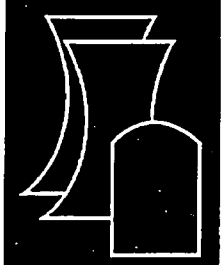
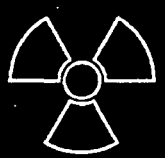
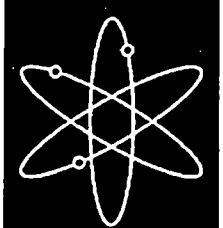
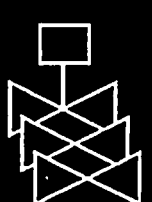
NUREG-1856









Safety Evaluation Report
Related to the License Renewal of the Brunswick Steam Electric Plant, Units 1 and 2

Docket Nos. 50-325 and 50-324

Carolina Power & Light Company

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

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NUREG-1856

Safety Evaluation Report

Related to the License Renewal of
the Brunswick Steam Electric Plant,
Units 1 and 2

Docket Nos. 50-325 and 50-324

Carolina Power & Light Company

Manuscript Completed: March 2006
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Prepared by
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Division of License Renewal
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

ABSTRACT

This safety evaluation report (SER) documents the technical review of the Brunswick Steam Electric Plant (BSEP), Units 1 and 2, license renewal application (LRA) by the staff of the U.S. Nuclear Regulatory Commission (NRC) (the staff). By letter dated October 18, 2004, Carolina Power & Light Company (CP&L or the applicant) submitted the LRA for BSEP in accordance with Title 10, Part 54, of the *Code of Federal Regulations* (10 CFR Part 54). CP&L is requesting renewal of the operating licenses for BSEP Units 1 and 2, (Facility Operating License Numbers DPR-71 and DPR-62, respectively) for a period of 20 years beyond the current expiration dates of midnight September 8, 2016, for Unit 1 and midnight December 27, 2014, for Unit 2.

The BSEP units are located south of Wilmington, NC, at the mouth of the Cape Fear River in Brunswick County, NC, and two miles north of Southport, NC. The NRC issued the construction permits for Units 1 and 2 on February 7, 1970. The NRC issued the operating licenses for Unit 1 on November 12, 1976; and for Unit 2 on December 27, 1974. Units 1 and 2 are boiling water reactors (BWRs) with primary containments of the BWR Mark I design. Each unit has a nuclear steam supply system that is supplied by General Electric (GE) Nuclear Energy Company. The balance of the plant was originally designed and constructed by Brown & Root with the assistance of its agent, United Engineers & Constructors. Each unit operates at a licensed power output of 2923 megawatt thermal (Mwt), with a gross electrical output of approximately 1007 megawatt electric (Mwe).

This SER presents the status of the staff's review of information submitted to the NRC through December 6, 2005, the cutoff date for consideration in the SER. The staff will present its final conclusion on the review of the BSEP application in its update to this SER.

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ABBREVIATIONS

AC	alternating current
ACI	American Concrete Institute
ACRS	Advisory Committee on Reactor Safeguards
ACSR	aluminum conductor steel reinforced
ADS	automatic depressurization system
AERM	aging effects requiring management
AFFF	aqueous fire fighting foam
AFW	auxiliary feedwater
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AMP	aging management program
AMR	aging management review
AMSAC	ATWS mitigating system actuation circuitry
ANSI	American National Standards Institute
AOG	augmented off-gas/auxiliary off-gas
AOO	anticipated operational occurrence
API	American Petroleum Institute
APRM	average power range monitor
ARI	alternate rod injection/alternate rod insertion
ARM	area radiation monitor
ART	adjusted reference temperature
AS&CR	auxiliary steam and condensate recovery
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
AST	accident source term
ASTM	American Society for Testing and Materials
ATWS	anticipated transient without scram
ATWS-RPT	anticipated transient without scram–recirculation pump trip
AWS	American Welding Society
AWWA	American Water Works Association
B&PV	boiler and pressure vessel
BNP	Brunswick Nuclear Plant
BSEP	Brunswick Steam Electric Plant
BTP	branch technical position
BTRS	boron thermal regeneration system
BWR	boiling water reactor
BWROG	Boiling Water Reactor Owners Group
BWRVIP	Boiling Water Reactor Vessel and Internals Program
CAC	containment atmospheric control
CAD	containment atmosphere dilution
CAP	Corrective Action Program
CASS	cast austentitic steel
CB	control board

CCW	closed cooling water or component cooling water
CDD	condensate deep bed demineralizer
CDF	core damage frequency
CET	core exit thermocouple
CF	chemistry factor
CFD	condensate filter demineralizer
CFR	*Code of Federal Regulations*
CHRS	containment heat removal system
CI	confirmatory item
CL	chlorination
CLB	current licensing basis
CMAA	Crane Manufacturers Association of America
CP&L	Carolina Power & Light Company, a Progress Energy Company
CR	condition report
CRD	control rod drive
CRDH	control rod drive housing
CRDM	control rod drive mechanism
CRGT	control rod guide tube
CRW	clean radioactive waste
CS	containment spray or carbon steel
CST	condensate storage tank
CUF	cumulative usage factor
CVCS	chemical and volume control system
CW	circulating water
DBA	design-basis accident
DBE	design-basis event
DC	direct current
DG	diesel generator
DGB	diesel generator building
DOR	Division of Operating Reactors (NRC)
D/P	differential pressure
DRW	dirty radioactive waste
DSCSS	drywell and suppression chamber spray system
DW	demineralized water
DWT	demineralized water tank
ECCS	emergency core cooling system
EDB	equipment database
EDG	emergency diesel generator
EFPY	effective full-power year
EOL	end of life
EPRI	Electric Power Research Institute
EQ	environmental qualification
ESF	engineered safety feature
FAC	flow-accelerated corrosion
F_{en}	environmental fatigue factor
FERC	Federal Energy Regulatory Commission

FHA	fire hazards analysis
FO	fuel oil
FOL	facility operating license
FOST	fuel oil storage tank
FP	fire protection
FPP	fire protection plan
FSAR	Final Safety Analysis Report
FSD	functional system description
FSER	Final Safety Evaluation Report
FW	feedwater
GALL	generic aging lessons learned
GDC	general design criteria or general design criterion
GE	General Electric
GEIS	generic environmental impact statement
GL	generic letter
GSI	general safety issue
HAZ	heat-affected zone
HCU	hydraulic control unit
HD	heater drains
HDFSS	high density fuel storage system
HELB	high-energy line break
HE/ME	high energy/moderate energy
HEPA	high efficiency particulate air
HJTC	heated junction thermocouple
HMWPE	high molecular weight polyethylene
HP	high pressure
HPCI	high pressure coolant injection
HPCS	high pressure core spray (not an applicable system for BSEP)
HVAC	heating, ventilation, and air conditioning
HWC	hydrogen water chemistry
HX	heat exchanger
IA	instrument air
IAN	non-interruptible instrument air
IASCC	irradiation assisted stress corrosion cracking
I&C	instrumentation and control
ID	inside diameter
IE	inspection and enforcement (former NRC Office of Inspection and Enforcement)
IEEE	Institute of Electrical and Electronics Engineers
IGA	intergranular attack
IGSCC	intergranular stress corrosion cracking
ILRT	integrated leak rate test (containment type A test)
IN	information notice
INPO	Institute of Nuclear Power Operations
IPA	integrated plant assessment
IPCEA	Insulated Power Cable Engineers Association
IR	insulation resistance

IRM	intermediate range monitor
ISG	interim staff guidance
ISI	inservice inspection
KV	kilovolt
LBB	leak before break
LER	Licensee Event Report
LO	lubricating oil
LOCA	loss-of-coolant accident
LOOP	loss of offsite power
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
—1	intended function (pressure boundary)
—2	intended function (filtration)
—3	intended function (flow restriction)
—4	intended function (structural support/seismic integrity)
—5	intended function (heat transfer)
MCB	main control board
MEAP	material, environment, aging program
MeV	million electron volts
MIC	microbiologically induced corrosion
MOD	motor operated disconnect
MS	main steam
MSIV/LCS	main steam isolation valve/leakage control system
MSL	main steam line or mean sea level
MSLB	main steam line break
MSR	moisture separator reheater
MVD	miscellaneous vents and drains
Mwe	megawatt electric
Mwt	megawatt thermal
MWTS	makeup water treatment system
NDE	nondestructive examination
NDTT	nil-ductility transition temperature
NEI	Nuclear Energy Institute
NEPA	National Environmental Policy Act of 1969
NFPA	National Fire Protection Association
Ni	nickel
NMS	neutron monitoring system
NPAR	nuclear plant aging research
NPS	nominal pipe size
NRC	U.S. Nuclear Regulatory Commission
NSR	non-safety-related

NSSS	nuclear steam supply system
NUREG	designation of publications prepared by the NRC staff
OBE	operating-basis earthquake
ODSCC	outside-diameter stress-corrosion cracking
OE	operating experience
OI	open item
OLTP	original licensed thermal power
OPRM	oscillation power range monitor
PASS	post-accident sampling system
PBDS	period based detection system
PCB	power circuit breaker
PCS	primary containment structure
PEC	Progress Energy Carolinas
PFM	probabilistic fracture mechanics
pH	concentration of hydrogen ion
P&ID	piping and instrumentation diagram
PM	preventive maintenance
PNS	pneumatic nitrogen system
PORV	power-operated relief valve
PRF	penetration room filtration
PRM	process radiation monitoring
PSRF	non-safety-related that can prevent a safety-related function
P-T	pressure-temperature
PTLR	pressure-temperature limits report
PTS	pressurized thermal shock
PVC	polyvinyl chloride
PW	pipe whip
PWS	potable water system
PWSCC	primary water stress-corrosion cracking
QA	quality assurance
RAI	request for additional information
RB	reactor building
RBCCW	reactor building closed cooling water
RBM	rod block monitor
RCIC	reactor core isolation cooling
RCP	reactor coolant pump
RCPB	reactor coolant pressure boundary
RCS	reactor coolant system
RFP	reactor feedwater pump
RG	regulatory guide
RHR	residual heat removal
RI	risk informed
RI-ISI	risk-informed inservice inspection
RMCS	reactor manual control system
RMS	radiation monitoring system

RMWST	reactor makeup water storage tank
RNA	reactor non-interruptible air
RPIS	rod position information system
RPS	reactor protection system
RPV	reactor pressure vessel
RT_{NDT}	reference temperature nil-ductility transition
$RT_{NDT(U)}$	reference temperature nil-ductility transition (unirradiated)
RT_{PTS}	reference temperature pressurized thermal shock
RTS	reactor trip system
RVI	reactor vessel internals
RVLIS	reactor vessel instrumentation system
RWCU	reactor water cleanup system
RWM	rod worth minimizer
RWST	refueling water storage tank
RXS	reactor building sampling system
SA	service air
SAT	startup auxiliary transformer
SBO	station blackout
SC	structure and component or suppression chamber
SCC	stress-corrosion cracking
SCW	screen wash water
SDV	scram discharge volume
SE	safety evaluation
SER	Safety Evaluation Report
SFP	spent fuel pool
SGBD	steam generator blowdown
SGTS	standby gas treatment system
SI	safety injection
SJAE	steam jet air ejector
SLC	standby liquid
SLMS	stator leak monitoring system
SMP	structural monitoring program
SOC	statement of consideration
SPDS	safety parameter display system
SR	safety-related
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
SW	service water
SWIS	service water intake structure
TAC	technical assignment control (internal NRC work management tool)
TASCS	thermal stratification, cycling, and striping

TB	turbine building
TBCCW	turbine building closed cooling water
TGSCC	trans-granular stress corrosion cracking
TID	total integrated does
TIP	traversing incore probe
TLAA	time-limited aging analysis
TPNS	total plant numbering system
TS	technical specification
TSC	technical support center
TSP	trisodium phosphate
TT	thermal transients
UAT	unit auxiliary transformer
UFSAR	updated final safety analysis report
USAS	United States of America Standards
USE	upper-shelf energy
UUSE	unirradiated upper shelf energy
UT	ultrasonic test
VAC	Volts alternating current
VDC	Volts direct current
VFLD	vessel flange leak detection
WANO	World Association of Nuclear Operators
WCAP	Westinghouse Commercial Atomic Power (report)
WOG	Westinghouse Owners Group
XLPE	cross-linked polyethylene

SECTION 1

INTRODUCTION AND GENERAL DISCUSSION

1.1 Introduction

This document is a safety evaluation report (SER) on the license renewal application (LRA) for the Brunswick Steam Electric Plant (BSEP), as filed by Carolina Power & Light Company (CP&L or the applicant). By letter dated October 18, 2004, CP&L submitted its application to the U.S. Nuclear Regulatory Commission (NRC or the Commission) for renewal of the BSEP operating licenses for an additional 20 years. The NRC staff (the staff) prepared this report, which summarizes the results of its safety review of the renewal application for compliance with the requirements of Title 10, Part 54, of the *Code of Federal Regulations* (10 CFR Part 54), "Requirements for Renewal of Operating Licenses for Nuclear Power Plants." The NRC license renewal project manager for the BSEP license renewal review is S.K. Mitra. Mr. Mitra can be contacted by telephone at 301-415-2783 or by electronic mail at skm1@nrc.gov. Alternatively, written correspondence may be sent to the following address:

License Renewal and Environmental Impacts Program
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001
Attention: S.K. Mitra, Mail Stop 0-11 F1

In its October 18, 2004, submittal letter, the applicant requested renewal of the operating licenses issued under Section 104b (Operating License Nos. DPR-71 and DPR-62) of the Atomic Energy Act of 1954, as amended, for BSEP Units 1 and 2 for a period of 20 years beyond the current license expiration dates of midnight September 8, 2016, for Unit 1 and midnight December 27, 2014, for Unit 2. The BSEP units are located south of Wilmington, NC, at the mouth of the Cape Fear River in Brunswick County, NC, and two miles north of Southport, NC. The NRC issued the construction permits for Units 1 and 2 on February 7, 1970. The staff issued the operating licenses for Unit 1 on November 12, 1976; and for Unit 2 on December 27, 1974. Units 1 and 2 are boiling water reactors (BWRs) with primary containments of the BWR Mark I design. Each unit has a nuclear steam supply system that is supplied by General Electric Nuclear Energy Company. The balance of the plant was originally designed and constructed by Brown & Root with the assistance of its agent, United Engineers & Constructors. Each unit operates at a licensed power output of 2923 megawatt thermal (Mwt), with a gross electrical output of approximately 1007 megawatt electric (Mwe). The updated final safety analysis report (UFSAR) contains details concerning 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 found in 10 CFR Parts 54 and 51, respectively, set forth the requirements for these reviews. The safety review for the BSEP license renewal is based on the applicant's LRA and on the responses to the staff's requests for additional information (RAIs). The applicant supplemented and clarified its responses to the LRA and RAIs in audits, meetings, and docketed correspondence. Unless otherwise noted, the staff reviewed and considered information submitted through December 6, 2005. The staff

reviewed the information received after that date on a case-by-case basis, depending on the stage of the safety review and the volume and complexity of the information. The public may view the LRA and all pertinent information and materials, including those mentioned above, at the NRC Public Document Room, located in One White Flint North, 11555 Rockville Pike (first floor), Rockville, MD, 20852-2738 (301-415-4737/800-397-4209), and at the William Madison Randal Library, 601 S. College Road, Wilmington, NC, 28403-3201. In addition, the public may find the BSEP Units 1 and 2 LRA, as well as materials related to the license renewal review, on the NRC website at 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 provided in NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants" (SRP-LR), dated July 2001.

SER Sections 2 through 4 address the staff's review and evaluation of license renewal issues that it has 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 report are in SER Section 6.

SER Appendix A is a table that identifies the applicant's commitments associated with the renewal of the operating licenses. SER Appendix B provides a chronology of the principal correspondence between the staff and the applicant related to the review of the application. SER Appendix C is a list of principal contributors to the SER. SER Appendix D is a bibliography of the references used in support of the review.

In accordance with 10 CFR Part 51, the staff prepared a draft plant-specific supplement to the Generic Environmental Impact Statement (GEIS). This supplement discusses the environmental considerations related to renewing the licenses for Units 1 and 2. The NRC staff issued draft Supplement 25 to NUREG-1437 "Generic Environmental Impact Statement for License Renewal of Nuclear Plants: Regarding Brunswick Steam Electric Plant, Units 1 and 2 Final Report," on August 30, 2005.

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. These licenses can be renewed for up to 20 additional years. The original 40-year license term was selected on the basis of economic and antitrust considerations, rather than on technical limitations; however, some individual plant and equipment designs may have been engineered on the basis of an expected 40-year service life.

In 1982, the NRC 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. On the basis of the results of that research, a technical review group concluded that many aging phenomena are readily manageable and do not pose technical issues that would preclude life extension for nuclear power plants. In 1986, the NRC published

a request for comment on a policy statement that would address major policy, technical, and procedural issues related to license renewal for nuclear power plants.

In 1991, the NRC published the license renewal rule in 10 CFR Part 54 (the Rule). The NRC participated in an industry-sponsored demonstration program to apply the Rule to a pilot plant and to gain experience necessary to develop implementation guidance. To establish a scope of review for license renewal, the Rule defined age-related degradation unique to license renewal; however, during the demonstration program, the NRC found that many aging mechanisms occur and are managed during the period of initial license. In addition, the NRC found that the scope of the review did not allow sufficient credit for existing programs, particularly the implementation of the Maintenance Rule, which may also manage plant-aging phenomena. As a result, the NRC amended the license renewal rule in 1995. The amended 10 CFR Part 54 established a regulatory process that is simpler, more stable, and more predictable than the previous license renewal rule. In particular, the NRC amended 10 CFR Part 54 to focus on managing the adverse effects of aging rather than on identifying age-related degradation unique to license renewal. The NRC initiated 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 revised Rule clarified and simplified the integrated plant assessment (IPA) process to be consistent with the revised focus on passive, long-lived structures and components (SCs).

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

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 provide and maintain an acceptable level of safety, with the possible exception of the detrimental effects of aging on the functionality of certain SSCs, as well as a few other safety-related (SR) 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 defines the scope of license renewal as including those SSCs (1) that are safety-related (SR), (2) whose failure could affect SR functions, and (3) that are relied on to demonstrate compliance with the NRC's regulations for fire protection (FP), environmental qualification (EQ), pressurized thermal shock (PTS), anticipated transient without scram (ATWS), and station blackout (SBO).

Pursuant to 10 CFR 54.21(a), an applicant for a renewed license must review all SSCs that are within the scope of the Rule to identify SCs that are subject to an aging management review (AMR). Those SCs that are subject to an AMR perform an intended function without moving parts or without a change in configuration or properties, and are not subject to replacement based on qualified life or specified time period. As required by 10 CFR 54.21(a), an applicant

for a renewed license must demonstrate that the effects of aging will be managed in such a way 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, the detrimental effects of aging that may affect active equipment are more readily detectable and can be identified and corrected through routine surveillance, performance monitoring, and maintenance activities. The surveillance and maintenance activities programs for active equipment, as well as other aspects of maintaining the plants' design and licensing basis, are required throughout the period of extended operation.

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

License renewal also requires the identification and updating of the TLAAs. During the design phase for a plant, certain assumptions are made about the length of time the plant can operate. These assumptions are incorporated into design calculations for several of the plant's 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 effects of aging on these SSCs can be adequately managed for the period of extended operation.

In 2001, the NRC developed and issued Regulatory Guide (RG) 1.188, "Standard Format and Content for Applications to Renew Nuclear Power Plant Operating Licenses." This RG endorses the Nuclear Energy Institute (NEI), "Industry Guideline for Implementing the Requirements of 10 CFR Part 54 - The License Renewal Rule," Revision 3, March 2001 (NEI 95-10). NEI 95-10 details an acceptable method of implementing the license renewal rule. The NRC also used the SRP-LR to review this application.

In the LRA, BSEP fully utilizes the process defined in NUREG-1801, "Generic Aging Lessons Learned (GALL) Report," issued in July 2001. The GALL Report provides the staff with a summary of staff-approved aging management programs (AMPs) for the aging of many SCs that are subject to an AMR. If an applicant commits to implementing these staff-approved AMPs, the time, effort, and resources used to review an applicant's LRA can be greatly reduced, thereby 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 also serves as a reference for both applicants and staff reviewers to quickly identify those AMPs and activities that the staff has determined can provide adequate aging management during the period of extended operation.

1.2.2 Environmental Review

In December 1996, the staff revised the environmental protection regulations to facilitate the environmental review for license renewal. The staff prepared a "Generic Environmental Impact Statement (GEIS) for License Renewal of Nuclear Plants" (NUREG-1437, Revision 1) to document its evaluation of the possible environmental impacts associated with renewing

licenses of nuclear power plants. For certain types of environmental impacts, the GEIS establishes generic findings that are applicable to all nuclear power plants. These generic findings are codified in 10 CFR Part 51, Appendix B to Subpart A. Pursuant to 10 CFR 51.53(c)(3)(I), an applicant for license renewal may incorporate these generic findings in its environmental report. In accordance with 10 CFR 51.53(c)(3)(ii), an environmental report must also include analyses of those environmental impacts that must be evaluated on a plant-specific basis (i.e., Category 2 issues).

In accordance with NEPA and the requirements of 10 CFR Part 51, the staff performed a plant-specific review of the environmental impacts of license renewal, including whether new and significant information existed that the GEIS did not consider. As part of its scoping process, the NRC held a public meeting on January 27, 2005, in Southport, NC, to identify environmental issues specific to the plant. The staff's draft plant-specific Supplement 25 to the GEIS, which was issued on August 30, 2005, documents the results of the environmental review and includes a preliminary recommendation with respect to the license renewal action. The staff held another public meeting on October 18, 2005, in Southport, North Carolina, to discuss the draft plant-specific Supplement 25 to the GEIS. After considering comments on the draft, the staff will prepare and publish a final, plant-specific supplement to the GEIS separately from this report.

1.3 Principal Review Matters

The requirements for renewing operating licenses for nuclear power plants are described in Title 10, Part 54, of the *Code of Federal Regulations* (10 CFR Part 54). The staff performed its technical review of the BSEP LRA in accordance with NRC guidance and the requirements of 10 CFR Part 54. The standards for renewing a license are set forth in 10 CFR 54.29. This SER describes the results of the staff's safety review.

In 10 CFR 54.19(a), the NRC requires a license renewal applicant to submit general information. The applicant provided this general information in LRA Section 1 for BSEP, Units 1 and 2, which it submitted to the staff by letter, dated October 18, 2004. The staff reviewed LRA Section 1 and found that the applicant had submitted the information required by 10 CFR 54.19(a).

In 10 CFR 54.19(b), the NRC requires that each 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." The applicant stated the following in the LRA regarding this issue:

> The current indemnity agreement for BSEP 1 and 2 states in Article VII that the agreement shall terminate at the time of expiration of that 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 amended, lists BSEP 1 and 2 Operating Licenses DPR-71 and DPR-62. The Company requests that conforming changes be made to the indemnity agreement, and/or the Attachment to the agreement, as required, to specify the extension of the agreement until the expiration date of the renewed BSEP 1 and 2 operating licenses as sought in this application.

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

In 10 CFR 54.21, the NRC requires that each LRA must contain: (a) an integrated plant assessment (IPA), (b) a description of any CLB changes that occurred during the staff review of the LRA, (c) an evaluation of TLAAs, and (d) a UFSAR supplement. LRA Sections 1, 3 and 4 and Appendix B address the license renewal requirements of 10 CFR 54.21(a), (b), and (c). LRA Appendix A contains the license renewal requirements of 10 CFR 54.21(d).

In 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 must submit an amendment to the renewal application that identifies any changes to the CLB of the facility that materially affect the contents of the LRA, including the UFSAR supplement. The applicant submitted an update to the LRA by letter dated September 29, 2005, which summarized the changes to the CLB that have occurred at BSEP, Units 1 and 2, during the staff's review of the LRA. This submission satisfies the requirements of 10 CFR 54.21(b) and is still under staff review.

In accordance with 10 CFR 54.22, an applicant's LRA must include changes or additions to the technical specifications that are necessary to manage the effects of aging during the period of extended operation. In Appendix D to the LRA, the applicant stated that it had not identified any technical specification changes necessary to support issuance of the renewed operating licenses for Units 1 and 2. This adequately addresses the requirement specified in 10 CFR 54.22.

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

As required by 10 CFR 54.25, the ACRS will issue a report to document its evaluation of the staff's LRA review and associated SER. SER Section 5 will incorporate the ACRS report once it is issued. SER Section 6 will document the findings required by 10 CFR 54.29.

The final plant-specific supplement to the GEIS will document the staff's evaluation of the environmental information required by 10 CFR 54.23 and will specify the considerations related to renewing the licenses for Units 1 and 2. The staff will prepare this supplement separately from this SER.

1.4 Interim Staff Guidance

The license renewal program is a living program. The NRC staff, industry, and other interested stakeholders gain experience and develop lessons learned with each renewed license. The lessons learned address the NRC'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 NRC staff, industry, and other interested stakeholders until it is incorporated into the license renewal guidance documents such as the SRP-LR and the GALL Report.

The following table provides the current set of ISGs issued by the staff, as well as the SER sections in which the staff addresses ISG issues.

