the applicant's OE described in LRA Section B.2.15. The applicant stated that "Related crane/hoist inspections have found no age-related degradation problems." Through the review of OE reports, including a sample of condition reports and interviews of the applicant's technical staff, the staff confirmed that the plant-specific OE did not reveal any degradation not bounded by industry experience. During an onsite audit review of plant-specific documentation, the staff found that in 2007, a crack was detected in a structural load-bearing weld. This incident was not reported in the LRA OE summary. The staff determined more information was needed to assess the severity of the incident.

In RAI B.2.15-3, dated June 30, 2008, the staff requested that the applicant provide a detailed explanation on the 2007 crane incident.

In its response to RAI B.2.15-3, dated July 28, 2008, the applicant stated that follow up corrective actions were completed in a timely manner to adequately address the issue. These actions included inspection of the weld, an engineering evaluation, consultation with the crane vendor's engineer, repair of the weld, load testing, and finally a re-inspection. The applicant returned the crane to service after it had determined that all tests were satisfactory. The staff determined that the crack in a structural load-bearing weld is OE already bounded by industry experience, and was properly addressed by the applicant's AMP.

Based on its review, the staff finds the applicant's response to RAI B.2.15-3 acceptable because the applicant has provided a satisfactory explanation of the incident involving a crack detected in a structural load-bearing weld and the corrective actions taken to address the issue. Therefore, the staff's concern described in RAI B.2.15-3 is resolved.

The staff confirms that the "operating experience" program element satisfies the criterion defined in the GALL Report and the guidance found in SRP-LR A.1.2.3.10. Therefore, the staff finds this program element acceptable.

UFSAR Supplement. The applicant provided the UFSAR supplement for the Crane Inspection Program in LRA section A.1.2.17 and Commitment No. 14 in TableA-1. The staff reviewed this section and finds it acceptable because it is consistent with the corresponding program description in SRP-LR Table 3.3-2.

The staff determines that the information in the UFSAR supplement is an adequate summary description of the program, as required by 10 CFR 54.21(d).

The staff confirmed that the applicant has committed to the ongoing implementation of the Crane Inspection Program for aging management of those in-scope components for which the AMP is credited. The staff also confirmed that the applicant has placed this commitment for the Crane Inspection Program in UFSAR Supplement Summary Section A.1.2.17.

Conclusion. On the basis of its review of the applicant's Crane Inspection Aging Management Program, as well as the applicant's RAI responses, the staff finds all program elements consistent with the GALL Report. The staff concludes that the applicant has demonstrated that effects of aging on crane and trolley structural components for those cranes within the scope of 10 CFR 54.4, and the effects of wear on the rails in the rail system will be adequately managed so that the intended functions of these components will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3). The staff also reviewed the UFSAR supplement for this AMP and concludes that it provides an adequate summary description of the program, as required by 10 CFR 54.21(d) and therefore is acceptable.

3.0.3.1.9 Condensate and Refueling Water Storage Tanks Inspection Program

Summary of Technical Information in the Application. In LRA B.2.19, the applicant described the Condensate and Refueling Water Storage Inspections Program as a new one-time inspection that, in conjunction with the Systems Walkdown Program, will be consistent with the GALL AMP XI.M29, "Aboveground Steel Tanks."

The applicant stated that this program, in conjunction with the Systems Walkdown Program, includes the inspection of the condensate storage tank (CST) and refueling water storage tank (RWST) inaccessible surfaces (i.e. tank bottoms) and accessible external surfaces. Furthermore, the applicant stated that this program includes volumetric and/or visual inspections that will be used to provide an indication of loss of material due to crevice, general or pitting corrosion that has occurred or may likely occur.

Staff Evaluation. During its audit, the staff reviewed the applicant's claim of consistency with the GALL Report. The staff reviewed the applicant's AMP evaluation for the Condensate and Refueling Water Storage Tanks Inspection Program, together with the applicant's program basis documents. The applicant claims that the Condensate and Refueling Water Storage Tanks Inspection Program, in conjunction with the Systems Walkdown Program, will be consistent with GALL AMP XI.M29.

In comparing the seven program elements in the applicant's program to those in GALL AMP XI.M29, the staff noted that the applicant claimed that the program elements in the applicant's AMP were consistent with the GALL Report. However the staff required additional information to complete its review of two program elements; "scope of program" and "acceptance criteria."

The staff further noted that, based on GALL AMP XI.M29, paints, coatings, sealants and caulking are to be monitored for degradation. In the Condensate and Refueling Water Storage Tanks Inspection Program, the applicant stated that these materials will be monitored under the Systems Walkdown Program. Upon review of the Systems Walkdown Program basis documents, the staff noted that these materials were not included in the scope of program for this AMP.

In RAI B.2.19-1, dated June 13, 2008, the staff requested that the applicant explain the basis for not scoping in paints, coatings, sealants and caulking as materials that should be monitored for degradation, in either the Condensate and Refueling Water Storage Tanks Inspection Program or the Systems Walkdown Program. The staff also requested that the applicant

explain the method in which the applicant will visually inspect these materials under the Systems Walkdown Program.

The staff noted in the applicant's response to RAI B.2.19-1, dated July 24, 2008, that the applicant has taken an exception to GALL XI.M29 for the "scope of program," "preventative actions," "parameters monitored or inspected," "detection of aging effects," and "acceptance criteria" program elements. The staff evaluation of this exception follows.

Based on GALL AMP XI.29, the staff determined that corrective actions are initiated upon the detection of any degradation of paints, coatings, sealants and caulking. However, the staff noted that in the applicant's Condensate and Refueling Water Storage Tanks Inspection Program and the Systems Walkdown Program, the corresponding program element "acceptance criteria" states that there shall be no unacceptable loss of material.

In RAI B.2.19-2, dated June 13, 2008, the staff requested that the applicant explain the discrepancy between the GALL AMP XI.M29 and the applicant's Condensate and Refueling Water Storage Tanks Inspection Program and the Systems Walkdown Program and; justify its basis for taking actions only upon the detection of an unacceptable loss of material. Additionally, the staff requested that the applicant explain why the program element for the Condensate and Refueling Water Storage Tanks Inspection Program and Systems Walkdown Program differs from GALL AMP XI.M29.

In its response to RAI B.2.19-2, dated July 24, 2008, the applicant stated that it has clarified and amended LRA Section B.2.19 to state that any indications of loss of material detected during the inspection of the tank bottoms will be reported and evaluated. The staff confirmed that the applicant has amended LRA Section B.2.19 to state that the results of the volumetric test performed on the tank bottom will be evaluated against the design thickness, and any indication of loss of material will be reported through the corrective actions process and then evaluated against the design corrosion allowance. The staff also confirmed that the applicant had amended LRA Section B.2.19 to state that indications of corrosion on the accessible external surface of the tanks will be reported and will require further evaluation.

Based on its review, the staff finds the applicant's response acceptable because the applicant has amended LRA Section B.2.19 to state that any indication of degradation on the tanks bottoms and corrosion on the accessible external surfaces will be reported and evaluated, consistent with recommendations in GALL AMP XI.M29. Therefore, the staff's concerns described in RAI B.2.19-2 are resolved.

Exception 1. Based on the applicant's response to RAI B.2.19-1, the following exception was taken which affects the "scope of program," "preventative actions," "parameters monitored or inspected," "detection of aging effects," and "acceptance criteria" program elements:

> Coatings of the tanks surfaces are not credited for preventing corrosion. The coatings do not perform an intended function for license renewal, aging management is not required, and degradation is not reported.
>
> Sealant at the interface between the tanks and the concrete pedestal is evaluated as a structural commodity and is not within the scope of the Condensate and Refueling Water Storage Tanks Inspection.

The staff noted in the applicant's response to RAI B.2.19-1, dated July 24, 2008, that the applicant does not credit paints and coating for prevention and mitigation of corrosion on the external surfaces of the CST and RWST. The staff further noted that since paints, coatings, sealants and caulking are not credited for aging management as part of license renewal, the applicant is not required to manage aging effects that may affect paints, coating, sealants and caulking as part of the Systems Walkdown Program. However, the applicant stated that caulking and sealants will be inspected by the Structures Monitoring Program. The staff confirms that the scope of the applicant's Structures Monitoring Program includes the CST and RWST and inspection of the associated caulking and sealants at the foundation and support pedestals. The staff notes that visual inspections of the condition of paints and coatings on the external surfaces of the CST and RWST will indicate whether degradation and corrosion is occurring on the underlying material, even though paints and coatings are not credited.

Based on its review, the staff finds the applicant's response to RAI B.2.19-1 acceptable because: (a) the applicant has not credited paints and coatings with preventing and mitigating aging of the underlying materials, and therefore does not require aging management; (b) the applicant will perform periodic visual inspections of the external surfaces of the tanks to determine the condition of the underlying metallic material; and (c) the staff confirmed that sealants and caulking are inspected and monitored by the applicant's Structures Monitoring Program. Therefore, the staff's concern described in RAI B.2.19-1 is resolved.

The staff finds the applicant's exception acceptable because the applicant will perform its periodic visual inspections of the external surfaces of the CST and RWST for indications of corrosion of the underlying material, and the staff has confirmed that the applicant will inspect and monitor sealants and caulking by the Structures Monitoring Program.

Operating Experience. The staff reviewed the applicant's OE described in the license renewal basis document for the Condensate and Refueling Water Storage Tanks Inspection Program. The applicant stated that the Condensate and Refueling Water Storage Tanks Inspection Program is a new one-time inspection activity for which there is no OE and that inspection methods will be consistent with accepted industry practices. For this program and for other new AMPs where the applicant provided no current plant-specific OE, the staff issued a generic RAI.

In RAI B.2.1, dated June 10, 2008, the staff requested that the applicant commit to provide documentation of plant-specific OE, for staff review, after the program has been implemented, but prior to entering the period of extended operation.

In its response to RAI B.2.1, dated July 8, 2008, the applicant stated that OE for new AMPs described in LRA Appendix B will be gained as these new programs are implemented during the period of extended operation. The applicant further stated that results of tests, inspections, and other aging management activities conducted in accordance with these programs will be subject to confirmation and corrective action elements of the Susquehanna 10 CFR Part 50, Appendix B, Quality Assurance Program and that results will be subject to staff review during regional inspections under existing staff inspection modules. The applicant also stated that it will perform one-time inspections, prior to entry to the period of extended operation, to confirm the effectiveness of existing AMPs, and that these programs are subject to review under NRC Inspection Procedure 71003, "Post-Approval Site Inspection for License Renewal."

The staff notes that the applicant's statement that inspection methods will be consistent with industry practices is consistent with the "operating experience" program element for GALL AMP XI.M29. The staff also notes that post-approval site inspections provide an opportunity for

staff review and assess the effectiveness of the applicant's Condensate and Refueling Water Storage Tanks Inspection Program, after the applicant has developed OE with that program. The staff concludes that the corrective action program, based on industry and plant-specific OE, will capture future OE to support the conclusion that the effects of aging are adequately managed.

During its review, the staff noted that even though the applicant states OE does not currently exist for this program, the applicant reviewed its CRs Database for indications of degradation of the CSTs and RWSTs and did not find any indications. During its onsite review, the staff reviewed the CRs for the Systems Walkdown Program provided in the license renewal basis documents, in order to determine whether there have been indications of degradation to the protective coatings, sealants, caulking and tank bottoms of the CSTs and RWSTs. Based on its review, the staff did not identify any CRs related of the degradation to the protective coatings, sealants, caulking and tank bottoms of the CSTs and RWSTs.

On this basis, the staff confirms that the "operating experience" program element satisfies the criterion defined in the GALL Report and the guidance in SRP-LR Section A.1.2.3.10. Therefore, the staff finds this program element acceptable and concludes that a separate commitment is not necessary.

UFSAR Supplement. The staff reviewed the UFSAR Supplement summary description that was provided in LRA Section A.1.2.14 for the Condensate and Refueling Water Storage Tanks Inspection Program. The staff verified that, in LRA Commitment No. 17 of UFSAR Supplement Table A-1, the applicant committed to perform a volumetric examination of the tank bottom and visual examinations of the bottom surface to the foundation pad interface of the Condensate and Refueling Water Storage Tanks within a 10-year period prior to the period of extended operation. The staff also verified that the applicant has placed this commitment in UFSAR Supplement summary description A.1.2.14 for the Condensate and Refueling Water Storage Tanks Inspection Program.

The staff reviewed this section and finds it acceptable because it is consistent with the corresponding description in SRP-LR Table 3.3-2 and because the summary description includes the bases for determining that aging effects will be managed.

The staff determines that the UFSAR supplement for this AMP provides an adequate summary description of the program, as required by 10 CFR 54.21(d).

Conclusion. On the basis of its audit and review of the applicant's Condensate and Refueling Water Storage Tanks Inspection Program and the applicant's responses to the RAIs, the staff finds all program elements consistent with the GALL Report. In addition, the staff reviewed the exception and its justification and determines that the AMP, with the exception, is adequate to manage the aging effects for which its credited.

The staff concludes that the applicant has demonstrated that the effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3). The staff also reviewed the UFSAR supplement for this AMP and concludes that it provides an adequate summary description of the program, as required by 10 CFR 54.21(d), and therefore is acceptable.

3.0.3.1.10 Chemistry Program Effectiveness Inspection

Summary of Technical Information in the Application. In LRA Section B.2.22, the applicant described the new Chemistry Program Effectiveness Inspection (CPEI) as consistent with GALL AMP XI.M32, "One-Time Inspection." The applicant stated that the program is a one-time inspection program to detect and characterize the condition of materials in representative low-flow and stagnant areas of plant systems influenced by the BWR Water Chemistry Program, the Closed Cooling Water Chemistry Program, and the Fuel Oil Chemistry Program, all of which are mitigation programs. The applicant also stated that the inspection provides direct evidence as to whether, and to what extent, a loss of material due to crevice, general, or pitting corrosion and to microbiologically influenced corrosion (MIC) in fuel oil, as well as cracking due to SCC of susceptible materials in susceptible locations has occurred. The applicant further stated that implementation of the program (Commitment No. 19), which is scheduled to be completed during the 10-year period prior to the period of extended operation, will provide confirmation of chemistry program effectiveness and assure that the integrity of susceptible components is maintained consistent with the CLB during the period of extended operation.

Staff Evaluation. During its audit, the staff reviewed the applicant's claim of consistency with the GALL Report. The staff reviewed the applicant's AMP evaluation for the Chemistry Program Effectiveness Inspection, together with the applicant's program outline which provides specific guidance for preparation of implementing procedures related to this new program. The staff noted the program elements in the AMP that the applicant claimed were consistent with the GALL Report are consistent with GALL AMP XI.M32, with the exception of two program element aspects for which the staff required additional information.

The staff noted that the applicant's description of the "monitoring and trending" program element for the CPEI refers to using engineering evaluations to determine sample size and inspection locations, but provides no details of the methodology to be used.

In RAI B.2.22-1, dated June 23, 2008, the staff requested that the applicant describe the methodology it will use to select sample sizes and sample locations for various components and also explain what methodology or basis will be used for sample size expansion, if unanticipated aging effects are found.

In its response to RAI B.2.22-1, dated July 17, 2008, the applicant stated the following:

> The sample population will be selected such that it is representative of each material and environment combination within the scope of the inspection. Consideration will be given in the sample selection to the variations among the treated water environments that could affect the potential for aging effects to occur. Each material type exposed to fuel oil will also be included in the sample population. The sample selection will focus on those locations determined to be subject to low flow or stagnant conditions, as these locations are expected to be the most likely to first experience the effects of degradation should it be evidenced. Identification of the inspection locations will be based on engineering knowledge of the system(s), supported by walkdowns of the systems as necessary, including the time in service and severity of operating condition. The inspection will focus on those systems, or portions of systems, most subject to stagnant or low flow condition.

> The results of the inspection of the sample population will be reviewed for any evidence of degradation. If degradation is detected the results will be entered into the SSES corrective action program. The corrective action program requires evaluation of the extent of the degradation, the effect on the component intended function, and the necessary corrective actions. The need to perform inspections of a larger portion of the total population of components within the scope of the activity will also be considered.

The staff confirms that the applicant has amended LRA Section B.2.22 and revised the second paragraph in the discussion of "monitoring and trending" to read as follows:

> Sample size will be determined by engineering evaluation, as described for the "detection of aging effects" program element above. Unacceptable inspection findings will be evaluated using the SSES corrective action process. The evaluation done under the SSES corrective action program will identify appropriate corrective actions including the need to perform additional inspections.

In evaluating the applicant's response, the staff noted that the applicant provided additional qualitative information with regard to the methodology it used to select sample sizes and locations. The applicant also provided a link between its corrective action program and its methodology and basis for sample size expansion. The staff noted that the additional information provided by the applicant with regard to the "monitoring and trending" program element is at a level of detail consistent with the description of this program element in GALL AMP XI.M32.

Based on its review, the staff finds the applicant's response to RAI B.2.22-1 acceptable because the applicant has provided an adequate description of its CPEI which is consistent with the program element as described in the GALL Report. Therefore, the staff's concern described in RAI B.2.22-1 is resolved.

The staff noted that the applicant's description of the "acceptance criteria" program element for the CPEI states that there shall be "no unacceptable loss of material, or cracking of stainless steel exposed to temperatures above 140°F, that could result in a loss of component intended function during the period of extended operation, as determined by engineering evaluation." However, the "acceptance criteria" program element in the GALL Report states that any indication or relevant conditions of degradation detected are to be evaluated.

In RAI B.2.22-2, dated June 23, 2008, the staff requested that the applicant explain why the acceptance criteria in the applicant's program is different from the recommendation in the GALL Report and clarify what is meant by "no unacceptable loss of material or cracking," as used in the acceptance criteria for the applicant's program.

In its response to RAI B.2.22-2, dated July 17, 2008, the applicant stated the following:

> Any indications or relevant conditions of degradation detected during the inspections will be evaluated. Similar to the example provided in the GALL text, the inspection observations will be compared to predetermined acceptance criteria. Inspection results that do not meet the acceptance criteria will be entered into the corrective action program for evaluation.

The staff confirms that the applicant has amended LRA B.2.22 to provide consistency with the description of the "acceptance criteria" program element in GALL AMP XI.M32 and has revised the text to read as follows:

> Any indications or relevant conditions of degradation detected during the inspections will be compared to pre-determined acceptance criteria. If the acceptance criteria are not met, then the indications/conditions will be evaluated under the SSES corrective action program to determine whether they could result in a loss of component intended function during the period of extended operation.

In evaluating the applicant's response, the staff notes that that the applicant's revision to the LRA brings its description for the "acceptance criteria" in the Chemical Program Effectiveness Inspection into conformance with the "acceptance criteria" program element in GALL AMP XI.M32.

Based on its review, the staff finds the applicant's response to RAI B.2.22-2 acceptable because the applicant has adequately explained the basis for why the acceptance criteria in the CPEI differs from the recommendation in the GALL Report and has revised the LRA to correct the discrepancy. The staff determines that with this revision, the "acceptance criteria" program element of the applicant's program is consistent with the same program element in the GALL Report. Therefore, the staff concern described in RAI B.2.22-2 is resolved.

In a letter dated December 11, 2008, the applicant amended the description of the Chemical Program Effectiveness Inspection in LRA Section B.2.22. The applicant revised the "scope of program" description to state that the Chemical Program Effectiveness Inspection includes the surfaces of nickel alloy components, in addition to aluminum, copper alloy, carbon, and low alloy steel, cast iron, and stainless steel components, which were already listed as within the scope of the AMP. The applicant also made a similar revision to LRA Commitment No. 19 to add surfaces of nickel alloy components, in addition to the other previously listed materials of construction.

The applicant stated that it had reviewed an LRA change made in response to RAI B.2.14-2, dated August 12, 2008, and identified that its earlier change with respect to components in the diesel generator system was incomplete. The applicant further stated that in its earlier change, corrosion monitoring probes in the diesel jacket cooling water system would be used to monitor actual corrosion rates as part of the Closed Cooling Water Chemistry Program and that the Chemical Program Effectiveness Inspection would not be used to monitor corrosion in the diesel jacket cooling water system. The applicant also stated that a subsequent review determined that the corrosion probes are used only to monitor corrosion of steel components, and that the Chemical Program Effectiveness Inspection will be used to confirm that loss of material is not occurring in other diesel jacket cooling water system components, including nickel alloy (Monel) heat exchanger tube plugs.

The staff reviewed the applicant's changes to the Chemical Program Effectiveness Inspection "scope of program" program element and commitment as described above. The staff determines that surface examinations provided by the applicant's Chemical Program Effectiveness Inspection for other materials are also capable of detecting loss of material due to pitting or crevice corrosion in nickel alloy components. On the basis that the CPEI AMP includes surface examinations that can detect loss of material in nickel alloy components, the staff finds

the applicant's addition of nickel alloy components to the "scope of program" program element and to LRA Commitment No. 19 to be acceptable.

Based on its staff's review, and resolution of the related RAIs as described above, the staff finds the CPEI consistent with the program elements of GALL AMP XI.M32 and therefore is acceptable.

Operating Experience. The staff reviewed the applicant's OE described in LRA Section B.2.22. The applicant stated that the CPEI is a new one-time inspection activity for which there is no OE and that inspection methods will be consistent with accepted industry practices. For this program and for other new AMPs where the applicant provided no current plant-specific OE, the staff issued generic RAI B.2.1.

In RAI B.2.1, dated June 10, 2008, the staff requested that the applicant commit to provide documentation of plant-specific operating for staff review, after the program has been implemented, but prior to entering the period of extended operation.

In its response to RAI B.2.1, dated July 8, 2008, the applicant stated that OE for new AMPs described in LRA Appendix B will be gained as these programs are implemented during the period of extended operation. The applicant further stated that results of tests, inspections, and other aging management activities, conducted in accordance with these programs, will be subject to confirmation and corrective action elements of the Susquehanna 10 CFR Part 50, Appendix B, Quality Assurance Program. The results will be subject to staff review during regional inspections under existing staff inspection modules. The applicant also stated that, to confirm the effectiveness of existing AMPs, one-time inspections will be performed prior to entry into the period of extended operation, and that these programs are subject to review under NRC Inspection Procedure 71003, "Post-Approval Site Inspection for License Renewal."

The staff notes the applicant's statement that inspection methods will be consistent with industry practices is consistent with the "operating experience" program element for GALL AMP XI.M32. The staff also notes that post-approval site inspections provide an opportunity for staff review and assessment of the effectiveness of the applicant's Chemistry Program Effectiveness Inspection, after the applicant has developed OE with that program. The staff concludes that the corrective action program, based on internal and external plant OE, will capture OE to support the conclusion that the effects of aging are adequately managed. On this basis, the staff confirms that the "operating experience" program element satisfies the criterion defined in the GALL Report and the guidance found in SRP-LR Section A.1.2.3.10. Therefore, the staff finds this program element acceptable and concludes that a separate commitment is not necessary.

UFSAR Supplement. The applicant provided the UFSAR supplement for the CPEI in LRA Section A.1.2.12 and Commitment No. 19 in Table A-1. The staff also notes that the applicant has committed to implement the CPEI for aging management of applicable components during the 10 years prior to the period of extended operation.

Based on this review, the staff finds that the UFSAR supplement summary in LRA Section A.1.2.12 provides an acceptable description of the applicant's CPEI because it is consistent with the UFSAR supplement summary description for the One-Time Inspection program in the SRP-LR.

The staff determines that the information in the UFSAR supplement is an adequate summary description of the program, as required by 10 CFR 54.21(d).

Conclusion. On the basis of its review of the applicant's CPEI and resolution of the relevant RAIs as described above, the staff finds all program elements consistent with the GALL Report. The staff concludes that the applicant has demonstrated that effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3). The staff also reviewed the UFSAR supplement for this AMP and concludes that it provides an adequate summary description of the program, as required by 10 CFR 54.21(d) and therefore is acceptable.

3.0.3.1.11 Cooling Units Inspection

Summary of Technical Information in the Application. In LRA Section B.2.23, the applicant described the Cooling Units Inspection Program as a new program that will be consistent with GALL AMP XI.M32, "One-Time Inspection." The applicant stated that this program will detect and characterize the condition of aluminum, carbon steel, copper alloy, and stainless steel cooling unit components that are exposed to a ventilation environment or to an uncontrolled raw water environment from cooling unit drain pans, and of certain heat exchanger components exposed to treated water or ventilation environments. The applicant further stated that the inspection provides direct evidence as to whether and to what extent, loss of material or reduction of heat transfer has occurred, or may likely occur and result in a loss of intended function.

Staff Evaluation. During its audit, the staff reviewed the applicant's claim of consistency with the GALL Report. In comparing the elements in the applicant's program to those in GALL AMP XI.M32, the staff noted that the program elements in the applicant's AMP claim of consistency with the GALL Report were consistent with GALL AMP XI.M32, with the exception of four program element aspects identified below that the staff determined required additional clarification. The staff also confirmed that the plant program contains all of the elements of the referenced GALL Report. The staff conducted onsite interviews with the applicant to confirm these results.

In the "scope of program" program element, the applicant stated that this program detects loss of material due to crevice and pitting corrosion and selective leaching of the copper-alloy cooler channel in the control structure heating, ventilation, and air conditioning (HVAC) system. GALL AMP XI.M33, "Selective Leaching of Materials," states that selective leaching generally does not cause changes in dimensions and is difficult to detect. The examination techniques used by the Cooling Units Inspection Program to detect degradation are visual and/or volumetric. Neither one of these techniques by itself will detect selective leaching.

In RAI B.2.23-1, dated June 23, 2008, the staff requested that the applicant justify how this program will manage selective leaching and explain why these components are not included in the Selective Leaching Inspection Program.

In its response to RAI B.2.23-1, dated July 25, 2008, the applicant amended the LRA to credit the Selective Leaching Inspection Program, in place of the Cooling Units Inspection Program, to manage loss of material due to selective leaching of the copper control structure HVAC cooler channels.

Based on its review, the staff finds the applicant's response to RAI B. 2.23-1 acceptable because the applicant has amended the LRA to manage these components for loss of material due to selective leaching with the Selective Leaching Inspection Program, which contains appropriate techniques to manage this aging effect. Therefore, the staff's concern described in RAI B.2.23-1 is resolved.

In the "detection of aging effects" program element, the applicant stated that a combination of established volumetric or visual examination techniques will be used to identify evidence of loss of material or to confirm a lack thereof. However, GALL AMP XI.M32 recommends specific inspection methods which are dependent on aging effects and mechanisms.

In RAI B.2.23-2, dated June 23, 2008, the staff requested that the applicant clarify the inspection techniques that it will use.

In its response to RAI B.2.23-2, dated July 25, 2008, the applicant stated that visual inspection (VT-1 or equivalent) and/or volumetric inspection (radiographic test (RT) or UT) techniques will be used to determine whether crevice or pitting corrosion is occurring; visual inspection (VT-3 or equivalent) and/or volumetric inspection (RT or UT) techniques will be used to determine whether galvanic or general corrosion is occurring; and visual inspection (VT-3 or equivalent) techniques will be used to determine whether reduction in heat transfer is occurring. The applicant also stated that the specific inspection technique will be determined prior to the inspection activities and will be consistent with the recommendations in GALL AMP XI.M32.

Based on its review, the staff finds the applicant's response to RAI B. 2.23-2 acceptable because the applicant has identified specific inspection techniques it will use for detection of the aging mechanisms that are consistent with the recommendations in GALL AMP XI.M32.

In the "monitoring and trending" program element, the applicant stated that no actions are taken as part of this program, since it is a one-time inspection activity. In the "monitoring and trending" program element, GALL AMP XI.M32 states that "unacceptable inspection findings are evaluated in accordance with the site corrective action process to determine the need for subsequent (including periodic) inspections..."

In RAI B.2.23-3, dated June 23, 2008, the staff requested that the applicant confirm whether the corrective action program will increase the sample size, in the event aging effects are detected.

In its response to RAI B.2.23-3, dated July 25, 2008, the applicant responded that unacceptable inspection findings will be evaluated under the SSES Corrective Action Program. The evaluation performed under this program will identify appropriate corrective actions, including the need to perform additional inspections.

Based on its review, the staff finds the applicant's response to RAI B.2.23-3 acceptable because the applicant has confirmed that it will evaluate unacceptable inspection findings under the SSES Corrective Action Program and take appropriate corrective action, including the need to perform additional inspections. The staff further finds the response acceptable because the applicant's actions are consistent with the recommendations of the GALL AMP XI.M32 "monitoring and trending" program element. Therefore, the staff's concern described in RAI 2.23-3 is resolved.

In the "acceptance criteria" program element, GALL AMP XI.M32 states that any indication or relevant conditions of degradation detected are evaluated. However, in LRA Section B.2.28, the applicant stated under the acceptance criteria that: "no unacceptable loss of material (or wall thinning), could result in a loss of component intended function, during the period of extended operation, as determined by engineering evaluation."

In RAI B.2.23-4, dated June 23, 2008, the staff requested that the applicant explain why the acceptance criteria for the Cooling Units Inspection Program differ from the recommendations of the GALL Report and clarify what is meant by "no unacceptable loss of material (or wall thinning)."

In its response to RAI B.2.23-4, dated July 25, 2008, the applicant amended LRA Cooling Unit Inspection Program "acceptance criteria" element to state:

> Any indications or relevant conditions of degradation detected during the inspections will be compared to pre-determined acceptance criteria. If the acceptance criteria are not met, then the indications/conditions will be evaluated under the SSES Corrective Action Program to determine whether they could result in a loss of component intended function during the period of extended operation.

Based on its review, the staff finds the applicant's response to RAI B.2.23-4 acceptable because the applicant has adequately explained why the acceptance criteria for the Cooling Units Inspection Program differ from the recommendations of the GALL Report and has sufficiently clarified what is meant by "no unacceptable loss of material (or wall thinning)." The staff also finds the applicant's response acceptable because the applicant has amended the "acceptance criteria" program element for this AMP to be consistent with the recommendations in GALL AMP XI.M32. Therefore, the staff's concern described in RAI B.2.23-4 is resolved.

Based on its review, the staff finds the applicant's Cooling Units Inspection Program consistent with the program elements of GALL AMP XI.M32 and therefore is acceptable.

Operating Experience. The staff reviewed the applicant's OE described in LRA Section B.2.23 and interviewed the applicant's technical personnel to confirm that the plant-specific OE did not reveal any aging effects not bounded by the GALL Report. The staff also confirmed that applicable aging effects and industry and plant-specific OE have been reviewed by the applicant and are evaluated in the GALL Report.

The "operating experience" program element states that the Cooling Units Inspection Program is a new program and there is no plant-specific program OE indicating the need for an aging management progam. However, the staff noted that the applicant has generated several CRs during walkdowns, surveillance and maintenance activities on the cooling units that are included in the scope of this program.

In RAI B.2.23-5, dated June 23, 2008, the staff requested that the applicant identify whether there exists, any age related degradation documentation for these cooling units.

In its response to RAI B.2.23-5, dated July 25, 2008, the applicant stated that CRs associated with the cooling units within the scope of the Cooling Units Inspection Program have been generated during various routine plant activities. The applicant also stated that a review of

those CRs did not identify any age-related degradation for the specific subcomponents addressed by the Cooling Units Inspection Program.

Based on its review, the staff finds the applicant's response to RAI B.2.23-5 acceptable because the applicant has reviewed the condition reports for OE and did not identify any age-related degradation for the specific subcomponents addressed by the Cooling Unit Inspection Program. Therefore, the staff's concern described in RAI B.2.23-5 is resolved.

Furthermore, the staff confirms that the applicant has addressed OE identified after the issuance of the GALL Report. The staff finds that the applicant's Cooling Units Inspection Program can be expected to ensure that the effects of aging will be adequately managed during the period of extended operation.

The staff also confirms that the OE program element satisfies the criterion defined in the GALL Report and the guidance found in SRP-LR Section A.1.2.3.10. Therefore, the staff finds this program element acceptable.

UFSAR Supplement. The applicant provided the UFSAR supplement for the Cooling Units Inspection Program in LRA Section A.1.2.16 and Commitment No. 20 in Table A-1. The staff reviewed this section and finds that it is acceptable because it is consistent with the corresponding program description in SRP-LR Table 3.3-2 and because the applicant has committed to implement the Cooling Units Inspection Program within the 10-year period prior to the period of extended operation.

The staff determines that the information in the UFSAR supplement is an adequate summary description of the program, as required by 10 CFR 54.21(d).

Conclusion. On the basis of the review of the applicant's Cooling Units Inspection Program and the applicant's response to the staff's RAIs, the staff finds all program elements consistent with the GALL Report. The staff concludes that the applicant has demonstrated that the effects of aging will be adequately managed so that the intended functions will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3). The staff also reviewed the UFSAR supplement for this AMP and concludes that it provides an adequate summary description of the program, as required by 10 CFR 54.21(d), and therefore is acceptable.

3.0.3.1.12 Heat Exchanger Inspection

Summary of Technical Information in the Application. In LRA Section B.2.24, the applicant described the Heat Exchanger Inspection Program as a new program that will be consistent with GALL Report AMP XI.M32, "One-Time Inspection." The applicant stated that this program will detect and characterize cracking due to SCC and reduction in heat transfer due to fouling of heat exchanger tubes exposed to treated water.

The applicant further stated that the inspection provides direct evidence as to whether, and to what extent, cracking due to SCC or reduction in heat transfer due to fouling has occurred or is likely to occur that may result in a loss of intended function.

Staff Evaluation. During its audit, the staff reviewed the applicant's claim of consistency with the GALL Report. The staff also confirmed that the plant program contains all of the elements of the referenced GALL Report and that the conditions at the plant are bounded by the conditions

for which the GALL Report is evaluated. The staff conducted onsite interviews with the applicant to confirm these results.

The staff noted the applicant stated that instead of focusing on a representative sample population, the Heat Exchanger Inspection Program will be applied to all heat exchangers within the scope of the program. The inspection and test techniques will be as recommended by GALL AMP XI.M32 for detecting the aging effect of concern.

The staff reviewed the applicant's license renewal basis document and confirmed that the program scope includes all the heat exchangers likely to be affected by the heat exchanger inspection. In its response to RAI B.2.17-2, dated June 30, 2008, and as identified in the SER Section 3.0.3.2.9, the applicant stated that this program will detect and characterize reduction in heat transfer due to fouling of heat exchanger tubes exposed to raw water or a lubricating oil environment, which brought additional components into the scope of this program. The applicant added the diesel-engine driven fire pump heat exchangers and oil coolers in the program scope. The staff noted that the additional components the applicant has brought into the scope of program are appropriate, and are heat exchanger components that require aging management as part of this program.

Based on its review, the staff finds the applicant's Heat Exchanger Inspection Program consistent with the program elements of GALL AMP XI.M32 and therefore is acceptable.

Operating Experience. The staff reviewed the applicant's OE described in LRA Section B.2.24 and interviewed the applicant's technical personnel to confirm that the plant-specific OE did not reveal any aging effects not bounded by the GALL Report. The staff also confirmed that applicable aging effects and industry and plant-specific OE have been reviewed by the applicant and are evaluated in the GALL Report.

The applicant stated for the "operating experience" program element that the Heat Exchanger Inspection Program is a new program and there is no plant-specific program OE. However, the applicant further stated that during performance of surveillance tests or preventive maintenance, any observed degradation of tubes would have been documented.

In RAI B.2.24-1, dated June 23, 2008, the staff requested that the applicant identify examples of issues that may have been documented to address age-related degradation of the heat exchanger tubes within the scope of this program, and include them in the OE element.

In its response to RAI B.2.24-1, dated July 25, 2008, the applicant stated that a review of documentation generated during various routine plant activities associated with the heat exchangers was performed within the scope of the Heat Exchanger Inspection Program. The review did not identify any age-related degradation of the heat exchanger tubes within the scope of this inspection.

Based on its review, the staff finds the applicant's response to RAI B.2.24-1 acceptable because the applicant has verified and the staff confirms that the applicant's review of plant OE related to the heat exchangers within the scope of the Heat Exchanger Inspection Program did not identify any age related degradation. Therefore, the staff's concern described in RAI B.2.24-1 is resolved.

The staff finds that the applicant's Heat Exchanger Inspection Program can be expected to ensure that effects of aging will be adequately managed during the period of extended operation.

The staff confirms that the OE program element satisfies the criterion defined in the GALL Report and the guidance found in SRP-LR Section A.1.2.3.10. Therefore, the staff finds this program element acceptable.

UFSAR Supplement. The applicant provided the UFSAR supplement for the Heat Exchanger Inspection Program in LRA Section A.1.2.22 and Commitment No. 21 in Table A-1, amended by letter dated June 30, 2008. The staff reviewed this section and finds it acceptable because it is consistent, with the amendment, with the corresponding program description in SRP-LR Table 3.3-2. The staff confirms that the applicant has amended the UFSAR supplement to include the diesel engine driven fire pump heat exchangers and oil coolers in the UFSAR supplement and had committed to implement the Heat Exchanger Inspection Program within the 10-year period, prior to the period of extended operation.

The staff determines that the information in the UFSAR supplement is an adequate summary description of the program, as required by 10 CFR 54.21(d).

Conclusion. On the basis of its review of the applicant's Heat Exchanger Inspection Program and the applicant's response to the RAIs, the staff finds all program elements consistent with the GALL Report. The staff concludes that the applicant has demonstrated that the effects of aging will be adequately managed so that the intended functions will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3). The staff also reviewed the UFSAR supplement for this AMP and concludes that it provides an adequate summary description of the program, as required by 10 CFR 54.21(d) and therefore is acceptable.

3.0.3.1.13 Lubricating Oil Inspection

Summary of Technical Information in the Application. In LRA Section B.2.25, the applicant described the "Lubricating Oil Inspection Program" as a new program consistent with GALL AMP XI.M32, "One-Time Inspection Program." The applicant stated that this program will verify the effectiveness of Lubricating Oil Analysis Program by sampling systems and components exposed to lubricating oil. The program will test for a loss of material due to crevice, galvanic, general or pitting corrosion. In addition, this program will also test for selective leaching or reduction in heat transfer due to fouling.

Staff Evaluation. During its audit, the staff reviewed the applicant's claim of consistency with the GALL Report. The staff also confirmed that the plant program contains all of the elements of the referenced GALL Report and that the conditions at the plant are bounded by the conditions for which the GALL Report is evaluated. The staff conducted onsite interviews with the applicant to confirm these results.

In comparing the seven program elements in the applicant's program to those in GALL AMP XI.M32, the staff noted the program elements in the applicant's AMP claim of consistency with the GALL Report were consistent with GALL AMP XI.M32, with the exception of one program element; namely, the "scope of program." The staff determined a need for additional clarification which resulted in the issuance of RAIs. The "operating experience" program element is discussed separately below.

The staff noted that the Lubricating Oil Inspection and Lubricating Oil Analysis Programs manage components in the diesel generator, control structure chilled water, RHR, reactor core isolation cooling (RCIC), and HPCI systems. It was not clear to the staff whether there are additional systems that require management by these two AMPs because of their exposure to lubricating oil.

In RAI B.2.25-1, dated July 10, 2008, the staff requested that the applicant identify whether there are any other systems exposed to lubricating oil that are within the scope of license renewal.

In its response to RAI B.2.25-1, dated August 12, 2008, the applicant stated that during its review of LRA Section B.2.25, it had identified that the reactor building chilled water system was omitted from the systems that are within the scope of the programs that manage aging for lubricating oils. The staff confirmed that the applicant amended LRA Section B.2.25 to include the reactor building chilled water system within the scope of this program.

Based on its review, the staff finds the applicant's response to RAI B.2.25-1 acceptable because the applicant has identified the reactor building chilled water system as a system exposed to lubricating oil and has amended the LRA to reflect the addition of this system within the scope of the Lubricating Oil Inspection Program.

Operating Experience. The staff reviewed the applicant's OE discussion described in the license renewal basis document for the Lubricating Oil Analysis Inspection Program. The applicant stated that this AMP is a new one-time inspection activity for which there is no OE and that inspection methods will be consistent with accepted industry practices. For this program and for other new AMPs where the applicant provided no current plant-specific OE, the staff issued generic RAI B.2.1

In RAI B.2.1, dated June 10, 2008, the staff requested that the applicant commit to provide documentation of plant-specific OE for staff review, after the program has been implemented, but prior to entering the period of extended operation.