ISG Issue (Approved ISG No.)	Purpose	SER Section
GALL Report presents one acceptable way to manage aging effects **(ISG-1)**	This ISG clarifies that the GALL Report contains one acceptable way, but not the only way, to manage aging for license renewal.	N/A
SBO Scoping **(ISG-2)**	The license renewal rule 10 CFR 54.4(a)(3) includes 10 CFR 50.63(a)(1)—SBO. The SBO rule requires that a plant must withstand and recover from an SBO event. The recovery time for offsite power is much faster than that of EDGs. The offsite power system should be included within the scope of license renewal.	2.1.3.1.1 2.5.1 3.6.2.3
Concrete AMP **(ISG-3)**	Lessons learned from the GALL demonstration project indicated that GALL is not clear on whether concrete requires an AMP.	3.5.2.2 3.5.2.3

ISG Issue (Approved ISG No.)	Purpose	SER Section
FP System Piping (ISG-4)	This ISG clarifies the staff position for wall-thinning of the FP piping system in GALL AMPs XI.M26 and XI.M27. The staff's new position is that there is no need to disassemble FP piping, as disassembly can introduce oxygen to FP piping, which can accelerate corrosion. Instead, use a non-intrusive method, such as volumetric inspection. Testing of sprinkler heads should be performed at year 50 of sprinkler system service life, and every 10 years thereafter. This ISG eliminates the Halon/carbon dioxide system inspections for charging pressure, valve line-ups, and the automatic mode of operation test from GALL; the staff considers these test verifications to be operational activities.	2.3.3.15 3.0.3.2.7 3.0.3.2.8

ISG Issue (Approved ISG No.)	Purpose	SER Section
Identification and Treatment of Electrical Fuse Holders **(ISG-5)**	This ISG includes electrical fuse holders AMR and AMP (i.e., same as terminal blocks and other electrical connections). The position includes only fuse holders that are not inside the enclosure of active components (e.g., inside of switchgears and inverters). Operating experience finds that metallic clamps (spring-loaded clips) have a history of age-related failures from aging stressors such as vibration, thermal cycling, mechanical stress, corrosion, and chemical contamination. The staff finds that visual inspection of fuse clips is not sufficient to detect the aging effects from fatigue, mechanical stress, and vibration.	2.1.3.2.3 2.5.1.1 3.6
The ISG Process **(ISG-8)**	This ISG provides clarification and update to the ISG process on Improved License Renewal Guidance Documents.	N/A
Standardized Format for License Renewal Applications **(ISG-10)**	The purpose of this ISG is to provide a standardized license renewal application format for applicants.	N/A

1.5 Summary of Open Items

An open item (OI) is an issue that, in the staff's judgment, has not been resolved in a manner that meets all applicable regulatory requirements. After completing a review of the LRA for

Units 1 and 2, including all additional information and clarifications submitted to the staff as of September 29, 2005, the staff has identified no OIs.

1.6 Summary of Confirmatory Items

A confirmatory item (CI) is an issue that the applicant and the staff have resolved, but for which the applicant has not yet formally submitted the resolution. After completing a review of the LRA for Units 1 and 2, including all additional information and clarifications submitted to the staff as of September 29, 2005, the staff has identified no CIs.

1.7 Summary of Proposed License Conditions

As a result of the staff's review of the LRA for Units 1 and 2, including subsequent information and clarifications provided by the applicant, the staff identified three proposed license conditions.

The first license condition requires the applicant to include the UFSAR supplement required by 10 CFR 54.21(d) in the next UFSAR update, as required by 10 CFR 50.71(e), following the issuance of the renewed licenses.

The second license condition requires that the activities identified in SER Appendix A be completed in accordance with the schedule in Appendix A.

The third license condition requires the implementation of the most recent staff-approved version of the Boiling Water Reactor Vessels and Internals Project (BWRVIP) Integrated Surveillance Program (ISP) as the method to demonstrate compliance with the requirements of 10 CFR Part 50, Appendix H. Any changes to the BWRVIP ISP capsule withdrawal schedule must be submitted for NRC staff review and approval. Any changes to the BWRVIP ISP capsule withdrawal schedule which affects the time of withdrawal of any surveillance capsules must be incorporated into the licensing basis. If any surveillance capsules are removed without the intent to test them, these capsules must be stored in manner which maintains them in a condition which would support re-insertion into the reactor pressure vessel, if necessary.

SECTION 2

STRUCTURES AND COMPONENTS SUBJECT TO AGING MANAGEMENT REVIEW

2.1 Scoping and Screening Methodology

2.1.1 Introduction

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

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

In developing the scoping and screening methodology for the BSEP LRA, the applicant considered the requirements of the Rule, the statements of consideration (SOCs) for the Rule, and the guidance presented by NEI 95-10, "Industry Guideline for Implementing the Requirements of 10 CFR Part 54 - The License Renewal Rule," Revision 3, March 2001. In addition, the applicant also considered the staff's correspondence with other applicants and with NEI in the development of this methodology.

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

Additionally, LRA Section 2.2, "Plant Level Scoping Results;" Section 2.3, "Scoping and Screening Results - Mechanical Systems;" Section 2.4, "Scoping and Screening Results - Structures;" and Section 2.5, "Scoping and Screening Results - Electrical and Instrumentation and Control (I&C) Systems;" amplify the process that the applicant used to identify the SCs that are subject to an AMR. LRA Section 3, "Aging Management Review Results," contains the following information:

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

LRA Section 4, "Time-Limited Aging Analyses," contains the applicant's identification and evaluation of TLAAs.

2.1.2.1 Scoping Methodology

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

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

The LRA states that 10 CFR 54.4(a)(1) pertains to SR SSCs and further states that SSCs within the scope of license renewal include SR SSCs that must remain functional during and following design-basis events (DBEs), as defined in 10 CFR 50.49(b)(1), to ensure the following functions:

(1) The integrity of the reactor coolant pressure boundary (RCPB)

(2) The capability to shut down the reactor and maintain it in a safe shutdown condition

(3) The capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposure comparable to the guidelines in 10 CFR 50.34(a)(1), 10 CFR 50.67(b)(2), or 10 CFR 100.11 of this chapter, as applicable

LRA Section 2.1.1.1 states that the PassPort equipment database (EDB) was used to implement the graded quality classification system defined at BSEP. The EDB applied the Quality Class A classification to structures and components necessary, actively or passively, to assure the accomplishment of SR functions. Component quality classifications documented in the EDB are derived according to plant administrative controls using functions defined in CLB documents, including the UFSAR.

A comparison of the criteria of 10 CFR 54.4(a)(1) with the definition of the EDB Quality Class A classification indicates that the Quality Class A criteria are consistent with 10 CFR 54.4(a)(1) with the exception of the references to 10 CFR 50.34(a)(1), which is associated with applications for an initial operating license and is not applicable to BSEP; and 10 CFR 50.67(b)(2), which is associated with accident source term limits and is discussed below. The LRA indicates that at BSEP, 10 CFR Part 100 guidelines have been applicable, historically, under the CLB; 10 CFR 100.11 has been used to identify components credited with preventing and mitigating offsite exposures. Concerning 10 CFR 50.67(b)(2), the LRA states

that the staff issued a safety evaluation authorizing the use of alternative source terms (ASTs) under 10 CFR 50.67(b)(2) in support of the ongoing BSEP Extended Power Uprate Project. Consistent with the terms of the AST license amendment, license renewal scoping impacts arising from the use of nonsafety-related (NSR) equipment to support the use of an AST are evaluated in accordance with the criteria of 10 CFR 54.4(a)(2).

The LRA states that EDB Quality Class A classification is consistent with the scoping criteria of 10 CFR 54.4(a)(1), such that this designation is sufficient to facilitate scoping of SSCs in accordance with 10 CFR 54.4(a)(1). For the purposes of license renewal, any system, including support systems, or structure that contains one or more SR component is considered to be an SR system or structure.

Application of the Scoping Criteria in 10 CFR 54.4(a)(2). LRA Section 2.1.1.2 states that since BSEP implemented a graded quality classification system in the mid-1980s, it has made extensive use of augmented quality classifications to identify SSCs that have functional or physical interactions with SR equipment. These augmented quality classifications have been assigned to NSR components and documented in the EDB. The EDB quality classification designations have been reconciled with license renewal scoping criteria to provide a means for scoping of license renewal components and associated systems/structures. The EDB quality classifications were used to identify NSR components that can be a potential source of damage to nearby SR components. In addition to scoping on the basis of augmented quality designations, an extensive review was performed to identify additional candidates for inclusion based on the CLB, a review of site and industry operating experience, and other pertinent sources of information.

The LRA states that the following NSR SSCs were not considered subject to the review: SSC hypothetical failures that are not part of the plant CLB, or that have not been experienced previously; SCs that would have been included within the scope of license renewal in accordance with 10 CFR 54.4(a)(2) that were already included in accordance with 10 CFR 54.4(a)(3); NSR equipment used to establish initial conditions for equipment operation; and NSR equipment that actuates SR equipment that does not result in the loss of an SR function.

BSEP design and licensing basis information was reviewed to identify NSR SSCs that function to directly support or that could interact with an SR system or structure and whose failure or interaction could prevent the performance of a required intended function. Sources of this information include design-basis documents (DBDs), the FSAR, plant drawings, and other CLB documentation, as well as the EDB and the Maintenance Rule database. The specific function/interaction required of an NSR SSC was also identified for each instance in which NSR SSCs were credited in the CLB. SSCs identified in this category were designated as being within the scope of license renewal per the 10 CFR 54.4(a)(2) criteria, and the associated function or interaction was considered a system/structure intended function.

The LRA states that the majority of NSR piping connected to SR piping can be identified by EDB quality class designation. Where necessary, plant design documents were reviewed or conservative assumptions made to identify additional piping/components in this category. Systems having components credited in this regard were included within the scope of license renewal. The CLB position for seismically induced effects between connected NSR and SR piping was provided in response to an NRC comment documented in Amendment 15 of the

BSEP UFSAR, dated March 1973. The position stated that, in cases where SR piping and NSR piping are connected, the analysis of seismically induced effects was continued well into the NSR piping in order to include the effects that NSR piping has on the adjoining SR piping. Generally, this continuation was to a point where the NSR pipe was restrained in three directions. If this was not practical, the NSR pipe was analyzed up to a point in the system where it was supported in three directions by three individual supports.

Interactions between SR SSCs and non-connected NSR SSCs were defined as NSR SSCs having physical interaction with SR SSCs that impairs an SR SSC's function and is associated with NSR SSC piping degradation and loss of pressure boundary. The LRA indicates that the UFSAR Section 3.6.1 states "operating experience has shown that mechanisms do not exist which could cause the instantaneous failure of piping systems without prior detectable leakage." The LRA indicates that the scoping process was based on the concept that the piping in operating systems that has retained its functional integrity will remain supported so long as its supports do not fail and that direct physical interaction with SR SSCs is prevented by the function of piping supports; therefore, the preventive option consists of managing the aging effects of the supports. Aging effect evaluations associated with direct physical interactions between NSR and SR components are limited to piping/component supports. Civil/structural scoping has included the supports for NSR piping/components that have the capability of preventing satisfactory accomplishment of any required SR functions in spaces where SR equipment within the scope of license renewal is present.

The LRA states that indirect physical interactions between spatially related NSR and SR piping/components are not limited to seismic events, but may include other age-related failures of NSR SSCs. The scoping process for these indirect interactions was accomplished on the basis of a systematic review of areas and hazards. Plant drawings and documentation were reviewed to identify areas housing SR SSCs. Pressure-retaining component types were identified, since potential spatial interactions (flooding, spray, wetting) were assumed to be related to liquid-filled piping systems. Pressure-retaining NSR components located in structures housing SR SSCs were identified on the basis of EDB location information, plant drawings, and other pertinent data. This group of components was further refined to exclude specific components evaluated as not presenting a spatial interaction hazard. Systems having NSR components identified as having the potential for adverse spatial interaction with SR SSCs were included within the scope of license renewal.

Additional scoping evaluations were performed to make scoping determinations against 10 CFR 54.4(a)(2) that cannot be made on the basis of EDB classification. Notable scoping additions include selected NSR connected piping, valves, and components (seismic support), NSR piping and supports in the proximity of SR SSCs (seismic interaction), service water discharge piping (flow path), long-term nitrogen supply to main steam safety relief valves (flow path), reactor building air receivers (explosion/missile hazard), and reactor building leak detection equipment and floor drain systems (flood hazard).

BSEP has implemented the use of accident source term (AST) for evaluation of accident consequences in accordance with 10 CFR 50.67. This activity, undertaken in support of the BSEP Extended Power Uprate (EPU) project, makes use of an NRC-approved methodology for evaluation of an NSR alternate leakage treatment path from the main steam line isolation valves (MSIVs) to the main condenser. Since the BSEP license amendment credits the use of

NSR SSCs in AST analyses, these have been included within the scope of license renewal in accordance with 10 CFR 54.4(a)(2).

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

The LRA states that 10 CFR 54.4(a)(3) indicates that SSCs relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with NRC's regulations for fire protection (10 CFR 50.48), EQ (10 CFR 50.49), PTS (10 CFR 50.61), ATWS (10 CFR 50.62), and SBO (10 CFR 50.63) are within the scope of license renewal.

With the exception of pressurized thermal shock, which is not applicable to BWRs, current licensing basis evaluations have been performed to identify and document those SSCs credited for compliance of each of these regulations. For these SSCs, the system/structure-level intended function is that function which is relied upon in safety analyses or evaluations to demonstrate compliance with NRC requirements for the regulated event. Systems or structures that have one or more components credited for demonstrating compliance with one of the regulated events are within the scope of license renewal per the 10 CFR 54.4(a)(3) criteria.

2.1.2.1.2 Documentation Sources Used for Scoping and Screening

In LRA Sections 2.1.1.1, and 2.1.1.2, the applicant stated information derived from the CLB information, design and licensing basis information, design basis documents (DBDs), the UFSAR, plant drawings, Maintenance Rule database, and the equipment database (EDB) was reviewed during the license renewal scoping and screening process. The applicant used this information to identify the functions performed by plant systems, structures, and components. These functions were then compared to the scoping criteria in 10 CFR 54.4(a)(1)-(3) to determine if the associated plant system, structure, or component performed a license renewal intended function and to develop the list of SCs subject to an AMR.

2.1.2.2 Screening Methodology

2.1.2.2.1 Mechanical Screening

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

- System intended function boundaries were established, and mechanical components subject to screening were identified. Additionally, license renewal boundary drawings were developed for selected BSEP systems within the scope of license renewal. These boundary drawings were used during the screening process for purposes such as identification of untagged commodities within evaluation boundaries.
- Mechanical components were subjected to screening based on active/passive function. THE BSEP EDB equipment codes were used to sort many components in accordance

to engineering discipline, active/passive determination and recommended intended function. Components having equipment types designated as active were not subject to AMR and were categorically screened out on this basis. Components having equipment types that are indeterminate were reviewed individually to ascertain if they are active and thereby excluded from AMR requirements.

- Mechanical components were reviewed to determine if they constituted a complex assembly. Complex assemblies were considered active and could be excluded from the scope of license renewal. However complex assemblies which include piping or components that interface with external equipment, or components that cannot be adequately tested/monitored as part of the complex assembly, were subject to screening.
- Mechanical components were reviewed to determine if they were subject to periodic replacement. Those mechanical component types subject to replacement based on a qualified life or specified time period (i.e., are not long-lived components) were screened as not subject to AMR.
- Consumable items were evaluated. Consumable parts of a component may be passive, long-lived, and necessary to fulfill an intended function. Screening of consumables was either done as part of the component AMR or the item was excluded based on NRC screening guidance.
- Component intended functions were identified. Each component subject to an AMR was evaluated to determine if the component-level mechanical function(s) were performed without moving parts or change in configuration, in fulfilling or supporting system intended functions.

Components determined to be not subject to an AMR were screened out. These include components that are (a) active, (b) short-lived or replaced based on qualified life or specific time period, or (c) not credited with performance of a mechanical intended function.

2.1.2.2.2 Structural Screening

LRA Section 2.1.2.2 states that the screening process was performed on each structure identified to be within the scope of license renewal. This method evaluated the individual SCs included on or within structures, within the scope of license renewal, to identify specific SCs or SC groups that require an AMR. The LRA describes the following sequence of steps performed for each structure which had been determined to be within the scope of license renewal:

(1) Typical components were grouped together and screened as a single commodity. The source of the civil commodities list was a combination of those civil components identified by tag number in the EDB and those un-tagged civil components identified through industry experience and a review of the plant CLB. An active/passive determination was performed based on whether the commodity supports its intended function without moving parts or without a change in configuration or properties. A determination of commodity replacement based on a qualified life or specified time period was performed for each commodity type. Finally, a set of potential intended functions was developed for each commodity group.

(2) Civil screening was performed on a structural system basis and only civil commodities located within the specific structural system being screened were addressed. The identification of civil commodities for a specific structure was performed using EDB location data, design drawings, general arrangement drawings, penetration drawings, plant modifications, the UFSAR, DBDs, system descriptions, and plant walkdowns. EDB equipment types within a specific structure were reviewed and civil commodities were assigned to the structure based on that review.

Evaluation boundaries between mechanical components, electrical components, and structures and structural components were coordinated between the discipline reviewers. This same methodology was used with components identified by means other than EDB, such as an UFSAR discussion of a specific component or design feature, an untagged component identified on a plant drawing, or a component observed during a plant walkdown.

(3) The commodity-specific intended functions were developed based on comparison of the potential intended functions from the generic commodity groups to the specific intended functions of the structure and the EDB component quality classification. The screening process reviewed EDB equipment types, design drawings, general arrangement drawings, plant modifications, the UFSAR, DBDs, system descriptions, and plant walkdown results within each structure and developed a list of commodities within that structure requiring aging management review. Those SCs that have a component or commodity intended function that supports a structure intended function were subject to an AMR.

2.1.2.2.3 Electrical/I&C Screening

LRA Section 2.1.2.3 described the methodology used to identify electrical and instrumentation and control (I&C) components that are subject to an AMR. For electrical and I&C SCs, the applicant used the component commodity group approach consistent with the guidance in NEI 95-10.

The sequence of steps that the applicant used to identify electrical and I&C SCs that require an AMR included:

(1) The EDB was used to identify electrical equipment and components types within systems and structures determined to be within the scope of license renewal.

(2) The UFSAR, plant drawings, and other documents, were used to identify electrical equipment and component types within electrical and I&C systems determined to be within the scope of license renewal in addition to those identified in the EDB.

(3) The component types associated with electrical and I&C components within scope of license renewal were organized into commodity groups such as circuits, breakers, cables and sensors. In general, grouping of component types followed the guidance in NEI 95-10 to group components based on similar functions.

(4) The electrical and I&C component commodity groups that perform an intended function without moving parts or without a change in configuration (passive) were identified.

(5) Passive electrical and I&C commodity groups, component commodity groups that are not subject to replacement based on a qualified life or time period, were identified.

Electrical and I&C components that were screened in accordance with the steps above and meet the requirements of 10 CFR 54.21(a)(1) were determined to be subject to an AMR.

2.1.3 Staff Evaluation

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

- Section 2.1, "Scoping and Screening Methodology," to verify that the applicant described a process for identifying SSCs that are within the scope of license renewal in accordance with the requirements of 10 CFR 54.4(a)(1), a(2), and a(3).
- Section 2.2, "Plant Level Scoping Results;" Section 2.3, "Scoping and Screening Results - Mechanical Systems;" Section 2.4, "Scoping and Screening Results - Structures;" and Section 2.5, "Screening Results - Electrical and Instrumentation and Controls (I&C) Systems" to verify that the applicant described a process for determining structural, mechanical, and electrical components at BSEP that are subject to an AMR for renewal in accordance with the requirements of 10 CFR 54.21(a)(1) and (2).

In addition, the staff conducted a scoping and screening methodology audit at BSEP March 1 through 4, 2005. The focus of the audit was to ensure that the applicant had developed and implemented adequate guidance to conduct the scoping and screening of SSCs in accordance with the methodologies described in the application and the requirements of the Rule. The staff reviewed implementation procedures and engineering reports which describe the scoping and screening methodology implemented by the applicant. In addition, it conducted detailed discussions with the cognizant engineers on the implementation and control of the program, and reviewed administrative control documentation and selected design documentation used by the applicant during the scoping and screening process. It further reviewed a sample of system scoping and screening results reports for main feedwater to ensure the methodology outlined in the administrative controls was appropriately implemented, and the results reports were found to be consistent with the CLB as described in the supporting design documentation.

2.1.3.1 Scoping Methodology

The staff reviewed implementation procedures and engineering reports which describe the scoping and screening methodology implemented by the applicant. These procedures included: EGR-NGGC-0501, "Nuclear Plant License Renewal Program;" EGR-NGGC-0502, "System/Structure Scoping for License Renewal;" EGR-NGCC-0503, "Mechanical Component Screening for License Renewal;" EGR-NGCC-0505, "Electrical Component Screening and Aging Management Review for License Renewal;" EGR-NGGC-0506, "Civil/Structural Screening and Aging Management for License Renewal;" 0ENP-33.5, "Quality Classification Analysis of Structures, Systems, and Components;" and BNP-LR-002, "Bulk Screening of EDB Equipment Types for License Renewal." The staff found that the scoping and screening methodology instructions were consistent with LRA Section 2.1 and were of sufficient detail to provide the applicant's staff with concise guidance on the scoping and screening implementation process to be followed during the LRA activities. In addition to the implementing procedures, the staff reviewed supplemental design information including design-basis drawings, system drawings, and selected licensing documentation relied upon by the applicant

during the scoping and screening phases of the review. The staff found these design documentation sources to be useful for ensuring that the initial scope of SSCs identified by the applicant was consistent with the CLB of the BSEP.

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

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

10 CFR 54.4(a)(1) requires, in part, that the applicant consider all SR SSCs that are relied upon to remain functional during and following DBEs to ensure the following functions: (1) the integrity of the reactor coolant pressure boundary, (2) the ability to shut down the reactor and maintain it in a safe shutdown condition, or (3) the capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to those referred to in 10 CFR 50.34(a)(1), 10 CFR 50.67(b)(2), or 10 CFR 100.11 to be within the scope of the license renewal.

The applicant used the EDB as the primary source of information to determine whether an SC would be considered within the scope of license renewal in accordance with the requirements of 10 CFR 54.4(a)(1). The SCs' quality designations were determined in accordance with BSEP procedure 0ENP-33.5, "Quality Classification Analysis of Structures, Systems, and Components," and documented in the EDB which had been developed and maintained in accordance with quality assurance requirements of 10 CFR Part 50, Appendix B. SR SCs were identified in the EDB as meeting one of approximately seventeen Quality Class A designations. The Quality Class A designation identified the operational attributes and safety functions of the SCs. All SCs designated as Quality Class A were determined to be within the scope of license renewal in accordance with the requirements of 10 CFR 54.4(a)(1).

The staff determined that the applicant had performed component-based scoping and had included SCs within the scope of license renewal based upon the SC's classification within the EDB relative to the criteria of 10 CFR 54.4 (a)(1), (a)(2), or (a)(3). The applicant had then included all systems within the scope of license renewal which contained any SCs which had been determined to be within the scope of license renewal based on the SC's classification within the EDB. The applicant indicated that the system CLB documentation, including the system intended functions, had been reviewed to verify that all SCs within the scope of license renewal had been identified.

In RAI 2.1-1, dated April 8, 2005, the staff stated that it reviewed the information contained in the LRA, discussed the process with the applicant, and reviewed the applicable process implementation guidance. The staff determined that the process by which the CLB information, including system intended functions, had been reviewed and considered during the scoping process was not clearly documented in the LRA. Therefore, the staff requested that the applicant document how the CLB information, including system intended functions, was considered during the scoping process.

In its response, by letter dated May 4, 2005, the applicant stated that the EDB had been developed from the Q-List, which is maintained in accordance with requirements of 10 CFR Part 50, Appendix B, to create a more detailed, component-level quality classification system for plant equipment. The procedure for classification of components in EDB utilizes a

process that begins with the established intended functions performed by the parent system or structure.

During the license renewal review, information from the EDB was evaluated to determine its suitability for use in the scoping process and a license renewal calculation was developed to document the evaluation. The review determined that EDB quality classifications could be used to facilitate identification of SSCs within the scope of license renewal and provide an indication of the intended functions that the SSCs perform. The methodology through which SCs are assigned a quality classification within the EDB also involves a procedurally controlled process that considers the intended functions of the parent SSC as documented in CLB documents.

The scoping process checked EDB component results against other sources and the EDB function descriptions were compared with UFSAR and DBD function descriptions. In addition, component-level scoping results were mapped to system drawings. Component mapping on the drawings afforded an effective check to ensure that the functions described in the CLB documents were consistent with EDB information.

In addition to the inclusion of SSCs based on quality classifications of individual SCs in the EDB, the scoping process included a review of plant and CLB documents to the extent required to develop the descriptive material, including system intended functions, for use in the LRA. The documents reviewed included the UFSAR, DBDs, system descriptions, docketed correspondence, the EDB, and the Maintenance Rule database. The review was performed to document the SSC descriptions and functions to be incorporated into the SSC scoping worksheets and ultimately into LRA Sections 2.3 and 2.4, so that the description of each SSC and its functions were available for review.

The staff reviewed the additional information provided by the applicant and determined the component-level classification contained in the EDB was based on the parent system intended functions. In addition, the applicant had also considered the system intended functions during the review of information including the CLB, UFSAR, DBDs system descriptions. Therefore, the staff's concern described in RAI 2.1-1 is resolved.

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

Application of the Scoping Criteria in 10 CFR 54.4(a)(2). Pursuant to 10 CFR 54.4(a)(2), the applicant must consider all NSR SSCs whose failure could prevent satisfactory accomplishment of any of the functions identified in paragraphs 10 CFR 54.4(a)(1)(I) - (iii), to be within the scope of the license renewal. By letters dated December 3, 2001, and March 15, 2002, the staff issued its position to NEI, providing staff expectations for determining which SSCs meet the 10 CFR 54.4(a)(2) criterion.