In its response to RAI B.2.1, dated July 8, 2008, the applicant stated that OE for new AMPs described in LRA Appendix B will be gained as these new programs are implemented, during the period of extended operation. The applicant further stated that results of tests, inspections, and other aging management activities conducted in accordance with these programs, will be subject to confirmation and corrective action elements of the Susquehanna 10 CFR Part 50, Appendix B, Quality Assurance Program and that results will be subject to staff review during regional inspections under existing staff inspection modules. The applicant also stated that one-time inspections will be performed prior to entry to the period of extended operation to confirm the effectiveness of existing AMPs, and that these programs are subject to review under NRC Inspection Procedure 71003, "Post-Approval Site Inspection for License Renewal."

The staff noted the applicant's statement that inspection methods will be consistent with industry practices is consistent with the "operating experience" program element for GALL AMP XI.M32. The staff also noted that post-approval site inspections provide an opportunity for staff to review and assess the effectiveness of the applicant's Lubricating Oil Inspection Program, after the applicant has developed OE with that program. The staff concludes that the corrective action program, based on industry and plant-specific OE, will capture OE to support the conclusion that the effects of aging are adequately managed. On this basis, the staff

confirms that the applicant's "operating experience" program element satisfies the criterion defined in the GALL Report and the guidance found in SRP-LR Section A.1.2.3.10. Therefore, the staff finds this program element acceptable and concludes that a separate commitment is not necessary.

UFSAR Supplement. The applicant provided the UFSAR supplement summary of the Lubricating Oil Inspection Program in LRA Section A.1.2.29 and Commitment No. 49 in Table A-1. The staff reviewed this section and finds it acceptable because it is consistent with the corresponding program description in SRP-LR Table 3.2-1. The staff confirms that the applicant has committed to implementing this program prior to the period of extended operation, and that the applicant has amended the LRA to include the reactor building chilled water system within the scope of the Lubricating Oil Inspection Program. The staff also confirms that the applicant has placed this commitment for the Lubricating Oil Inspection Program in UFSAR Supplement Summary Section A.1.2.29.

The staff determines that the information in the UFSAR supplement is an adequate summary description of the program, as required by 10 CFR 54.21(d).

Conclusion. On the basis of the audit and review of the applicant's Lubricating Oil Inspection Program and the applicant's responses to the RAIs, the staff finds all program elements consistent with the GALL Report. Also, the staff confirms that the applicant has committed (Commitment No. 49) to implement this program prior to the period of extended operation. The staff concludes that the applicant has demonstrated that the effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3). The staff also reviewed the UFSAR supplement for this AMP and concludes that it provides an adequate summary description of the program, as required by 10 CFR 54.21(d) and therefore is acceptable.

3.0.3.1.14 Main Steam Flow Restrictor Inspection

Summary of Technical Information in the Application. In LRA Section B.2.26, the applicant described the Main Steam (MS) Flow Restrictor Inspection Program as a new program that will be consistent with GALL AMP XI.M32, "One-Time Inspection." The applicant stated that this program will detect and characterize reduction of fracture toughness of the CASS subcomponents of the MS flow restrictors. The applicant also stated that the inspection will detect cracking that is symptomatic of reduction of fracture toughness. The applicant further stated that reduction of fracture toughness does not cause cracking, but the reduced toughness allows existing cracks to propagate at higher rates.

Staff Evaluation. During its audit, the staff reviewed the applicant's claim of consistency with the GALL Report. In comparing the elements in the applicant's program to those in GALL AMP XI.M32, the staff noted the program elements in the applicant's AMP claim of consistency with the GALL Report were consistent with GALL AMP XI.M32, with the exception of the three program element aspects identified below, for which the staff determined required additional clarification. The staff confirmed that the applicant's plant program contains all of the elements of the referenced GALL Report. Further, the staff conducted onsite interviews with the applicant to confirm these results.

In the "detection of aging effects" program element, the applicant stated that it will use a combination of established visual examination techniques to detect reduction of fracture

toughness as evidenced by cracking. However, GALL AMP XI.M32 recommends specific inspection methods dependent on aging mechanisms.

In RAI B.2.26-1, dated June 23, 2008, the staff requested that the applicant clarify the inspection techniques it will use to detect evidence of cracking.

In its response to RAI B.2.26-1, dated July 25, 2008, the applicant stated that pursuant to its response to RAI B.2.26-2, which is provided below, the MS Flow Restrictor Inspection Program has been deleted.

In the "acceptance criteria" program element, GALL AMP XI.M32 states that any indication or relevant conditions of degradation detected are evaluated. In LRA Section B.2.26, the applicant stated that the acceptance criterion is: "no cracking that could result in a loss of component intended function(s) during the period of extended operation, as determined by engineering evaluation."

In RAI B.2.26-2, dated June 23, 2008, the staff requested that the applicant (a) confirm whether the CASS MS flow restrictors were screened for thermal aging; (b) indicate whether the CASS MS flow restrictors are susceptible to thermal aging; (c) indicate whether flaw tolerance evaluations will be performed, if cracking is detected; and (d) explain what type of corrective actions and monitoring will be implemented, if cracking is detected.

In the response to RAI B.2.26-2, dated July 25, 2008, the applicant stated that consistent with GALL AMP XI.M12, "Thermal Embrittlement of Cast Austenitic Stainless Steel (CASS)," PPL has performed a screening of the CASS portions of the MS flow restrictors to determine their susceptibility for thermal aging. The applicant determined that the CASS portions of the flow restrictors are not susceptible to reduction of fracture toughness due to thermal embrittlement on the following basis:

> The applicant stated that the CASS portions of the flow restrictors were cast by a centrifugal casting method. PPL reviewed the QA documentation packages for the flow restrictors and determined that the castings were constructed from cast austenitic stainless steel, in conformance with material specification SA-351 CF8. This material is a low-molybdenum grade of CASS, as opposed to a high-molybdenum grade (i.e., "M" grade) of CASS material, such as SA- 351 CF8M, which requires 2-3% molybdenum content. Therefore, the steam line flow restrictor castings for SSES are considered to be constructed of low molybdenum (0.5% maximum) content material. In accordance with the guidance provided in the GALL Section XI.M12, the centrifugally-cast, low molybdenum CASS portions of the flow restrictors are not susceptible to thermal embrittlement. As such, the AMP B.2.26 "Main Steam Flow Restrictor Inspection" which was intended to manage reduction of fracture toughness due to thermal embrittlement for CASS portions of the MS flow restrictors is not an aging management program required for license renewal because, as described above, the CASS portions of the MS flow restrictors are not susceptible to reduction of fracture toughness due thermal embrittlement.

In addition to the screening for susceptibility for thermal aging, the applicant re-evaluated the other conclusions from the AMR of the MS flow restrictors. The applicant provided the following results and conclusions of the re-evaluation in its response to RAI B.2.26-2:

- The flow restrictors in the Main Steam system are not pressure boundary components. Therefore, neither ASME Section III nor ANSI B31.1, which typically require a fatigue analysis or the use of stress range reduction factors for 7000 cycles, are applicable. As such, fatigue cracking of the main steam flow restrictors is not an applicable aging effect.

- The ISI Program was credited to confirm the effectiveness of the BWR Water Chemistry Program to manage a loss of material for the main steam flow restrictors. The basis for crediting the ISI program was that similar materials and environments were inspected by ISI. However, the Chemistry Program Effectiveness Inspection (CPEI) confirms the effectiveness of the BWR Water Chemistry Program. While ISI results may be considered in the development and implementation of the CPEI one-time inspection, the ISI Program is not an aging management program for the main steam flow restrictors.

- Stress Corrosion Cracking (SCC) is not an aging effect requiring management for the main steam flow restrictors because there is no tensile stress in the CASS portions of the flow restrictors to promote SCC. Also, the flow restrictors do not have a pressure boundary function that could be affected by cracking, and cracking will not affect the flow restriction function of the flow restrictors. Extreme cracking that could result in the loss of flow restrictor structural integrity could affect its flow restriction function; however, such a failure is not plausible, given the lack of a driving mechanism for crack initiation and/or crack growth.

The applicant revised LRA Section 3.1.2.1.3, Table 3.1.1, Table 3.1.2-3, Appendix A (Table of Contents, Section A.1.2.30, and Table A-1), and Appendix B (Table of Contents, Table B-1, Table B-2, and Section B.2.26) to reflect these results that reduction in fracture toughness due to thermal embrittlement is not an AERM for license renewal.

The staff reviewed the applicant's response and confirmed that based on the screening criteria provided in GALL AMP XI.M12, the CASS portion of the flow restrictors are not susceptible to reduction of fracture toughness because all centrifugal-cast low-molybdenum steels are not susceptible to this aging effect. Furthermore, based on a review of the drawings provided by the applicant during the audit, the staff determined that these flow restrictors are in-line flow restrictors and therefore, are not pressure boundary components.

Based on its review, the staff finds the applicant's response to RAI B.26-2 acceptable because the applicant has verified and the staff confirms that: (a) the CASS flow restrictors are not susceptible to reduction of fracture toughness due to thermal embrittlement; (b) the flow restrictors are not pressure boundary components; and (c) the BWR Water Chemistry Program and CPEI Program are credited for similar material and environments to manage the aging effects of loss of material. The staff agrees with the deletion of the Main Steam Line Flow Restrictor Inspection Program from the LRA. Therefore, the staff's concern described in RAI B.2.26-2 is resolved.

In the "detection of aging effects" program element, the applicant stated that the Main Steam Flow Restrictor Inspection Program will be applied to all eight (four per unit) MS flow restrictors.

In RAI B.2.26-3, the staff requested that the applicant clarify whether this means that all eight flow restrictors will be inspected and; if not, please provide the sample size, and identify whether the program will provide for increasing the sample size in the event that aging effects are detected.

In its response to RAI B.2.26-3, dated July 25, 2008, the applicant stated that pursuant to its response to RAI B.2.26-2 above, the Main Steam Flow Restrictor Inspection Program has been deleted.

Based on its review, the staff finds the applicant's response to RAI B.2.26-3 acceptable because the applicant has verified and the staff confirms that the Main Steam Flow Restrictor Inspection Program has been deleted. Therefore, the staff's concern described in RAI B.2.26-3 is resolved.

UFSAR Supplement. In its letter dated July 25, 2008, the applicant deleted UFSAR Summary Section A.1.2.30 and Commitment No. 22 in Table A-1, because the Main Steam Flow Restrictor Inspection Program has been deleted. The staff's evaluation of the applicant's deletion of the Main Steam Flow Restrictor Inspection Program is described above.

Conclusion. In the letter dated July 25, 2008, the applicant responded that pursuant to its response to RAI B.2.26-2 above, the Main Steam Flow Restrictor Inspection Program has been deleted. On the basis that the CASS flow restrictors are not susceptible to reduction of fracture toughness due to thermal embrittlement, the flow restrictors are not pressure boundary components, and LRA Section B.2.2, BWR Water Chemistry Program and Section B.2.22, CPEI Program are credited for similar material and environments to manage the aging effects of loss of material, the staff finds the applicant response acceptable and agrees with the deletion of the Main Steam Line Flow Restrictor Inspection Program from the LRA. The staff concurs with the deletion and the staff's basis for agreement is described above.

3.0.3.1.15 Monitoring and Collection System Inspection

Summary of Technical Information in the Application. In LRA Section B.2.27, the applicant described the Monitoring and Collection System Inspection Program as a new program that will be consistent with GALL AMP XI.M32, "One-Time Inspection." The applicant stated that this program will detect and characterize the condition of the internal surfaces of subject components that are exposed to equipment and/or area drainage water and other potential contaminants or fluids. The applicant further stated that the inspection provides direct evidence as to whether, and to what extent, a loss of material due to crevice, general or pitting corrosion, or to MIC has occurred or is likely to occur in the liquid waste management system that may result in a loss of intended function.

Staff Evaluation. During its audit, the staff reviewed the applicant's claim of consistency with the GALL Report. In comparing the elements in the applicant's program to those in GALL AMP XI.M32, the staff noted the program elements in the applicant's AMP claim of consistency with the GALL Report were consistent with GALL AMP XI.M32, with the exception of three program element aspects identified below that the staff determined required additional clarification. The staff also confirmed that the plant program contains all of the elements of the

referenced GALL Report. The staff conducted onsite interviews with the applicant to confirm these results.

In the "detection of aging effects" program element, the applicant stated that a combination of established volumetric or visual examination techniques will be used to identify evidence of loss of material or to confirm a lack thereof. However, GALL AMP XI.M32 recommends specific inspection methods dependent on aging mechanisms.

In RAI B.2.27-1, dated June 23, 2008, the staff requested that the applicant clarify which inspection techniques it will use.

In its response to RAI B.2.27-1, dated July 25, 2008, the applicant stated that visual inspection (VT-1 or equivalent) and/or Volumetric inspection (RT or UT) techniques will be used to determine whether crevice or pitting corrosion is occurring; visual inspection (VT-3 or equivalent) and/or Volumetric inspection (RT or UT) techniques will be used to determine whether galvanic or general corrosion is occurring; and visual inspection (VT-3 or equivalent) techniques will be used to determine whether reduction in heat transfer is occurring. The specific inspection technique will be determined prior to inspection activities and will be consistent with the recommendations in GALL AMP XI.M32.

Based on its review, the staff finds the applicant's response to RAI B.2.27-1 acceptable because the applicant has provided specific inspection techniques for detection of the aging effects and the mechanisms are consistent with the recommendations in GALL AMP XI.M32. Therefore, the staff's concern described in RAI B.2.27-1 is resolved.

In the "monitoring and trending" program element, the applicant stated that no actions are taken as part of this program, since it is a one-time inspection activity. In the "monitoring and trending" program element, the GALL AMP XI.M32 states that "unacceptable inspection findings are evaluated in accordance with the site corrective action process to determine the need for subsequent (including periodic) inspections..."

In RAI B.2.27-2, dated June 23, 2008, the staff requested that the applicant confirm whether the corrective action program will increase the sample size, in the event aging effects are detected.

In its response to RAI B.27-2, dated July 25, 2008, the applicant stated that unacceptable inspection findings will be evaluated under the SSES Corrective Action Program, which will identify appropriate corrective actions, including the need to perform additional inspections.

Based on its review, the staff finds the applicant's response to RAI B.2.27-2 acceptable because the applicant will evaluate unacceptable inspection findings under its corrective action program and take appropriate corrective action, including performance of additional inspections, which is consistent with the recommendations of the GALL AMP XI.M32 "monitoring and trending" program element. Therefore, the staff's concern described in RAI B.2.27-2 is resolved.

In the "acceptance criteria" program element, GALL AMP XI.M32 states that any indication or relevant conditions of degradation detected are evaluated. In LRA Section B.2.27, the applicant stated the following acceptance criteria: "no unacceptable loss of material (or wall thinning) that could result in a loss of component intended function during the period of extended operation, as determined by engineering evaluation."

In RAI B.2.27-3, dated June 23, 2008, the staff requested that the applicant explain why the acceptance criteria for the Monitoring and Collection System Inspection Program differ from the recommendations of the GALL Report, and clarify what is meant by "no unacceptable loss of material (or wall thinning)."

In its response to RAI B.2.27-3, dated July 25, 2008, the applicant amended the Monitoring and Collection System Inspection Program acceptance criteria" program element to state:

> Any indications or relevant conditions of degradation detected during the inspections will be compared to pre-determined acceptance criteria. If the acceptance criteria are not met, then the indications/conditions will be evaluated under the SSES Corrective Action Program to determine whether they could result in a loss of component intended function during the period of extended operation.

Based on its review, the staff finds the applicant's response to RAI B.2.27-3 acceptable because the applicant has appropriately amended the Monitoring and Collection System Inspection Program "acceptance criteria" program element to be consistent with the recommendations provided in GALL AMP XI.M32. Therefore, the staff's concern described in RAI B.2.27-3 is resolved.

Based on its review, the staff finds the Monitoring and Collection System Inspection Program consistent with the program elements of GALL AMP XI.M32 and therefore is acceptable.

Operating Experience. The staff reviewed the applicant's OE described in LRA Section B.2.27 and interviewed the applicant's technical personnel to confirm that the plant-specific OE did not reveal any aging effects not bounded by the GALL Report. The staff also confirmed that applicable aging effects and industry and plant-specific OE have been reviewed by the applicant and are evaluated in the GALL Report.

The "operating experience" program element in the LRA states that the Monitoring and Collection System Inspection Program is a new program and there is no plant-specific program OE. Furthermore, the staff confirmed that the applicant has addressed OE identified after the issuance of the GALL Report. However, for this program and for other new AMPs where the applicant provided no current plant-specific OE, the staff issued a generic RAI.

In RAI B.2-1, dated June 10, 2008, the staff requested that the applicant commit to provide documentation of plant-specific OE for staff review, after the program has been implemented, but, prior to entering the period of extended operation.

In its response to RAI B.2.1, dated July 8, 2008, the applicant stated that OE for new AMPs described in LRA Appendix B will be gained as these new programs are implemented during the period of extended operation. The applicant further stated that results of tests, inspections, and other aging management activities conducted in accordance with these programs will be subject to confirmation and corrective action elements of the Susquehanna 10 CFR Part 50, Appendix B, Quality Assurance Program and that results will be subject to staff review during regional inspections under existing staff inspection modules. The applicant also stated that one-time inspections will be performed prior to entry to the period of extended operation, to confirm the effectiveness of existing AMPs, and that these programs are subject to review under NRC Inspection Procedure 71003, "Post-Approval Site Inspection for License Renewal."

The staff noted the applicant's statement that inspection methods will be consistent with industry practices is consistent with the "operating experience" program element for GALL AMP XI.M32. The staff also noted that post-approval site inspections provide an opportunity for staff to review and assess the effectiveness of the applicant's Monitoring and Collection System Inspection Program, after the applicant has developed OE with that program. The staff concludes that the corrective action program, based on internal and external plant OE, will capture OE to support the conclusion that the effects of aging are adequately managed. On this basis, the staff finds this program element acceptable and concludes that a separate commitment is not necessary.

The staff confirms that the "operating experience" program element satisfies the criterion defined in the GALL Report and the guidance found in SRP-LR Section A.1.2.3.10. Therefore, the staff finds this program element acceptable.

UFSAR Supplement. The applicant provided the UFSAR supplement summary for the Monitoring and Collection System Inspection Program in LRA Section A.1.2.33 and Commitment No. 23 in Table A-1. The staff reviewed this section and finds it acceptable because it is consistent with the corresponding program description in SRP-LR Table 3.3-2. The staff also finds that the applicant has committed to implement the Monitoring and Collection System Inspection Program within the 10-year period, prior to the period of extended operation.

The staff determines that the information in the UFSAR supplement is an adequate summary description of the program, as required by 10 CFR 54.21(d).

Conclusion. On the basis of the review of the applicant's Monitoring and Collection System Inspection Program and the applicant's response to the staff's RAIs, the staff finds all program elements consistent with the GALL Report. The staff concludes that the applicant has demonstrated that the effects of aging will be adequately managed so that the intended functions will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3). The staff also reviewed the UFSAR supplement for this AMP and concludes that it provides an adequate summary description of the program, as required by 10 CFR 54.21(d), and therefore is acceptable.

3.0.3.1.16 Supplemental Piping/Tank Inspection Program

Summary of Technical Information in the Application. In LRA Section B.2.28, the applicant described the Supplemental Piping/Tank Inspection Program as a new program that will be consistent with GALL Report AMP XI.M32, "One-Time Inspection." The applicant stated that this program will detect and characterize the condition of carbon and stainless steel components that are exposed to moist air environments, particularly the aggressive wet and/or dry environment that exists at air-water interfaces. The applicant further stated that the inspection provides direct evidence as to whether and to what extent, loss of material due to crevice, galvanic, general and pitting corrosion, has occurred or is likely to occur that could result in a loss of intended function.

Staff Evaluation. During its audit, the staff confirmed the applicant's claim of consistency with the GALL Report. In comparing the elements in the applicant's program to those in GALL AMP XI.M32, the staff noted that the program elements in the applicant's AMP claimed to be consistent with GALL were consistent with the corresponding program element criteria recommended in the program elements of GALL AMP XI.M32 with the exception of below

identified four program element aspects that the staff determined were in need of additional clarification. The staff also confirmed that the plant program contains all of the elements of the referenced GALL Report program. On-site interviews were also held to confirm these results.

In the "scope of program" program element, the LRA identifies systems and components within the scope of the program. In Table 3.2.2-9, diesel generator starting air system, the Supplemental Piping/Tank Inspection Program is credited for managing the aging effect of loss of material for stainless steel drain trap bodies and carbon steel moisture separators. However, this system and components are not included in the scope of this program. The staff issued RAI B.2.28-1 by letter dated June 23, 2008, to request the applicant to justify why this system is not included in the program scope.

In its letter dated July 25, 2008, the applicant responded to RAI B.2.28-1 stating that the carbon steel moisture separators and stainless steel drain trap bodies in the diesel generator starting air system are within the scope of the Supplemental Piping/Tank Inspection. The applicant further stated the Diesel Generators system should have been included in the listing of systems within the scope of this inspection, but was inadvertently omitted. The applicant revised the LRA Section B.2.28 "scope of program" element to include diesel generators system in the list of systems within the scope of this program.

On the basis that the diesel generators system is added to the scope of the program and thus accurately identifying components and systems in the scope of this program, the staff finds the response acceptable. Therefore, the staff's concern described in RAI B.2.28-1 is resolved.

In the letter dated October 21, 2008, in response to the NRC regional inspection of the LRA, the applicant revised the "scope of program" program element to include diesel fuel oil system in the list of systems within the scope of the program.

On the basis that the diesel fuel oil system is added to the scope of the program and thus accurately identifying components and systems in the scope of this program, the staff finds the revision acceptable.

In the letter dated September 30, 2008, in response to the NRC regional inspection of the LRA, the applicant revised the "scope of program" program element to include aging management of loss of material due to crevice, galvanic, general, and pitting corrosion within the air space of diesel generator starting air receiver tanks and E diesel compressor skid air receiver tanks. The applicant also revised the "detection of aging effects" program element to include at least 2 of these tanks in the sample population for inspection.

On the basis that the diesel generator starting air receiver tanks and E diesel compressor skid air receiver tanks are included in the sample population, the staff finds the response acceptable because the applicant has included these tanks in the program scope and two of these tanks will be part of the sample population that will be inspected, which will provide inspection results that could be evaluated and applied to the other tanks.

In the "detection of aging effects" program element, the LRA states that a combination of established volumetric or visual examination techniques will be used to identify evidence of loss of material or to confirm a lack thereof. However, the GALL AMP XI.M32, "One-Time Inspection," recommends specific inspection methods dependent on aging effects and mechanisms. The staff issued RAI B.2.28-2 by letter dated June 23, 2008, to request the

applicant to clarify the inspection techniques that will be used for the different aging effects and mechanisms.

In the letter dated July 25, 2008, the applicant responded to RAI B.2.28-2 stating that visual inspection (VT-1 or equivalent) and/or Volumetric inspection (RT or UT) techniques will be used to determine whether crevice or pitting corrosion is occurring; visual inspection (VT-3 or equivalent) and/or Volumetric inspection (RT or UT) techniques will be used to determine whether galvanic or general corrosion is occurring; and visual inspection (VT-3 or equivalent) techniques will be used to determine whether reduction in heat transfer is occurring. The applicant stated the specific inspection technique will be determined prior to the inspection activities and will be consistent with the recommendations in GALL AMP XI.M32.

The staff reviewed the applicant's response and finds the specific inspection techniques provided by the applicant for detection of the aging effects and mechanisms are consistent with the recommendations provided by GALL AMP XI.M32 and are acceptable. On this basis, the staff finds the applicant response acceptable.

In the "monitoring and trending" program element, the LRA states that no actions are taken as part of this program, since it is a one-time inspection activity. In the "monitoring and trending" program element, GALL AMP XI.M32 states that unacceptable inspection findings are evaluated in accordance with the site corrective action process to determine the need for subsequent (including periodic) inspections. The staff issued RAI B.2.28-3 by letter dated June 23, 2008, to request the applicant to confirm if the corrective action program will increase the sample size in the event aging effects are detected.

In the letter dated July 25, 2008, the applicant responded to RAI B.2.28-3 stating that unacceptable inspection findings will be evaluated under the SSES corrective action program. The evaluation done under the SSES corrective action program will identify appropriate corrective actions, including the need to perform additional inspections.

On the basis that the applicant will evaluate unacceptable inspection findings under the SSES corrective action program and take appropriate corrective action including the need to perform additional inspections, the staff finds the response acceptable because the applicant is consistent with the recommendations of the GALL AMP XI.M32 "monitoring and trending" program element.

In the "acceptance criteria" program element, the GALL AMP XI.M32 states that any indication or relevant conditions of degradation detected are evaluated. The LRA Section B.2.28 identifies acceptance criteria as: no unacceptable loss of material (or wall thinning) that could result in a loss of component intended function during the period of extended operation, as determined by engineering evaluation. The staff issued RAI B.2.28-4 by letter dated June 23, 2008, to request the applicant to explain why the acceptance criteria for AMP B.2.28 differ from the recommendations of the GALL Report and to clarify what "no unacceptable loss of material (or wall thinning)" means.

In the letter dated July 25, 2008, the applicant amended LRA Section B.2.28, Supplemental Piping/Tank Inspection Program "acceptance criteria" program element to state:

> Any indications or relevant conditions of degradation detected during the inspections will be compared to pre-determined acceptance criteria. If the acceptance criteria are not met, then the indications/conditions will be evaluated

under the SSES Corrective Action Program to determine whether they could result in a loss of component intended function during the period of extended operation.

The staff reviewed the applicant's response and finds that the amended "acceptance criteria" program element is consistent with the recommendations provided in GALL AMP XI.M32, and therefore the staff finds the response acceptable.

In a letter dated January 12, 2009, the applicant amended the scope of the Supplemental Piping and Tanks Inspection Program to include the internal steel and stainless steel emergency diesel generator exhaust piping, piping component, and piping element surfaces that are exposed to the diesel exhaust environment (which is identified in LRA Table 3.0-1 as a subsection of the ventilation air environment). The staff noted that the applicant made the applicable amendment of this AMP in order to conform to the staff's recommendations in SRP-LR Section 3.3.2.2.3.3 and the GALL AMR VII.H2-1, for the management of stress corrosion cracking in stainless steel diesel generator exhaust piping components and in SRP-LR Section 3.3.2.2.7.3 and GALL AMR VII.H2-2, for the management of loss of material in steel stainless steel emergency diesel generator exhaust piping components. The staff finds that the applicant amendment of the LRA to include the internal surfaces of these components is acceptable because it conforms to the staff's aging management recommendations in these SRP-LR and GALL AMR sections that a valid AMP be credited to manage cracking and loss of material in these diesel generator exhaust piping components. The staff's evaluations in SER Sections 3.3.2.2.3.3 and 3.3.2.2.7.3 provide additional details on why it is acceptable to credit this AMP for aging management of these emergency diesel generator exhaust piping components.

Based on its review, the staff finds the Supplementary Piping/Tank Inspection Program consistent with the program elements with the program elements of GALL AMP XI.32, and therefore acceptable.

Operating Experience. The staff reviewed the operating experience described in LRA Section B.2.28 and interviewed the applicant's technical personnel to confirm that the plant-specific operating experience did not reveal any aging effects not bounded by the GALL Report. The staff also confirmed that applicable aging effects and industry and plant-specific operating experience have been reviewed by the applicant and are evaluated in the GALL Report.

The "operating experience" program element in the LRA states that the Supplementary Piping/Tank Inspection is a new program and there is no plant-specific program operating experience. Furthermore, the staff confirmed that the applicant has addressed operating experience identified after the issuance of the GALL Report. However, for this program and for other new AMPs where the applicant provided no current plant-specific operating experience, the staff issued generic RAI B.2-1 by letter dated June 10, 2008, asking that the applicant commit to provide documentation of plant-specific operating experience for staff review after the program has been implemented, but prior to entering the period of extended operation.

In the letter dated July 8, 2008, the applicant responded to RAI B.2-1 and stated that operating experience for new aging management programs described in LRA Appendix B will be gained as these new programs are implemented during the period of extended operation. The applicant stated that results of tests, inspections, and other aging management activities conducted in accordance with these programs will be subject to confirmation and corrective action elements of the SSES 10 CFR 50, Appendix B, quality assurance program and that results will be subject to NRC review during regional inspections under existing NRC inspection

modules. The applicant further stated that one-time inspections will be performed prior to entry to the period of extended operation to confirm the effectiveness of existing AMP and that these programs are subject to review under NRC Inspection Procedure 71003, Post-Approval Site Inspection for License Renewal.

The staff noted that the applicant's statement that inspection methods will be consistent with industry practices is consistent with the "operating experience" program element for GALL AMP XI.M32. The staff also noted that post-approval site inspections provide an opportunity for staff review and assessment of the effectiveness of the applicant's Supplementary Piping/Tank Inspection Program after the applicant has developed operating experience with that program. The staff concludes that the corrective action program, based on internal and external plant operating experience, would capture operating experience in the future to support the conclusion that the effects of aging are adequately managed. On this basis, the staff finds this program element acceptable and concludes that a separate commitment is not necessary.

The staff confirmed that the "operating experience" program element satisfies the criterion defined in the GALL Report and in SRP-LR Section A.1.2.3.10. The staff finds this program element acceptable.

UFSAR Supplement: In LRA Section A.1.2.46 and Commitment No. 24 in Table A-1, the applicant provided the UFSAR supplement for the Supplementary Piping/Tank Inspection Program. The staff verified that the UFSAR supplement summary description for the Supplementary Piping/Tank Inspection Program was in conformance with the staff's recommended UFSAR supplement for the One-Time Inspection Program provided in Table 3.3-2 of the SRP-LR.

Based on this review, the staff finds that UFSAR supplement Section A.1.2.46 provides an acceptable UFSAR Supplement summary description of the applicant's Supplementary Piping/Tank Inspection Program because it is consistent with the UFSAR supplement summary description in the SRP-LR for the One-Time Inspection Program and because the applicant has included in Table A-1, Commitment No. 24 to implement the Supplementary Piping/Tank Inspection Program within the 10-year period prior to the period of extended operation.

The staff reviewed this section and determines that the information in the UFSAR supplement provides an adequate summary description of the program consistent with the SRP-LR, as required by 10 CFR 54.21(d).

Conclusion. On the basis of its review of the applicant's Supplementary Piping/Tank Inspection Program and the applicant's response to the staff's RAIs, the staff finds all program elements consistent with the GALL Report. The staff concludes that the applicant has demonstrated that the effects of aging will be adequately managed so that the intended functions will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3). The staff also reviewed the UFSAR supplement for this AMP and concludes that it provides an adequate summary description of the program, as required by 10 CFR 54.21(d).

3.0.3.1.17 Selective Leaching Inspection Program

Summary of Technical Information in the Application. In LRA Section B.2.29, the applicant described the new Selective Leaching Program as consistent with GALL AMP XI.M33, "Selective Leaching of Materials." This program combines the use of a visual inspection with a hardness test on the external and internal surfaces of materials susceptible to selective

leaching, to determine whether the aging effect of loss of material due to selective leaching has occurred.

Staff Evaluation. During its audit, the staff confirmed the applicant's claim of consistency with the GALL Report. In comparing the elements in the applicant's program to those in GALL AMP XI.M33, the staff noted the program elements in the applicant's AMP claim of consistency with the GALL Report were consistent with GALL AMP XI.M33, with the exception of the one program element aspect identified below that the staff determined required additional clarification. The staff also confirmed that the plant program contains all of the elements of the referenced GALL Report. The staff conducted onsite interviews with the applicant to confirm these results.

The staff reviewed the applicant's Program Basis Document and confirmed that the program scope includes all systems that could be susceptible to selective leaching. The staff noted that this includes copper alloys (brass and bronze), cast iron, and ductile iron exposed to raw water, treated water, groundwater (buried), indoor air with condensation, outdoor air, and fuel oil environments. The staff further noted that twenty-five plant systems have this combination of material and environment and include susceptible components that include piping and tubing, valve bodies, pump and turbocharger casings, heat exchangers, coolers, chillers, hydrants, sprinkler heads, strainers, level gauges, orifices, and heater sheaths. The staff finds the applicant's Selective Leaching Program acceptable because it conforms to the recommendations in GALL AMP XI.M33.

During the review of the applicant's Cooling Unit Inspection Program (SER Section 3.0.3.1.11), the staff noted that the "scope of program" element in the LRA states that loss of material due to crevice corrosion, pitting corrosion, and selective leaching of the copper-alloy cooler channel in the control structure HVAC system. As stated in the GALL Report, selective leaching does not cause a noticeable change in dimensions and is difficult to detect using visual and/or volumetric detection techniques, which are the techniques used in the Cooling Unit Inspection Program.

In RAI B.2.23-1, dated June 23, 2008, the staff requested that the applicant justify the use of the Cooling Unit Inspection Program to manage loss of material due to selective leaching in the control structure HVAC system. The staff also requested that the applicant explain why the copper-alloy cooler channel was not included within the scope of the Selective Leaching Inspection Program.

In the response to RAI B.2.23-1, dated July 25, 2008, the applicant stated that the LRA has been amended to credit the Selective Leaching Inspection Program, in place of the Cooling Unit Inspection Program, to manage loss of material due to selective leaching for the copper alloy cooler channel in the control structure HVAC system.

Based on the review, the staff finds the applicant's response to RAI B.2.23-1 acceptable because the applicant has amended the LRA to credit the Selective Leaching Program to manage loss of material due to selective leaching for the copper-alloy cooler channel in the control structure HVAC system. Therefore, the staff's concern described in RAI B.2.23-1 is resolved.

Based on the review, the staff finds the Selective Leaching Program consistent with the program elements in GALL AMP XI.M33 and therefore is acceptable.

Operating Experience. The applicant stated that the Selective Leaching Program is a new program for which there is no OE and that inspection methods will be consistent with accepted industry practices. For this program and for other new AMPs where the applicant provided no current plant-specific OE, the staff issued a generic RAI.

In RAI B.2.1, dated June 10, 2008, the staff requested that the applicant commit to provide documentation of plant-specific operating for staff review, after the program has been implemented, but, prior to entering the period of extended operation.

In the response to RAI B.2.1, dated July 8, 2008, the applicant stated that OE for new AMPs described in LRA Appendix B will be gained as these new programs are implemented during the period of extended operation. The applicant stated that results of tests, inspections, and other aging management activities conducted in accordance with these programs will be subject to confirmation and corrective action elements of the Susquehanna 10 CFR Part 50, Appendix B, Quality Assurance Program. Results will be subject to staff review during regional inspections under existing staff inspection modules. The applicant stated that these new programs will be implemented prior to, and continue through, the period of extended operation and that OE will be gained for these programs as they are implemented. The applicant further stated that test and inspection results that do not meet acceptance criteria for these new programs will be evaluated under the applicant's corrective action program, which includes requirements for identification of appropriate corrective actions and verification of the effectiveness of corrective actions.

The staff noted the applicant's statement that inspection methods will be consistent with industry practices is consistent with the "operating experience" program element for GALL AMP XI.M33. The staff also noted that post-approval site inspections provide an opportunity for the staff to review and assess the effectiveness of the applicant's Selective Leaching Program, after the applicant has developed OE with that program. The staff concludes that the corrective action program, based on internal and external plant OE, will capture OE to support the conclusion that the effects of aging are adequately managed.

On this basis, the staff confirms that the "operating experience" program element satisfies the criterion defined in the GALL Report and the guidance found in SRP-LR Section A.1.2.3.10. The staff finds this program element acceptable and concludes that a separate commitment is not necessary.

UFSAR Supplement. The applicant provided the UFSAR supplement summary for the Selective Leaching Program in LRA Section A.1.2.43 and Commitment No. 25 in Table A-1. The staff reviewed this section and determines that the information in the UFSAR supplement provides an adequate summary description of the program consistent with the SRP-LR, as required by 10 CFR 54.21(d). The staff confirms that the applicant has made a commitment to implement this new program, after issuance of the renewed license and prior to entering the period of extended operation.

Conclusion. On the basis of the review of the applicant's Selective Leaching Program and the applicant's RAI responses, the staff finds all program elements consistent with the GALL Report. The staff concludes that the applicant has demonstrated that effects of aging the will be adequately managed so that the intended functions of these components will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3). The staff also reviewed the UFSAR supplement for this AMP and

concludes that it provides an adequate summary description of the program, as required by 10 CFR 54.21(d) and therefore is acceptable.

3.0.3.1.18 Small Bore Class 1 Piping Inspection Program

Summary of Technical Information in the Application. In LRA Section B.2.31, the applicant described the new Small Bore Class 1 Piping Inspection as consistent with GALL AMP XI.M35, "One-Time Inspection of ASME Code Class 1 Small-Bore Piping." The applicant stated that the program is a one-time inspection program to confirm the effectiveness of the BWR Water Chemistry Program in mitigating loss of material and cracking for small bore Class 1 piping and also to verify, by inspections for cracking, that reduction of fracture toughness due to thermal embrittlement requires no additional aging management for small bore Class 1 piping. The applicant also stated that the program is applicable to small bore ASME Code Class 1 piping and piping components less than four inches nominal pipe size (<NPS 4), which includes pipes, fittings, and branch connections, and that the inspection provides additional assurances that either aging of small bore ASME Code Class 1 piping is not occurring or that the aging is insignificant. The applicant further stated that implementation of the program is scheduled to be completed during the 10-year period, prior to the period of extended operation (Commitment No. 27, LRA Table A-1).

Staff Evaluation. During the audit, the staff reviewed the applicant's claim of consistency with the GALL Report. The staff reviewed the applicant's AMP evaluation for the Small Bore Class 1 Piping Inspection Program, together with the applicant's program outline which provides specific guidance for preparation of implementing procedures related to this new program. In comparing the program description and elements in the applicant's AMP to those in GALL AMP XI.M35, the staff noted a number of instances where the program description and elements that the applicant claimed to be consistent with the GALL Report did not appear to be consistent with the corresponding program element criteria recommended in GALL AMP XI.M35. Furthermore, it appeared to the staff that for the one-time inspection of small-bore Code Class 1 piping, the applicant combined recommendations in GALL AMP XI.M35 with recommendations in GALL AMP XI.M32, "One-Time Inspection." The applicant's AMP resulting from this combination was substantially different from GALL AMP XI.M35, with which the applicant claimed consistency. The staff identified a need for additional clarification and issued four RAIs to support the staff's evaluation of the applicant's Small Bore Class 1 Piping Inspection program. The staff evaluates the applicant's responses to these RAIs in the following discussions.

The applicant stated in the LRA that the Small Bore Class 1 Piping Inspection Program, is a new program that will be consistent with GALL AMP XI.M35. The applicant further stated that the GALL AMP XI.M35 is credited only with managing the aging effect of cracking, and the only examination technique used is volumetric examination. However, in the LRA, both in the program description and in several aging management review line items, the Small Bore Class 1 Piping Inspection is credited with confirming effectiveness of the BWR Water Chemistry Program in mitigating the aging effect of loss of material using "nondestructive examinations (including volumetric techniques)."

In RAI B.2.31-1, dated June 23, 2008, the staff requested that the applicant provide the basis for categorizing the Small Bore Class 1 Piping Inspection Program as being consistent with the GALL AMP XI.M35 when the Small Bore Class 1 Piping Inspection Program implies that non-volumetric examination techniques may be used as an alternate basis for performing the one-time inspections of the small bore Class 1 piping components

and when this AMP is credited with managing an aging effect (i.e., loss of material) that is not within the scope of the GALL AMP XI.M35. The staff also requested that the applicant clarify whether the LRA will be amended to identify these aspects of the program as exceptions to GALL AMP XI.M35 and; if so, justify the basis for crediting these exceptions for aging management of small bore Class 1 piping components.