The December 3, 2003, letter (ADAMS accession ML033370195) provided specific examples of operating experience which identified pipe failure events (summarized in NRC Information Notice (IN) 2001-09, "Main Feedwater System Degradation in Safety-Related ASME Code Class 2 Piping Inside the Containment of a Pressurized Water Reactor") and the approaches the NRC considers acceptable to determine which piping systems should be included within the scope of license renewal based on the 10 CFR 54.4(a)(2) criterion. The March 15, 2002, letter (ADAMS accession ML020770026) further described the staff's expectations for the evaluation of non-piping SSCs to determine which additional NSR SSCs are within the scope of license renewal. The position states that applicants should not consider hypothetical failures, but rather should base their evaluation on the plant's CLB, engineering judgement and analyses, and relevant operating experience. The paper further describes operating experience as all documented plant-specific and industry-wide experience which can be used to determine the plausibility of a failure. Documentation would include NRC generic communications and event reports, plant-specific condition reports, industry reports, and engineering evaluations.

In keeping with the NEI draft position on NSR SSCs that could adversely affect SR SSCs, the applicant developed guidance for interpreting and applying the 10 CFR 54.4(a)(2) criteria including NSR components spatially oriented near SR components, seismic II/I components, NSR piping attached to SR piping, flooding, missiles, and high energy line breaks. The applicant used the EDB quality classifications and a review of design and licensing basis information to identify NSR components that could be considered a potential source of damage to nearby SR components.

The applicant's guidance for performing 10 CFR 54.4(a)(2) scoping of NSR SSCs was documented in the following Brunswick Nuclear Plant (BNP) calculations: Nuclear Generation Group calculations BNP -LR-003, "Use of Equipment Database for License Renewal Scoping Calculations;" BNP-LR-007, "License Renewal Scoping Calculation for Criteria 10 CFR 54.4(a)(2);" BNP-LR-009, "Civil Nonsafety-Related (II/I) Determination for License Renewal;" BNP-LR-012, "License Renewal Scoping for Seismic Continuity Piping;" and BNP-LR-013, "License Renewal Scoping Calculation for Nonsafety-Related Spatial Interaction Piping." The applicant reviewed the plant's design and licensing basis information to identify NSR SSC interactions with SR SSCs that could prevent the performance of a required intended function. For each such instance, the specific interaction that may affect the function of SR SSCs was identified. The SSCs meeting these criteria were designated as within the scope of the 10 CFR 54.4(a)(2) criteria.

LRA Section 2.1.1.2, "Non-Safety Related Criteria Pursuant to 10 CFR 54.4(a)(2)," discusses the methodology for including NSR SSCs within the scope of license renewal whose failure could prevent the satisfactory accomplishment of any of the functions identified for SR SSCs interim staff guidance (ISG)-9. Sources of information reviewed by the applicant included DBDs, the FSAR, EDB, Maintenance Rule database, and docketed correspondence. The specific function/interaction required of an NSR SSC was also identified for each instance where NSR SSCs were credited in the CLB. SSCs identified in this category were designated as within the scope of license renewal pursuant to 10 CFR 54.4(a)(2).

The applicant prepared calculations which addressed the issue of including within the scope of license renewal the NSR piping attached to SR piping that is seismically designed and supported up to the "first seismic anchor" past the SR/NSR interface. The LRA states that the analysis of seismically induced effects was continued well into the NSR piping in order to

include the effects on the adjoining SR piping. Generally, this continuation was to a point where the Category II piping was restrained in three directions or if not practical, the Category II piping was analyzed up to a point in the system where it was supported in three directions by three individual supports. The applicant stated this position is consistent with the plant's CLB for seismically induced effects between connected NSR and SR piping, as documented in Comment C.54 of the FSAR, Amendment 15, dated March 1973. The comment responds to an earlier Atomic Energy Commission question requesting that the applicant describe the evaluation performed to determine seismically induced effects of Category II piping systems on Category I piping. BNP was designed prior to issuance of RG 1.29 which required NSR components with the potential to impact safety components to be seismically supported.

During the audit, the team reviewed a study report prepared for CP&L in 1986 by United Engineers and Constructors, the architect-engineer for the plant, entitled "Documentation of Seismic Class I Boundary Conditions." The purpose of the report was to document the seismic Class I boundaries, identify supports utilized to define the seismic stress analysis boundary, and ensure that each boundary had been adequately addressed and evaluated.

In RAI 2.1-2, dated April 8, 2005, the staff stated that based on a review of the LRA, the applicant's scoping and screening implementation procedures, calculations, and discussions with the applicant, the staff determined that additional information was required with respect to certain aspects of the applicant's evaluation pursuant to 10 CFR 54.4(a)(2). Therefore, the staff requested confirmation that use of the term "first seismic anchor" is, in fact, consistent with the CLB position for seismically induced effects between connected NSR and SR piping. The staff also requested that the applicant further describe the methodology of its LRA in relation to the CLB.

In its response, by letter dated May 4, 2005, the applicant stated that during the original final safety analysis report (FSAR) development, the applicant had documented the effects of seismic Category II piping systems on seismic Category I piping systems. In cases where Category I piping and Category II piping are connected, the analysis was continued well into the Category II piping in order to include the effects that Category II piping has on the adjoining Category I piping. Generally, this continuation was to a point where the Category II pipe was restrained in three directions. If this was not practical, the Category II pipe was analyzed up to a point in the system where it was supported in three directions by three individual supports. In addition, the BSEP architect/engineer later provided study reports to document pipe stress analysis methodology. One of these study reports specifically addressed seismic Class I boundary conditions. Corporate procedures for the performance of pipe stress analysis have incorporated the aforementioned study report by reference. This information was incorporated into the design control documents and ensures that the CLB requirements are met.

The applicant further stated that the methodology employed to validate that all seismically connected piping per ISG-09 was properly evaluated for inclusion within the scope of license renewal was multi-faceted. BSEP employed a spaces approach for the review of liquid-filled piping systems. Liquid-filled piping located in buildings housing SR components was brought within the scope of license renewal unless a specific documented evaluation was performed to exclude a particular space. When this evaluation was complete, a separate evaluation was performed to ensure that the seismically connected piping (associated with SR/NSR boundaries), that had not yet been included, was brought within the scope of license renewal

consistent with the CLB. The license renewal boundary drawings were reviewed to ensure that there were no anomalous conditions that required further evaluation.

The staff reviewed the applicant's response and determined that the applicant had previously evaluated the NSR/SR piping interfaces and that the results of the previous evaluations were conservative and consistent with the plant's design basis, the UFSAR, and the CLB. Therefore, the staff's concern described in RAI 2.1-2 is resolved.

Conclusion. Based on the information supplied by the applicant, including determination of credible failures that could impact the ability of SR SSCs to perform their intended functions, evaluation of relevant operating experience, and incorporation of identified NSR SSCs into the applicant's AMPs; and the results of NRC inspection and audit activities, the staff concluded that the applicant has supplied sufficient information to demonstrate that all SSCs that meet the 10 CFR 54.4(a)(2) scoping requirements have been identified as being within the scope of license renewal.

Application of the Scoping Criteria in 10 CFR 54.4(a)(3). 10 CFR 54.4(a)(3) requires, in part, that the applicant consider all SSCs relied on in safety analyses or plant evaluations to perform a function that demonstrates compliance with NRC regulations for fire protection (10 CFR 50.48), EQ (10 CFR 50.49), PTS (10 CFR 50.61), ATWS (10 CFR 50.62), and SBO (10 CFR 50.63) to be within the scope of the license renewal.

In LRA Sections 2.1.1.3, "Other Scoping Pursuant to 10 CFR 54.4(a)(3)," and 2.1.4, "Interim Staff Guidance Issues," the applicant discussed the methodology used to identify SSCs credited for performing a function that demonstrates compliance with regulations for fire protection, EQ, ATWS, and SBO pursuant to the 10 CFR 54.4(a)(3) license renewal scoping criteria. The applicant did not evaluate PTS because it is not applicable to BWRs. The applicant's approaches for scoping systems and structures required mitigating each of these four regulated events, as described in the following sections.

Fire Protection - The applicant described the scoping of SSCs required to demonstrate compliance with the fire protection requirements of 10 CFR 50.48 in LRA Section 2.1.1.3.1, "Fire Protection." The applicant stated that a detailed review of the CLB, which included the EDB, the Safe Shutdown Analysis Report, the fire protection safe shutdown and SBO screening procedure, and the Fire Protection Program Manual, for fire protection was performed and SSCs that support either fire protection design features or safe shutdown following a postulated fire are within the scope of license renewal, and the associated intended functions relied were identified.

Environmental Qualification - The applicant described the scoping of SSCs required to demonstrate compliance with EQ requirements of 10 CFR 50.49 in LRA Section 2.1.1.3.2, "Environmental Qualification." Electric equipment important to safety that is required to be environmentally qualified to mitigate certain accidents that would result in harsh environmental conditions in the plant is defined in 10 CFR 50.49. The applicant stated that an EQ Master List (EQML) was developed in accordance with the requirements of 10 CFR 50.49(b) based on 1) a review of the BSEP design-basis accidents, 2) the resulting environmental service conditions, 3) the functional requirements of the systems, 4) the functional requirements of individual components required to isolate the break or mitigate or monitor the effects of the accident, and 5) the

physical location of the components. THE EQML is maintained in the EDB, which was used as the principal input document for scoping of SSCs. Any system that contained one or more components designated as EQ-related in the EDB was considered within the scope of license renewal per 10 CFR 54.4(a)(3).

Anticipated Transients without Scram (ATWS) - The applicant described the scoping of SSCs required to demonstrate compliance with the ATWS requirements of 10 CFR 50.62 in LRA Section 2.1.1.3.3, "Anticipated Transients without Scram." The applicant stated that the BSEP design features related to ATWS are within the scope of license renewal because they are relied on to meet the requirements of 10 CFR 50.62. The applicant stated that ATWS mitigation is accomplished by the use of three systems at BSEP: 1) the alternate rod injection system, 2) the standby liquid control (SLC) system, and 3) the ATWS-recirculation pump trip system. Based on a review of the CLB, the intended functions supporting the 10 CFR 50.62 requirements were determined.

Station Blackout - In an April 1, 2002 letter from D. Matthews to A. Nelson and D. Lochbaum, the staff provided guidance on the scoping of equipment relied on to meet the requirements of 10 CFR 50.63. In this letter, the staff noted that, consistent with the requirements specified in 10 CFR 54.4(a)(3) and 10 CFR 50.63(a)(1), the plant system portion of the offsite power system used to connect the plant to the offsite power source should be included within the scope of the rule. The applicant described the scoping of SSCs required to demonstrate compliance with the SBO requirements of 10 CFR 50.63 in LRA Section 2.1.1.3.4, "Station Blackout." The applicant noted that the EDB quality classifications that have been assigned to components credited with compliance with SBO requirements were used to identify the applicable equipment. In addition, the applicant augmented the EDB by identifying components with additional reviews of the Station Blackout Coping Analysis Report and other plant documents and procedures. The applicant stated that, based on the review of the CLB for SBO, the equipment performing intended functions required for compliance with 10 CFR 50.63 was determined and was included within the scope of license renewal in accordance with the requirements of 10 CFR 54.4(a)(3). The staff determined that the applicant's approach to scoping SSCs relied on to demonstrate compliance with 10 CFR 50.63 was consistent with the staff's April 1, 2002, interim guidance (ISG-2).

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

2.1.3.1.2 Mechanical Component Scoping

The applicant described the methodology used for mechanical scoping in LRA Section 2.1.1 "Scoping;" EGR-NGGC-0502, "System/Structure Scoping for License Renewal;" and

BNP-License Renewal (LR)-010, "Bulk Screening of EDB Equipment Types for License Renewal." The applicant developed a list of SSCs using the information contained in the EDB. The EDB and the CLB were reviewed to identify SSCs credited with compliance with 10 CFR 54.4(a)(1), (a)(2), and (a)(3). The primary source of this information was the component-level classification provided in the EDB. The system and component intended functions had been used in determining the quality classification of SCs within the EDB. Systems which contained components determined to meet the requirements of 10 CFR 54.4(a)(1), (a)(2), and (a)(3) were considered within the scope of license renewal.

The applicant noted that while the quality classification used in the EDB would accurately identify the SCs that would meet the requirements of 10 CFR 54.4(a)(1) and a portion of those SCs that would meet the requirements of 10 CFR 54.4(a)(2), there may be NSR SCs which would have potential physical interactions with SR SSCs that might not be identified in the EDB. In this case, the applicant performed additional CLB reviews and did on-site walkdowns to identify NSR SSCs that could potentially interact with SR SSCs and included the identified NSR SSCs within the scope of license renewal. In addition, the applicant indicated that additional reviews of the CLB were performed to identify all SCs required to meet those system functions credited with compliance with regulated events (10 CFR 54.4(a)(3)) and to include the identified SCs within the scope of license renewal.

For each mechanical system the applicant developed a scoping worksheet in accordance with calculation BNP-LR-010, "License Renewal Project Scoping Calculation." These worksheets provided a general description of the mechanical system, identified whether the system was in or out of the scope of license renewal, identified a list of applicable CLB documents, and identified each of the system functions required to support the component functions meeting license renewal scoping criteria.

The staff reviewed the scoping process for a selected mechanical system, the main steam system. The staff verified that the EDB had been appropriately used to identify SSCs within the scope of license renewal and that the applicant had identified and highlighted system piping and instrumentation diagrams to develop the system boundaries in accordance with the procedural guidance. The applicant was knowledgeable of the process and conventions for establishing boundaries as defined in the license renewal implementation procedures. Additionally, the staff verified that the applicant had performed independent verification of the results in accordance with its governing procedures. Specifically, the marked-up drawings were reviewed by other personnel knowledgeable with the system, and cross-discipline verification and independent reviews of the resultant highlighted drawings were also performed.

Insulation. During the audit, the applicant described the evaluation performed to determine if any insulation installed in the plant was required to support any system intended functions identified during the scoping process. As a result, the staff requested that the applicant describe any intended functions performed by insulation or the basis for determining that insulation (e.g. piping insulation) did not meet the scoping criteria described in 10 CFR 54.4(a)(1), (a)(2), or (a)(3). The applicant stated that the intended function of thermal insulation is to provide thermal resistance, which has been identified as an intended function.

Section 3.5.1.4, "Thermal Insulation," of BNP-LR-007, "License Renewal Scoping Calculation for Criteria 10 CFR 54.4(a)(2)," states that insulating materials can be credited with reducing piping/equipment heat loads in support of SR room/area cooling systems, with limiting heat

transfer into or out of system working fluids, or with limiting temperatures in support of equipment environmental qualification. The applicant stated that thermal insulation within the scope of license renewal under 10 CFR 54.4(a)(2) is identified as a system commodity in Attachment 2 of the calculation. Plant areas and systems where temperature control may be of concern include the drywell, emergency core cooling system (ECCS) pump rooms, cryogenic systems, and heat-traced outdoor piping and components needed for freeze protection. A review of the mechanical component screening result calculations identified four engineered safety feature (ESF) systems (residual heat removal (RHR), high pressure coolant injection (HPCI), reactor core isolation cooling (RCIC) and the heating, ventilation, and air conditioning (HVAC) control building) as the primary systems that credit thermal insulation. To the extent that insulation is relied upon to mitigate the effects or propagation of fire, calculation BNP LR-004 addresses these fire barriers against the 10 CFR 54.4(a)(3) fire protection criteria.

Consumables. During the audit, the applicant described the screening review for certain types of consumable commodities in LRA Section 2.1.2.1, "Mechanical Components." Section 2.1.2.1(6) states that consumable items were evaluated in accordance with the staff screening guidance of SRP-LR Table 2.1-3, "Specific Staff Guidance on Screening." The table provides guidance for determining if consumable items should be subject to an AMR. For consumables that are periodically replaced, SRP-LR Table 2.1-3 states that the applicant should identify the standards that are relied on for replacement as part of the methodology description.

For consumables such as packing, gaskets, component seals, and O-rings, the table states that these components may be excluded from an AMR using a clear basis. The table also divides consumables into the following four basic categories: (1) packing, gaskets, component seals, and O-rings; (2) structural sealants; (3) oil, grease, and component filters; and (4) system filters, fire extinguishers, fire hoses, and air packs. The LRA states that screening of consumables was either performed as part of the component AMR or the item was excluded based on the staff's screening guidance. The applicant's guidance for performing screening reviews for commodity groups is documented in calculation BNP-LR-002, Revision 0, "Bulk Screening of EDB Equipment Types for License Renewal," which provides the description and the justification for the methodology used for the bulk screening of tagged components in the EDB. Bulk screening is the ability to render an active/passive determination based on EDB equipment type and provide proposed component intended functions for those equipment types that are passive and long-lived.

The staff selected various applicant's AMRs and verified that each contained a discussion on the treatment of consumables. The following applicant's AMRs were reviewed during the staff's scoping and screening audit and were verified to contain components subject to short-lived/replaceable determinations: BNP-LR-306, 337, 338, 341, 345, 348, 359, 364, 365, and 372. The staff concluded that for the remaining AMRs, no short-lived equipment had been identified.

Conclusion. The staff reviewed the LRA, samples of applicable calculations, procedures, drawings, EDB information, and scoping worksheets. The staff determined that the applicant's proceduralized methodology was consistent with the description provided in LRA Section 2.1.1 and the guidance contained in SRP-LR Section 2.1. Based on review of information contained in the LRA, the applicant's detailed scoping implementation procedures, and a sampling review of mechanical scoping results; the staff concluded that the applicant's methodology for

identifying mechanical SSCs within the scope of license renewal meets the requirements of 10 CFR 54.4(a).

2.1.3.1.3 Structural Component Scoping

The applicant described the methodology used for structural scoping in LRA Section 2.1.1 "Scoping;" EGR-NGGC-0502, "System/Structure Scoping for License Renewal;" and BNP-LR-002, "Bulk Screening of EDB Equipment Types for License Renewal." The applicant developed a list of SSCs using the information contained in the EDB. The EDB and the CLB were reviewed to identify structures credited with compliance with 10 CFR 54.4(a)(1), (a)(2), and (a)(3). The primary source of this information was the component-level classification provided in the EDB. The structure and component intended functions had been used in determination of the quality classification of SCs within the EDB. Systems which contained components determined to meet the requirements of 10 CFR 54.4(a)(1), (a)(2), and (a)(3) were considered within the scope of license renewal.

The EDB contained all SR class components and structures and the majority of other plant components and structures. The EDB also included civil commodities such as doors, supports, and penetrations, and the component location. The applicant included all structures within the scope of license renewal which contained components required to be within the scope of license renewal in accordance with the requirements of 10 CFR 54.4(a)(1), (a)(2), and (a)(3).

The applicant conducted a series of additional reviews for 10 CFR 54.4(a)(2) and (a)(3) criteria, documented in a series of calculations, to determine if additional components, civil commodities, or structures were included within the scope of license renewal. All civil components and any component civil functions were assigned to civil commodity groups. The applicant reconciled the commodity types with those in NEI-95-10, the GALL Report, and other facility applications, and added appropriate commodity types. In addition, the applicant reviewed other CLB information such as the UFSAR, the structures' DBD and plant drawings; and walked down all structures utilizing a detailed checklist to determine if additional structures housed any components required for license renewal. The walkdowns also served to identify or confirm the commodity types and materials in each structure. If portions of NSR systems were required for 10 CFR 54.4(a)(2) criteria, the entire system's civil components were placed within the scope of license renewal.

For each structure, the applicant developed a structure scoping worksheet in accordance with calculation BNP-LR-010, "License Renewal Project Scoping Calculation." These worksheets provided a general description of the structure, identified whether the structure was in or out of the scope of license renewal, identified a list of applicable CLB documents, and identified each of the civil intended functions required to support the component functions meeting license renewal scoping criteria.

Conclusion. The staff reviewed the LRA, samples of applicable calculations, procedures, drawings, EDB information, and scoping worksheets. The staff determined that the applicant's proceduralized methodology was consistent with the description provided in LRA Section 2.1.1 and the guidance contained in SRP-LR, Section 2.1. Based on review of information contained in the LRA, the applicant's detailed scoping implementation procedures, and a sampling review of structural scoping results, the staff concluded that the applicant's methodology for

identification of structural SSCs within the scope of license renewal met the requirements of 10 CFR 54.4(a).

2.1.3.1.4 Electrical and I&C Component Scoping

Electrical and I&C component scoping was performed using the commodity method and is discussed, along with electrical and I&C component screening, in SER Section 2.1.3.2.3.

2.1.3.2 Screening Methodology

2.1.3.2.1 Mechanical Component Screening

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

The applicant determined the components within the scope of license renewal to be those that performed an intended function without moving parts or without a change in configuration or properties. Active/passive screening determinations were based on the guidance in NEI 95-10, Appendix B. The passive components within the scope of license renewal that were not subject to replacement based on a qualified life or specified time period were identified as requiring an AMR. The determination of whether a passive component within the scope of license renewal has a qualified life or specified replacement time period was based on a review of plant-specific information including the EDB, maintenance programs, and procedures. The applicant identified the component intended functions based on the guidance of NEI 95-10.

The results of the mechanical component screening process were documented in system screening calculations which contained the system intended function boundaries, identified the components subject to screening, and documented the screening results for each system component. The component documentation included the component identification, commodity type, screening results (active or passive), a description, and the intended function. The staff reviewed a sample of the mechanical screening packages assembled by the applicant.

The staff also examined the applicant's implementation of this methodology by reviewing a sample mechanical system, the main steam system, identified as being within the scope of license renewal. The review included the evaluation boundaries and resultant components determined to be within the scope of license renewal, the corresponding component-level intended functions, and the resulting list of mechanical components and commodity groups subject to an AMR.

Conclusion. The staff reviewed the LRA, samples of applicable calculations, procedures, drawings, EDB information, and screening results. The staff determined that the applicant's proceduralized methodology was consistent with the description provided in LRA Section 2.1.2 and the guidance contained in SRP-LR Section 2.1. Based on review of information contained in the LRA, the applicant's detailed screening implementation procedures, and a sampling review of mechanical screening results, the staff concluded that the applicant's methodology for

identification of mechanical SCs subject to an aging management review meet the requirements of 10 CFR 54.21(a)(1).

2.1.3.2.2 Structural Component Screening

The applicant initially performed a bulk screening process in accordance with guidance of procedure ENG-NGGC-0506, "Civil/Structural Screening and Aging Management Review for LR" and calculations BNP-LR-002 and BNP-LR-008, "Civil Commodity Types and Bulk Screening of EDB Equipment Types" utilizing component information from the EDB. Calculation BNP-LR-008 also provided a list of the 13 civil intended functions, defined civil equipment types, and provided guidance for active/passive/long-lived determinations. This screening process resulted in typical commodity types pertinent to each structure. In addition, reviews of CLB information and facility walkdowns were conducted. Commodity types were reconciled with NEI 95-10, the GALL Report, and other facility license renewal applications.

Portions of the structures such as walls, beams, and foundations do not have unique identifiers, so the applicant identified structural members which support the intended function(s) that the structure performs via review of structural drawings and walkdowns. These items were assigned to a commodity group.

The applicant developed calculations BNP-LR-0110, "License Renewal Civil Screening for Outside Areas," and BNP-LR-0111, "License Renewal Civil Screening for Primary Containment System," to document the results of the screening effort for each structure. The calculations provided a list of structures and structural components subject to aging management review and described the methodology used to develop that list. The calculations provided a description of each structure, identified the structure and commodity civil intended functions, identified the evaluation boundary, and described all components which were transferred into the system from other disciplines (mechanical, electrical) and other structural systems.

Conclusion. The staff reviewed the LRA, samples of applicable calculations, procedures, drawings, EDB information, and screening results. The staff determined that the applicant's proceduralized methodology was consistent with the description provided in LRA Section 2.1.2 and the guidance contained in SRP-LR Section 2.1. Based on review of information contained in the LRA, the applicant's detailed screening implementation procedures, and a sampling review of structural screening results; the staff concluded that the applicant's methodology for identification of structural SCs subject to an AMR meets the requirements of 10 CFR 54.21(a)(1).

2.1.3.2.3 Electrical and I&C Component Scoping and Screening

The applicant described the methodology used for electrical and I&C scoping in LRA Section 2.1.1, "Scoping;" EGR-NGGC-0505, "Electrical Component Screening and Aging Management Review for License Renewal;" and BNP-LR-002, "Bulk Screening of EDB Equipment Types for License Renewal." The applicant developed a list of SSCs using the information contained within the EDB. The EDB and the CLB were reviewed to identify SSCs credited with compliance with 10 CFR 54.4(a)(1), (a)(2), and (a)(3). The primary source of this information was the component-level classification provided in the EDB. The system and component intended functions had been used in determination of the quality classification of SCs within the EDB. Systems which contained components determined to meet the

requirements of 10 CFR 54.4(a)(1), (a)(2), and (a)(3) were considered within the scope of license renewal.

The applicant identified electrical components contained in the EDB that were determined to be within the scope of license renewal and developed a list of the EDB electrical component types for the systems within the scope of license renewal. The applicant reviewed the UFSAR, plant design drawings, and other documentation to identify additional electrical and I&C systems within the scope of license renewal and subsequently identified the equipment and components within the electrical and I&C systems. The applicant developed a comprehensive list of electrical component types present in the systems and structures within the scope of license renewal. The component types associated with the electrical and I&C systems within the scope of license renewal were organized into commodity groupings, such as circuit breakers, cables, and sensors in accordance with the guidance in NEI 95-10.