In its response to RAI B.2.31-1, dated July 25, 2008, the applicant stated the following:

> The SSES LRA is amended [as shown in a multi-page attachment] to demonstrate that AMP B.2.31, Small Bore Class 1 Piping Inspection, is consistent with GALL AMP XI.M35 with no exceptions.
>
> AMP B.2.31 is credited for managing the aging effect of cracking, as a result of stress corrosion or thermal or mechanical loading, and one-time volumetric examination is the acceptable method for confirming that cracking of ASME Code Class 1 small-bore piping is not occurring.
>
> AMP B.2.22, Chemistry Program Effectiveness Inspection, is credited with verifying the effectiveness of AMP B.2.2, BWR Water Chemistry Program, to mitigate loss of material.

The applicant provided a multi-page attachment (Attachment 3 to PLA-6391, LRA Revisions in Response to RAIs B.2.31-1 and B.2.31-3) as part of the response, in which the applicant described revisions to LRA text and tables affected by its responses to RAIs B.2.31-1 and B.2.31-3.

The staff noted the changes affecting text related to AMP descriptions and the AMR results tables as well as evaluations in the LRA.

The AMP related text sections in the LRA affected by the applicant's changes are as follows:

> Section A.1.2.44, the UFSAR supplement describing the Small Bore Class 1 Piping Inspection was revised to delete aging management for loss of material and to state: "Small Bore Class 1 Piping Inspection is a one-time inspection to detect cracking resulting from thermal and mechanical loading or intergranular stress corrosion. The inspection will provide assurance that either cracking of small bore Class 1 piping is not occurring or the cracking is insignificant, such that an aging management program (AMP) is not warranted. The inspection will also confirm the effectiveness of the BWR Water Chemistry Program in mitigating cracking due to intergranular stress corrosion."
>
> Table A-1, "SSES License Renewal Commitments," was revised to state in Commitment No. 27 that the Small Bore Class 1 Piping Inspection will verify that cracking is not occurring and thereby validate the effectiveness of the Chemistry Program to mitigate cracking.
>
> Section B.2.22, "Chemistry Program Effectiveness Inspection," was revised to include reactor coolant system (RCS) pressure boundary components within the scope of the program.

Section B.2.31, Small Bore Class 1 Piping Inspection, was revised in multiple places consistent with removing management of loss of material from the scope of the program and relocating it into the Chemistry Program Effectiveness Inspection program. The changes clarified that the focus of the Small Bore Class 1 Piping Inspection Program is to detect cracking resulting from thermal and mechanical loading or intergranular stress corrosion and that the non-destructive examination will use volumetric techniques, consistent with the recommendations in GALL AMP XI.M35. The applicant stated that the program may also include destructive examinations.

LRA Appendix C, "Response to BWRVIP Applicant Action Items, Discussion of BWRVIP-74-A," was revised to state that effectiveness of the BWR Water Chemistry Program to mitigate cracking in the flange leak detection lines will be verified by the Chemistry Program Effectiveness Inspection (rather than the previously identified Small Bore Class 1 Piping Inspection Program).

The AMR results tables and evaluations in the LRA affected by the applicant's changes are as follows:

- Table 3.1.1, "Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System"
- Table 3.1.2-3, "Aging Management Review Results – Reactor Coolant System Pressure Boundary"
- Section 3.1.2.2.2.1, "BWR Top Head and Top Head Nozzles, PWR Steam Generator Shell Assembly"
- Section 3.1.2.2.2.3, "Flanges, Nozzles, Penetrations, Pressure Housings, Safe Ends, and Vessel Shells, Heads, and Welds"
- Section 3.1.2.2.4.1, "BWR Top Head Enclosure Vessel Flange Leak Detection Lines"
- Section 3.1.2.2.8.1, "Stainless Steel Jet Pump Sensing Lines"

The staff reviewed all of the applicant's LRA changes, noting that the changes removed the activities associated with monitoring for loss of material from the scope of the Small Bore Class 1 Piping Inspection Program and reassigned them to the Chemistry Program Effectiveness Inspection, consistent with the GALL AMP XI.M32. By making these changes, the applicant fully addressed and resolved the staff's concerns with the applicant's Small Bore Class 1 Piping Inspection program, as initially described in the LRA, combined elements of the GALL AMP XI.M32 with elements of GALL AMP XI.M35. However, in its review of the applicant's LRA changes, the staff noted the following three instances in which the as-revised LRA did not appear to conform with the applicant's general approach of removing activities associated with monitoring for loss of material from the scope of the Small Bore Class 1 Piping Inspection Program and reassigning them to the Chemistry Program Effectiveness Inspection:

- The change in LRA Section 3.1.2.2.4.1, "BWR Top Head Enclosure Vessel Flange Leak Detection Lines," that replaced use of the Small Bore Class 1 Piping Inspection Program with the CPEI for monitoring the aging effect of cracking due to SCC in stainless steel lines exposed to treated water, did not appear to be appropriate.

- The change in LRA Section 3.1.2.2.8.1, "Stainless Steel Jet Pump Sensing Lines," that replaced use of the Small Bore Class 1 Piping Inspection Program with the CPEI for monitoring the aging effect of cracking in the stainless steel lines external to the vessel, did not appear to be appropriate.
- The change in LRA Appendix C, "Response to BWRVIP Applicant Action Items," which was made for consistency with the change in LRA Section 3.1.2.2.4.1, also did not appear to be appropriate.

In RAI B.2.31-5, the staff requested that the applicant explain the basis for these changes.

In addition, the staff noted that in making the changes to the LRA, the applicant introduced wording that referred to "significant" and "insignificant" cracking.

In RAI B.2.31-6, the staff requested that the applicant clarify the meaning of "significant" and "insignificant" cracking or eliminate the problematic wording.

In its response to RAI B.2.31-5, dated September 11, 2008, the applicant reversed the changes that had been made in LRA Sections 3.1.2.2.4.1 and 3.1.2.2.8.1 and Appendix C, and restored these affected parts of the LRA to the version originally submitted by the applicant.

Based on the review, the staff finds the applicant's response to RAI B.2.31-5 acceptable because the applicant has reversed the changes to the LRA that were made in error and restored the LRA text affected by these changes to the originally submitted version of these LRA Sections, so that monitoring for loss of material will be performed by the CPEI and monitoring for cracking will be performed by the Small Bore Class 1 Piping Inspection Program. Therefore, the staff's concern described in RAI B.2.31-5 is resolved.

In the response to RAI B.2.31-6, dated September 11, 2008, the applicant revised text in LRA Section A.1.2.44 to state that the Small Bore Class 1 Piping Inspection will provide assurance that cracking of small bore Class 1 piping is not occurring or an evaluation of any detected crack indications will be performed to justify continued operation with no further monitoring, such that an AMP is not warranted. The applicant also revised the "program description" in LRA Section B.2.31 to include a similar statement and also to state that should cracking be revealed by a one-time inspection or previous OE, periodic inspection will be performed under a plant-specific AMP, unless cracking is evaluated and determined to be acceptable for continued operation during the period of extended operation, with no further monitoring. The applicant also revised the "monitoring and trending" program element in LRA Section B.2.31 to include a similar statement.

Based on the review, the staff finds the applicant's response to RAI B.2.31-6 acceptable because the applicant has removed problematic wording from the LRA and has provided acceptable criteria for the disposition of crack indications, if found by the Small Bore Class 1 Piping Inspection Program. Therefore, the staff's concern described in RAI B.2.31-6 is resolved.

The staff reviewed the composite of LRA changes made by the applicant in response to RAI B.2.31-1, as amended by the applicant's responses to RAIs B.2.31-5 and B.2.31-6, and determines that the as-revised program description and program elements for the applicant's Small Bore Class 1 Piping Inspection Program are consistent with GALL AMP XI.M35.

Based on the review, the staff finds the applicant's response to RAI B.2.31-1 acceptable because the applicant has appropriately revised the LRA sections and table to ensure consistency with GALL AMP XI.M35. Therefore, the staff's concerns described in RAI B.2.31-1 are resolved.

The applicant stated in the LRA that the Small bore Class 1 Piping Inspection Program will be used to monitor both the aging effect of cracking and the aging effect of loss of material in Class 1 small bore piping. However, the environmental stressors that may lead to cracking are not necessarily the same as the environmental stressors that may lead to loss of material.

In RAI B.2.31-2, dated June 23, 2008, the staff requested that the applicant clarify the selection processes and criteria that will be applied to ensure that the program will select and schedule inspections for the most limiting small bore Class 1 piping locations for both of these aging effects.

In the response to RAI B.2.31-2, dated July 25, 2008, the applicant stated:

> The Small Bore Class 1 Piping Inspection, as amended in the response to RAI B.2.31-1, is credited to manage only cracking. As such, in the selection of the small bore Class 1 piping locations for the one-time inspection, there is no need to consider environmental stressors that may lead to loss of material.
>
> The selection criteria to be applied as part of this program are provided in the "Monitoring and Trending" program element discussion in LRA Section B.2.31.

The staff notes that the applicant's revision to the LRA eliminated management of loss of material from the scope of the Small Bore Class 1 Piping Inspection Program. Because the revised AMP manages only the aging effect of cracking, which is consistent with the recommendations in GALL AMP XI.M35, the potential issue addressed in RAI B.2.31-2 was eliminated by the LRA amendment that resulted from RAI B.2.31-1.

Based on the review, the staff finds the applicant's response to RAI B.2.31-2 acceptable because the applicant has revised the Small Bore Class 1 Piping Inspection Program to manage only the aging effect of cracking, consistent with the recommendations in the GALL AMP XI.M35. Therefore, the staff's concern described in RAI B.2.31-2 is resolved.

In describing the Small Bore Class 1 Piping Inspection Program, under the program element "monitoring and trending" in LRA Section B.2.31, the applicant stated that actual inspection locations will be based on physical accessibility, exposure levels, nondestructive examination techniques, and locations identified in NRC Information Notice (IN) 97-46. IN 97-46 was written relative to cracking that was detected in small bore unisolable high-pressure injection piping at Oconee Unit 2, which is a pressurized water reactor (PWR).

In RAI B.2.31-3, dated June 23, 2008, the staff requested that the applicant justify the basis for applying the Oconee Unit 2 experience as applicable OE for the Small Bore Class 1 Piping Inspection Program, and clarify how the information contained in IN 97-46 will be applied in the selection process in order to ensure that the small bore Class 1 piping locations most susceptible to cracking, as a result of thermal and mechanical loading or SCC, will be selected for the one-time inspection.

In the response to RAI B.2.31-3, dated July 25, 2008, that applicant stated:

> The considerations in determining the inspection for AMP B.2.31, Small Bore Class 1 Piping Inspection, include operating experience and related industry guidance documents. Operating experience to date includes NRC Information Notice (IN) 97-46, which was issued to all holders of operating licenses or construction permits for power reactors (BWRs and PWRs). IN 97-46 states that a gap between a thermal sleeve and the associated safe-end allowed intermittent mixing of the hot reactor coolant and the cooler makeup water flowing through the pipeline, resulting in alternating heating and cooling of the weld between the pipe and the safe-end. This phenomenon was a likely contributor to the fatigue cracking that occurred at the weld. PPL will consider the potential for piping locations to experience intermittent mixing between hot and cold flows in the sample selection of inspection locations for AMP B.2.31.
>
> The SSES LRA is amended to state, more generally, that operating experience will be considered, without referencing a specific document such as IN-97-46.

In evaluating the applicant's response, the staff reviewed the changes made by the applicant in the LRA description of program element "monitoring and trending" for the Small Bore Class 1 Piping Inspection Program. The staff notes that the applicant's changes replace the previous reference to IN 97-46 with a more general statement that applicable OE will be included in determining the actual inspection locations.

Based on its review, the staff finds the applicant's response to RAI B.2.31-3 acceptable because the applicant has amended the LRA to eliminate the reference to IN 97-46, but continue to state that applicable OE will be considered. Therefore, the staff's concern described in RAI B.2.31-3 is resolved.

In describing the Small Bore Class 1 Piping Inspection, under program element "detection of aging effects" in LRA Section B.2.31, the applicant stated that it found cracking due to vibrational fatigue of small bore piping and is performing augmented inspections as part of the ISI Program.

In RAI B.2.31-4, dated June 23, 2008, the staff requested that the applicant identify the small bore piping components that experienced the vibrational-induced cracks and the augmented inspection techniques that resulted in the detection of the cracking in the piping components. Additionally, the staff requested that the applicant clarify whether it has taken appropriate corrective actions either to repair the flaw indications in the components or to replace the impacted components, and identify whether those components' locations will be reinspected in the future. If these components will be reinspected in the future, identify and provide technical justification for the inspection technique and frequency that will be used.

In the response to RAI B.2.31-4, dated July 25, 2008, the applicant stated:

> SSES experienced nine socket weld failures (leaks) between 1992 and 2005. All of the leaks were on small bore piping attached to the Unit 2 reactor recirculation system. No socket weld failures have been experienced on Unit 1. All of the leaking welds were cut out and replaced, or entirely eliminated by modification of the pipeline.

In response to the socket weld failures experienced at SSES and other plants, the SSES ISI group developed a shear wave ultrasonic (UT) inspection technique to volumetrically inspect socket welds. The shear wave UT is an augmented technique that has been used extensively during plant outages since 2000 to inspect welds that had been determined to be at-risk for vibrational fatigue due to their proximity to a vibration source (e.g., a recirculation pump).

Every weld with a crack-like indication was either cut-out and replaced or eliminated by a piping modification. Numerous modifications were made to replace socket-welded fittings with solid pipe (using pipe bends, instead of fittings) and to alter the natural frequency of the piping to avoid excitation by the vibration source. All new socket welds were made with the EPRI 2x1 configuration to improve fatigue resistance. To date, none of the 2x1 welds have resulted in a leaking crack at SSES.

Recent inspection results have indicated a substantial reduction in the number of indications. PPL is confident that vibrational fatigue on the subject piping welds has been successfully addressed. As such, the necessity to continue volumetric inspections under the augmented ISI program is currently being evaluated.

Based on its review, the staff finds the applicant's response to RAI B.2.31-4 acceptable because the applicant has provided detailed summary information about its methodology for and history of small bore pipe examination, and because the applicant's response supports a conclusion that previous problems with vibrational fatigue on small bore piping welds have been successfully addressed. Therefore, the staff's concern described in RAI B.2.31-4 is resolved.

The staff notes that in a letter dated September 30, 2008, the applicant revised LRA Section B.2.31 by deleting the discussions related to small bore piping failures attributed to vibrational (high-cycle) fatigue. The applicant made this change because the Small Bore Class 1 Piping Inspection Program is credited with managing age-related cracking due to stress corrosion or thermal and mechanical loading, but not with managing cracking due to high-cycle, vibrational fatigue, which is a short-term failure mechanism, not a long term aging mechanism. The staff finds this LRA change acceptable because it deletes from the LRA the discussion of a short-term failure mechanism that is not managed by the Small Bore Class 1 Inspection Program, and because the Small Bore Class 1 Inspection Program, including all revisions to the LRA, is consistent with the corresponding AMP as described in the GALL Report.

Based on its review, and resolution of the related RAIs as described above, the staff finds the Small-Bore Class 1 Piping Inspection Program consistent with program elements of GALL AMP XI.M35 and therefore is acceptable.

Operating Experience. The applicant stated that the Small Bore Class 1 Piping Inspection Program is a new one-time inspection activity for which there is no OE and that inspection methods will be consistent with accepted industry practices. For this program and for other new AMPs where the applicant provided no current plant-specific OE, the staff issued a generic RAI.

In RAI B.2.1, dated June 10, 2008, the staff requested that the applicant commit to provide documentation of plant-specific operating for staff review, after the program has been implemented, but, prior to entering the period of extended operation.

In the response to RAI B.2.1, dated July 8, 2008, the applicant stated that OE for new AMPs described in LRA Appendix B will be gained as these new programs are implemented during the period of extended operation. The applicant further stated that results of tests, inspections, and other aging management activities conducted in accordance with these programs will be subject to confirmation and corrective action elements of the Susquehanna 10 CFR Part 50, Appendix B, Quality Assurance Program. Results will be subject to staff review during regional inspections, under existing staff inspection modules. The applicant also stated that one-time inspections will be performed prior to entry into the period of extended operation to confirm the effectiveness of existing AMPs, and that these programs are subject to review under NRC Inspection Procedure 71003, "Post-Approval Site Inspection for License Renewal."

The staff noted the applicant's statement that inspection methods will be consistent with industry practices is consistent with the "operating experience" program element for GALL AMP XI.M35. The staff also noted that post-approval site inspections provide an opportunity for staff to review and assess the effectiveness of the applicant's Small Bore Class 1 Piping Inspection Program, after the applicant has developed OE with that program. The staff concludes that the corrective action program, based on internal and external experience, will capture OE to support the conclusion that the effects of aging are adequately managed.

On this basis, the staff confirms that the "operating experience" program element satisfies the criterion defined in the GALL Report and the guidance found in SRP-LR Section A.1.2.3.10. Therefore, the staff finds this program element acceptable and concludes that a separate commitment is not necessary.

UFSAR Supplement. The applicant provides the UFSAR supplement summary for the Small Bore Class 1 Piping Inspection Program in LRA Section A.1.2.44 and Commitment No. 27 in Table A-1. The staff reviewed this section, as revised in response to RAI B.2.31-1, and finds it acceptable because it is consistent with the corresponding program description in SRP-LR Table 3.1-2. The staff also notes that the applicant has committed to implement the Small Bore Class 1 Piping Inspection Program for aging management of applicable components during the 10 years prior to the period of extended operation.

The staff determines that the information in the UFSAR supplement is an adequate summary description of the program, as required by 10 CFR 54.21(d).

Conclusion. On the basis of the review of the applicant's Small Bore Class 1 Piping Inspection Program, the staff finds that, after incorporation of all LRA and program revisions made in response to the staff's RAIs, all program elements are consistent with the GALL Report. The staff concludes that the applicant has demonstrated that effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3). The staff also reviewed the UFSAR supplement for this AMP and concludes that it provides an adequate summary description of the program, as required by 10 CFR 54.21(d) and therefore is acceptable.

3.0.3.1.19 Inservice Inspection (ISI) Program - IWE

Summary of Technical Information in the Application. In LRA Section B.2.34, the applicant described the existing ISI Program - IWE as consistent with GALL AMP XI.S1 "ASME Section XI, Subsection IWE."

The applicant stated that the ISI Program - IWE is implemented through plant procedures which provide for ISI of Class MC and metallic liners of Class CC components. Section 50.55a of 10 CFR requires the use of the examination requirements in the ASME Code, Section XI, Subsection IWE, for steel liners of concrete containments and other containment components. The applicant also stated that it has implemented ASME Code Section XI, Subsection IWE, 1998 Edition with the 2000 Addenda, and will adopt new ASME Code editions and addenda, consistent with the provisions of 10 CFR 50.55a, during the period of extended operation.

Staff Evaluation. During the onsite review, the staff reviewed the applicant's claim of consistency with the GALL Report. The staff interviewed the applicant's technical staff and reviewed the applicant's ASME Code Section XI, Subsection IWE Program onsite basis documents to determine their consistency with GALL AMP XI.S1. Specifically, the staff reviewed the program elements and associated onsite documents and found that they are consistent with the GALL Report. On the basis of its review, the staff concludes that the applicant's ISI Program - IWE provides assurance that the steel containments (Class MC) and steel liners for concrete containments (Class CC) will be adequately managed.

Based on its review, the staff finds the applicant's ISI Program - IWE consistent with the program elements of GALL AMP XI.S1 and therefore is acceptable.

Operating Experience. The staff also reviewed the applicant's OE described in LRA Section B.2.34 and some of the applicant's onsite basis documents, including some samples of condition reports, and interviewed the applicant's technical staff to confirm that the plant-specific OE did not reveal any degradation not bounded by industry experience. In the application and during the onsite review, the applicant explained that the OE of the ISI Program - IWE activities shows no adverse trend of program performance. The staff noted that previous SSES IWE inspections have identified age-related degradation including flaking, discoloration, light to heavy pitting, and corrosion. The staff also noted that underwater containment suppression chambers were inspected by VT-3 certified divers. Metal loss appears to have progressed slowly and localized pitting is below the threshold values. The staff further noted that deficiencies were further evaluated and corrected by the applicant in accordance with the ISI Program – IWE. The documents reviewed by the staff provided assurance that the program is capturing degradation and correcting it in accordance with ASME Code Section XI. The applicant also established periodic IWE inspections in which all accessible surfaces of the steel containments and steel liners for concrete containments are visually inspected for the duration of plant operation. The staff's OE review has concluded that administrative controls are effective in detecting age-related degradation and in initiating corrective action. The staff did not identify any age-related related issues not bounded by the industry OE.