The applicant identified electrical and I&C component commodity groups that perform an intended function without moving parts or without a change in configuration or properties in accordance with the requirements of 10 CFR 54.21(a)(1)(i). The applicant identified the components within the passive electrical and I&C component commodity groups which are not subject to replacement based on a qualified life or specified time period in accordance with 10 CFR 54.21(a)(1)(ii). The electrical and I&C commodities which were determined to be within the scope of license renewal and subject to an AMR are as follows:

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

The staff also reviewed the applicant's approach to scoping and screening of electrical fuse holders in accordance with ISG-05, "Identification and Treatment of Electrical Fuse Holders for License Renewal," dated March 10, 2003. ISG-05 stated that, consistent with the requirements specified in 10 CFR 54.4(a), fuse holders (including fuse clips and fuse blocks) are considered to be passive electrical components. Fuse holders should be scoped, screened, and included in the AMR in the same manner as terminal blocks and other types of electrical connections that are currently being treated in the process. This staff position only applies to fuse holders that are not part of a larger assembly, but support SR and NSR functions in which the failure of a fuse precludes a safety function from being accomplished.

The EDB contained information on all fuses installed at BSEP. The applicant had reviewed each fuse listed in the EDB to determine whether the fuse was part of a larger assembly. The EDB provided sufficient information concerning the application of the fuses to determine that the majority of fuses were part of a larger assembly. However, the applicant identified a subset of the fuses listed in the EDB that were described with limited information and required further evaluation. The applicant reviewed the point-to-point wiring diagrams for the resulting subset of fuses which provided the actual location and equipment in which the fuses were installed. The applicant determined that all fuses contained within the subset were part of a larger assembly; therefore, the fuseholders were not within the scope of license renewal. The applicant did not

identify any fuseholders that were required to be within the scope of license renewal in accordance with ISG-05.

Conclusion. The staff reviewed the LRA, samples of applicable calculations, procedures, drawings, EDB information, and scoping and screening results. The staff determined that the applicant's proceduralized methodology was consistent with the description provided in LRA Sections 2.1.1 and 2.1.2 and the guidance contained in SRP-LR Section 2.1. Based on its review of information contained in the LRA, the applicant's detailed scoping and screening implementation procedures, and a sampling review of electrical and I&C scoping and screening results, the staff concluded that the applicant's methodology for identification of electrical and I&C SSCs within the scope of license renewal and electrical and I&C SCs subject to an AMR meets the requirements of 10 CFR 54.4(a) and 10 CFR 54.21(a)(1).

2.1.4 Evaluation Findings

The staff's review of the information presented in LRA Section 2.1, the supporting information in the scoping and screening implementation procedures, calculations and reports, and the information presented during the scoping and screening audit formed the basis of the staff's safety determination. The staff verified that the applicant's scoping and screening methodology was consistent with the requirements of the Rule and the staff's position on the treatment of NSR SSCs. On the basis of this review, the staff concluded that there is reasonable assurance that the applicant's methodology for identifying the SSCs within the scope of license renewal and the structures and components requiring an AMR is consistent with the requirements of 10 CFR 54.4 and 10 CFR 54.21(a)(1).

2.2 Plant-Level Scoping Results

2.2.1 Introduction

In LRA Section 2.1, the applicant described the methodology for identifying the SSCs within the scope of license renewal. In LRA Section 2.2, the applicant used the scoping methodology to determine which of the SSCs are required to be included within the scope of license renewal. The staff reviewed the plant-level scoping results to determine whether the applicant had properly identified all plant-level systems and structures relied upon to mitigate DBEs, as required by 10 CFR 54.4(a)(1), or whose failure could prevent satisfactory accomplishment of any of the SR functions, as required by 10 CFR 54.4(a)(2), as well as the systems and structures relied on in safety analysis or plant evaluations to perform a function required by one of the regulations referenced in 10 CFR 54.4(a)(3).

2.2.2 Summary of Technical Information in the Application

In LRA Tables 2.2-1, 2.2-2, and 2.2-3, the applicant provided a list of the plant mechanical systems, structures, and electrical/I&C systems, respectively, identifying those mechanical systems, structures, and electrical/I&C systems that are within the scope of license renewal. Based on the DBEs considered in the plant's CLB, other CLB information relating to NSR systems and structures, and certain regulated events, the applicant identified those plant-level systems and structures that are within the scope of license renewal, as defined by 10 CFR 54.4.

2.2.3 Staff Evaluation

In LRA Section 2.1, the applicant described its methodology for identifying the systems and structures that are within the scope of license renewal and subject to an AMR. The staff reviewed the scoping and screening methodology and provided its evaluation in SER Section 2.1. To verify that the applicant properly implemented its methodology, the staff focused its review on the implementation results, as 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 falling within the scope of license renewal to verify whether the systems and structures have any intended functions that would require their inclusion within the scope of license renewal. The staff's review of the applicant's implementation was conducted in accordance with the guidance described in SRP-LR Section 2.2, "Plant-Level Scoping Results."

The staff sampled the contents of the UFSAR based on the systems and structures listed in LRA Tables 2.2-1, 2.2-2, and 2.2-3 to determine whether there were systems or structures that may have intended functions within the scope of license renewal, as defined by 10 CFR 54.4, that were omitted from the scope of license renewal. The staff did not identify any omissions.

2.2.4 Conclusion

The staff reviewed LRA Section 2.2 and the supporting information in the UFSAR to determine whether any systems and structures within the scope of license renewal had not been identified by the applicant. The staff's review did not identify any omissions. On the basis of this review, the staff concluded that the applicant properly identified the systems and structures that are within the scope of license renewal in accordance with 10 CFR 54.4.

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 the following mechanical systems:

- reactor vessel, internals, and reactor coolant system
- engineered safety features
- auxiliary systems
- steam and power conversion systems

In accordance with the requirements set forth in 10 CFR 54.21(a)(1), the applicant must list and describe structures and components that are within the scope of license renewal (i.e., those that meet the scoping criteria of the License Renewal Rule) and are subject to an AMR. To verify that the applicant properly implemented its scoping and screening methodology, the staff focused its review on the implementation results. This enabled the staff to confirm that the applicant did not inadvertently omit any mechanical system structures or components that meet the scoping criteria and are subject to an AMR.

Staff Evaluation Methodology. The staff evaluated the information provided in the LRA using the same approach for all mechanical systems. The objective of the staff's review was to determine whether all components and supporting structures for a given mechanical system that meet the scoping criteria specified in the rule were identified by the applicant as being within the scope of license renewal in accordance with 10 CFR 54.4. Similarly, the staff evaluated the applicant's screening results to verify that all long-lived, passive components were identified by the applicant as being subject to an AMR in accordance with 10 CFR 54.21(a)(1).

Scoping. To perform its scoping evaluation, the staff reviewed the applicable LRA section and associated component drawings (with the exception of some balance-of-plant (BOP) systems discussed below), focusing on components that were not identified as being within the scope of license renewal. The staff reviewed relevant licensing-basis documents, including the plant's UFSAR, for each mechanical system to determine whether the applicant omitted from the scope of license renewal any components with intended functions delineated under 10 CFR 54.4(a). The staff also reviewed the licensing-basis documents to determine whether the LRA omitted any intended function(s) delineated under 10 CFR 54.4(a). If the review revealed an omission, the staff issued an RAI to resolve the discrepancy.

Screening. After completing its scoping evaluation, the staff reviewed the applicant's screening results. For structures and components with intended functions delineated under 10 CFR 54.4(a), the staff sought to determine whether those structures and components perform their function(s) with moving parts or a change in configuration or properties, or if they are subject to replacement based on a qualified life or specified time period, as described in 10 CFR 54.21(a)(1). For those that did not meet either of these criteria, the staff sought to confirm that the given structures and components were subject to an AMR as required by 10 CFR 54.21(a)(1). If the review revealed any discrepancies, the staff issued an RAI to resolve them.

Two-Tier Scoping Review Process for BOP Systems. There are 62 mechanical systems in the LRA among which 39 are BOP systems, which include most of the auxiliary systems and all the steam and power conversion systems. The staff performed a two-tier scoping review for these BOP systems.

In the two-tier scoping review, the staff reviewed the LRA and UFSAR description focusing on the system intended function to screen all the BOP systems into two groups based on the following screening criteria:

- safety importance/risk significance
- potential for system failure to cause failure of redundant safety system trains
- operating experience indicating likely passive failures
- systems subject to omissions based on previous LRA reviews

Examples of the safety important/risk significant systems are the instrument air (IA) system, the diesel generator (DG) and support systems, and the service water (SW) system based on the results of Individual Plant Examination (IPE) for Brunswick. An example of a system whose failure could result in common cause failure of redundant trains is a drain system providing flood protection. Examples of systems with operating experience indicating likely passive failures include main steam system, feedwater system, and SW system. Examples of systems

with identified omissions in previous LRA reviews include spent fuel cooling system, and makeup water sources to safety systems.

From the 39 BOP systems, the staff selected 24 systems for a detailed (Tier-2) scoping review as described above. For the remaining 15 BOP systems, the staff performed a Tier-1 review of the LRA (that do not require detailed boundary drawings) and UFSAR that would identify apparent missing components for an AMR. However, Tier 2 requires the review of detailed boundary drawings in accordance with SRP-LR NUREG - 1800 Section 2.3. The following is a list of these 15 systems:

- screen wash water system
- turbine building closed cooling water system
- heat tracing system
- service air system
- chlorination system
- potable water system
- area radiation monitoring system
- non-contaminated water drainage system
- extraction steam system
- moisture separator reheater drains system and reheat steam system
- heater drains and miscellaneous vents and drains
- turbine building sampling system
- turbine electro-hydraulic control system
- stator cooling system
- hydrogen seal oil system

The staff verified that there is no risk significant system in the above list by examining the results of the Brunswick IPA. None of the above 15 systems are dominant contributors to core damage frequency (CDF), nor are these systems involved in the dominant initiating events.

Systems Identified for Inspection. By the memorandum dated April 28, 2004, the staff recommended that the inspection be used to verify 10 CFR 54.4(a)(2) scoping results. To implement this recommendation in reviewing the Brunswick LRA, the staff identified several systems for the regional inspection team to include in its scoping and screening inspection. These systems have been included in scope of license renewal by the applicant as a result of the 10 CFR 54.4(a)(2) review. The staff requested that the inspection include a sampling review of the engineering report (if available), plant layout drawings, and other documentation, as well as walk-downs of the plant areas that contain these systems and associated components. The following are the list of systems, which the staff identified for inspection:

- heat tracing system
- moisture separator reheater drains system and reheat steam system
- heater drains and miscellaneous vents and drains

As shown in the inspection report, dated July 12, 2005 (ADAMS accession ML052100315).

> "The inspectors reviewed the applicants screening and scoping analysis for the following non-safety related systems located in proximity to safety related systems to assess the implementation of 10 CFR 54.4(a)(2):

Heat Tracing System
Moisture Separator Reheater Drain System & Reheat Steam System
Heater Drains & Miscellaneous Vents and Drains

The review included the applicant's calculation that assessed the system and component applicability to 10 CFR 54.4(a)(2), applicable plant drawings, and visual examination of the in-plant configuration. The inspectors concluded that the applicant had appropriately implemented the criteria of 10 CFR 54.4(a)(2) in identifying these systems as being in-scope for license renewal due to their proximity to other safety related systems."

2.3.1 Reactor Vessel, Internals, and Reactor Coolant System

In LRA Section 2.3.1, the applicant identified the structures and components of the reactor vessel, internals, and reactor coolant system that are subject to an AMR for license renewal.

The applicant described the supporting structures and components of the reactor vessel, internals, and reactor coolant system in the following sections of the LRA:

- 2.3.1.1 reactor vessel and internals
- 2.3.1.2 neutron monitoring system
- 2.3.1.3 reactor manual control system
- 2.3.1.4 control rod drive hydraulic system
- 2.3.1.5 reactor coolant recirculation system

The corresponding subsections of this SER (2.3.1.1 – 2.3.1.5, respectively) present the staff's review findings with respect to the reactor vessel, internals, and reactor coolant system for Units 1 and 2.

2.3.1.1 Reactor Vessel and Internals

2.3.1.1.1 Summary of Technical Information in the Application

In LRA Section 2.3.1.1, the applicant described the reactor vessel and internals. The reactor pressure vessel (RPV) is a vertical, cylindrical pressure vessel with hemispherical heads and is of welded construction. The major safety consideration for the reactor vessel is the ability of the vessel to function as a radioactive material barrier. The vessel also provides a floodable core volume and provides support for the reactor vessel internals. The RPV contains the RPV internals, consisting of the following: reactor core shroud and support structure; steam separators and dryers; jet pump assemblies; control rod guide tubes; distribution lines for the feedwater, core spray, and standby liquid control systems; the incore instrumentation; and associated components. The purposes of the RPV internals are to properly distribute the flow of coolant delivered to the RPV, to locate and support the fuel assemblies and other internal components, and to provide an inner volume containing the core that can be flooded following a break in the nuclear system process barrier external to the reactor vessel. In addition, the reactor vessel and internals include connected piping that is part of the RCPB.

The reactor vessel and internals contain SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the reactor vessel and internals could potentially prevent the satisfactory accomplishment of an SR function. In addition, the reactor vessel and internals perform functions that support FP, EQ, ATWS, and SBO.

The intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary/flow
- provides flow restriction (throttle)
- provides structural support/seismic integrity
- provides post-accident containment, holdup, and plateout of MSIV bypass leakage
- provides adequate flow in a properly-distributed spray pattern

In LRA Table 2.3.1-1, the applicant identified the following reactor vessel and internals component types that are within the scope of license renewal and subject to an AMR:

- top head enclosure (top head)
- top head enclosure [nozzles (vent, top head spray or RCIC, and spare)]
- top head enclosure (head flange)
- top head enclosure (closure studs and nuts)
- vessel shell (vessel flange)
- vessel shell (upper shell)
- vessel shell (intermediate nozzle shell)
- vessel shell (intermediate beltline shell)
- vessel shell (lower shell)
- vessel shell (beltline welds)
- vessel shell (attachment welds)
- nozzles (main steam)
- nozzles (feedwater)
- nozzles (control rod drive (CRD) return line)
- nozzles (recirculation outlet)
- nozzles (recirculation inlet)
- nozzles (low pressure core spray (LPCS) - Unit 1)
- nozzles (LPCS - Unit 2)
- nozzles (shell flange)
- nozzles safe ends (LPCS)
- nozzles safe ends (CRD return line)
- nozzles safe ends (recirculation water inlet and outlet)
- nozzles safe ends (feedwater - Unit 1)
- nozzles safe ends (feedwater - Unit 2)
- nozzles safe ends (standby liquid control)
- nozzles safe ends (instrumentation)
- penetrations (CRD stub tubes)
- penetrations (instrumentation)
- penetrations (jet pump instrument)
- penetrations (standby liquid control)
- penetrations (flux monitor)
- penetrations (drain line)

- reactor vessel (boiling water reactor) (bottom head)
- reactor vessel (boiling water reactor) (support skirt and attachment welds)
- thermal sleeves (feedwater - Unit 1)
- thermal sleeves (feedwater - Unit 2)
- thermal sleeves (LPCS)
- core shroud and core plate [core shroud (upper, central, lower)]
- core shroud and core plate (core plate)
- core shroud and core plate (core plate bolts)
- core shroud and core plate (access hole cover)
- core shroud and core plate (shroud support structure)
- core shroud and core plate (core plate plugs)
- core shroud and core plate (top guide)
- core spray lines and spargers (core spray lines headers)
- core spray lines and spargers (spray rings)
- core spray lines and spargers (spray nozzles)
- core spray lines and spargers (thermal sleeves)
- jet pump assemblies (thermal sleeve)
- jet pump assemblies (inlet header)
- jet pump assemblies (riser brace arm)
- jet pump assemblies (holddown beams)
- jet pump assemblies (inlet elbow)
- jet pump assemblies (mixing assembly)
- jet pump assemblies (diffuser)
- jet pump assemblies (castings)
- jet pump assemblies (jet pump sensing line)
- jet pump assemblies (jet pump holddown beam keeper, lock plate, and bolt)
- fuel supports and CRD assemblies (orificed fuel support)
- fuel supports and CRD assemblies (CRD housing)
- instrumentation (intermediate range monitor dry tubes)
- instrumentation (source range monitor dry tubes)
- reactor vessel internals (boiling water reactor – NSR) (steam dryer)
- reactor vessel internals (boiling water reactor – NSR) (shroud head and separators)
- reactor vessel internals (boiling water reactor – NSR) (feedwater spargers)
- reactor vessel internals (boiling water reactor – NSR) (surveillance capsule holder)
- piping and fittings (main steam)
- piping and fittings (feedwater)
- piping and fittings (small bore piping less than nominal pipe size (NPS) 4)
- piping and fittings (reactor vessel head vent components)
- valves (body)
- non-RCPB (boiling water reactor) (piping and fittings)
- non-RCPB (boiling water reactor) (valves)
- non-RCPB (boiling water reactor) (piping specialties)
- piping (piping and fittings)
- valves (including check valves and containment isolation) (body and bonnet)
- air receiver (shell access cover)

2.3.1.1.2 Staff Evaluation

The staff reviewed LRA Section 2.3.1.1 and UFSAR Sections 3.9.5, 4.5-4.6, and 5.1-5.3 using the evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3, "Scoping and Screening Results - Mechanical Systems."

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff's review of LRA Section 2.3.1.1 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 2.3.1.1-1, dated April 8, 2005, the staff stated that UFSAR Section 3.9.5.1.1 states that the core shroud is reinforced at the upper shroud/top fuel guide support ring/middle shroud interface with twelve brackets located at 30 degree intervals starting at the 15 degree azimuth. These brackets provide structural integrity across the interface and compensate for cracking in the heat-affected zones of the original fabrication welds. Therefore, the staff requested that the applicant indicate whether the top fuel guide support ring and middle shroud interface brackets have been included in scope of license renewal or justify the exclusion of these components. In its response, by letter dated May 4, 2005, the applicant stated:

> These components are in scope. The 12 brackets are evaluated as "Core Shroud and Core Plate (Core Shroud Repair Hardware)" and the subcomponents of the Core Shroud are evaluated as "Core Shroud and Core Plate (Core Shroud (Upper, Central, Lower))" as shown in Table 2.3.1-1 on page 2.3-6 of the LRA.

Based on the inclusion of the above components, the staff's concern described in RAI 2.3.1.1-1 is resolved.

In RAI 2.3.1.1-2, dated April 8, 2005, the staff stated that UFSAR Section 3.9.5.1.3 states that a thermal sleeve is inserted into the control rod drive housing (CRDH) from below and is rotated to lock the control rod guide tube in place. A key is inserted into a locking slot in the bottom of the CRDH to hold the thermal sleeve in position. Therefore, the staff requested that the applicant indicate whether the CRDH thermal sleeve is included in the scope of license renewal or justify its exclusion. In its response, by letter dated May 4, 2005, the applicant stated:

> This subcomponent is in scope but is below the level of detail presented in the AMR tables. See page 2.3-2 of the LRA - "Control Rod Drive (CRD) equipment." Similar to other subcomponents that comprise the Reactor Vessel Internals, the applicable aging management programs are Water Chemistry and Reactor Vessel and Internals Structural Integrity.

Based on the inclusion of the above component, the staff's concern described in RAI 2.3.1.1-2 is resolved.

In RAI 2.3.1.1-3, dated April 8, 2005, the staff requested that the applicant indicate whether thermal sleeves for recirculation inlet nozzles are considered part of reactor vessel nozzles, nozzle safe ends and/or instrumentation penetrations requiring an AMR. The subject components represent a pressure boundary and direct flow to core spray spargers and jet pumps. In its response, by letter dated May 4, 2005, the applicant stated:

> The thermal sleeve is evaluated as "Jet Pump Assemblies (Thermal Sleeve)" as shown in Table 2.3.1-1 on page 2.3-6 of the LRA. The associated AMR line items are shown on pages 3.1-58 and 3.1-59 of the LRA. Note: Flow from the Reactor Pressure Vessel (RPV) Recirculation Inlet Nozzles, i.e., Nozzles N2A through N2K, directs flow only to the Jet Pumps. Flow to the Core Spray Spargers is through the Core Spray Nozzles, i.e., N5A and N5B.

Based on the inclusion of the above component, the staff's concern described in RAI 2.3.1.1-3 is resolved.

In RAI 2.3.1.1-4, dated April 8, 2005, the staff stated that the differential pressure and liquid control line serves a dual function within the reactor vessel: (1) to inject liquid control solution into the coolant stream, and (2) to sense the differential pressure across the core support assembly. Therefore, the staff requested that the applicant indicate whether the subject component is considered part of reactor vessel nozzles, nozzle safe ends and/or instrumentation penetrations requiring an AMR. In its response, by letter dated May 4, 2005, the applicant stated:

> The core differential pressure and standby liquid control (SLC) lines within the vessel are not within the scope of license renewal. On May 15, 1998, the BWR Vessel and Internals Program (BWRVIP) issued "Appendix B, BWR Standby Liquid Control System Core Plate Delta P Inspection and Flaw Evaluation Guideline, Demonstration of Compliance with the Technical Information Requirements of the License Renewal Rule (10 CFR 54.21)." Refer to letter from V. Wagoner, BWRVIP Integration Committee, to C. Carpenter, (NRC), (Serial: 98-185), "License Renewal Appendix B to BWR Vessel and Internals Project, BWR Standby Liquid Control System Core Plate Delta P Inspection and Flaw Evaluation Guideline (BWRVIP-27), April, 1997," dated May 15, 1998, for further information. Section B.2 discusses the components subject to an AMR. Regarding differential pressure/standby liquid control (ΔP/SLC) lines, it states:
>
> > The only ΔP/SLC components required to accomplish the intended function are the vessel penetration/nozzle and SLC external piping. The ΔP/SLC internals piping is not within the license renewal evaluation boundary because it is not required to accomplish the intended function. Therefore, an aging management review of the internals piping is not needed for license renewal.
>
> In Section 2.1 of the NRC Safety Evaluation (SE) for the License Renewal version of BWRVIP-27, it states:

> In Appendix B, the BWRVIP identified the passive and long-lived components as required by 10 CFR 54.21(a)(1). The BWRVIP noted that the ΔP/SLC vessel penetration/nozzle and safe-end extensions are subject to aging management review.

The NRC SE was provided by letter from C. Grimes, (NRC), to C. Terry, (BWRVIP), "Acceptance for Referencing of Report, 'BWR Vessel and Internals Project, BWR Standby Liquid Control System/Core Plate ΔP Inspection and Flaw Evaluation Guidelines (BWRVIP-27),' for Compliance with the License Renewal Rule (10 CFR Part 54)," dated December 20, 1999.

In Section 3.1 of the SE, it states:

> The staff agrees that the ΔP/SLC vessel penetration/nozzle and safe-end extensions are subject to aging management review because they perform intended functions without moving parts or without a change in configuration or properties, and are not subject to replacement based on a qualified life or specified time period. The staff concludes that BWR applicants for license renewal must identify the appropriate subject RPV internal components as subject to aging management to meet the applicable requirements of 10 CFR 54.21 (a)(1).

The ΔP/SLC vessel penetration/nozzle is evaluated as part of "Penetrations (Standby Liquid Control)" and the safe-end is evaluated as "Nozzle Safe Ends (Standby Liquid Control)." These commodities are shown in Table 2.3.1-1 on page 2.3-5 of the LRA. The associated AMR line items appear in Table 3.1.2-1 on pages 3.1-34, 3.1-40, and 3.1-41 of the LRA.

Based on the explanation provided above, the staff's concern described in RAI 2.3.1.1-5 is resolved.

In RAI 2.3.1.1-5, dated April 8, 2005, the staff stated that the two 100 percent-capacity core spray lines separately enter the reactor vessel through the two core spray nozzles. Each line divides immediately inside the reactor vessel. The two halves are routed to opposite sides of the reactor vessel and are supported by clamps attached to the vessel wall. The header halves are then routed downward into the downcomer annulus and pass through the upper shroud immediately below the flange. The flow divides again as it enters the center of the semi-circular sparger ring which is routed halfway around the inside of the upper shroud. The ends of the two sparger rings for each line are supported by slip-fit brackets designed to accommodate thermal expansion of the rings. The header routing and supports are designed to accommodate differential movement between the shroud and the vessel. Therefore, the staff requested that the applicant indicate whether the core spray clamps which are attached to the vessel wall and the slip-fit brackets which support the ends of the two sparger rings are included in the scope of license renewal requiring an AMR or justify their exclusion. In its response, by letter dated May 4, 2005, the applicant stated:

> The components described are within the scope of License Renewal. The Core Spray Bracket is evaluated as part of "Vessel Shell (Attachment Welds)" as shown in Table 2.3.1-1 on page 2.3-5 of the LRA. The associated AMR line items appear in

Table 3.1.2-1 on pages 3.1-22 and 3.1-23 of the LRA. The slip-fit brackets which support the ends of the two sparger rings are evaluated as part of "Core Shroud and Core Plate (Core Shroud (Upper, Central, Lower))" as shown in Table 2.3.1-1 on page 2.3-6 of the LRA. The associated AMR line items appear in Table 3.1.2-1 on pages 3.1-46 and 3.1-47 of the LRA.

Based on the inclusion of the above component, the staff's concern described in RAI 2.3.1.1-5 is resolved.

In RAI 2.3.1.1-6, dated April 8, 2005, the staff stated that its position on reactor vessel flange leak-off lines is that unless a plant-specific justification is provided, the components should be within scope requiring aging management. Therefore, the staff requested that the applicant confirm whether any of the component types listed in LRA Table 2.3.1-1, "Reactor Vessel and Internals," include the subject component. If not, then the subject components should be identified as within scope requiring aging management or provide a plant-specific justification for the exclusion. In its response, by letter dated May 4, 2005, the applicant stated:

> The vessel flange leak detection line is within the scope of License Renewal. The vessel flange leak detection line is evaluated as part of "Non-Reactor Coolant Pressure Boundary (Boiling Water Reactor) (Piping and Fittings)" and "Non-Reactor Coolant Pressure Boundary (Boiling Water Reactor) (Valves)" as shown in Table 2.3.1-1 on page 2.3-7 of the LRA. The associated AMR line items appear in Table 3.1.2-1 on pages 3.1-75, 3.1-76, and 3.1-77 of the LRA. The vessel flange leak detection line is discussed in Section 3.1.2.2.4.2 on page 3.1-8 as follows:
>
> > The reactor vessel flange leak detection line at BSEP is a Class 2 line that is normally dry. The BSEP AMR methodology assumed that this stainless steel line is exposed to treated water and, therefore, is susceptible to cracking due to stress corrosion cracking. This aging effect will be managed with a combination of the Water Chemistry Program and the One-Time Inspection Program.
>
> Further, the vessel flange leak detection line is discussed in the context of responding to Applicant Action Item 4 to BWRVIP-74-A on page B-78 of the LRA as follows:
>
> > The vessel flange leak detection lines are not part of the reactor coolant pressure boundary and as such are not evaluated against Chapter IV of NUREG-1801. These lines (associated with Nozzle N13) are within the scope of License Renewal and are evaluated with all other non-reactor coolant pressure boundary piping and fittings. The AMR for these lines concluded that these lines are susceptible to cracking and loss of material. These lines will be managed by the Water Chemistry and One-Time Inspections Programs.

Based on the inclusion of the above component within the scope of license renewal, the staff's concern described in RAI 2.3.1.1-6 is resolved.

In RAI 2.3.1.1-7, dated April 8, 2005, the staff stated that at BSEP the steam separators are attached to the top of stand pipes which are welded into the shroud head. Therefore, the staff requested that the applicant indicate whether the subject component is included in LRA Table 2.3.1-1 component group "Reactor Vessel Internals (Boiling Water Reactor - Non-safety

Related) (Shroud Head and Separators)." In its response, by letter dated May 4, 2005, the applicant stated: "This subcomponent of the shroud head and separators is within the scope of License Renewal and is evaluated as part of 'Reactor Vessel Internals (Boiling Water Reactor-Non-safety Related) (Shroud Head and Separators).'"

Based on the inclusion of the above component within the scope of license renewal the staff's concern described in RAI 2.3.1.1-7 is resolved.

2.3.1.1.3 Conclusion

The staff reviewed the LRA and RAI responses to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the reactor vessel and internals components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the reactor vessel and internals components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.1.2 Neutron Monitoring System

2.3.1.2.1 Summary of Technical Information in the Application

In LRA Section 2.3.1.2, the applicant described the neutron monitoring system (NMS). The NMS is an in-core neutron monitoring system, which detects and monitors neutron flux in the reactor core. The NMS is designed to (1) detect conditions in the core that threaten the overall integrity of the fuel barrier due to excessive power generation and to provide signals to the reactor protection system, so that the release of radioactive materials from the fuel barrier is limited, (2) provide information for the efficient, expedient operation and control of the reactor, and (3) prevent reactor coupled neutronic/thermal-hydraulic instabilities from occurring. The NMS provides the capability to shutdown the reactor via the reactor protection system (RPS) following a DBE and maintains it in a safe shutdown condition. The NMS is composed of the following subsystems: (1) source range monitoring (SRM) subsystem, (2) intermediate range monitoring subsystem, (3) local power range monitoring (LPRM) subsystem, which includes the period-based detection system feature, (4) average power range monitoring subsystem, which includes the oscillation power range monitor subsystem, (5) rod block monitor subsystem, and (6) traversing incore probe (TIP) subsystem.

The NMS contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the NMS could potentially prevent the satisfactory accomplishment of an SR function.

The intended function, within the scope of license renewal, is to provide a pressure-retaining boundary.

In LRA Table 2.3.1-2, the applicant identified the following NMS component types that are within the scope of license renewal and subject to an AMR:

- instrumentation (incore neutron flux monitor guide tubes)
- non-RCPB (BWR) (piping and fittings)
- non-RCPB (BWR) (valves)
- non-RCPB (BWR) (piping specialties)

2.3.1.2.2 Staff Evaluation

The staff reviewed LRA Section 2.3.1.2 and UFSAR Section 7.6.1.1 using the evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff did not identify any omissions. The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.1.2.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the NMS components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the NMS components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.1.3 Reactor Manual Control System

2.3.1.3.1 Summary of Technical Information in the Application

In LRA Section 2.3.1.3, the applicant described the reactor manual control system (RMCS). The RMCS allows the operator to control core reactivity by inserting and withdrawing control rods. The system consists of the electrical components and logic circuits required to monitor and manipulate the control rods. The RMCS also acts to block rod motion and/or selection in response to protective signals generated by other plant monitoring systems. Supporting the RMCS is the rod position information system (RPIS) which provides the operator with a means for determining the positions of all control rods in the core and for observing the position of a selected rod in relation to specific adjacent rods. The RPIS also provides rod position and identification data to the process computer. The RPIS is considered as a subsystem of RMCS. The function of the rod worth minimizer (RWM) system, another RMCS subsystem, is to implement features that provide (1) protection against the existence of a rod worth which could result in significant fuel damage in the unlikely event of a control rod drop accident, (2)

implementation of the banked position withdrawal sequence as a hard-wired system, and (3) provision of several rod position indication data and control rod testing functions.

The failure of NSR SSCs in the RMCS could potentially prevent the satisfactory accomplishment of an SR function.

The intended function, within the scope of license renewal, is to provide a pressure-retaining boundary/flow.

In LRA Table 2.3.1-3, the applicant identified the non-RCPB (BWR) (piping and fittings) as the RMCS component type that is within the scope of license renewal and subject to an AMR.

2.3.1.3.2 Staff Evaluation

The staff reviewed LRA Section 2.3.1.3 and UFSAR Section 7.7.1.8 using the evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff did not identify any omissions. The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.1.3.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the RMCS components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the RMCS components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.1.4 Control Rod Drive Hydraulic System

2.3.1.4.1 Summary of Technical Information in the Application

In LRA Section 2.3.1.4, the applicant described the CRD hydraulic system. The CRD hydraulic system supplies the pressure to and controls the flow requirements of the control rod drives. The CRD hydraulic system supplies water at the proper pressures and in sufficient flow to the hydraulic control units (HCU). Each HCU controls the flow to and from a CRD. The water discharged from the drives during a scram flows through the HCU to the scram discharge volume. During a normal control rod positioning operation, the water discharged from a drive

flows through its HCU and exhaust header to the cooling water header. The control rod drive hydraulic supply and discharge subsystems control the pressure and flows required for the operation of the CRD mechanisms and also to supply backfill flow to the cold reference legs for reactor vessel level instrumentation. The CRD hydraulic system is an open loop system consisting of two CRD water pumps, two drive water filters, a flow control station, a drive water pressure control station, hydraulic control units for each of the 137 CRD mechanisms, a scram discharge volume, interconnecting piping, associated valves, controls and instrumentation. Reactor coolant pressure-retaining portions of the CRD units attached to the RPV are considered part of the reactor vessel and internals system. The safety objective of the CRD hydraulic system is to insert control rods to provide a means of rapid reactor shutdown, thus limiting damage to the fuel barrier and primary system pressure.

The CRD hydraulic system contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the CRD hydraulic system could potentially prevent the satisfactory accomplishment of an SR function. In addition, the CRD hydraulic system performs functions that support EQ and ATWS

The intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary/flow
- provides filtration
- provides structural support/seismic integrity

In LRA Table 2.3.1-4, the applicant identified the following CRD hydraulic system component types that are within the scope of license renewal and subject to an AMR:

- non-RCPB (BWR) (piping and fittings)
- non-RCPB (BWR) (valves)
- non-RCPB (BWR) (piping specialties)
- hydraulic control units (tanks)
- hydraulic control units (rupture disks)
- hydraulic control units (nitrogen fittings)
- hydraulic control units (filters)
- hydraulic control units (miscellaneous piping)
- CRD pumps (CRD pump casing)
- CRD pumps (CRD pump gearbox coolers)
- CRD pumps (CRD pump skid piping and valves)
- piping (piping and fittings)
- valves (including check valves and containment isolation) (body and bonnet)

2.3.1.4.2 Staff Evaluation

The staff reviewed LRA Section 2.3.1.4 and UFSAR Sections 3.9.4 and 4.6 using the evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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

delineated under 10 CFR 54.4(a). The staff did not identify any omissions. The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.1.4.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the CRD hydraulic system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the CRD hydraulic system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.1.5 Reactor Coolant Recirculation System

2.3.1.5.1 Summary of Technical Information in the Application

In LRA Section 2.3.1.5, the applicant described the reactor coolant recirculation system. The reactor coolant recirculation system regulates coolant flow through the core. Adjustment of the core coolant flow rate changes reactor power output, thus providing a means of following plant load demand without adjusting control rods. The reactor coolant recirculation system consists of two recirculation pump loops external to the reactor vessel that provide the piping path for the driving flow of water to the reactor vessel internal jet pumps. Each external loop contains one high-capacity, motor-driven recirculation pump and three motor-operated gate valves for pump maintenance. Each pump discharge line contains a venturi-type flowmeter nozzle. The recirculation loops are a part of the nuclear system process barrier and are located inside the drywell. The arrangement of the recirculation system is such that a piping failure cannot compromise the integrity of the floodable inner volume of the reactor vessel. To support ECCS following a loss-of-coolant accident (LOCA), the recirculation pump discharge valves close automatically to direct low pressure coolant injection (LPCI) flow upward through the jet pump drive lines and into the core floodable volume.

The reactor coolant recirculation system contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the reactor coolant recirculation system could potentially prevent the satisfactory accomplishment of an SR function. In addition, the reactor coolant recirculation system performs functions that support FP, EQ, and ATWS.

The intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary/flow
- provides structural support/seismic integrity

In LRA Table 2.3.1-5, the applicant identified the following reactor coolant recirculation system component types that are within the scope of license renewal and subject to an AMR:

- piping and fittings (recirculation)
- piping and fittings (small bore piping less than NPS 4)
- recirculation pump (casing)
- recirculation pump (cover)
- recirculation pump (seal flange)
- recirculation pump (closure bolting)
- valves (body)
- non-RCPB (BWR) (piping and fittings)
- non-RCPB (BWR) (valves)
- non-RCPB (BWR) (piping specialties)
- non-RCPB (BWR) (piping and fittings - closed cooling water)

2.3.1.5.2 Staff Evaluation

The staff reviewed LRA Section 2.3.1.4 and UFSAR Section 5.4.1 using the evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff did not identify any omissions. The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.1.5.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the reactor coolant recirculation system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the reactor coolant recirculation system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.2 Engineered Safety Features Systems

In LRA Section 2.3.2, the applicant identified the structures and components of the ESFs systems that are subject to an AMR for license renewal.

The applicant described the supporting structures and components of the ESFs systems in the following sections of the LRA:

- 2.3.2.1 residual heat removal system
- 2.3.2.2 containment isolation system
- 2.3.2.3 containment atmospheric control system
- 2.3.2.4 high pressure coolant injection system
- 2.3.2.5 automatic depressurization system
- 2.3.2.6 core spray system
- 2.3.2.7 standby gas treatment system
- 2.3.2.8 standby liquid control system
- 2.3.2.9 hvac control building system
- 2.3.2.10 reactor protection system

The corresponding subsections of this SER (2.3.2.1 – 2.3.2.10, respectively) present the staff's review findings with respect to the ESFs systems for Units 1 and 2.

2.3.2.1 Residual Heat Removal System

2.3.2.1.1 Summary of Technical Information in the Application

In LRA Section 2.3.2.1, the applicant described the RHR system. The RHR system operates in several modes to remove heat from plant systems or to provide water to plant systems during normal and post-accident conditions. The functions of LPCI, suppression pool cooling, and drywell spray cooling are SR and, therefore, are RHR system intended functions for license renewal. The RHR system functions of normal shutdown cooling, spent fuel pool cooling, torus spray, hydrogen mixing (via containment sprays), supplying water to systems via the SW system cross-connect, and RHR system leak detection are not SR and, therefore, are not RHR system intended functions. In order to minimize the possibility of a single event causing the loss of the entire RHR system, the system is divided into two loops which are physically separated from each other. One loop, consisting of one heat exchanger, two main system pumps in parallel, and associated piping, is located in one area of the reactor building. The other heat exchanger, pumps, and piping, forming a second loop, are located in another area of the reactor building. Portions of the RHR system maintain the integrity of the RCPB.

The RHR system contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the RHR system could potentially prevent the satisfactory accomplishment of an SR function. In addition, the RHR system performs functions that support FP, EQ, and SBO.

The intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary/flow
- provides flow restriction (throttle)
- provides structural support/seismic integrity
- provides heat transfer
- provides insulation/thermal resistance
- provides adequate flow in a properly-distributed spray pattern

In LRA Table 2.3.2-1, the applicant identified the following RHR system component types that are within the scope of license renewal and subject to an AMR:

- piping and fittings (LPCI system)
- valves (body)
- piping and fittings (LPCI system and RHR)
- piping and fittings (lines to drywell and suppression chamber spray system (DSCSS))
- piping and fittings (piping specialties)
- piping and fittings (misc. auxiliary and drain piping and valves)
- pumps (high pressure core spray (HPCS) or HPCI main and booster, LPCS, LPCI or RHR, and RCIC) (bowl/casing)
- pumps (HPCS or HPCI main and booster, LPCS, LPCI or RHR, and RCIC) (suction head)
- pumps (HPCS or HPCI main and booster, LPCS, LPCI or RHR, and RCIC) (discharge head)
- valves (check, control, hand, motor operated, and relief valves) (body and bonnet)
- heat exchangers (RHR and LPCI) (tubes)
- heat exchangers (RHR and LPCI) (tubesheet)
- heat exchangers (RHR and LPCI) (shell)
- DSCSS (piping and fittings)
- DSCSS (spray nozzles)
- ECCS (BWR) (ECCS pump suction strainers)
- piping (piping and fittings)
- valves (body and bonnet)
- heat exchanger (shell)
- heat exchanger (channel head and access cover)
- heat exchanger (tubes)
- pump (casing)

2.3.2.1.2 Staff Evaluation

The staff reviewed LRA Section 2.3.2.1 and UFSAR Sections 5.4.7 and 6.3 using the evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff's review of LRA Section 2.3.2.1 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 2.3.2.1-1 dated April 8, 2005, the staff stated that the LPCI coupling was identified in the BWRVIP-06 report as an SR component. It appears, however, that the component was not identified in the LRA as requiring an AMR. Therefore, the staff requested that the applicant indicate whether the subject component is within the scope of license renewal requiring an AMR or justify its exclusion from aging management. In its response, by letter dated May 4, 2005, the applicant stated:

> BSEP does not have a LPCI coupling as defined by BWRVIP-06.
>
> As stated on page B-77of the BSEP LRA:
>
> > BWRVIP-42, "LPCI Coupling Inspection and Flaw Evaluation Guidelines," is not applicable to BSEP. BSEP is a BWR-4 whose low pressure coolant injection function of the Residual Heat Removal System injects into the Reactor Coolant Recirculation system discharge lines rather than injecting directly into the reactor vessel.

Based on the explanation above and the non-applicability of the subject component at BSEP, the staff found the applicant's response acceptable. Therefore, the staff's concern described in RAI 2.3.2.1-1 is resolved.

2.3.2.1.3 Conclusion

The staff reviewed the LRA and RAI response to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the RHR system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the RHR system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.2.2 Containment Isolation System

2.3.2.2.1 Summary of Technical Information in the Application

In LRA Section 2.3.2.2, the applicant described the containment isolation system. The containment isolation system is an engineered safety feature (ESF) that provides for the closure or integrity of primary and secondary containment penetrations to prevent leakage of uncontrolled or unmonitored radioactive materials to the environment following postulated accidents. The pressure boundary portions of electrical penetrations and miscellaneous/spare mechanical penetrations that are not associated with a process system are included in the civil structural screening described in LRA Section 2.4. The electrical portions of containment electrical penetrations are included in the electrical screening described in LRA Section 2.5. Systems that include primary containment isolation valves are: reactor vessel and internals, NMS, CRD hydraulic system, reactor water cleanup (RWCU) system, reactor coolant recirculation system, core spray system, standby liquid control system, RHR system, containment atmosphere control system, high pressure coolant injection (HPCI) system, RCIC

system, post-accident sampling system, torus drain system, reactor building closed cooling water system, instrument air system, radioactive floor drains system, radioactive equipment drains system, and reactor protection system. The containment isolation valves for these systems are included in the screening results for the above systems described elsewhere in this section. Systems that include secondary containment isolation dampers are: standby gas treatment system and HVAC reactor building system. The containment isolation dampers for these systems were determined to be subject to an AMR and are included in the screening results for the above systems described elsewhere in this section.

Containment isolation system components for the above systems have been screened during the screening of each system that includes containment isolation valves. Therefore, the containment isolation system components that require an AMR are included in the screening results for each system described elsewhere in this SER Section 2.3.

Containment isolation system components for the above systems have been screened during the screening of each system that includes containment isolation valves. Therefore, the containment isolation system components that require aging management review are included in the screening results for each system described elsewhere in this section. No separate listing of containment isolation system components/commodities requiring AMR is provided.

2.3.2.2.2 Staff Evaluation

The staff reviewed LRA Section 2.3.2.2 and UFSAR Sections 6.2.3 and 6.2.4 using the evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1). The staff did not identify any omissions.

2.3.2.2.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the containment isolation system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the containment isolation system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.2.3 Containment Atmospheric Control System

2.3.2.3.1 Summary of Technical Information in the Application

In LRA Section 2.3.2.3, the applicant described the containment atmospheric control (CAC) system. The CAC system consists of three major subsystems: the containment inerting subsystem, the containment atmospheric dilution (CAD) subsystem, and the containment atmospheric makeup subsystem. Of these, only the CAD subsystem is designed to function as an ESF system. Based on NRC guidance to control either hydrogen or oxygen concentration within the flammability limit following a LOCA, the CAD subsystem provides long-term nitrogen makeup to the primary containment to maintain oxygen concentration at or below 5 percent. Since this subsystem is designed to ESF standards, all equipment required for CAD service is designed with suitable redundancy and interconnections such that no single failure of an active component will render the system inoperable. This equipment includes a nitrogen storage vessel, electric liquid nitrogen vaporizers, instrumentation, and appropriate piping, flow control stations, and isolation valves. The CAD subsystem nitrogen supply also provides a backup to the instrument air header in the augmented off-gas (AOG) building upon loss of instrument air for the CAD subsystem. The CAC system supports the capability of purging the primary containment through the standby gas treatment system (SGTS) to reduce pressure resulting from nitrogen addition. In order to limit containment pressure to one half of design pressure, venting through the SGTS can be initiated several days following a LOCA. Purging provides a method for limiting containment pressure and for controlling combustible gas concentrations in the containment.

The CAC system contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the CAC system could potentially prevent the satisfactory accomplishment of an SR function. In addition, the CAC system performs functions that support fire protection, EQ, and SBO.

The intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary/flow
- provides filtration
- provides flow restriction (throttle)
- provides structural support/seismic integrity

In LRA Table 2.3.2-2, the applicant identified the following CAC system component types that are within the scope of license renewal and subject to an AMR:

- containment atmospheric dilution/control system (valves)
- containment atmospheric dilution/control system (piping and fittings)
- containment atmospheric dilution/control system (piping specialties)
- containment atmospheric dilution/control system (tanks)
- containment atmospheric dilution/control system (pumps)
- containment atmospheric dilution/control system (heat exchangers)

2.3.2.3.2 Staff Evaluation

The staff reviewed LRA Section 2.3.2.3 and UFSAR Section 6.2.5 using the evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1). The staff did not identify any omissions.

2.3.2.3.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the CAC system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the CAC system components that are subject to an AMR, as required by 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

In LRA Section 2.3.2.4, the applicant described the HPCI system. Each BSEP unit has a dedicated HPCI system. The HPCI system consists of a steam turbine that drives a constant flow pump, and system piping, valves, controls, and instrumentation. The principal HPCI system equipment is installed in the reactor building. Suction piping comes from the condensate storage tank (CST) and the suppression pool. Injection water is piped to the reactor feedwater pipe at a tee connection. Steam supply for the turbine is piped from a main steam header in the primary containment. This piping is provided with an isolation valve on each side of the drywell barrier. Remote controls for valves and turbine operation are provided in the control room. If a LOCA occurs, the HPCI system is actuated automatically. The primary purpose of the HPCI system is to maintain reactor vessel inventory after small breaks which do not depressurize the reactor vessel. The HPCI system permits the nuclear plant to be shut down, maintaining sufficient reactor vessel water inventory until the vessel is depressurized. The HPCI system continues to operate until reactor vessel pressure is below the pressure at which either LPCI or core spray (CS) operation can maintain core cooling. In this manner, the HPCI system provides a means for cooling the core at high pressure for those break sizes which are of such a magnitude that, because of a lack of vessel depressurization, the top of the core would become uncovered before the low pressure standby cooling systems were effective.

The HPCI system contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the HPCI system could potentially prevent the satisfactory accomplishment of an SR function. In addition, the HPCI system performs functions that support fire protection, EQ, and SBO.

The intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary/flow
- provides filtration
- provides flow restriction (throttle)
- provides structural support/seismic integrity
- provides heat transfer
- provides insulation/thermal resistance

In LRA Table 2.3.2-3, the applicant identified the following HPCI system component types that are within the scope of license renewal and subject to an AMR:

- piping and fittings (HPCI system)
- piping and fittings (steam line to HPCI and RCIC pump turbine)
- piping and fittings (small bore piping less than NPS 4)
- valves (body)
- piping and fittings (HPCI)
- piping and fittings (lines to SC)
- piping and fittings (lines from HPCI and RCIC pump turbines to torus or wetwell)
- piping and fittings (piping specialties)
- piping and fittings (misc. auxiliary and drain piping and valves)
- piping and fittings (restrictive orifices/flow elements)
- pumps (HPCS or HPCI main and booster, LPCS, LPCI or RHR, and RCIC) (bowl/casing)
- pumps (HPCS or HPCI main and booster, LPCS, LPCI or RHR, and RCIC) (suction head)
- pumps (HPCS or HPCI main and booster, LPCS, LPCI or RHR, and RCIC) (discharge head)
- valves (check, control, hand, motor operated, and relief valves) (body and bonnet)
- emergency core cooling system (BWR) (auxiliary pumps)
- emergency core cooling system (BWR) (misc. tanks and vessels)
- emergency core cooling system (BWR) (steam turbines)
- auxiliary heat exchangers (tubing)
- auxiliary heat exchangers (auxiliary heat exchanger shell/housing)

- auxiliary strainers/filters (auxiliary strainer element)
- auxiliary strainers/filters (auxiliary strainer housing)
- emergency core cooling system (BWR) (ECCS pump section strainers)

2.3.2.4.2 Staff Evaluation

The staff reviewed LRA Section 2.3.2.4 and UFSAR 6.3.2 using the evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff did not identify any omissions. The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.2.4.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the HPCI system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the HPCI system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.2.5 Automatic Depressurization System

2.3.2.5.1 Summary of Technical Information in the Application

In LRA Section 2.3.2.5, the applicant described the automatic depressurization system (ADS). The ADS provides automatic nuclear system depressurization for small and intermediate breaks so that RHR low pressure coolant injection (LPCI) and the CS system can operate when the HPCI system has not been able to accomplish its function. The relief capacity of the ADS is based on the time required after its initiation to depressurize the nuclear system so that the core can be cooled by LPCI and the CS system. The ADS uses seven nuclear system safety relief valves (SRVs) to relieve high pressure steam to the suppression pool. In support of the ADS function, the SRVs open automatically, after a time delay, upon coincident signals of reactor vessel low water level and discharge pressure indication of the availability of any low pressure cooling system (LPSI or CS). In fulfilling its ESF unction, the ADS provides output signals to automatically open designated safety-relief valves. ADS instrumentation and control circuits activate protective actions and support post-accident monitoring of SR systems.

The ADS contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the ADS could potentially prevent the satisfactory accomplishment of an SR function. In addition, the ADS performs functions that support fire protection, EQ, and SBO.

The intended function, within the scope of license renewal, is to provide a pressure-retaining boundary/flow.