On this basis, the staff confirms that the "operating experience" program element satisfies the criterion defined in the GALL Report and the guidance found in SRP-LR Section A.1.2.3.10. Therefore, the staff finds this program element acceptable.

UFSAR Supplement. The applicant provided the UFSAR supplement summary for the ISI Program – IWE in LRA Section A.1.2.24, Commitment No. 29. The staff reviewed this section and determines that the information in the UFSAR supplement is an adequate summary description of the program, as required by 10 CFR 54.21(d).

Conclusion. On the basis of its review of the applicant's ISI Program - IWE, the staff finds all program elements consistent with the GALL Report. The staff concludes that the applicant has

demonstrated that the effects of aging will be adequately managed so that the intended functions will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3). The staff also reviewed the UFSAR supplement for this AMP and concludes that it adequately describes the program, as required by 10 CFR 54.21(d) and therefore is acceptable.

3.0.3.1.20 ISI Program - IWL

Summary of Technical Information in the Application. In LRA Section B.2.35, the applicant described the existing ISI Program - IWL as consistent with GALL AMP XI.S2, "ASME Section XI, Subsection IWL."

The ISI Program - IWL consists of periodic visual inspections of the reinforced concrete containment structures for Units 1 and 2. The applicant stated in the LRA that no significant aging effects have been identified for the concrete containment structures.

Staff Evaluation. During its review, the staff reviewed the applicant's claim of consistency with the GALL Report. The staff interviewed the applicant's technical staff and reviewed the applicant's ISI Program - IWL onsite basis documents to determine their consistency with GALL AMP XI.S2. Specifically, the staff reviewed the program elements and associated onsite documents and found that they are consistent with the GALL Report. On the basis of its review, the staff concludes that the applicant's ISI Program -IWL provides assurance that the reinforced concrete containment structures will be adequately managed.

Based on its review, the staff finds the applicant's ISI Program - IWL consistent with the program elements of GALL AMP XI.S2 and therefore is acceptable.

Operating Experience. The staff also reviewed the applicant's OE described in LRA Section B.2.35 and some of the applicant's onsite basis documents, including inspection data and summaries, and interviewed the applicant's technical staff to confirm that the plant-specific OE did not reveal any degradation not bounded by industry experience. In the application and during the onsite review, the applicant explained that the OE of the ISI Program - IWL activities shows no adverse trend of program performance. The staff noted that previous IWL inspections have identified minor exterior surface cracks on the containment surface. The staff also noted that deficiencies were documented, further evaluated, and corrected, if necessary, in accordance with the ISI Program – IWL. For example, visual examinations in 2000 discovered surface cracking on the containment exterior. The applicant provided documentation showing the cracking to be less than the allowable values in accordance with American Concrete Institute (ACI) 224R, Table 4.1 and acceptable pursuant to its applicable plant specification. The staff further noted that the applicant established periodic containment concrete IWL inspections in which all accessible external surfaces containment buildings are visually inspected for the duration of plant operation. The staff's OE review has concluded that administrative controls are effective in detecting age-related degradation and initiating corrective action. The staff did not identify any age-related issues not bounded by the industry OE.

On this basis, the staff confirms that the "operating experience" program element satisfies the criterion defined in the GALL Report and the guidance found in SRP-LR Section A.1.2.3.10. Therefore, the staff finds this program element acceptable.

UFSAR Supplement. The applicant provided the UFSAR supplement summary for the ISI Program – IWL in LRA Section A.1.2.26 and Commitment No. 31 in Table A-1. The staff reviewed this section and determines that the information in the UFSAR supplement is an adequate summary description of the program, as required by 10 CFR 54.21(d).

Conclusion. On the basis of the review of the applicant's ISI Program – IWL, the staff finds all program elements consistent with the GALL Report. The staff concludes that the applicant has demonstrated that the effects of aging will be adequately managed so that the intended functions will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3). The staff also reviewed the UFSAR supplement for this AMP and concludes that it provides an adequate summary of the program, as required by 10 CFR 54.21(d) and therefore, is acceptable.

3.0.3.1.21 ISI Program - IWF

Summary of Technical Information in the Application. In LRA Section B.2.36, the applicant described the existing ISI Program - IWF as consistent with GALL AMP XI.S3, "ASME Section XI, Subsection IWF."

The applicant stated that the ISI Program - IWF is implemented through plant procedures, which provide for periodic visual ISI of Class 1, 2, and 3 component supports for loss of mechanical function and material. Section 50.55a of 10 CFR requires the use of the examination requirements pursuant to ASME Code, Section XI, Subsection IWF, for ASME Code Class 1, 2, 3, and MC piping and components and their associated supports. The applicant also stated that it has implemented ASME Code Section XI, Subsection IWF, 1998 Edition with the 2000 Addenda, and will adopt new ASME Code editions and addenda, consistent with the provisions of 10 CFR 50.55a, during the period of extended operation.

Staff Evaluation. During its onsite review, the staff reviewed the applicant's claim of consistency with the GALL Report. The staff interviewed the applicant's technical staff and reviewed the applicant's ISI Program - IWF onsite basis documents to determine their consistency with the GALL AMP XI.S3. Specifically, the staff reviewed the program elements and associated onsite documents and found that they are consistent with the GALL Report. On the basis of the review, the staff concludes that the applicant's ISI Program - IWF provides assurance that the ASME Code Class 1, 2, and 3 component supports will be adequately managed.

Based on its review, the staff finds the applicant's ISI Program - IWF consistent with the program elements of GALL AMP XI.S3 and therefore is acceptable.

Operating Experience. The staff also reviewed the applicant's OE described in the LRA Section B.2.36 and some of the applicant's onsite basis documents, including some samples of condition reports (CR), and interviewed the applicant's technical staff to confirm that the plant-specific OE did not reveal any degradation not bounded by industry experience. In the application and during the onsite review, the applicant explained that the OE of the ISI Program - IWF activities shows no adverse trend of program performance. The staff noted in the LRA OE that previous IWF inspections have identified non aging-related degradation such as bent rods on spring can supports and sway struts. Deficiencies were further evaluated and corrected in accordance with the ISI Program – IWF. During its onsite review, the staff requested that the applicant provide more information about the bent spring can supports described in the OE of the LRA. The applicant provided the CRs which detailed the finding and the resolution. The staff reviewed the documents which provided assurance that the applicant's program captures

degradation and corrects it, in accordance with ASME Code Section XI. The applicant has established periodic IWF inspections in which ASME Code Class 1, 2, and 3 component supports are visually inspected for the duration of plant operation. The staff's OE review concludes that the applicant's administrative controls are effective in detecting age-related degradation and initiating corrective action. The staff did not identify any age-related related issues not bounded by the industry OE.

On this basis, the staff confirms that the "operating experience" program element satisfies the criterion defined in the GALL Report and the guidance found in SRP-LR Section A.1.2.3.10. Therefore, the staff finds this program element acceptable.

UFSAR Supplement. The applicant provided the UFSAR supplement summary for the ISI Program – IWF in LRA Section A.1.2.25 and Commitment No. 30 in Table A-1. The staff reviewed this section and determines that the information in the UFSAR supplement is an adequate summary description of the program, as required by 10 CFR 54.21(d).

Conclusion. On the basis of the review of the applicant's ISI Program – IWF, the staff finds all program elements consistent with the GALL Report. The staff concludes that the applicant has demonstrated that the effects of aging will be adequately managed so that the intended functions will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3). The staff also reviewed the UFSAR supplement for this AMP and concludes that it adequately describes the program, as required by 10 CFR 54.21(d) and therefore is acceptable.

3.0.3.1.22 Containment Leakage Rate Test Program

Summary of Technical Information in the Application. In LRA Section B.2.37, the applicant described the existing Containment Leakage Rate Test Program as consistent with the GALL AMP XI.S4, "10 CFR Part 50, Appendix J." The applicant uses Option B, the performance-based approach, to implement the requirement of containment leak rate monitoring and testing.

The 10 CFR Part 50, Appendix J Program monitors leakage rates through the containment pressure boundary, including penetrations and access openings. Containment leak rate tests assure that leakage through the primary containment and systems and components penetrating primary containment does not exceed the acceptance criteria limits.

Staff Evaluation. During its onsite review, the staff reviewed the applicant's claim of consistency with the GALL Report. The staff interviewed the applicant's technical staff and reviewed the applicant's Containment Leakage Rate Test Program onsite basis documents to determine their consistency with the GALL AMP XI.S4. Specifically, the staff reviewed the program elements and associated onsite documents and found that they are consistent with the GALL Report. On the basis of the review, the staff concludes that the applicant's Containment Leakage Rate Test Program provides assurance that leakage through primary containment and system and components penetrating primary containment will be adequately managed.

Based on the review, the staff finds the applicant's Containment Leakage Rate Test Program consistent with the program elements of GALL AMP XI.S4 and therefore is acceptable.

Operating Experience. The staff also reviewed the applicant's OE described in LRA Section B.2.37 and some of the applicant's onsite documents, including some samples of condition reports, and interviewed the applicant's technical staff to confirm that the plant-

specific OE did not reveal any degradation not bounded by industry experience. The staff found that the most recent containment structure integrated leak rate tests were performed in April 2006 and 2007 for Units 1 and 2, respectively. The results were below the plant limits found in the technical specifications, and demonstrate the leak tightness of the containments. The staff noted that there were no instances of Appendix J test failures due to causes other than valve or flange seat leakage. For these failures, all conditions were evaluated and corrected. The staff also reviewed a CR which the applicant documented corrosion discovered on an access hatch during the IWE inspection. The corrosion was removed and all four door seals were replaced. The staff did not identify any age-related issues not bounded by the industry OE.

On this basis, the staff confirms that the "operating experience" program element satisfies the criterion defined in the GALL Report and in SRP-LR Section A.1.2.3.10. Therefore, the staff finds this program element acceptable.

UFSAR Supplement. The applicant provided the UFSAR supplement summary for the Containment Leakage Rate Test Program in LRA Section A.1.2.15 and Commitment No. 32 in Table A-1. The staff reviewed this section and determines that the information in the UFSAR supplement is an adequate summary description of the program, as required by 10 CFR 54.21(d).

Conclusion. On the basis of the review of the applicant's Containment Leakage Rate Test Program, the staff finds all program elements consistent with the GALL Report. The staff concludes that the applicant has demonstrated that the effects of aging will be adequately managed so that the intended functions will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3). The staff also reviewed the UFSAR supplement for this AMP and concludes that it adequately describes the program, as required by 10 CFR 54.21(d) and therefore is acceptable.

3.0.3.1.23 Non-EQ Electrical Cables and Connections Visual Inspection Program

Summary of Technical Information in the Application. In LRA Section B.2.41, the applicant described the Non-Environmental Qualification (EQ) Electrical Cables and Connections Visual Inspection Program as a new program that is consistent with the GALL AMP XI.E1, "Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements." The applicant stated that the applicable electrical components will perform their intended function(s) for the period of extended operation. The applicant also stated that the program provides for the periodic visual inspection of accessible, non-EQ electrical cables and connections, in order to determine if age-related degradation is occurring, particularly in plant areas with high temperatures and/or high radiation levels.

Staff Evaluation. During its audit, the staff reviewed the applicant's claim of consistency with the GALL Report. The staff reviewed and compared the "scope of program," "preventative actions," "parameters monitored/detected," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "operating experience" program elements of the AMP to the corresponding program element criteria in the GALL AMP XI.E1.

The staff compared the program elements in the applicant's program to those in GALL AMP XI.E1 to verify that the program elements in the applicant's AMP, which the LRA identified as consistent with the GALL Report, were consistent with the corresponding program

element criteria recommended in the program elements of the GALL AMP XI.E1. The staff determined that additional information was required to complete its review.

The GALL AMP XI.E1 considers the technical information and guidance provided in NUREG/CR-5643, Institute for Electrical and Electronic Engineers (IEEE) Standard P1205, SAND 96-0344, and EPRI TR-109619.

In LRA Section B.2.41, the applicant stated that this program is consistent with the GALL Report; however, the applicant did not provide technical information and guidance as referenced in the GALL AMP XI.E1.

In RAI B.2.41-1, dated July 3, 2008, the staff requested that the applicant provide the specific industry guidance or explain why the guidance was not necessary.

In its response to RAI B.2.41-1, dated August 5, 2008, the applicant stated that the technical documents listed in GALL AMP XI.E1 (*e.g.*, NUREG/CR-5643, IEEE Standard P1205, SAND96-0344, and EPRI TR-109619) provide information pertinent to plant environmental conditions, environmental effects (particularly with regard to adverse environmental conditions), evaluation of environmental conditions and effects, degradation mechanisms, and aging effects. The applicant also stated that the information is relevant to the understanding of electrical cable aging mechanisms and effects, and is also relevant to potential inspection methods necessary to identify degradation. The applicant further stated that the technical guidance contained in these staff and industry reports will be used as input to develop this AMP.

Based on the review, the staff finds the applicant's response to RAI B.2.41-1 acceptable because the applicant has identified the appropriate references that are consistent with those in the GALL AMP XI.E1. Therefore, the staff's concern described in RAI B.2.41-1 is resolved.

The GALL XI.E1 states that an adverse localized environment is a condition in a limited plant area that is significantly more severe than the specified service environment for the cable. The staff reviewed the plant basis document associated with the Non-EQ Electrical Cables and Connections Visual Inspection Program and noted that the applicant did not define the criteria for an adverse localized environment.

In RAI B.2.41-2, dated July 3, 2008, the staff requested that the applicant discuss how an adverse localized environment is determined based on the most limiting service environment of cables (i.e., radiation, temperature, and moisture) within the scope of the GALL AMP XI.E1. The GALL AMP XI.E1 states conductor insulation material used in electrical cables and connection may degrade in adverse localized environments. The exposure of electrical cables and connections to adverse localized environments caused by heat, or radiation can result in reduced insulation resistance.

In the response to RAI B.2.41-2, dated August 5, 2008, the applicant stated that adverse localized environments are identified by using a combination of existing information and plant walk downs. The applicant further stated that an adverse localized environment typically occurs when cables are routed in proximity to a source of heat or radiation, or are exposed to significant moisture. The applicant also stated that information sources that can be used to identify potential adverse localized environments include, plant design information, experience and knowledge of plant personnel, radiological survey maps, and plant OE records. Plant walk

downs guided by the information from these sources, along with the use of thermography to identify heat sources, will determine the adverse localized environments.

The staff found the applicant's response unacceptable because the applicant did not clearly identify the threshold condition (i.e. temperature, radiation) at which the localized environment is considered adverse. In a follow up conference call on October 10, 2008, the staff requested that the applicant define the most limiting temperature and radiation dose values that will be used to identify an adverse localized environment.

In a letter dated November 11, 2008, the applicant responded with a supplement to RAI B.2.41-2 and stated that the most restrictive 60-year service limiting temperature for electrical insulating materials in use at SSES is 112°F for polyvinyl chloride. The most restrictive 60-year service limiting radiation dose for electrical insulating materials in use at SSES is 5×10^4 rads for fluorinated ethylene propylene. These values will be used as the thresholds for evaluation to identify adverse localized environments.

Based on the review, the staff finds the applicant's response to RAI B.2.41-2, in addition to the supplemental response acceptable because the applicant has clearly identified the threshold condition (i.e. temperature, radiation) at which the localized environment is considered adverse. Therefore, the staff's concern described in RAI B.2.41-2 is resolved.

In addition to the requirements of 10 CFR Part 50, Appendix B, the "corrective actions" program element in the electrical GALL Report AMPs recommends certain actions, such as making a determination of whether the same condition or situation is applicable to other accessible or inaccessible cables and connections. In the LRA, the applicant stated that the AMPs are consistent with the GALL Report and referred to a corrective action element in LRA Section B.1.3 that is common to all AMPs. The corrective actions described in LRA Section B.1.3 do not contain certain recommendations described in GALL AMP XI.E1.

In RAI Q3, dated July 3, 2008, the staff requested that the applicant explain in detail how the generic corrective actions in LRA Section B.1.3 are consistent with GALL AMP XI.E1.

In the response to RAI Q3, dated August 5, 2008, the applicant stated that for the Non-EQ Electrical Cables and Connections Visual Inspection Program, all unacceptable visual indications of cable and connection jacket surface anomalies will be subject to an engineering evaluation. The applicant further stated that evaluation will consider the age and OE of the component, as well as the severity of the anomaly and whether the anomaly has previously been correlated to degradation of the conductor insulation or connections. The applicant also stated that corrective actions may include, but are not limited to, testing, shielding or otherwise changing the environment, or relocation and/or replacement of the affected cable or connection. When an unacceptable condition or situation is identified, the applicant stated that it determines whether the same condition or situation is applicable to other cables or connections within the scope of license renewal.

Based on the review, the staff finds the applicant's response to RAI Q3 acceptable because the applicant has adequately explained that the corrective actions it has identified will include actions as described in GALL AMP XI.E1. Therefore, the staff concern described in RAI Q3 is resolved.

Based on the review of the information contained in the LRA and the applicant's responses to RAIs B.2.41-1, B.2.41-2 and Q3, the staff determines that the Non-EQ Electrical Cable &

Connections Visual Inspection Program is consistent with the program elements of GALL AMP XI.E1 and therefore, is acceptable.

Operating Experience. The staff also reviewed the applicant's OE in the onsite plant basis document. The staff confirmed that the applicant has correctly identified the appropriate root causes of cable aging and has taken appropriate corrective actions.

However, under the "operating experience" program element in the Non-EQ Electrical Cables and Connections Visual Inspection Program, the applicant stated that the AMP is a new program for which there is no SSES plant-specific OE.

In RAI Q1, dated July 3, 2008, the staff requested that the applicant describe plant-specific OE associated with cables and connections in this AMP and explain how the new program will manage the aging effects of cable and connection insulation.

In the response to RAI Q1, dated August 5, 2008, the applicant included the following OE: (a) during routine preventive maintenance activities in 2000, cables connected to moisture separator level switches were found to be brittle and cracked due to excessive heat and the damaged cables were replaced and (b) in 2002, instrumentation cables connected to a thermocouple in the MS tunnel were found to be heat damaged and brittle. The damaged section of cable was replaced.

Based on the review, the staff finds the applicant's response to RAI Q1 acceptable because the applicant has provided an adequate description of plant-specific OE associated with the cables and connectors in the Non-EQ Electrical Cables and Connections Visual Inspection Program. The staff determines that the OE is consistent with and bounded by those in the GALL AMP XI.E1. Therefore, the staff's concern described in RAI Q1 is resolved.

On this basis, the staff determines that the "operating experience" program element satisfies the criterion defined in the GALL Report and the guidance found in SRP-LR Section A.1.2.3.10. Therefore, the staff finds this program element acceptable.

UFSAR Supplement. The applicant provided the UFSAR supplement summary for the Non-EQ Electrical Cable and Connections Visual Inspection Program in LRA Section A.1.2.35, and Commitment No. 36 in Table A-1. The staff notes that SRP-LR Table 3.6-2 identifies when an inspection will be implemented and how often the inspection will be performed. The UFSAR supplement for the Non-EQ Electrical Cables and Connections Visual Inspection Program does not provide the frequency of inspection.

In RAI Q2, dated July 3, 2008, the staff requested that the applicant provide the frequency of inspection in the UFSAR supplement.

In the response to RAI Q2, dated August 5, 2008, the applicant included the inspection frequency in the UFSAR supplement, in agreement with the Non-EQ Electrical Cables and Connections Visual Inspection Program.

Based on the review, the staff finds the applicant's response to RAI Q2 acceptable because the applicant had revised the UFSAR supplement to include the frequency of inspection. Therefore, the staff's concern described in RAI Q2 is resolved.

On this basis, the staff determines that the UFSAR supplement provides an adequate summary description of the applicant's Non-EQ Electrical Cable and Connections Visual Inspection, as required by 10 CFR 54.21(d). The staff notes that the applicant has committed (Commitment No. 36) to implement this AMP prior to the period of extended operation.