In LRA Table 2.3.2-4, the applicant identified the valves (including check valves and containment isolation) (body and bonnet) as the ADS component type that is 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 6.3.2 using the evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff did not identify any omissions. The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.2.5.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the ADS components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the ADS components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.2.6 Core Spray System

2.3.2.6.1 Summary of Technical Information in the Application

In LRA Section 2.3.2.6, the applicant described the CS system. The CS system is provided to protect the core by removing decay heat following the postulated design-basis LOCA. The CS system provides adequate cooling for all intermediate and large line break LOCAs without assistance from any other core standby cooling system. The protection provided by the CS system also extends to a small break in which the CRD water pumps, the RCIC system, and the HPCI system all are unable to maintain the reactor vessel water level; but the ADS has operated

to reduce the reactor vessel pressure such that LPCI and the CS systems can provide core cooling. The CS system consists of two independent loops. Each loop includes one 100 percent capacity centrifugal pump driven by an electric motor, a spray sparger in the reactor vessel above the core, piping and valves that convey water from the suppression pool to the sparger, and associated instrumentation and controls. Actuation of the CS system results from a low water level in the reactor vessel or coincident high pressure in the drywell and low reactor pressure signals. Portions of the CS system support the integrity of the RCPB.

The CS system contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the CS system could potentially prevent the satisfactory accomplishment of an SR function. In addition, the CS system performs functions that support fire protection, EQ, and SBO.

The intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary/flow
- provides filtration
- provides flow restriction (throttle)
- provides structural support/seismic integrity

In LRA Table 2.3.2-5, the applicant identified the following CS system component types that are within the scope of license renewal and subject to an AMR:

- piping and fittings (LPCS system)
- piping and fittings (small bore piping less than NPS 4)
- valves (body)
- piping and fittings (LPCS)
- piping and fittings (lines to SC)
- piping and fittings (piping specialties)
- piping and fittings (misc. auxiliary and drain piping and valves)
- piping and fittings (restrictive orifices/flow elements)
- pumps (HPCS or HPCI main and booster, LPCS, LPCI or RHR, and RCIC) (bowl/casing)
- pumps (HPCS or HPCI main and booster, LPCS, LPCI or RHR, and RCIC) (suction head)
- pumps (HPCS or HPCI main and booster, LPCS, LPCI or RHR, and RCIC) (discharge head)
- pumps (HPCS or HPCI main and booster, LPCS, LPCI or RHR, and RCIC) (body and bonnet)
- emergency core cooling system (BWR) (ECCS pump suction strainers)

2.3.2.6.2 Staff Evaluation

The staff reviewed LRA Section 2.3.2.6 and UFSAR Section 6.3.2 using the evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff did not identify any omissions. The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.2.6.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the CS system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the CS system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.2.7 Standby Gas Treatment System

2.3.2.7.1 Summary of Technical Information in the Application

In LRA Section 2.3.2.7, the applicant described the standby gas treatment system (SGTS). The SGTS provides a means for minimizing the release of radioactive material to the environs by filtering and exhausting the atmosphere from the primary or secondary containment during containment isolation conditions. The suction of the system normally is aligned to draw from the reactor building at elevation 50 feet into which all areas of the reactor building communicate. Elevated release is assured by exhausting to the plant stack. Normally closed suction valves are provided in the flow paths from the drywell and the suppression pool to the SGTS. These valves can be opened only upon operator action. The principal functions of the system are (1) to maintain secondary containment below atmospheric pressure when it is contaminated, for example, following a fuel handling accident, (2) to clean up a contaminated drywell or suppression chamber atmosphere when they are being vented to the atmosphere, (3) to provide a filtered pathway when venting the drywell during nitrogen inerting following a LOCA, and (4) to assist in controlling hydrogen stratification in the reactor building following a LOCA. The SGTS, as a part of the secondary containment isolation system, limits the release of radioactivity to the environs after an accident. The system provides a back-up means of controlling post-LOCA hydrogen inside primary containment by venting of the primary containment through the SGTS. SGTS instrumentation and control circuits actuate ESF functions and support post-accident monitoring of SR systems.

The SGTS contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the SGTS could potentially prevent the satisfactory accomplishment of an SR function. In addition, the SGTS performs functions that support fire protection and EQ.

The intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary/flow
- provides structural support/seismic integrity

In LRA Table 2.3.2-6, the applicant identified the following SGTS component types that are within the scope of license renewal and subject to an AMR:

- ductwork (equipment frames and housing)
- filters (housing and supports)
- filters (elastomer seals)
- standby gas treatment system (BWR) (piping)
- standby gas treatment system (BWR) (valves)
- standby gas treatment system (BWR) (piping specialties)
- standby gas treatment system (BWR) (instrument tubing)

2.3.2.7.2 Staff Evaluation

The staff reviewed LRA Section 2.3.2.7 and UFSAR Section 6.5.1 using the evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff's review of LRA Section 2.3.2.7 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 2.3.2.7-1, dated May 18, 2005, the staff requested that the applicant clarify whether all the system components such as, but not limited to, exhaust fan (blower) housings, piping, valve bodies, and damper housings, screens for air intake or exhaust structures, etc., 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).

In its response, by letter dated June 14, 2005, the applicant stated:

> The SGTS is safety related, and components required to supports its safety related function are in the scope of license renewal in accordance with 10 CFR 54.4(a). This

includes fans and filters, valves, screens at the system intake, as well as ductwork / dampers. Passive, long-lived components are subject to AMR under 10 CFR 54.21(a)(1), and include the filter housings, fan housings, screens, and valve bodies.

The SGTS boundaries at BSEP are fairly limited, generally encompassing the SGTS exhaust fans, filters, and piping and valves. Line items for each of these components are represented in the LRA Table 3.2.2-6. Specifically, fan housings are included under "Ductwork (equipment frames and housings)," and valve bodies are addressed under "Standby Gas Treatment (Boiling Water Reactor) (Valves)." The SGTS system interfaces with the reactor building ventilation system and the containment atmospheric control (CAC) system to accomplish its intended functions. The debris screens on the lines from the drywell and suppression chamber are part of the CAC System, and are addressed in LRA Table 3.2.2-2 under "Piping Specialties," with the —2 intended function. Reactor building dampers required to isolate in support of SGTS are part of the reactor building ventilation system and are addressed in LRA Table 3.3.2-22.

Based on its review, the staff found the applicant's response acceptable because the applicant clarified that all applicable system components consisting of exhaust fan (blower) housings, piping, valve bodies, and damper housings, screens for air intake or exhaust structures are within the scope of license renewal in accordance with 10 CFR 54.4(a), and are subject to an AMR in accordance with 10 CFR 54.21(a)(1). Therefore, the staff's concern described in RAI 2.3.2.7-1 is resolved.

2.3.2.7.3 Conclusion

The staff reviewed the LRA and RAI response to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the SGTS components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the SGTS components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.2.8 Standby Liquid Control System

2.3.2.8.1 Summary of Technical Information in the Application

In LRA Section 2.3.2.8, the applicant described the SLC system. The SLC system provides a backup method, independent of the control rods, to establish and maintain the reactor subcritical as the nuclear system cools. Maintaining the nuclear system in a subcritical condition as it cools assures that the fuel barrier will not be threatened by overheating in the unlikely event that too few control rods can be inserted to counteract the positive reactivity effects of a colder moderator. Insertion of control rods is always expected to assure prompt shutdown of the reactor should it be required. However, the SLC system can be manually initiated from the control room to pump a neutron absorber solution of sodium pentaborate into the reactor if the operator believes the reactor cannot be shut down or kept shut down with the control rods. The boron in the solution absorbs thermal neutrons and thereby terminates the nuclear fission chain reaction.

The boron solution is piped into the reactor vessel and discharged near the bottom of the core shroud so it mixes with the cooling water rising through the core. The SLC system is credited in AST evaluations with post-LOCA pH control in the suppression pool in order to maintain iodine in solution. Portions of the SLC system support the integrity of the RCPB.

The SLC system contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the SLC system could potentially prevent the satisfactory accomplishment of an SR function. In addition, the SLC system performs functions that support ATWS.

The intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary/flow
- provides structural support/seismic integrity

In LRA Table 2.3.2-7, the applicant identified the following SLC system component types that are within the scope of license renewal and subject to an AMR:

- piping and fittings (lines to RWC and SLC systems)
- piping and fittings (small bore piping less than NPS 4)
- valves (body)
- piping (piping and fittings)
- solution storage (tank)
- valves (pump suction, relief, injection, containment isolation, and explosive actuated discharge) (body and bonnet)
- injection pumps (casing)
- standby liquid control system (boiling water reactor) (hydraulic accumulator tank)

2.3.2.8.2 Staff Evaluation

The staff reviewed LRA Section 2.3.2.8 and UFSAR Section 9.3.4 using the evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff did not identify any omissions. The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.2.8.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the SLC system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the SLC system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.2.9 HVAC Control Building System

2.3.2.9.1 Summary of Technical Information in the Application

In LRA Section 2.3.2.9, the applicant described the HVAC control building system. The HVAC control building system is designed to permit continuous occupancy of the control room area, computer rooms and the electronic workrooms (this multi-room area is also called the control room envelope or emergency zone) under normal operating and postulated design basis accident conditions throughout the life of the plant. The system is designed to ensure that optimum habitability and temperature conditions exist within the various control building areas for the safety of plant personnel and equipment. The HVAC control building system permits continuous occupancy of the control room emergency zone under normal and postulated design-basis accident conditions, including a postulated LOCA, main steam line break (MSLB) accident, or release of chlorine gas or smoke. The system permits access and occupancy of the control room under accident conditions without personnel receiving excessive radiation exposure.

The HVAC control building system contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the HVAC control building system could potentially prevent the satisfactory accomplishment of an SR function. In addition, the HVAC control building system performs functions that support fire protection, and SBO.

The intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary/flow
- provides flow restriction (throttle)
- provides structural support/seismic integrity
- provides heat transfer

In LRA Table 2.3.2-8, the applicant identified the following HVAC control building system component types that are within the scope of license renewal and subject to an AMR:

- piping (piping and fittings)
- valves (including check valves and containment isolation) (body and bonnet)
- air receiver (shell and access cover)
- filter (shell and access cover)
- dryer (shell and access cover)

- duct (duct fittings, access doors, damper housings and closure bolts)
- duct (equipment frames and housings, including fan housings)
- duct (flexible collars between ducts and fans)
- duct (seals in dampers and doors)
- air handler heating/cooling (heating/cooling coils)
- piping (piping and fittings)
- filters (housing and supports)
- filters (elastomer seals)

2.3.2.9.2 Staff Evaluation

The staff reviewed LRA Section 2.3.2.9 and UFSAR Sections 6.4 and 9.4.1 using the evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1) . The staff did not identify any omissions.

2.3.2.9.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the HVAC control building system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the HVAC control building system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.2.10 Reactor Protection System

2.3.2.10.1 Summary of Technical Information in the Application

In LRA Section 2.3.2.10, the applicant described the reactor protection system (RPS). The RPS provides timely protection against the onset and consequences of conditions that are threats to the integrity of the fuel barriers (uranium dioxide sealed in cladding) and of the nuclear system process barrier. Excessive temperature tends to degrade the cladding and/or melt the uranium dioxide. Excessive pressure tends to rupture the nuclear system process barrier. The RPS limits the uncontrolled release of radioactive material from the fuel and nuclear system process barrier by initiating an automatic scram to terminate excessive temperature and pressure increases resulting from high reactor power.

The RPS contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the RPS could potentially prevent the satisfactory accomplishment of an SR function. In addition, the RPS performs functions that support fire protection, EQ, and SBO.

The intended function, within the scope of license renewal, is to provide a pressure-retaining boundary/flow.

In LRA Table 2.3.2-9, the applicant identified the ESFs (misc. non-GALL components (inside)) as the RPS component type that is within the scope of license renewal and subject to an AMR.

2.3.2.10.2 Staff Evaluation

The staff reviewed LRA Section 2.3.2.10 and UFSAR Section 7.2 using the evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff did not identify any omissions. The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.2.10.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the RPS components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the RPS components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3 Auxiliary Systems

In LRA Section 2.3.3, the applicant identified the structures and components of the auxiliary systems that are subject to an AMR for license renewal.

The applicant described the supporting structures and components of the auxiliary systems in the following sections of the LRA:

- 2.3.3.1 reactor water cleanup system
- 2.3.3.2 reactor core isolation cooling system
- 2.3.3.3 reactor building sampling system
- 2.3.3.4 post accident sampling system

- 2.3.3.5 circulating water system
- 2.3.3.6 screen wash water system
- 2.3.3.7 service water system
- 2.3.3.8 reactor building closed cooling water (RBCCW) system
- 2.3.3.9 turbine building closed cooling water (TBCCW) system
- 2.3.3.10 diesel generator system
- 2.3.3.11 heat tracing system
- 2.3.3.12 instrument air system
- 2.3.3.13 service air system
- 2.3.3.14 pneumatic nitrogen system
- 2.3.3.15 fire protection system
- 2.3.3.16 fuel oil system
- 2.3.3.17 radioactive floor drains system
- 2.3.3.18 radioactive equipment drains system
- 2.3.3.19 makeup water treatment system
- 2.3.3.20 chlorination system
- 2.3.3.21 potable water system
- 2.3.3.22 process radiation monitoring system
- 2.3.3.23 area radiation monitoring system
- 2.3.3.24 liquid waste processing system
- 2.3.3.25 spent fuel system
- 2.3.3.26 fuel pool cooling and cleanup system
- 2.3.3.27 HVAC diesel generator building
- 2.3.3.28 HVAC reactor building
- 2.3.3.29 HVAC service water intake structure
- 2.3.3.30 HVAC turbine building
- 2.3.3.31 HVAC radwaste building
- 2.3.3.32 torus drain system
- 2.3.3.33 civil structure auxiliary systems
- 2.3.3.34 non-contaminated water drainage system

The corresponding subsections of this SER (2.3.3.1 – 2.3.3.34, respectively) present the staff's review findings with respect to the auxiliary systems for Units 1 and 2.

2.3.3.1 Reactor Water Cleanup System

2.3.3.1.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.1, the applicant described the reactor water cleanup system (RWCU) system. The RWCU system provides continuous purification of a portion of the reactor recirculation flow. The system can be operated at any time. The major equipment of this system, which is located in the reactor building, consists of pumps, heat exchangers (both regenerative and non-regenerative), two filter-demineralizers, and the associated valves, piping, and instrumentation. Reactor coolant is removed from the reactor coolant recirculation system and is cooled in the regenerative and nonregenerative heat exchangers. After cooling, the circulated water is filtered and demineralized to reduce the amount of activated corrosion products in the water. It is then returned to the feedwater system through the shell side of the regenerative heat exchanger. RWCU is isolated automatically upon initiation of the standby liquid control system

and upon detection of conditions that may indicate a pipe break in the RWCU system. These conditions are low reactor vessel water level, high differential flow in RWCU piping, and high room temperature. Portions of the RWCU system support the integrity of the RCPB.

The RWCU system contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the RWCU system could potentially prevent the satisfactory accomplishment of an SR function. In addition, the RWCU system performs functions that support EQ, ATWS, and SBO.

The intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary/flow
- provides flow restriction (throttle)
- provides structural support/seismic integrity

In LRA Table 2.3.3-1, the applicant identified the following RWCU system component types that are within the scope of license renewal and subject to an AMR:

- piping and fittings (lines to RWC and SLC systems)
- piping and fittings (small bore piping less than NPS 4)
- valves (body)
- piping (piping and fittings - beyond second isolation valves)
- regenerative heat exchanger (shell and access cover)
- reactor water cleanup system (BWR) (valves - beyond second isolation valves)
- RWCU system (BWR) (tanks, pumps, and piping specialties - beyond second isolation valves)

2.3.3.1.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.1 and UFSAR Section 5.4.8 using the Tier-2 evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff's review of LRA Section 2.3.3.1 identified areas in which additional information was necessary to complete the review of the applicant's scoping and screening results. Therefore, by letter dated April 8, 2005, the staff issued RAIs concerning the specific issues to determine whether the applicant had properly applied the scoping criteria of 10 CFR 54.4(a) and the

screening criteria of 10 CFR 54.21(a)(1). The following paragraphs describe the staff's RAIs and the applicant's related responses.

In RAI 2.3.3.1-1, the staff stated that LRA Table 2.3.3 1 identifies the license renewal intended function for the regenerative heat exchanger (RHX) shell(s) and access cover(s) as structural support and does not identify it as pressure boundary. This is in contrast to all other RWCU components listed in LRA Table 2.3.3 1. Therefore, the staff requested that the applicant provide additional information describing the basis for the RHX shell and access cover intended function in Table 2.3.3 1.

In its response, dated May 4, 2005, the applicant stated that the RWCU heat exchanger forms the termination point for the seismic evaluation of the SR/NSR interface at the valve F042 and that this boundary appears on drawing D-25027-LR, sheet 1B (quadrant E6) for Unit 1 and D-02527-LR, sheet 1A (quadrant E6) for Unit 2.

LRA Section 2.1.1.2 discusses the criteria used for the scope assessments of NSR SSCs pursuant to 10 CFR 54.4(a)(2). The LRA states that for NSR piping connected to SR piping, the NSR piping is included within the scope of license renewal up to either the first seismic anchor past the safety/non-safety interface, or a point where the NSR pipe is restrained in three directions (either by a single support or by individual supports). Since the RWCU RHX 1C shell and access cover are restrained in three directions, the staff concluded that terminating the seismic evaluation of the SR/NSR piping interface at the valve F042 is consistent with SRP-LR, Revision 1, Section 2.1.3.1.2; therefore license renewal function —4 "Provide structural support/seismic integrity" is appropriate for this component.

In its response to RAI 2.3.3.1-1, dated May 4, 2005, the applicant also stated that the RWCU heat exchangers are in a walled area in the reactor building that houses no SR components and is sufficiently isolated/protected from other parts of the reactor building to preclude adverse spatial interactions (i.e., flooding, wetting, and spraying) with SR components elsewhere in the building. The line 1/2-G31-50-4-907 connected to the heat exchanger is partially located outside this discrete area and therefore the —1 "Provide pressure retaining boundary" function was assigned to this line because of spatial interaction considerations.

Based on its review, the staff found the applicant's response acceptable. The applicant provided clear criteria and bases for limiting the license renewal function of the RWCU RHX shells and connecting piping to M 4 "Provide structural support/seismic integrity" and for excluding M 1 "Provide pressure retaining boundary." Therefore, the staff's concern described in RAI 2.3.3.1-1 is resolved.

In RAI 2.3.3.1-2, the staff stated that license renewal boundary drawing D-25027-LR, sheet 1A (quadrant E-4), and drawing D-25027-LR, sheet 1B (quadrant D-3), show Unit 1 RHX shell "1C" and Unit 2 RHX shell "2C" as within the scope of license renewal. However, the remaining Units 1 and 2 RHX shells "1A," "1B," "2A," and "2B" and their associated piping are shown as not within the scope of license renewal. In addition, several piping sections between the RHX shells and a normally closed isolation valve are also shown as not within the scope of license renewal. Therefore, the staff requested that the applicant provide additional information to support its determination that these components and associated piping are not within the scope of license renewal despite the components intended function defined in LRA Section 2.3.3.1.

In its response, by letter dated May 4, 2005, the applicant stated that the NSR RWCU heat exchangers (i.e., "1C" and "2C") form the termination point for the seismic evaluation of the SR/NSR interface at the F042 valve. The RWCU heat exchangers "1A," "1B," "2A," and "2B" are not credited with seismic support. The applicant also confirmed that all the RWCU regenerative heat exchangers are enclosed within a walled area in the reactor building that houses no SR components and is sufficiently isolated/protected from other parts of the reactor building to preclude adverse spatial interactions (i.e., flooding, wetting, and spraying) with SR components elsewhere in the building. Therefore, the "1C" and "2C" NSR RWCU RHX are brought within the scope of license renewal per 10 CFR 54.4(a)(2) but not the other NSR SSCs in the exclusion area.

Based on its review, the staff found the applicant's response acceptable because the license renewal function of the RWCU regenerative heat exchangers 1C and 2C is to provide structural support/seismic integrity, and the applicant has provided clear criteria and bases for concluding that the failure of any RWCU regenerative heat exchanger shells and connecting piping will not result in spatial interactions with SR equipment per 10 CFR 54.4(a)2. Therefore, the staff's concern described in RAI 2.3.3.1-2 is resolved.

In RAI 2.3.3.1-3, the staff stated that on sheet 1A of license renewal boundary drawings D-25027-LR and D-02527-LR, it was not clear why the portions of lines 36-3-153 and 51-3-153 from inside the reactor building to valves F035, F034, and F036 are shown as not within the scope of license renewal. Therefore, the staff requested that the applicant provide additional information justifying why these are not within scope and why the scope does not include the remaining non-isolable piping between the inside wall of the secondary containment and the piping adjacent to valves F034, F035, and F036.

In its response, by letter dated May 4, 2005, the applicant stated:

> The portions of the RWCU System within the scope of License Renewal shown on License Renewal Boundary Drawing D-25027-LR, Sheet 1A, Locations B-8 and C- 8, for Unit No. 1 and on License Renewal Boundary Drawing D-02527-LR, Sheet 1A, Locations B-8 and C-8, for Unit No. 2 are related to spatial interaction considerations. The License Renewal boundary flags indicate the transition to the walled area containing the RWCU heat exchangers in the Reactor Building that houses no safety related components and is sufficiently isolated/protected from other parts of the Reactor Building to preclude adverse spatial interactions (i.e., flooding, wetting, and spraying) with safety related components elsewhere in the building.

Based on its review, the staff found the applicant's response acceptable because the applicant provided clear criteria and bases for concluding that failure of the portions of RWCU components identified in this RAI will not result in spatial interactions with SR equipment per 10 CFR 54.4(a)2. Therefore, the staff's concern described in RAI 2.3.3.1-3 is resolved.

In RAI 2.3.3.1-4, the staff stated that sheet 1B (quadrant D-6) of license renewal boundary drawings D-25027-LR and D-02527-LR terminate the in-scope portion of line 49-6-907 in the middle of line 65-6-907. Since the portion of 49-6-907 within the scope of license renewal also includes two 3/4-inch capped vent connections, it was not clear why the non-isolable portions of connecting piping would not also be within the scope of license renewal. Therefore, the staff

requested that the applicant clarify the reason for terminating the scope at line 65-6-907 and not including the non-isolable portions of connecting piping.

In its response, by letter dated May 4, 2005, the applicant stated that line 1/2-G31-49-6-907 is an NSR line that was brought within the scope of license renewal because it is required to protect the SR/NSR boundary at valve 1/2-G31-F004. The highlighted portions of the license renewal drawings indicate the extent of the piping included in the seismic evaluation. The license renewal flag on line 1/2-G31 49-6-907 indicates the terminus of the seismic evaluation. Based on its review, the staff found the applicant's response acceptable, because the applicant clarified the extent of the piping that is included within the scope of license renewal to protect the SR portions of the system, and it is based on a seismic evaluation. Therefore, the staff's concern described in RAI 2.3.3.1-4 is resolved.

2.3.3.1.3 Conclusion

The staff reviewed the LRA, the accompanying scoping boundary drawings, and RAI responses to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the RWCU system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the RWCU system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.2 Reactor Core Isolation Cooling System

2.3.3.2.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.2, the applicant described the RCIC system. The RCIC system consists of a steam-driven turbine pump unit and associated valves and piping capable of delivering makeup water to the reactor vessel. The steam supply to the turbine comes from the main steam line upstream of the isolation valves and exhausts to the suppression pool. The pump can take suction from the CST or from the suppression pool. The makeup water is delivered into the reactor vessel through a connection to the feedwater line and is distributed within the reactor vessel through the feedwater sparger. Cooling water for the RCIC system turbine lube oil cooler and gland seal condenser is supplied from the discharge of the pump. The RCIC system operates automatically to maintain sufficient coolant in the reactor vessel to prevent overheating of the reactor fuel in the event of reactor isolation accompanied by loss of feedwater flow. The system functions in a timely manner so that integrity of the radioactive material barrier is not compromised.

The RCIC system contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the RCIC system could potentially prevent the satisfactory accomplishment of an SR function. In addition, the RCIC system performs functions that support fire protection, EQ, and SBO.

The intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary/flow
- provides filtration
- provides flow restriction (throttle)
- provides structural support/seismic integrity
- provides heat transfer
- provides insulation/thermal resistance

In LRA Table 2.3.3-2, the applicant identified the following RCIC system component types that are within the scope of license renewal and subject to an AMR:

- piping and fittings (RCIC system)
- piping and fittings (steam line to HPCI and RCIC pump turbine)
- piping and fittings (small bore piping less than NPS 4)
- valves (body)
- piping and fittings (RCIC)
- piping and fittings (lines to SC)
- piping and fittings (lines to HPCI and RCIC pump turbine)
- piping and fittings (lines from HPCI and RCIC pump turbines to torus or wetwell)
- piping and fittings (piping specialties)
- piping and fittings (misc. auxiliary and drain piping and valves)
- piping and fittings (restrictive orifices/flow elements)
- pumps (HPCS or HPCI main and booster, LPCS, LPCI or RHR, and RCIC) (bowl/casing)
- pumps (HPCS or HPCI main and booster, LPCS, LPCI or RHR, and RCIC) (suction head)
- pumps (HPCS or HPCI main and booster, LPCS, LPCI or RHR, and RCIC) (discharge head)
- pumps (HPCS or HPCI main and booster, LPCS, LPCI or RHR, and RCIC) (body and bonnet)
- emergency core cooling system (BWR) (auxiliary pumps)
- emergency core cooling system (BWR) (misc. tanks and vessels)
- emergency core cooling system (BWR) (steam turbines)
- auxiliary heat exchangers (auxiliary heat exchanger tubing)
- auxiliary heat exchangers (auxiliary heat exchanger shell/housing)
- auxiliary strainers/filters (auxiliary strainer housing)
- emergency core cooling system (BWR) (ECCS pump suction strainers)
- pressure regulators (body and bonnet)

2.3.3.2.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.2 and UFSAR Sections 5.4.6 and 6.3.2.8 using the evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff did not identify any omissions. The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.3.2.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the RCIC system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the RCIC system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.3 Reactor Building Sampling System

2.3.3.3.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.3, the applicant described the reactor building sampling (RXS) system. The RXS system monitors plant and equipment performance to determine routine chemical properties and radiation levels necessary to provide information for equipment operation, corrosion control, and radiation activity. The system also provides information for making operational decisions with regard to effectiveness, safety, and proper performance. Samples can be taken continuously or obtained as grab samples. There is one central sampling station that is essentially a package of sample conditioning and analyzing sections and a sample hood. Consideration of accessibility, safe withdrawal, and efficient handling of samples were factored into the design of the centralized sampling station. Portions of this system comprise part of the RCPB. Also, portions of this system are used for primary containment isolation.