Conclusion. On the basis of the review of the applicant's Non-EQ Electrical Cable and Connections Visual Inspection Program and the applicant's responses to RAIs B.2.41-1, B.2.41-2, Q1, Q2, and Q3, the staff finds all program elements consistent with the GALL Report. The staff concludes that the applicant has demonstrated that effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation as required by 10 CFR 54.21(a)(3). The staff also reviewed the UFSAR supplement for this AMP and concludes that it provides an adequate summary description of the program, as required by 10 CFR 54.21(d) and therefore is acceptable.

3.0.3.1.24 Non-EQ Cables and Connections Used in Low-Current Instrumentation Circuits Program

Summary of Technical Information in the Application. In LRA Section B.2.42, the applicant described the Non-EQ Cables and Connections Used in Low-Current Instrumentation Circuits Program as a new program consistent with the GALL AMP XI.E2, "Electrical Cables and Connections Not Subject to 10 CFR50.49 Environmental Qualification Requirements Used in Instrumentation Circuits." The applicant stated that the purpose of this AMP is to manage the age-related degradation associated with non-EQ, low current instrumentation cables and connections within the scope of license renewal. The applicant also stated that this program applies to in-scope, non-EQ electrical cables and connections used in neutron monitoring circuits with sensitive, low-current signals. The sensitive nature of these circuits is such that visual inspection alone may not detect degradation to the insulation resistance function of the conductor insulation.

Staff Evaluation. During its audit, the staff reviewed the applicant's claim of consistency with the GALL Report. The staff reviewed and compared the "scope of program," "preventive actions," "parameters monitored/detected," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "operating experience" program elements of the AMP to the corresponding program element criteria in GALL AMP XI.E2.

The staff compared the programs elements in the applicant's AMP to those in the GALL AMP XI.E2. The staff verified that the program elements, which the LRA identified as consistent with the GALL Report, were consistent with the corresponding program element criteria recommended in GALL AMP XI.E2. However, the staff determined that additional information was required to complete its review.

The GALL AMP XI.E2 considers the technical information and guidance provided in NUREG/CR-5643, IEEE Standard P1205, SAND96-0344 and EPRI TR-109619. In LRA Section B.2.42, the applicant stated that its program is consistent with the GALL Report, but did not provide any information on industrial technical guidance.

In RAI B.2.42-1, dated July 3, 2008, the staff requested that the applicant provide specific technical guidance which it will use to develop this AMP.

In its response to RAI B.2.42-1, dated August 5, 2008, the applicant stated that the technical documents listed in GALL AMP XI.E2 (*e.g.*, NUREG/CR-5643, IEEE Standard P1205,

SAND 96-0344, and EPRI TR-109619) provide information pertinent to plant environmental conditions, environmental effects (i.e., adverse environmental conditions), evaluation of environmental conditions and effects, degradation mechanisms, and aging effects. The applicant also stated that the information is relevant to the understanding of electrical cable aging mechanisms and effects, and is also relevant to potential inspection methods to identify degradation. The applicant further stated that technical guidance contained in these staff and industry reports will be used as input to develop this AMP.

Based on the review, the staff finds the applicant's response to RAI B.2.42-1 acceptable because the applicant has confirmed that it will use industry guidance to develop the AMP and that the guidance identified by the applicant is consistent with that in GALL AMP XI.E2. Therefore, the staff's concern described in RAI B.2.42-1 is resolved.

The GALL AMP XI.E2 states that a proven cable system test for detecting deterioration of the insulation system such as insulation resistance tests, time domain reflectometry tests, or other testing judged to be effective in determining cable insulation condition as justified in the application, should be performed. In LRA Section B.2.42, under the same element, the applicant stated that the testing methodology will be specified prior to the first test.

In RAI B.2.42-2, dated July 3, 2008, the staff requested that the applicant provide the type of tests that it will use to detect degradation of insulation in high-voltage, and in low-level signal instrumentation circuits.

In its response to RAI B.2.42-2, dated August 05, 2008, the applicant stated that this is a new program that will be implemented consistent with the GALL Report. Therefore, as recommended in the GALL Report, a proven cable system test for detecting degradation of insulation such as, insulation resistance testing, time domain reflectometry, or other suitable test, will be used. The applicant further stated that the test method will be selected prior to performance of the first test and will be a test type consistent with the recommendations in the GALL Report.

Based on its review, the staff finds the applicant's response to RAI B.2.42-2 acceptable because the applicant has identified proven methods of testing that it will use and that these methods are consistent with those recommended in the GALL AMP XI.E2. Therefore, the staff's concern described in RAI B.2.42-2 is resolved.

In addition to the requirements of 10 CFR Part 50, Appendix B, the "corrective actions" program element in the electrical GALL Report AMPs recommends certain actions, such as making a determination of whether the same condition or situation is applicable to other accessible or inaccessible cables and connections. In the LRA, the applicant stated that its AMPs are consistent with the GALL Report and referred to a corrective action element in LRA Section B.1.3, common to all AMPs. The staff determined that the corrective actions described in this LRA section may not contain certain recommendations described in the GALL AMP XI.E2.

In RAI Q3, dated July 3, 2008, the staff requested that the applicant explain in detail how the generic corrective actions in LRA Section B.1.3 are consistent with GALL AMP XI.E2.

In its response to RAI Q3, dated August 5, 2008, the applicant stated for the Non-EQ Cables and Connections Used in Low-Current Instrumentation Circuits Program, corrective actions such as recalibration and circuit trouble-shooting are implemented when calibration or

surveillance results do not meet the acceptance criteria. The applicant performs an engineering evaluation when the test results do not meet the acceptance criteria. The applicant also stated that the evaluation will consider the significance of the test results, the operability of the component, the reportability of the event, the extent of the concern, the potential root causes, the corrective actions required, and the likelihood of recurrence.

Based on its review, the staff finds the applicant's response to RAI Q3 acceptable because the applicant has identified corrective actions that are consistent with those in GALL AMP XI.E2. Therefore, the staff's concern described in RAI Q3 is resolved.

Based on its review of the information contained in the LRA and the applicant's responses to RAIs B.2.42-1, B.2.42-2 and Q3, the staff finds the applicant's Non-EQ Cables and Connections Used in Low-Current Instrumentation Circuits Program consistent with the program elements of GALL AMP XI.E2 and therefore is acceptable.

Operating Experience. The staff reviewed CRs as part of its onsite review of the Non-EQ Cables and Connections Used in Low-Current Instrumentation Circuits Program. The staff determined that the CRs demonstrate that the applicant has implemented appropriate corrective actions. However, the applicant states that the Non-EQ Cables and Connections Used in Low-Current Instrumentation Circuits Program is a new program for which there is no plant-specific OE.

In RAI Q1, dated July 3, 2008, the staff requested that the applicant describe plant-specific OE associated with cables and connections in this AMP and explain how the new program will manage the aging effects of cable and connection insulations used in low-current instrumentation circuits.

In its response to RAI Q1, dated August 5, 2008, the applicant stated that the Non-EQ Cables and Connections Used in Low-Current Instrumentation Circuits Program has not been implemented, but the following example of OE demonstrates that the aging effect of interest in this AMP (i.e., reduction in insulation resistance), can be, and has been, successfully detected. During routine plant maintenance activities in 2003, two Unit 2 local power range monitoring cables were identified with lower than acceptable insulation resistance. The applicant replaced those cables. GALL AMP XI.E2 states that exposure of electrical cables to adverse localized environments caused by heat, radiation, or moisture can result in reduced insulation resistance. Reduced insulation resistance caused an increase in leakage currents between conductors and from individual conductor to ground. A reduction in insulation resistance is a concern for circuits with sensitive, high-voltage, low-level signals such as radiation monitoring and nuclear instrumentation circuits, because a reduced insulation resistance may contribute to signal inaccuracies.

Based on its review, the staff finds the applicant's response to RAI Q1 acceptable because the applicant has adequately described the plant-specific OE associated with cables and connections in this AMP and has sufficiently explained how the new program will manage the aging effects of cable and connection insulations used in low-current instrumentation circuits. The staff determines that reduced insulation resistance is the aging effect of sensitive instrumentation cables installed in an adverse localized environment. This aging effect is bounded by that in the GALL AMP XI.E2. Therefore, the staff's concern described in RAI Q1 is resolved.

On the basis of its review, the staff determines that the "operating experience" program element satisfies the criterion defined in the GALL Report and the guidance found in SRP-LR Section A.1.2.3.10. Therefore, the staff finds this program element acceptable.

UFSAR Supplement. The applicant provided the UFSAR supplement summary description for the Non-EQ Cables and Connections Used in Low-Current Instrumentation Circuits Program in LRA Section A.1.2.34 and Commitment No. 37 in Table A-1. The staff notes that SRP-LR Table 3.6-2 identifies when an inspection will be implemented and how often the inspection will be performed. The applicant's UFSAR supplement for the Non-EQ Cables and Connections Used in Low-Current Instrumentation Circuits Program does not provide the frequency of inspection.

In RAI Q2, dated July 3, 2008, the staff requested that the applicant provide the frequency of inspection in the UFSAR supplement.

In its response to RAI Q2, dated August 5, 2008, the applicant provided the inspection frequency, as described in the Non-EQ Cables and Connections Used in Low-Current Instrumentation Circuits Program, in the UFSAR supplement. The staff finds that UFSAR supplement summary description in LRA Section A.1.2.34 provides an adequate summary description of the applicant's Non-EQ Cables and Connections Used in Low-Current Instrumentation Circuits Program, as required by 10 CFR 54.21(d). The staff confirms the applicant's commitment (Commitment No. 37) to implement this AMP prior to the period of extended operation.

Conclusion. On the basis of its technical review of the applicant's Non-EQ Cables and Connections Used in Low-Current Instrumentation Circuits Program, the staff finds all program elements consistent with the GALL Report. Upon reviewing the LRA and the applicant's responses to RAIs B.2.42-1 B.2.42-2, Q1, Q2, and Q3, the staff finds all program elements consistent with the GALL Report. The staff concludes that the applicant has demonstrated that effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3). The staff also reviewed the UFSAR supplement for this AMP and concludes that it provides an adequate summary description of the program, as required by 10 CFR 54.21(d) and. therefore, is acceptable.

3.0.3.1.25 Non-EQ Inaccessible Medium-Voltage Cables Program

Summary of Technical Information in the Application. In LRA Section B.2.43, the applicant described the new Non-EQ Inaccessible Medium-Voltage Cables Program as consistent with GALL AMP XI.E3, "Inaccessible Medium-Voltage Cables Not Subject to 10 CFR 50.49 EQ Requirements." The applicant also stated that this AMP will manage the aging of non-EQ inaccessible medium-voltage electrical cables subject to wetting, within the scope of license renewal. The applicant further stated that the program provides for the periodic testing of non-EQ inaccessible medium-voltage electrical cables, in order to determine if age-related degradation is occurring, and includes provisions for the inspection of associated manholes to identify any collection of water.

Staff Evaluation. During the audit, the staff reviewed the applicant's claim of consistency with the GALL Report. The staff reviewed and compared the "scope of program," "preventive actions," "parameters monitored/detected," "detection of aging effects," "monitoring and

trending," "acceptance criteria," and operating experience" program elements of the AMP to GALL AMP XI.E3.

The staff compared the program elements in the applicant's program to those in the GALL AMP XI.E3 and verified that the program elements in the applicant's AMP, which the applicant identified as consistent with the GALL Report, were consistent with the GALL AMP XI.E3. However, the staff determined that additional information was required to complete its review.

In LRA Section B.2.43, under the "scope of program" element, the applicant stated that this program applies to six cables associated with the offsite power supply for SSES. The applicant also stated that these are the only inaccessible medium-voltage cables that are within the scope of license renewal and are exposed to significant moisture and significant voltage. Significant voltage is defined by the GALL Report as any device or cable that is energized more than 25% of the time. The staff noted that the RHR and emergency service water (ESW) pump cables could be subjected to significant moisture and significant voltage.

In RAI B.2.43-1, dated July 3, 2008, the staff requested that the applicant explain why these cables are not within the scope of the Non-EQ Inaccessible Medium-Voltage Cables Program.

In the response to RAI B. 2.43-1, dated August 5, 2008, the applicant stated that the cables for the RHR pump motors are not within the scope of the Non-EQ Inaccessible Medium-Voltage Cables Program because they are not routed underground and are not exposed to significant moisture. The cables for the RHR service water (RHRSW) and ESW pump motors are not included in the scope of the Non-EQ Inaccessible Medium-Voltage Cables Program because they are energized less than 25% of the time. The applicant also stated that as described in the GALL AMP XI.E3, this AMP applies to inaccessible medium-voltage cables within the scope of license renewal that are exposed to significant moisture, simultaneously with significant voltage. The GALL Report states that significant moisture is defined as periodic exposures to moisture that last more than a few days, and significant voltage is defined as being subject to system voltage more than 25% of the time. The applicant concluded that, because the RHR, RHRSW, and ESW pump motor cables are either not exposed to significant moisture, or to significant voltage, they are excluded from the scope of the Non-EQ Inaccessible Medium-Voltage Cables Program.

Based on the review, the staff finds the applicant's response to RAI B.2.43-1 acceptable because the applicant has adequately explained that the RHR, RHRSW, and ESW pump motor cables are either not exposed to significant moisture or to significant voltage; therefore, they are not required to be within the scope of the Non-EQ Inaccessible Medium-Voltage Cables Program. Therefore, the staff's concern described in RAI B.2.43-1 is resolved.

The GALL AMP XI.E3 considers the technical information and guidance provided in NUREG/CR-5643, IEEE Standard P1205, SAND96-0344 and EPRI TR-109619. In LRA Section B.2.43, the applicant stated that the program is consistent with the GALL Report and yet, it did not provide any information on industrial technical guidance.

In RAI B.2.43-3, dated July 3, 2008, the staff requested that the applicant provide technical guidance for the Non-EQ Inaccessible Medium-Voltage Cables Program or provide a justification for why this guidance is not necessary.

In the response to RAI B.2.43-3, dated August 5, 2008, the applicant stated that the technical documents listed in GALL AMP XI.E3 (e.g., NUREG/CR-5643, IEEE Standard P1205, SAND96-0344, and EPRI TR-109619) provide information pertinent to plant environmental conditions, environmental effects (i.e., adverse environmental conditions), evaluation of environmental conditions and effects, degradation mechanisms, and aging effects. The applicant further stated that the information is relevant to understanding electrical cable aging mechanisms and effects, and is also relevant to potential testing methods to identify degradation. The technical guidance contained in these staff and industry reports will be used as input to develop this AMP.

Based on the review, the staff finds the applicant's response to RAI B.2.43-3 acceptable because the applicant has provided the technical documents listed in the GALL AMP XI.E3 as its references. Therefore, the staff's concern described in RAI B.2.43-3 is resolved.

The GALL AMP XI.E3, under the "detection of aging effects" program element, states that the specific type of test is to be a proven test for detecting deterioration of the insulation system due to wetting (i.e., power factor, partial discharge, or polarization index), as described in EPRI TR-103834-P1-2, or other testing that is state-of-the-art at the time of the test is performed. In LRA Section B.2.43, under the same attribute, the applicant stated that the program will utilize a proven test for detecting deterioration of the cable insulation due to wetting and energization, and will reflect the actual test methodology prior to the initial performance of the cable testing.

In RAI B.2.43-4, dated July 3, 2008, the staff requested that the applicant describe the testing methodology for detecting deterioration of the cable insulation under this AMP.

In the response to RAI B.2.43-4, dated August 5, 2008, the applicant stated that this is a new program that will be implemented consistent with the GALL Report. The applicant further stated that, as recommended in the GALL Report, a proven test for detecting deterioration of the insulating system (i.e., such as, power factor, partial discharge, polarization index), as described in EPRI TR103834-P1-2, or other state-of-the-art testing, will be used. The test method will be selected prior to performance of the first test and will be a test-type consistent with the recommendations of the GALL Report.

Based on its review, the staff finds the applicant's response to RAI B.2.43-4 acceptable because the applicant has reasonably described the testing methodology for detecting deterioration of the cable insulation under this AMP, which is consistent with those recommended in the GALL AMP XI.E3. Therefore, the staff's concern described in RAI B.2.43-4 is resolved.

In addition to the requirements of 10 CFR Part 50, Appendix B, the "corrective actions" program element in the electrical GALL AMPs recommends certain actions, such as making a determination of whether the same condition or situation is applicable to other accessible or inaccessible cables and connections. In the LRA, the applicant stated that its AMPs are consistent with the GALL Report and referred to a corrective action element in LRA Section B.1.3, common to all AMPs. The staff determined that the corrective actions described in LRA Section B.1.3 may not contain certain recommendations described in the GALL AMP XI.E3.

In RAI Q3, dated July 3, 2008, the staff requested that the applicant explain in detail how the generic corrective actions in LRA Section B.1.3 are consistent with GALL AMP XI.E3.

In its response to RAI Q3, dated August 5, 2008, the applicant stated that for the Non-EQ Inaccessible Medium-Voltage Cables Program, an engineering evaluation is performed in order to ensure that the intended function of the electrical cables can be maintained consistent with the CLB, when the test acceptance criteria are not met. The evaluation will consider the significance of the test results, the operability of the component, the reportability of the event, the extent of the concern, the potential root causes, the corrective actions required, and the likelihood of recurrence. When an unacceptable condition or situation is identified, a determination will be made as to whether the same condition or situation is applicable to other in-scope medium-voltage cables.

Based on its review, the staff finds the applicant's response to RAI Q3 acceptable because the applicant has adequately explained how the corrective actions are consistent with those in GALL AMP XI.E3. Therefore, the staff's concern described in RAI Q3 is resolved.

Based on the review of the information contained in the LRA and the applicant's responses to RAIs B.2.43-1, B.2.43-3, B.2.43-4, and Q3, the staff finds the Non-EQ Inaccessible Medium-Voltage Cables Program consistent with the program elements of GALL AMP XI.E3, and therefore is acceptable.

Operating Experience. The staff reviewed the applicant's OE and noted that inaccessible medium-voltage cables in certain manholes at SSES have experienced significant moisture (i.e., cable in standing water for more than few days). In addition, during a walk down, the staff found several feet of water in Manhole Numbers 2 and 16.

The staff identified water in manholes as a generic, current operating plant issue in IN 2002-12, "Submerged Safety-Related Electrical Cables," dated March 21, 2002, and GL 2007-01, "Inaccessible or Underground Power Cable Failures That Disable Accident Mitigation Systems Or Cause Plant Transients," dated February 7, 2007. The staff will address water in manholes, during the current period of operation, through the reactor oversight process, in accordance with the requirements of 10 CFR Part 50.

During its review of the LRA, the staff determined that the Non-EQ Inaccessible Medium-Voltage Cable Program, if implemented as described, would ensure that the aging affects on inaccessible medium-voltage cables, due to exposure to significant moisture and significant voltage, will be adequately managed during the period of extended operation, and pursuant to the guidance contained in GALL AMP XI.E3. The Non-EQ Inaccessible Medium-Voltage Cable Program is a new AMP which will require the applicant to test the cables and to evaluate plant-specific OE to determine whether the inspection frequency of the manholes should be increased to ensure that the cables will be maintained in a dry environment, during the period of extended period of operation.

In the LRA, the applicant stated that the Non-EQ Inaccessible Medium-Voltage Cable Program is a new program for which there is no plant-specific OE.

In RAI Q1, dated July 3, 2008, the staff requested that the applicant describe plant-specific OE associated with cables and connections in this AMP and explain how the new program will manage non-EQ medium voltage cables.

In the response to RAI Q1, dated August 5, 2008, the applicant stated that the Non-EQ Inaccessible Medium-Voltage Cable Program is license renewal AMP and has not yet been implemented. However, the following example of OE demonstrates that the aging effects of

interest in this AMP (i.e., degradation of the conductor insulation for medium-voltage cables exposed to significant moisture and voltage) can be, and has been, successfully detected at SSES. The applicant further stated that it detected a negative trend in power factor test results of 15 kV underground cables supplying power to the plant's river water intake. The test results are indicative of expected aging of the cable insulation system. The applicant also stated that these cables continue to be monitored under the plant corrective action program.

Based on its review, the staff finds the applicant's response to RAI Q1 acceptable because the applicant has adequately explained how the aging effects due to significant moisture and voltage will be detected and the corrective actions it will take. The staff determines that the applicant's response supports the conclusion that this AMP will provide assurance that the aging effects will be managed consistent with CLB, during the period of extended operation. Therefore, the staff's concern described in RAI Q1 is resolved.