The RXS system contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the RXS system could potentially prevent the satisfactory accomplishment of an SR function.

The intended function, within the scope of license renewal, is to provide a pressure-retaining boundary/flow.

In LRA Table 2.3.3-3, the applicant identified the following RXS system component types that are within the scope of license renewal and subject to an AMR:

- piping and fittings (sample lines)
- piping (piping and fittings)
- valves (body and bonnet)
- heat exchanger (shell and access cover)
- flow orifice (body)
- pump (casing)
- filters (shell and access cover)
- immersion element (pressure-retaining housing)
- tank (shell)

2.3.3.3.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.3 and UFSAR Section 9.3.2.1 using the Tier-2 evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff's review of LRA Section 2.3.3.3 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 2.3.3.3-1, dated April 8, 2005, the staff stated that LRA Section 2.3.3.3 states that the RXS system monitors the plant and equipment performance to determine routine chemical properties and radiation levels necessary to provide information for equipment operation, corrosion control, and radiation activity. The following inconsistencies were identified in the LRA for the RXS system.

- The pressure relief valves PRV-207, PRV-208, PRV-209, and PRV-210 and their associated piping on Unit 1 drawing D-70070-LR, sheet 1, at locations D-7, D-5, D-2, and D-1, are not shown as being included within the scope of license renewal. However, the same pressure relief valves and associated piping shown on the Unit 2 drawing D-07070-LR at the same relative locations are shown as being included within the scope of license renewal.
- The piping and isolation valves V132, V133, V134, V135, V136, and V137 on Unit 1 drawing D-70070-LR, sheet 1, at locations D-4 through D-6, are not shown as being included within the scope of license renewal. However, the same piping and isolation valves on the Unit 2 drawing D-07070-LR, sheet 1, at the same relative locations are shown as being included within the scope for license renewal. The piping for pressure

indicators PI-5220 (for both Units 1 and 2), PI-5221, PI-5222, and PI-R007A shown on Unit 1 drawing D-70070-LR, sheet 1, at locations D-5 through D-7 are not shown as being included in scope for license renewal. However, the same piping for similar pressure indicators on the Unit 2 drawing D-07070-LR, sheet 1, at the same relative locations are shown as being included in scope for license renewal.

Therefore, the staff requested that the applicant provide additional clarification and justification as to whether the above listed valves and associated piping should be or should not be included in scope for license renewal.

In its response, by letter dated May 4, 2005 the applicant stated that the subject components are within the RXS system license renewal scoping boundary and are subject to an AMR. The staff found the applicant's response acceptable and, therefore, the staff's concern described in RAI 2.3.3.3-1 is resolved.

2.3.3.3.3 Conclusion

The staff reviewed the LRA, the accompanying scoping boundary drawings, and RAI response to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the RXS system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the RXS system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.4 Post Accident Sampling System

2.3.3.4.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.4, the applicant described the post-accident sampling system (PASS). The PASS function is to obtain representative liquid samples from the primary coolant system and gas samples from primary and secondary containment for radiological analysis following an accident, including a LOCA. The basic system consists of a liquid and gas sample station located outside the reactor building in the turbine building breezeway. Each unit has its own sampling system. Each sampling and control station is located near each unit's reactor building personnel access doors. To meet the requirements of NUREG-0578, the design is intended to minimize radiation exposure during sampling by minimizing the required sample sizes, to optimize the weight of shielded sample containers in order to facilitate movement through potentially high-level radiation areas, and to provide adequate shielding at the sample station and in the laboratory. The system is also designed to provide useful samples under all conditions ranging from normal shutdown and power operation. A local area radiation monitor is provided to inform the operator of the ambient radiation level.

The PASS contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the PASS could potentially prevent the satisfactory accomplishment of an SR function. In addition, the PASS performs functions that support EQ.

The intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary/flow
- provides structural support/seismic integrity

In LRA Table 2.3.3-4, the applicant identified the following PASS component types that are within the scope of license renewal and subject to an AMR:

- piping (piping and fittings)
- valves (body and bonnet)
- heat exchanger (shell and access cover)

2.3.3.4.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.4 and UFSAR Section 9.3.2.2 using the Tier-2 evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff's review of LRA Section 2.3.3.4 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 2.3.3.4-1, dated April 8, 2005, the staff stated that the in-scope license renewal boundaries identified at quadrant E-5 and E-6 on sheet 1 license renewal boundary drawings D-73027-LR and D-07327-LR terminate in the middle of a pipe run. Therefore, the staff requested that the applicant discuss the basis for terminating the in-scope portion of this piping downstream of solenoid valves SV 4180, SV 4181, SV 4184, and SV 4185 in the middle of the piping runs.

In its response, by letter dated May 4, 2005, the applicant stated that lines 1/2-RXS-2 and 1/2-RXS-20 are NSR lines that were brought within the scope of license renewal because they are required to protect the SR/NSR boundary at valves 1/2-RXS-SV-4180/4181 and 1/2-RXS-SV-4184/4185 respectively. The applicant explained that the license renewal boundaries identified at quadrant E-5 and E-6 on sheet 1 license renewal boundary drawings D-73027-LR and D-07327-LR are associated with stress analyses and represent supports or anchor points that define the extent of in-scope piping credited with providing a structural support/seismic integrity license renewal intended function. Based on its review, the staff found the applicant's response acceptable; therefore, the concern described in RAI 2.3.3.4-1 is resolved.

2.3.3.4.3 Conclusion

The staff reviewed the LRA, the accompanying scoping boundary drawings, and RAI response to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the PASS components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the PASS components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.5 Circulating Water System

2.3.3.5.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.5, the applicant described the circulating water (CW) system. The CW system provides the heat sink necessary to remove the latent heat of condensation from the exhaust steam of the low pressure turbines and to cool the condensate sufficiently to prevent cavitation in the condensate system, thus maintaining the vacuum required for operation. The system also provides the dilution flow necessary for acceptable radioactive liquid effluent release concentrations. The CW system is designed to supply a continuous flow of cooling water to the main condensing system to remove heat rejected from the steam power cycle. The CW system takes suction from the Cape Fear River estuary, provides cooling water through the main condensers, then discharges to the ocean. The CW system also dilutes the liquid waste flow prior to its release to the environment. The CW system is not required to function in order to shutdown the reactor or maintain it in a safe shutdown condition. Some electrical components in the system are classified as seismically analyzed to avoid adverse interactions with SR SSCs during an earthquake.

The failure of NSR SSCs in the CW system could potentially prevent the satisfactory accomplishment of an SR function.

The CW system component types that are within the scope of license renewal and subject to an AMR are addressed as civil commodities in LRA Section 2.4.

2.3.3.5.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.5 and UFSAR Section 10.4.5 using the Tier-2 evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff did not identify any omissions. The staff then reviewed those components that the applicant had identified as being within the scope of license

renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.3.5.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the CW system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the CW system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.6 Screen Wash Water System

2.3.3.6.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.6, the applicant described the screen wash water (SCW) system. The SCW system consists of twelve traveling screens, four screen wash pumps, and four self-cleaning strainers. This system provides filtering capabilities for the circulating water and SW systems of both units. Intake canal water enters the SW intake structure through trash racks mounted across the inlet bays. Large debris is stopped by the trash racks and accumulates on the upstream face. The traveling screens at the individual pump bays remove the smaller debris and refuse that enters the intake structure. The SCW system is not required for safe shutdown of the unit and does not provide any essential auxiliary service.

The failure of NSR SSCs in the SCW system could potentially prevent the satisfactory accomplishment of an SR function.

The intended function, within the scope of license renewal, is to provide a pressure-retaining boundary/flow.

In LRA Table 2.3.3-5, the applicant identified the following SCW system component types that are within the scope of license renewal and subject to an AMR:

- piping (piping and fittings)
- valves (body and bonnet)
- pump (casing)
- strainer (body)

2.3.3.6.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.6 and UFSAR Section 9.2.1.2 using the evaluation methodology described in SER Section 2.3 as related to the "Two-Tier Scoping Review Process for BOP Systems."

In conducting its Tier-1 review of the two-tier review process, 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 did not omit from the scope of license renewal any components with intended functions delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant identified as being within the scope of license renewal to verify that the applicant did not omit any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff's review of LRA Section 2.3.3.6 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 2.3.3.6-1, dated April 8, 2005, the staff noted that LRA Section 2.3.3.6 states that the SCW system consists of 12 traveling screens. The four traveling screens associated with the SW system were determined to be within the scope of license renewal, but the screens are active components, not subject to an AMR. The application had not addressed the other eight traveling screens. Therefore, the staff requested that the applicant address the following:

(a) The systems/components having intended functions as identified in 10 CFR 54.4(a) are within the scope of license renewal. Clarify whether the other eight traveling screens are within the scope of license renewal. If not, identify where these eight traveling screens are located and explain the intended functions of the system.

(b) Based on the NRC review guidance in SRP-LR Table 2.1-5 and industry guidance, Appendix B to NEI 95-10, Revision 3, for passive/active determination, the screen is not generally included as an active component. The applicant is requested to justify the screen being an active component for Brunswick, or add screens to LRA Table 2.3.3-5 as component requiring an AMR.

(c) Identify all the systems that have screens and were excluded from an AMR based on screens being active.

In its response, by letter dated May 4, 2005, the applicant discussed the bases for its scoping and screening determination for the traveling screens. The applicant stated that traveling screens in the SCW system are provided for trash, fish, and larvae removal to minimize the fouling and clogging of water box tube sheets and piping and to protect fish and larvae. The traveling screens consist of a series of screen panels connected in a continuous loop across rotating drive sprockets. As water flows through the screen panels, debris is collected and held against the screens by the force of flowing water. As debris collects, the pressure differential between the inlet and outlet sides of the screens increases. During normal operations, when the pressure differential reaches the predetermined setpoint, the SW screen rotates and the screen wash pumps wash the debris free.

The eight traveling screens that are not within the scope of license renewal act as filters in the CW system. The CW system provides a condenser cooling function that is not one of the license renewal intended functions specified in 10 CFR 54.4(a). Therefore, the staff agreed with the applicant that these eight traveling screens are not within the scope of license renewal. The four traveling screens act as filters for the SW system, which performs SR functions, and are within the scope of license renewal. These traveling screens are subcomponents of active assemblies, subject to periodic maintenance and replacement, and continuously monitored through control

room annunciation. The traveling screens can move at between 2.5 and 20 feet per minute. The staff agreed with the applicant on its determination that these four traveling screens are active, and can be screened out from an AMR in the license renewal screening process. All the twelve traveling screens in BSEP are not subject to an AMR with acceptable justifications. No other type of screen was excluded from the requirement of an AMR on the basis of being classified as "active." Based on its review, the staff found the applicant's response acceptable. Therefore, the staff's concerns described in RAI 2.3.3.6-1 are resolved.

2.3.3.6.3 Conclusion

The staff reviewed the LRA and RAI response to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the SCW system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the SCW system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.7 Service Water System

2.3.3.7.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.7, the applicant described the SW system. The SW system provides water from the Cape Fear River for lubrication and cooling of equipment in the reactor building, turbine building, diesel generator building, and the circulating water system, and for dilution flow in the chlorination system. SW can also be cross-connected to the RHR system in an emergency to provide reactor core flooding capability. The SW system is required to operate following a DBE in order to provide cooling water to the diesel generators and to the RHR system for LPCI cooling and to limit the suppression pool temperature during operation of HPCI and RCIC systems. The system also provides cooling water to the CS pump room and RHR pump room coolers. The SW system is subdivided into two major portions, one basically for nuclear and vital loads and the other normally for conventional loads in the turbine building. The two portions of the system are normally operated independently, each consisting of a group of SW pumps, parallel loads, and interconnecting headers. Suitable cross-connecting valves and piping are provided to permit use of the conventional system as a backup supply for reactor building cooling loads. Backup for diesel generator cooling is provided by the nuclear headers of each unit or by cross-connecting conventional header pumps to the nuclear header.

The SW system contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the SW system could potentially prevent the satisfactory accomplishment of an SR function. In addition, the SW system performs functions that support fire protection and EQ.

The intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary/flow
- provides filtration

- provides flow restriction (throttle)
- provides structural support/seismic integrity
- provides heat transfer

In LRA Table 2.3.3.7, the applicant identified the following SW system component types that are within the scope of license renewal and subject to an AMR:

- piping (piping and fittings)
- piping (underground piping and fittings)
- piping (piping specialties)
- valves (body and bonnet)
- heat exchanger (SW pump motor cooler coils)
- flow orifice (body)
- pump (casing)
- basket strainer (body)
- CW strainer (body only)

2.3.3.7.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.7 and UFSAR Section 10.4.7 using the Tier-2 evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff's review of LRA Section 2.3.3.7 identified areas in which additional information was necessary to complete the review of the applicant's scoping and screening results Therefore, by letter to the applicant dated April 8, 2005, the staff issued RAIs concerning the specific issues to determine whether the applicant had properly applied the scoping criteria of 10 CFR 54.4 (a) and the screening criteria of 10 CFR 54.21(a)(1). The following paragraphs describe the staff's RAIs and the applicant's related responses.

In RAI 2.3.3.7-1, the staff stated that License renewal drawing D-02041-LR, sheet 1, location F-2, has strainer 2-SW-ST-3 within the scope of license renewal; however, strainer 2-SW-ST-2 is not within the scope of license renewal. Therefore, the staff requested that the applicant explain why strainer 2-SW-ST-2 is not within the scope of license renewal.

In its response, by letter dated May 4, 2005, the applicant stated that 2-SW-ST-2 was inadvertently omitted from highlighting. This component is in the scope of license renewal, and was subject to an AMR.

Based on its review, the staff found the applicant's response acceptable because the applicant had concluded that 2-SW-ST-2 is within the scope of license renewal. Therefore, the staff's concern described in RAI 2.3.3.7-1 is resolved.

In RAI 2.3.3.7-2a and 2b, the staff stated that license renewal drawings D-02041-LR, sheet 1, location F-1, has an LRA flag in the middle of a section of pipe which is continued on D-2041-3. Similarly, license renewal drawing D-20041-LR, sheet 1, location F-8, has an LRA flag in the middle of a section of pipe which is continued on D-20041, sheet 3. Therefore, the staff requested that the applicant explain why the LR scope boundary occurs in the middle of these sections of pipe.

In its response, by letter dated May 4, 2005, the applicant stated that the subject lines supply cooling water to the circulating water pumps. They are NSR, but the portion of the lines inside the SW building are within the scope of license renewal for potential spatial interaction. The boundary flag represents the location where the line exits the SW intake structure.

Based on its review, the staff found the applicant's response acceptable, because the NSR lines within the SW intake structure are included within scope for potential spatial interaction. The LRA boundary flag is placed where the lines exit the SW intake structure where spatial interaction is not a concern. Therefore, the staff's concerns described in RAI 2.3.3.7-2a and 2b are resolved.

In RAI 2.3.3.7-3a and 3b, the staff stated that license renewal drawing D-02041-LR, sheet 1, locations A-8, A-6, and A-3, depict three lines each from the conventional header SW pumps with continuations on drawing F-4024. Drawing F-4024 was not provided with the LRA. Similarly, license renewal drawing D-20041-LR, sheet 1, locations B-1, B-6, and B-3, depict three lines each from the conventional header SW pumps with continuations on drawing F-04024. Drawing F-04024 was not provided with the LRA. Therefore, the staff requested that the applicant provide additional information on where the LRA boundary was located for these sections of pipe.

In its response, by letter dated May 4, 2005, the applicant stated that the subject lines are the seal leak off and lube oil cooler discharge lines on the conventional SW pumps. They are within scope to provide a discharge flow path in support of the operation of the pumps. All six lines discharge into an open hub drain, which drains directly down into the pump intake bay. Failure of the hub drain itself and the short run of pipe back to the pump bay could not obstruct the flow path of these lines, nor otherwise present a liability to the pump or nearby SR equipment. As such, the hub drains and piping depicted on F-4024 do not perform an intended function that satisfies any one of the 10 CFR 54.4 criteria and, therefore, are not within the scope of license renewal.

Based on its review, the staff found the applicant's response acceptable because all six lines discharge into an open hub drain, which drains directly down into the pump intake bay. Failure of the hub drain itself and the short run of pipe back to the pump bay could not obstruct the flow path of these lines, nor otherwise present a liability to the pump or nearby SR equipment. Therefore, the staff's concerns described in RAI 2.3.3.7-3a and 3b are resolved.

In RAI 2.3.3.7-4a and 4b, the staff stated that license renewal drawing D-02034-LR, sheet 1, locations F-2, and E-2, depict five drains, which include valves 2-SW-V444, V95, 2-SW-663, 2-SW-669, and 2-SW-664 that are not within the scope of license renewal. Similarly, license

renewal drawing D-20034-LR, sheet 2, locations F-7, and D-8, depicts five drains which include valves 1-SW-V444, V95, 2-SW-663, 2-SW-669, and 2-SW-664 that are not within the scope of license renewal. Therefore, the staff requested that the applicant explain why these sections of pipe and valves are not within the scope of license renewal.

In its response, by letter dated May 4, 2005, the applicant stated that the subject piping/components are attached to the 36-inch SW discharge line. The NSR SW discharge line is within the scope of license renewal for providing a discharge flow path from SR components in the reactor building to the CW system discharge tunnel/canal. The area it travels through under the turbine building houses no SR components, so a pressure boundary of the piping does not represent a spatial interaction concern. As such, only the SW discharge flow itself is within the scope of license renewal. Peripheral piping and components such as those identified serve no intended function and are not within the scope of license renewal

Based on its review, the staff found the applicant's response acceptable, because the NSR lines under the turbine building do not represent a spatial interaction concern. Therefore, the staff's concerns described in RAI 2.3.3.7-4a and 4b are resolved.

In RAIs 2.3.3.7-5a and 5b, the staff stated that license renewal drawing D-02034-LR, sheet 1, locations E-2, and E-1, depict two manholes that are not within the scope of license renewal. License renewal drawing D-20034-LR, sheet 2, locations D-8, and E-7, depict two manholes that appear to be within the scope of license renewal. Therefore, the staff requested that the applicant clarify if these manholes are within the scope of license renewal and if not, explain why these manholes are not within the scope of license renewal.

In its response, by letter dated May 4, 2005, the applicant stated that the subject piping/components are attached to the 36-inch SW discharge line. The NSR SW discharge line was within the scope of license renewal for providing a discharge flow path from SR components in the reactor building to the CW system discharge tunnel/canal. The area it travels through under the turbine building houses no SR components, so a pressure boundary of the piping does not represent a spatial interaction concern. As such, only the SW discharge flow itself is within the scope of license renewal. Peripheral piping and components such as those identified serve no intended function and are not within the scope of license renewal.

Based on its review, the staff found the applicant's response acceptable because the NSR lines under the turbine building do not represent a spatial interaction concern. Therefore, the staff's concerns described in RAIs 2.3.3.7-5a and 5b are resolved.

In RAIs 2.3.3.7-6a and 6b, the staff stated that license renewal drawing D-02034-LR, sheet 1, location E-2, depict three sections of pipe which include valves 2-SW-V443 (2-SW-296-30-R-1) and 2-SW-299 (2-SW-266-1-R-2) and pipe line number (2-SW-22-30-R-1) that are not within the scope of license renewal. Similarly, license renewal drawing D-20034-LR, sheet 2, location E-7, depict three sections of pipe which include valves 2-SW-V443 (1-SW-296-30-R-1) and 1-SW-299 (1-SW-228-1-R-2) and pipe line number (1-SW-22-30-R-1) that are not within the scope of license renewal. Therefore, the staff requested that the applicant explain why these sections of pipe and valves are not within the scope of license renewal.

In its response, by letter dated May 4, 2005, the applicant stated that the subject piping/components are attached to the 36-inch SW discharge line. The NSR SW discharge line

is within the scope of license renewal for providing a discharge flow path from SR components in the reactor building to the CW system discharge tunnel/canal. The area it travels through under the turbine building houses no SR components, so a pressure boundary of the piping does not represent a spatial interaction concern. As such, only the SW discharge flow itself is within scope. Peripheral piping and components such as those identified above serve no intended function and are not within the scope of license renewal.

Based on its review, the staff found the applicant's response acceptable because the NSR lines under the turbine building do not represent a spatial interaction concern. Therefore, the staff's concerns described in RAIs 2.3.3.7-6a and 6b are resolved.

In RAIs 2.3.3.7-7a and 7b, the staff stated that license renewal drawing D-02041-LR, sheet 2, locations B-3 and B-6, depict three lines each from the nuclear header SW pumps. Similarly license renewal drawing D-20041-LR, sheet 2, locations B-3 and B-6, depict three lines each from the nuclear header SW pumps with continuations on drawing F-40024. Drawing F-40024 was not provided with the LRA. Therefore, the staff requested that the applicant provide additional information as to where the LRA boundary is located for these sections of pipe.

In its response, by letter dated May 4, 2005, the applicant stated that the subject lines are the seal leakoff and lube oil cooler discharge lines on the nuclear SW pumps. They are in scope to provide a discharge flow path in support of the operation of the pumps. All three lines discharge into an open hub drain, which drains directly down into the pump intake bay. Failure of the hub drain itself and the short run of pipe back to the pump bay could not obstruct the flow path of these lines, nor otherwise present a liability to the pump or nearby SR equipment. As such, the hub drain and piping depicted on F-4024 perform no intended function and are not within the scope of license renewal.

Based on its review, the staff found the applicant's response acceptable because all six lines discharge into an open hub drain, which drains directly down into the pump intake bay. Failure of the hub drain itself and the short run of pipe back to the pump bay could not obstruct the flow path of these lines, nor otherwise present a liability to the pump or nearby SR equipment. Therefore, the staff's concerns described in RAIs 2.3.3.7-7a and 7b are resolved.

In RAI 2.3.3.7-8a and 8b, license renewal drawing D-02041-LR, sheet 2, location F-7, has an LRA flag in the middle of a section of pipe which is continued on D-2041-3 and D-2034. Similarly, license renewal drawing D-20041-LR, sheet 2, location F-2, has an LRA flag in the middle of a section of pipe which is continued on D-20034 and D-20041-3. Therefore, the staff requested that the applicant explain why the LRA boundary occurs in the middle of these sections of pipe.

In its response, by letter dated May 4, 2005, the applicant stated that the subject lines are the SW supply to NSR cooling loads in the turbine building, as well as a fill line to the CW system. The SR portion of the line ends at the 2-SW-V3 and 1-SW-V3 valves. The highlighted portions of the license renewal drawings indicate the extent of the piping included in the seismic evaluation. The license renewal flag on line 2-SW-100-30-R-1 indicates the terminus of the seismic evaluation.

Based on its review, the staff found the applicant's response acceptable because the SR portion of the line ends at the 2-SW-V3 and 1-SW-V3 valves, and a segment of piping past these points

has been included for seismic support. The boundary flag represents the terminus of the seismic evaluation. Therefore, the staff's concerns described in RAIs 2.3.3.7-8a and 8b are resolved.

In RAIs 2.3.3.7-9a and 9b, the staff stated that license renewal drawing D-02537-LR, sheet 2, location B-2, has an LRA flag in the middle of a section of pipe which is continued on D-2544. Similarly, license renewal drawing D-25037-LR, sheet 2, location B-2, has an LRA flag in the middle of a section of pipe which is continued on D-25043, sheet 1B. Therefore, the staff requested that the applicant explain why the LRA boundary occurs in the middle of these sections of pipe.

In its response, by letter dated May 4, 2005, the applicant stated that line 2-G16-1178-1-160 and line 1-G16-1177-1-160 are NSR lines that were brought within the scope of license renewal because they are required to protect the SR/NSR boundary at valve 2-E11-F073 and 1-E11-F073. The highlighted portions of the license renewal drawings indicate the extent of the piping included in the seismic evaluation. The license renewal flag on lines 2-G16-1178-1-160 and 1-G16-1178-1-160 indicates the terminus of the seismic evaluation.

Based on its review, the staff found the applicant's response acceptable because the subject lines are within the scope of license renewal and are required to protect the SR/NSR boundary at valve 2-E11-F073 and 1-E11-F073. The highlighted portions of the license renewal drawings indicate the extent of the piping included in the seismic evaluation. Therefore, the staff's concerns described in RAIs 2.3.3.7-9a and 9b are resolved.