On this basis, the staff determines that the "operating experience" program element satisfies the criterion defined in the GALL Report and the guidance found in SRP-LR Section A.1.2.3.10. Therefore, the staff finds this program element acceptable.

UFSAR Supplement. The applicant provided the UFSAR supplement summary for the Non-EQ Inaccessible Medium-Voltage Cables Program in LRA Section A.1.2.36 and Commitment No. 38 in Table A-1. The staff notes that SRP-LR Table 3.6-2 identifies when an inspection will be implemented and how often the inspection will be performed. The UFSAR supplement for the Non-EQ Inaccessible Medium-Voltage Cables Program does not provide the frequency of inspection.

In RAI Q2, dated July 3, 2008, the staff requested that the applicant provide the frequency of inspection in the UFSAR supplement.

In the response to RAI Q2, dated August 5, 2008, the applicant provided the inspection frequency for its UFSAR supplement.

Based on the review, the staff finds the applicant's response to RAI Q2 acceptable because the applicant has provided the frequency of inspection in the UFSAR supplement.

The staff finds that UFSAR Supplement summary description in LRA Section A.1.2.36 provides an adequate summary description of the applicant's Non-EQ Inaccessible Medium-Voltage Cables Program, as required by 10 CFR 54.21(d). The staff notes that the applicant has committed (Commitment No. 38) to implement this AMP prior to the period of extended operation.

Conclusion. On the basis of the review of the applicant's Non-EQ Inaccessible Medium-Voltage Cables Program and the applicant's responses to RAI B.2.43-1, B.2.43-3, B.2.43-4, Q1, Q2, and Q3, the staff finds all program elements consistent with the GALL Report. The staff concludes that the applicant has demonstrated that effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(d). The staff also reviewed the UFSAR supplement for this AMP and concludes that it provides an adequate summary description of the program, as required by 10 CFR 54.21(d) and therefore is acceptable.

3.0.3.1.26 Metal-Enclosed Bus Inspection Program

Summary of Technical Information in the Application. In LRA Section B.2.44, the applicant described the new Metal-Enclosed Bus Inspection Program as consistent with the GALL AMP XI.E4, "Metal-Enclosed Bus." The applicant also stated that this AMP will provide the periodic inspection of the applicable metal-enclosed bus, in order to determine whether age-related degradation is occurring. The applicant further stated that the program provides for the periodic inspection of the applicable metal-enclosed bus, in order to determine if age-related degradation is occurring.

Staff Evaluation. During the audit, the staff reviewed the applicant's claim of consistency with the GALL Report. The staff reviewed and compared the "scope of program," "preventative actions," "parameters monitored/detected," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "operating experience" program elements of the AMP to the corresponding program element criteria in the GALL AMP XI.E4.

The staff compared the programs elements in the applicant's program to those in the GALL AMP XI.E4. The staff noted the program elements in the applicant's AMP claim of consistency with GALL were consistent with the GALL AMP XI.E4. The staff determined that additional information was required to complete its review.

In addition to the requirements of 10 CFR Part 50, Appendix B, the "corrective actions" program element in the electrical GALL AMP XI.E4 recommends certain actions, such as making a determination of whether the same condition or situation is applicable to other accessible or inaccessible metal-enclosed busses. In the LRA, the applicant stated that its AMP is consistent with the GALL Report and referred to a corrective action element in the LRA, Section B.1.3, common to all AMPs. The staff determined that the corrective actions described in LRA Section B.1.3 do not contain certain recommendations described in the GALL AMP XI.E4.

In RAI Q3, dated July 3, 2008, the staff requested that the applicant explain, in detail, how the generic corrective actions in LRA Section B.1.3 are consistent with GALL AMP XI.E4.

In its response to RAI Q3, dated August 5, 2008, the applicant stated that for the new Metal-Enclosed Bus Inspection Program, further investigation and evaluation are performed when the acceptance criteria are not met. Corrective actions may include, but are not limited to cleaning, drying, an increased inspection frequency, replacement, or repair of the affected metal-enclosed bus components. If an unacceptable condition or situation is identified, the applicant further stated that it determines whether the same condition or situation is applicable to other metal-enclosed busses.

Based on the review, the staff finds the applicant's response to RAI Q3 acceptable because the applicant has adequately explained how its generic corrective actions in the new Metal-Enclosed Bus Inspection Program are consistent with the GALL AMP XI.E4. The staff determines that the applicant's corrective actions are consistent with those in the GALL AMP XI.E4. Therefore, the staff's concern described in RAI Q3 is resolved.

Based on the review, the staff finds the Metal-Enclosed Bus Inspection Program consistent with the program elements of GALL AMP XI.E4 and therefore is acceptable.

Operating Experience. The staff reviewed the applicant's OE described in LRA Section B.2.44. The staff also reviewed industry experience relevant to this AMP and noted that industry

experience has shown that failures have occurred on metal-enclosed busses caused by cracked insulation and moisture or debris buildup internal to the metal enclosed busses. Experience also has shown that bus connections in metal-enclosed busses exposed to appreciable ohmic heating, during operation, may experience loosening due to repeated cycling of connected loads. However, under the "operating experience" program element in the LRA, the applicant states that the Metal-Enclosed Bus Inspection Program is a new program for which there is no plant-specific OE.

In RAI Q1, dated July 3, 2008, the staff requested that the applicant describe plant-specific OE associated with cables and connections in this AMP and explain how the new program will manage the aging effects of metal-enclosed buses.

In the response to RAI Q1, dated August 5, 2008, the applicant stated that visual inspections were performed of bus 0A206 in 2006 and 0A107 in 1996. No significant age-related degradation was detected during these inspections. The applicant also stated that bus enclosures were found to be clean, with no evidence of overheating of bus connections. The applicant concluded that these activities demonstrate that the bus is generally accessible for visual inspection and in good condition, such that if any aging effects of interest for this AMP occur, they should be detected during future inspections.

Based on the review, the staff finds the applicant's response to RAI Q1 acceptable because the applicant has adequately explained how the Metal-Enclosed Bus Inspection Program will manage the aging effects of metal-enclosed buses. The staff determines that the aging effects of metal-enclosed busses will be detected and this AMP will provide assurance that the aging effects will be managed consistent with CLB, during the period of extended operation. Therefore, the staff's concern described in RAI Q1 is resolved.

On this basis, the staff confirms that the "operating experience" program element satisfies the criterion defined in the GALL Report and the guidance found in SRP-LR Section A.1.2.3.10. Therefore, the staff finds this program element acceptable.

UFSAR Supplement. The applicant provided the UFSAR supplement summary for the Metal-Enclosed Bus Inspection Program in LRA Section A.1.2.32 and Commitment No. 39 in Table A-1. The staff notes that SRP-LR Table 3.6-2 identifies when an inspection will be implemented and how often the inspection will be performed. The staff determined that the UFSAR supplement for the Metal-Enclosed Bus Inspection Program does not provide the frequency of inspection.

In RAI Q2, dated July 3, 2008, the staff requested that the applicant provide the frequency of inspection in the UFSAR supplement.

In the response to RAI Q2, dated August 5, 2008, the applicant provided the inspection frequency for the UFSAR supplement.

Based on the review, the staff finds the applicant's response to RAI Q2 acceptable because the applicant has provided the inspection frequency for the UFSAR supplement. Therefore, the staff's concern described in RAI Q2 is resolved.

The staff finds that UFSAR supplement in LRA Section A.1.2.32 provides an adequate summary description of the applicant's Metal-Enclosed Bus Inspection Program, as required by

10 CFR 54.21(d). The staff notes that the applicant has committed (Commitment No. 39) to implement this AMP, prior to the period of extended operation.

Conclusion. On the basis of the review of the applicant's Metal-Enclosed Bus Inspection Program and the applicant's responses to RAIs Q1, Q2, and Q3, the staff finds all program elements consistent with the GALL Report. The staff concludes that the applicant has demonstrated that effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3). The staff also reviewed the UFSAR supplement for this AMP and concludes that it provides an adequate summary description of the program, as required by 10 CFR 54.21(d) and therefore is acceptable.

3.0.3.1.27 Non-EQ Electrical Cable Connections Program

Summary of Technical Information in the Application. In LRA Section B.2.45, the applicant described the new Non-EQ Electrical Cable Connections Program as consistent with the GALL AMP XI.E6, "Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements." The applicant stated that this AMP will manage the aging effects for the metallic parts of non-EQ electrical cable connections within the scope of license renewal. It will address cable connections that are used to connect cable conductors to other cables or electrical devices.

Staff Evaluation. During its audit, the staff reviewed the applicant's claim of consistency with the GALL Report. The staff reviewed and compared the "scope of program," "preventative actions," "parameters monitored/detected," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "operating experience" program elements of the AMP to the corresponding program element criteria in GALL AMP XI.E6.

The staff compared the programs elements in the applicant's program to those in GALL AMP XI.E6. The staff noted that the program elements in the applicant's AMP claim of consistency with the GALL Report were consistent with the GALL AMP XI.E6. The staff determined that additional information was required to complete its review.

In addition to the requirements of 10 CFR Part 50, Appendix B, the "corrective actions" program element in the electrical GALL AMPs recommends certain actions, such as making a determination of whether the same condition or situation is applicable to other accessible or inaccessible cables and connections. In the LRA, the applicant stated that the AMPs are consistent with the GALL Report and referred to a corrective action element in LRA Section B.1.3, common to all AMPs. The staff determined that the corrective actions described in LRA Section B.1.3 do not contain certain recommendations described in the GALL AMP XI.E6.

In RAI Q3, dated July 3, 2008, the staff requested that the applicant explain, in detail, how the generic corrective actions in LRA Section B.1.3 are consistent with the GALL AMP XI.E6.

In the response to RAI Q3, dated August 5, 2008, the applicant stated that for the GALL AMP XI.E6, (the Non-EQ Electrical Cable Connections Program), it performs an engineering evaluation, when the test acceptance criteria are not met, to ensure that the intended functions of the cable connections can be maintained, consistent with the CLB. The evaluation will consider the significance of the test results, the operability of the component, the reportability of the event, the extent of the concern, the potential root causes, the corrective actions required,

and the likelihood of recurrence. The applicant further stated that when an unacceptable condition or situation is identified, a determination is made as to whether the same condition or situation is applicable to other in-scope cable connections that were not tested.

Based on its review, the staff finds the applicant's response to RAI Q3 acceptable because the applicant has adequately explained how the generic corrective actions in LRA Section B.1.3 are consistent with the GALL AMP XI.E6. The staff confirms that the corrective actions identified by the applicant are consistent with those recommended in the GALL report AMP XI.E6. Therefore, the staff's concern described in RAI Q3 is resolved.

Based on the review, the staff finds the Non-EQ Electrical Cable Connections Program consistent with the program elements of the GALL AMP XI.E6 and therefore is acceptable.

Operating Experience. The staff reviewed the applicant's OE described in LRA Section B.2.45. The staff also reviewed industry guidance with relevance to this AMP. The staff noted that under the OE program element in the LRA, the applicant stated that the Non-EQ Electrical Cable Connections Program is a new program for which there is no plant-specific OE.

In RAI Q1, dated July 3, 2008, the staff requested that the applicant describe plant-specific OE associated with cables and connections in this AMP and explain how the new program will manage the aging effects of cable and connection insulations.

In the response to RAI Q1, dated August 5, 2008, the applicant stated that this license renewal AMP has not yet implemented, but, the following are examples of OE that demonstrate that the aging effects of interest in this AMP (i.e., loosening of cable connections), can be, and have been successfully detected. The applicant further stated that during routine maintenance activities in 2007, it found a cable crimp connection in a switchgear cubicle, operating at a higher temperature than other connections in the same circuit. The applicant determined that the temperature differential was only minor and; thus, not an operability concern. Nonetheless, the applicant replaced the cable lug. The applicant concluded that this demonstrates that a loose connection can be detected via thermography, before loss of intended functions. The applicant further stated that in 1997, using thermography while performing preventive maintenance activities on a battery charger, it detected a hot spot on the DC output cable lugs. The applicant replaced the cable lugs and returned the battery charger to service, without loss of intended function.

Based on the review, the staff finds the applicant's response to RAI Q1 acceptable because the applicant has demonstrated that the aging effects of cable connections will be detected using thermography. The staff determines that this AMP will provide assurance that the aging effects will be managed consistent with the CLB. Therefore, the staff's concern described in RAI Q1 is resolved.

On this basis, including the applicant's response to the RAI, the staff confirms that the "operating experience" program element satisfies the criterion defined in the GALL Report and the guidance found in SRP-LR Section A.1.2.3.10. Therefore, the staff finds this program element acceptable.

UFSAR Supplement. The applicant provided the UFSAR supplement summary for the Non-EQ Electrical Cable Connections Program in LRA Section A.1.2.37 and Commitment No. 50 in Table A-1. The staff notes that SRP-LR Table 3.6-2 identifies when an inspection will be implemented and how often the inspection will be performed. The UFSAR supplement for the

Non-EQ Electrical Cable & Connections Visual Inspection Program does not provide the frequency of inspection.

In RAI Q2, dated July 3, 2008, the staff requested that the applicant provide the frequency of inspection in the UFSAR supplement.

In the response to RAI Q2, dated August 5, 2008, the applicant provided the inspection frequency for its UFSAR supplement, Commitment No. 50.

Based on the review, the staff finds the applicant's response to RAI Q2 acceptable because the applicant has provided the frequency of inspection for the UFSAR summary. Therefore, the staff's concern described in RAI Q2 is resolved.

The staff finds that UFSAR Supplement summary description in LRA Section A.1.2.37, provides an adequate summary description of the applicant's Non-EQ Electrical Cable Connections Program, as required by 10 CFR 54.21(d). The staff notes that the applicant has committed to implement this AMP prior to the period of extended operation.

Conclusion. On the basis of the review of the applicant's Non-EQ Electrical Cable Connections Program, the staff finds all program elements consistent with the GALL Report. The staff concludes that the applicant has demonstrated that effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB, for the period of extended operation, as required by 10 CFR 54.21(a)(3). The staff also reviewed the UFSAR supplement for this AMP and concludes that it provides an adequate summary description of the program, as required by 10 CFR 54.21(d) and therefore is acceptable.

3.0.3.1.28 Environmental Qualification (EQ) Program

Summary of Technical Information in the Application. In LRA Section B.3.2, the applicant described the existing Environmental Qualification (EQ) Program as consistent with the GALL AMP X.E1, "Environmental Qualification (EQ) of Electric components." The applicant stated that this EQ program manages component thermal, radiation, and cyclic aging through the use of aging evaluation in accordance with 10 CFR 50.49(f) qualification methods.

As required by 10 CFR 50.49, EQ components not qualified for the current license term are to be refurbished, replaced or have their qualification extended, prior to reaching the aging limits established in the evaluation.

Staff Evaluation. During its audit, the staff reviewed the applicant's claim of consistency with the GALL Report. The staff reviewed and compared the "scope of program," "preventive actions," "parameters monitored/detected," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "operating experience" program elements of the AMP to the corresponding program element criteria in the GALL AMP X.E1.

The staff's review of the "corrective actions," "administrative controls," and "confirmatory controls" program elements for the Environmental Qualification (EQ) Program was performed as part of the staff's review of the QA attributes of the AMPs and is discussed in SER Section 3.0.4.

In comparing the programs elements in the applicant's program to those in the GALL AMP X.E1, the staff noted the program elements in the applicant's AMP claim of consistency with the GALL Report, were consistent with GALL AMP X.E1.

Based on the review, the staff finds the Environmental Qualification (EQ) Program consistent with the program elements of the GALL AMP X.E1 and therefore is acceptable.

Operating Experience. The staff reviewed the applicant's OE described in LRA Section B.3.2. The staff also reviewed the applicant's plant basis documents and discussed with the applicant the OE with existing program. The OE included past corrective actions, which resulted in a program's enhancement. The applicant stated in CR 191057, that while performing investigation of equipment, it concluded that terminal voltages typically exceed the 120 VAC rating of solenoid-operated valves in the EQ program. The study concluded an establishment of the maximum end-device voltages for U1 Class 1E 120V panels, and on the average T10 and T20 bus voltage over the last year. A review of effected Environmental Qualification Assessment Report has determined that temperature rise due to self-heat, at voltages above 120 VAC, has not been factored into qualified life determinations. Corrective action was taken to address the issue. The staff determines that this information will provide objective evidence to support the conclusion that the effects of aging will be managed so that the intended functions will be maintained consistent with CLB, during the period of extended operation.

The staff confirms that the "operating experience" program element satisfies the criterion defined in the GALL Report and the guidance found in SRP-LR Section A.1.2.3.10. Therefore, the staff finds this program element acceptable.

UFSAR Supplement The applicant provided the UFSAR supplement summary of the EQ of electrical equipment in LRA Section A.1.3.4 and Commitment No. 44 in Table A-1. The summary description is not consistent with SRP-LR Table 4.4.2, as it does not contain reanalysis attributes. Reanalysis should address the attributes of analytical methods, data collection and reduction methods, underlying assumptions, acceptance criteria, corrective actions, if acceptance criteria are not met, and the period of time when the reanalysis will be completed.

In RAI B.3.2-1, dated July 3, 2008, the staff requested that the applicant revise the UFSAR supplement to include these reanalysis attributes.

In the response to RAI B.3.2-1, dated August 5, 2008, the applicant added the following in LRA Section A.1.3.4:

> 10 CFR 50.49 requires EQ components that are not qualified for the current license term to be refurbished, replaced, or have their qualifications extended prior to reaching the aging limits established in the aging evaluation. Reanalysis of aging evaluation to extend the qualifications of components is performed on a routine basis as part of the EQ Program. Important attributes for the reanalysis of aging evaluations include analytical methods, data collection and reduction methods, underlying assumptions, acceptance criteria, corrective actions (if acceptance criteria are not met), and the time remaining to the end of qualified life.

Based on the review, the staff finds the applicant's response to RAI 3.2-1 acceptable because the applicant has revised the UFSAR supplement to be consistent with SRP-LR Table 4.4.2. Therefore, the staff's concern described in RAI 3.2-1 is resolved.

The staff finds that the UFSAR supplement summary description in LRA Section A.1.3.4, provides an adequate summary description of the applicant's EQ Program, as required by 10 CFR 54.21(d). The staff notes that the applicant has committed (Commitment No. 44) to implement this AMP prior to the period of extended operation.

Conclusion. On the basis of the review of the applicant's Environmental Qualification (EQ) Program, the staff finds all program elements consistent with the GALL Report. The staff concludes that the applicant has demonstrated that effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3). The staff also reviewed the UFSAR supplement for this AMP, including the applicant's response to RAI B.3.2-1, and concludes that it provides an adequate summary description of the program, as required by 10 CFR 54,21(d) and therefore is acceptable.

3.0.3.2 AMPs Consistent with the GALL Report with Exceptions or Enhancements

In LRA Appendix B, the applicant stated that the following AMPs are, or will be, consistent with the GALL Report, with exceptions or enhancements:

- Inservice Inspection (ISI) Program
- BWR CRD Return Line Nozzle Program
- BWR Penetrations Program
- BWR Vessel Internals Program
- Bolting Integrity Program
- Piping Corrosion Program
- Closed Cooling Water Chemistry Program
- Fire Protection Program
- Fire Water System Program
- Buried Piping and Surveillance Program
- Fuel Oil Chemistry Program
- Reactor Vessel Surveillance Program
- Buried Piping and Tanks Inspection Program
- System Walkdown Program
- Lubricating Oil Analysis Program
- Masonry Wall Program
- Structures Monitoring Program
- RG 1.127 Water-Control Structures Inspection
- Fatigue Monitoring Program
- Fuse Holders Program

For AMPs that the applicant claimed are consistent with the GALL Report, with exception(s), enhancement(s), or both, the staff performed an audit and review to confirm that those attributes or features of the program, for which the applicant claimed consistency with the GALL Report, were indeed consistent. The staff also reviewed the exception(s) and/or enhancement(s) to the GALL Report to determine whether they were acceptable and adequate. The results of the staff's audits and reviews are documented in the following sections.