2.3.3.7.3 Conclusion

The staff reviewed the LRA, the accompanying scoping boundary drawings, and RAI responses to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the SW system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the SW system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.8 Reactor Building Closed Cooling Water System

2.3.3.8.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.8, the applicant described the reactor building closed cooling water (RBCCW) system. The RBCCW system removes heat from the reactor auxiliary systems and their related accessories during normal operation. The system also provides an additional barrier between contaminated systems and the SW discharged to the environment. Those portions of the system that are within the scope of license renewal are located in the drywell, reactor building, and control building. The RBCCW system provides cooling for the non-regenerative heat exchangers, reactor coolant recirculation system pump and motor coolers, sump and equipment drain tank coolers, sample coolers, cleanup recirculation pump coolers, cleanup

pre-coat pump coolers, fuel pool heat exchangers, drywell coolers, CRD supply pump coolers, and penetration cooling system. The RBCCW system pumps, heat exchangers, and equipment required for normal system heat removal are designed to Class II requirements. RBCCW system instrumentation and control circuits activate protective actions following postulated accidents and transients, and system indicating circuits support post-accident monitoring functions, such as containment isolation valve position.

The RBCCW system contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the RBCCW system could potentially prevent the satisfactory accomplishment of an SR function. In addition, the RBCCW system performs functions that support EQ. The intended function, within the scope of license renewal, is to provide a pressure-retaining boundary/flow.

In LRA Table 2.3.3-7, the applicant identified the following RBCCW system and penetration cooling system component types that are within the scope of license renewal and subject to an AMR:

- piping (pipe, fittings, and flanges)
- piping (piping specialties)
- valves (check, hand, control, relief, solenoid, and containment isolation) (body and bonnet)
- pump (casing)
- tank (shell)
- flow orifice (body)
- closed-cycle cooling water system (strainers)
- closed-cycle cooling water system (heat exchangers)
- closed-cycle cooling water system (piping specialties)
- valves (including check valves and containment isolation) (body and bonnet)
- pressure regulators (body and bonnet)

2.3.3.8.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.8 and UFSAR Section 9.2.2 using the Tier-2 evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff's review of LRA Section 2.3.3.8 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 RAI as discussed below.

In RAI 2.3.3.8-1, dated April 8, 2005, the staff stated that sheet 2 of license renewal boundary drawings D-25038-LR and D-02538-LR (quadrants C4 and D4) show the in-scope boundary terminating in the middle of non-isolable portions of lines 1(2)-RCC-6-6-154 and 1(2)-RCC-54-2-154. Therefore, the staff requested that the applicant discuss the basis for terminating the in-scope portion of this piping at these locations and provide additional information describing the as-built plant locations that these scope boundaries represent.

In its response, by letter dated May 4, 2005, the applicant stated that the piping described in RAI 2.3.3.8-1 (1(2)-RCC-6-6-154 and 1(2)-RCC-54-2-154) performs no SR function and that portions of this piping are within the scope of license renewal for potential spatial interaction. The applicant stated that the scoping boundary described in boundary drawings D-25038-LR and D-02538-LR (quadrants C-4 and D-4) represents the point at which RBCCW enters an area in the reactor building that houses no SR components and is sufficiently isolated/protected from other parts of the reactor building to preclude adverse spatial interactions with SR components elsewhere in the building.

Based on its review, the staff found the applicant's response acceptable because the applicant has sufficiently clarified that the in-scope boundaries for portions of lines 1(2)-RCC-6-6-154 and 1(2)-RCC-54-2-154 described in boundary drawings D-25038-LR and D-02538-LR (quadrants C-4 and D-4) are consistent with plant as-built configurations and that the failure of the out-of-scope piping would not impact the intended functions of SR components. Therefore, the staff's concern described in RAI 2.3.3.3-1 is resolved.

In RAI 2.3.3.8-2, dated April 8, 2005, the staff stated that license renewal boundary drawing D-25038-LR sheet 2 (quadrants E1 and E2) identifies a portion of the RBCCW supply piping (1-RCC-57-1½ -154) to cleanup recirculation pump cooler 1B and adjacent valve V304 as within the scope of license renewal. This is inconsistent with the RBCCW supply piping and valve combinations for the remaining Unit 1 cleanup recirculation pump cooler 1A and the Unit 2 cleanup recirculation pump coolers 1A and 1B (sheet 2 of D-02538-LR), which are shown as out of scope for license renewal. Therefore, the staff requested that the applicant discuss the basis for terminating the in-scope portion of this piping at these locations and provide additional information describing the as-built plant locations that the in-scope boundaries represent.

In its response, by letter dated May 4, 2005, the applicant stated that the portion of the RBCCW supply piping (1-RCC-57-12 -154) to cleanup recirculation pump cooler 1B and adjacent valve V304 shown as in-scope for license renewal on boundary drawing D-25038-LR sheet 2 (quadrants E-1 and E-2) is a drawing error. The applicant stated that this piping does not perform an SR function and is located in an area in the reactor building that houses no SR components and is sufficiently isolated/protected from other parts of the reactor building to preclude adverse spatial interactions with SR components elsewhere in the building. The applicant stated that boundary drawing D-25038-LR, sheet 2 will be revised to show that this piping is not within the scope of license renewal. Based on its review, the staff found the applicant's response acceptable. Therefore, the staff's concern described in RAI 2.3.3.8-2 resolved.

2.3.3.8.3 Conclusion

The staff reviewed the LRA, the accompanying scoping boundary drawings, and RAI responses to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the RBCCW system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the RBCCW system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.9 Turbine Building Closed Cooling Water System

2.3.3.9.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.9, the applicant described the turbine building closed cooling water (TBCCW) system. The TBCCW system is a closed loop system, which removes heat from the following secondary plant equipment and turbine-generator accessories: (1) turbine-generator lube oil coolers, (2) turbine-generator electro-hydraulic control system coolers, (3) generator stator and rectifier coolers, (4) generator bus duct heat exchangers, (5) Alterex exciter coolers, (6) generator hydrogen coolers, (7) air compressors and air aftercoolers, (8) turbine building sample coolers, (9) condenser mechanical vacuum pump coolers, (10) reactor feed pump turbine oil coolers, (11) recirculation pump motor-generator set oil coolers, (12) heater drain pump jacket and motor thrust bearings, (13) condensate pump motor thrust bearings, (14) condensate booster pump oil coolers. Each unit is provided with a TBCCW system consisting of two pumps, two heat exchangers and integrated piping. The systems utilize a common head tank. In addition, the Unit 2 TBCCW system is equipped with a chemical feed tank and a spare pump and heat exchanger. The spare pump and/or heat exchanger may be lined up to either unit's TBCCW system but not both. The TBCCW pumps that are arranged in parallel take suction from a common header and discharge to the heat exchangers.

The failure of NSR SSCs in the TBCCW system could potentially prevent the satisfactory accomplishment of an SR function.

The TBCCW system components that are subject to an AMR are addressed as civil commodities in LRA Section 2.4.

2.3.3.9.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.9 and UFSAR Section 9.2.7 using the Tier-1 evaluation methodology described in SER Section 2.3.

In conducting its Tier-1 review of the two-tier review process, 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 did not omit from the scope of license renewal any components with intended functions delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant identified as being within the scope of license renewal to

verify that the applicant did not omit any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.3.9.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the TBCCW system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the TBCCW system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.10 Diesel Generator System

2.3.3.10.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.10, the applicant described the DG system. The DG system provides emergency alternating current (AC) power to the onsite electrical distribution system of each unit. The DG system contains four emergency diesel generator sets and is used to ensure that a supply of electrical power is available for the operation of SR equipment in the event of loss of offsite power. Electrical equipment and controls that are required to start and load the diesel, or prevent it from operating are classified SR. Diesel capacity is such that any three of the four diesels provided can supply all required loads for the safe shutdown of one unit and a design-basis accident on the other unit without offsite power. During a SBO event, diesel capacity is such that one operational diesel can supply the required loads for safe shutdown of the non-blacked-out unit and the required SBO coping loads in the blacked-out unit. The DG system provides the AC power required by the Class 1E distribution system to provide power for emergency systems and engineered safety features during and following the shutdown of the reactor when the preferred power supply is not available. The system starts automatically on loss of voltage to its associated buses, an ESF actuation signal on either unit, a loss of offsite power, or a unit trip of either unit.

Support systems necessary to ensure proper operation of the DGs are (1) diesel fuel oil system, (2) diesel lube oil system, (3) diesel jacket water system, (4) DG SW system, (5) DG starting air system, and (6) DG intake/exhaust system. The diesel fuel oil system stores and distributes fuel oil for use by the DGs. The diesel lube oil system is a closed loop system that lubricates various DG components and rejects heat to the lube oil cooling subsystem. The diesel jacket water system is a closed loop system that removes most of the heat generated by the DG during operation by cooling the engine components and DG lubricating oil. The DG SW system contains redundant SW supply lines to remove heat from each DG jacket water cooler; if the normal supply is not available, the alternate supply line valve will open and the normal supply valve will close. The DG starting air system provides compressed air to the diesel engine cylinders for starting the emergency DGs and supplies air to the instrumentation and controls. The DG intake/exhaust system provides combustion air to each DG and removes exhaust gases and potentially explosive fumes from each DG.

The DG system contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the DG system could potentially prevent the satisfactory accomplishment of an SR function. In addition, the DG system performs functions that support fire protection and SBO.

The intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary/flow
- provides filtration
- provides flow restriction (throttle)
- provides structural support/seismic integrity
- provides heat transfer

In LRA Table 2.3.3-8, the applicant identified the following DG system component types that are within the scope of license renewal and subject to an AMR:

- valves, connected pipe, tubing and fittings
- piping (aboveground pipe and fittings)
- piping (underground pipe and fittings)
- valves (body and bonnet)
- pump (casing)
- tank (internal/external surface)
- immersion element (pressure-retaining housing)
- strainer (body)
- tanks (day and drip)
- filters (shell)
- valves, connected pipe, tubing and fittings
- heaters an thermowells (housing)
- filter (shell)
- pump (casing)
- gauge glass
- heat exchanger (tubes)
- heat exchanger (shell)
- heat exchanger (tube sheet and channel head)
- strainer (casing)
- strainer (screen)
- heat exchanger (shell)
- heat exchanger (channel)
- heat exchanger (channel head and access cover)
- heat exchanger (tubesheet)
- heat exchanger (tubes)
- piping (pipe, fittings, and flanges)
- valves (check, hand, control, relief, solenoid, and containment isolation) (body and bonnet)
- closed-cycle cooling water system (piping specialties)
- diesel engine cooling water subsystem (pipe and fittings)
- diesel engine cooling water subsystem (tanks and vessels)
- diesel engine cooling water subsystem (heat exchangers)
- diesel engine cooling water subsystem (pumps)

- diesel engine cooling water subsystem (piping specialties)
- piping (piping and fittings)
- piping (piping specialties)
- valves (body and bonnet)
- pipe and fittings
- valves (hand and check)
- drain trap
- air accumulator vessel
- filter (shell)
- strainer (shell)
- strainer (basket)
- piping and fittings
- filter
- muffler (intake silencer)
- turbo charger (inlet-housing)
- valve (body), connected piping, tubing and fittings
- turbo charger (inlet-bellows)
- filter (media)
- piping and fittings
- muffler (exhaust)
- fans (housing)
- oil separator (housing)
- valve (body), connected pipe and fittings
- turbo charger (exhaust-housing)
- turbo charger (exhaust-bellows)

2.3.3.10.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.10 and UFSAR Sections 8.3.1.1.6 through 8.3.1.1.6.2.14 using the Tier-2 evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff's review of LRA Section 2.3.3.10 identified areas in which additional information was necessary to complete the review of the applicant's scoping and screening results. Therefore, by letter to the applicant dated April 8, 2005, the staff issued RAIs concerning the specific issues to determine whether the applicant had properly applied the scoping criteria of 10 CFR 54.4 (a) and the screening criteria of 10 CFR 54.21(a)(1). The following paragraphs describe the staff's RAIs and the applicant's related responses.

In RAI 2.3.3.10-1, the staff stated that the DG system has several auxiliary support systems, including the diesel fuel oil system, that must function in order to perform its SR functions. There are two sections of piping associated with fuel oil transfer pump 2A shown on drawing D-02268-LR, sheet 1B, at locations B-3 and B-4, that are shown as being out of scope for license renewal. This is not consistent with the fuel transfer pump 1A shown on drawing D-02268-LR, sheet 1A, at locations B-3 and B-4, which shows the same piping sections as being within the scope of license renewal. Therefore, the staff requested that the applicant provide additional clarification or justification to support the determination that it is acceptable to not include these sections of piping as within the scope of license renewal.

In its response, by letter dated May 4, 2005, the applicant stated that the two sections of piping components associated with fuel oil transfer pump 2A shown on drawing D-02268-LR, sheet 1B, at locations B-3 and B-4, are within the DG system license renewal scoping boundary and subject to an AMR. Therefore, the staff found the applicant's response acceptable and the staff's concern described in RAI 2.3.3.10-1 is resolved.

In RAI 2.3.3.10-2, the staff stated that the DG system has several auxiliary support systems, including the diesel fuel oil system, that must function in order to perform its SR functions. There are several blind flanges and fittings for the DG fuel oil storage tanks listed below that are not consistently treated as being either within the scope or out of the scope of license renewal.

- DG No. 1 fuel oil day tank the 2-inch blind flange on drawing D-02268-LR, sheet 1A, at location F-6, is shown as being out of scope.
- DG No. 1 four day storage tank: the 6-inch blind flange, 24-inch man hole, and 2-inch blind flange on drawing D-02268-LR, sheet 1A, at locations C-4 and B-5, are shown as being in scope.
- DG No. 1 fuel oil transfer pump 1B on drawing D-02268-LR, sheet 1A, at location C-2, has a discharge pressure tap pipe plug down stream of PI-1242-6 that is shown as being out of scope. This is inconsistent with fuel oil transfer pump 1A that has a similar pipe plug downstream of PI-1241-6 that is shown as being in scope.
- DG No. 2 fuel oil day tank: the 2-inch blind flange on drawing D-02268-LR, sheet 1B at location F-6 is shown as being out of scope.
- DG No. 2 four day storage tank: the 6-inch blind flange on drawing D-02268-LR, sheet 1B, at location C-4, is shown as being out of scope.
- DG No. 3 fuel oil day tank: the 2-inch blind flange on drawing D-02269-LR, sheet 2A, at location F-6, is shown as being out of scope.
- DG No. 3 four day storage tank: the 6-inch blind flange, 24-inch man hole, and 2-inch blind flange on drawing D-02269-LR, sheet 2A, at locations C-4 and B-5, are shown as being in scope.
- The diesel seven day storage tank: shown on drawing D-02269-LR, sheet 2A at location B-7 shows a man way, an instrument line flanged access, and a tank fill line that are shown as being out of scope.
- DG No. 4 fuel oil day tank: the 2-inch blind flange, 2-inch blind flange and 6-inch blind flange on drawing D-02269-LR, sheet 2B at locations F-6, B-5, and C-4 are shown as being out of scope.

Therefore, the staff requested that the applicant provide additional clarification or justification to support the determination that it is acceptable to not include the blind flanges and fittings listed above as within the scope of license renewal.

In its response, by letter dated May 4, 2005, the applicant stated that the blind flanges and fittings identified are either piece-parts or miscellaneous appendages of in-scope components and are, therefore, conservatively assumed to be within the diesel fuel oil system license renewal scoping boundary and subject to an AMR. The staff found the applicant's response acceptable, therefore, the staff's concern described in RAI 2.3.3.10-2 is resolved.

In RAI 2.3.3.10-3, the staff stated that the DG system has several auxiliary support systems, including the diesel lube oil system, that must function in order to perform its SR functions. There are several instrument lines, fittings, and piping segments for the diesel generator lube oil systems listed below that are not consistently treated as being either in scope or out of scope for license renewal.

- DG No. 1 engine control panel pressure gage PI-6520 piping on drawing D-02270-LR, sheet 1A, at location F-7, is shown as being out of scope. This is inconsistent with similar pressure gage piping for DG No. 2 on drawing D-02270-LR, sheet 1B, at the same location that is shown as being in scope.
- DG No. 2 sensing line for TI-6542-2 on drawing D-02270-LR, sheet 1B, at location C-6, is shown as being in scope. This is inconsistent with similar sensing lines for DG No. 1 on drawing D-02270-LR, sheet 1A, at the same location that is shown as out of scope. This same sensing line for DG No. 3, TI-6542-3; and DG No. 4, TI-6542-4, is also shown as being out of scope.
- DG No. 1 level switch LS-6562-1 piping on drawing D-02270-LR, sheet 1A, at location E-6 is shown as being out of scope. This is inconsistent with similar level switch piping for DG No. 2 on drawing D-02270-LR, sheet 1B, at the same location that is shown as being in scope.
- DG No. 2 pipe cap downstream of SS-6577-2-10 on drawing D-02270-LR, sheet 1B, at location E-5, is shown as being out of scope. This is inconsistent with similar pipe caps for DG No. 1 on drawing D-02270-LR, sheet 1A, at the same location that is shown as being in scope. This same pipe cap is also shown as being in scope for DG No. 3 and DG No. 4.
- For DG Nos. 1, 3, and 4, there is a 3-inch diameter piping segment on drawings 0-02270-LR, sheet 1A, at location E-4; D-02271-LR, sheet 2A, at location B-4; and D-02271-LR at location B-4 shown as being out of scope. This is inconsistent with DG No. 2 that shows the same 3-inch diameter piping segment at the same location as being in scope.

Therefore, the staff requested that the applicant provide additional clarification or justification to support the determination that it is acceptable to not include the instrument lines, fittings, and piping segments listed above as within the scope of license renewal.

In its response, by letter dated May 4, 2005, the applicant stated that the instrument lines, fittings, and piping segments for the DG lube oil systems listed in RAI 2.3.3.10-3 are within the DG system license renewal scoping boundary and are therefore subject to an AMR. The staff found the applicant's response acceptable; therefore, the staff's concerns identified in RAI 2.3.3.10-3 are resolved.

In RAI 2.3.3.10-4, the staff stated that the DG system has several auxiliary support systems, including the diesel SW system, that must function in order to perform its SR functions. The license renewal documentation shows inconsistencies in how the vent piping and pipe caps are shown for this system. For DG No. 1, there is a vent pipe and pipe caps on drawing D-02274-LR, sheet 1, at location E-3, that are shown as out of the scope of license renewal. There is also a pipe cap for DG No. 2 on drawing D-02274-LR, sheet 1, at location E-6, that is shown as out of scope. The same vent piping and pipe caps for DG No. 3 and DG No. 4 on drawing D-02274-LR, sheet 2, at the same locations are shown in scope. Therefore, the staff requested that the applicant provide additional clarification or justification for not including these sections of piping and pipe caps as within the scope of license renewal.

In its response, by letter dated May 4, 2005, the applicant stated that the vent piping and pipe caps identified in RAI 2.3.3.10-4 are miscellaneous appendages of in-scope components and are, therefore, conservatively assumed to be within diesel SW system license renewal scoping boundary and subject to an AMR. The staff found the applicant's response acceptable; therefore, the staff's concern described in RAI 2.3.3.10-4 is resolved.

In RAI 2.3.3.10-5, the staff stated that the DG system has several auxiliary support systems that must function in order to perform its SR functions including the diesel exhaust and crankcase vacuum blower system. The crankcase vacuum blower discharge lines shown on drawings D-02267-LR, sheets 1 and 2, at locations C-3 and C-6, are not shown as within the scope of license renewal. The crankcase vacuum blower system ensures potentially dangerous crankcase vapors are exhausted to the atmosphere. It is not clear that the crankcase vacuum blower system could perform its intended function if the discharge lines are damaged, pinched off, fail, or are otherwise restricted. Therefore, the staff requested that the applicant provide additional clarification or justification to support the determination that it is acceptable to not include the crankcase vacuum blower discharge lines as within the scope of license renewal.

In its response, by letter dated May 4, 2005, the applicant stated that the piping down stream of the four diesel crank case vacuum blowers is classified in the plant design records as NSR and is not credited as being required for any of the 10 CFR 54.4 (a)(3) events. The applicant stated that the restriction of crank case ventilation in the vacuum blower discharge lines shown on drawings D-02267-LR, sheets 1 and 2, is a hypothetical event outside of the CLB, therefore, not addressed as a scoping consideration under 10 CFR 54.4. The applicant also stated that potential age-related degradation of the piping could allow the leakage of crank case fumes into the diesel building but would not impact the safety function of the DGs.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.10-5 acceptable, because the crank case vacuum blower is a non-safety related component and age related degradation would not impact the safety function of the DG. Thus, it does not perform an intended function within the meaning of the 10 CFR 54.4(a) criteria. Therefore, the staff's concern described in RAI 2.3.3.10-5 is resolved.

2.3.3.10.3 Conclusion

The staff reviewed the LRA, the accompanying scoping boundary drawings, and RAI responses to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the DG system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the DG system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.11 Heat Tracing System

2.3.3.11.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.11, the applicant described the heat tracing system. The original purpose of the freeze protection and heat tracing system was to provide a source of heat to prevent certain system piping from freezing and/or to maintain proper process system fluid temperatures. The system is no longer used for these purposes and its name has been changed to the heat tracing system. However, a steam line from the system supporting CAC system nitrogen vaporization is located in the vicinity of SR equipment in the AOG building. Therefore, it was concluded that the system contains NSR components (steam piping and valve) that have the potential to cause an adverse physical interaction with SR equipment. These components have been included within the scope of license renewal as a result of the 10 CFR 54.4(a)(2) review.

The failure of NSR SSCs in the heat tracing system could potentially prevent the satisfactory accomplishment of an SR function.

The intended function, within the scope of license renewal, is to provide a pressure-retaining boundary/flow.

In LRA Table 2.3.3-9, the applicant identified the following heat tracing system component types that are within the scope of license renewal and subject to an AMR:

- piping and fittings (steam drains)
- valves (check, control, hand, motor operated, safety valves) (body and bonnet)

2.3.3.11.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.11 and UFSAR Sections 10.4.8 and 3A-22 using the Tier-1 evaluation methodology described in SER Section 2.3.

In conducting its Tier-1 review of the two-tier review process, 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 did not omit from the scope of license renewal any components with intended functions delineated under 10 CFR 54.4(a). The staff then reviewed

those components that the applicant identified as being within the scope of license renewal to verify that the applicant did not omit any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.3.11.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the heat tracing system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the heat tracing system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.12 Instrument Air System

2.3.3.12.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.12, the applicant described the instrument air (IA) system. The IA system provides instrument-quality air to pneumatically operated instruments and controls throughout the plant. Instrument air consists of interruptible instrument air and non-interruptible instrument air. The interruptible instrument air system provides operating air to less vital pneumatic instruments and controls and is not essential to safe plant shutdown. The non-interruptible instrument air system is designed with the capability of supplying instrument air requirements in the reactor building (RB) required for plant safety during normal operation. The nitrogen backup system (also designated reactor non-interruptible air (RNA)) provides an independent, SR pneumatic source to selected SR loads in the event of either a LOCA or the loss of the normal pneumatic supply. The CAD system provides a backup to the instrument air header in the AOG building upon loss of instrument air for the CAD subsystem. Components in the IA system automatically actuate and monitor backup nitrogen supplies when required.

The IA system contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the IA system could potentially prevent the satisfactory accomplishment of an SR function. In addition, the IA system performs functions that support fire protection, EQ, and SBO.

The intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary/flow
- provides structural support/seismic integrity

In LRA Table 2.3.3.12, the applicant identified the following IA system component types that are within the scope of license renewal and subject to an AMR:

- piping (piping and fittings)
- valves (including check valves and containment isolation) (body and bonnet)
- air receiver (shell and access cover)

- pressure regulators (body and bonnet)
- filter (shell and access cover)

2.3.3.12.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.12 and UFSAR Section 9.3.1 using the Tier-2 evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff's review of LRA Section 2.3.3.12 identified areas in which additional information was necessary to complete the review of the applicant's scoping and screening results. Therefore, by letter to the applicant dated April 8, 2005, the staff issued RAIs concerning the specific issues to determine whether the applicant had properly applied the scoping criteria of 10 CFR 54.4(a) and the screening criteria of 10 CFR 54.21(a)(1). The following paragraphs describe the staff's RAIs and the applicant's related responses.

In RAI 2.3.3.12-1, the staff stated that the IA system receivers 1A, 1B, 2A, and 2B are within the scope of license renewal and provide a pressure-retaining boundary function; however, none of the air receiver discharge lines that allow the system to provide IA to components are identified as being within the scope of license renewal on the following drawings:

- D-70029-LR, sheet 2B, at location E-7 (line 221-2-170)
- D-72006-LR, sheet 4, at location B-1 (line 201-2-170, 206-2-170, 215-2-170, 220-2-170)
- D-07029-LR, sheet 2A, at location F-1 (line 201-2-170, 251-2-170, 203-2-170)
- D-07029-LR, sheet 2B, at location E-7 (line 221-2-170)

Therefore, the staff requested that the applicant provide information and justify its determination to exclude the identified lines from the scope of license renewal.

In its response, by letter dated May 4, 2005, the applicant stated:

> The referenced Instrument Air (IA) Receivers 1A, 1B, 2A, 2B are located in the Unit 1 and Unit 2 Reactor Buildings and quality classified as non-safety related. These air receivers are discussed in UFSAR Section 3.5.1.1. The IA System safety evaluation is described in UFSAR Section 9.3.1.2.3. BNP-LR-007, "License Renewal Scoping Calculation For Criteria 10 CFR 54.4(a)(2) Nonsafety Affecting Safety-Related Equipment," Revision 2, page 20 states:
>
> > Missiles may be generated by failure of compressed air tanks located within buildings/structures. The Reactor Building air receivers are located in the vicinity

of safety related equipment, hence these receivers are included in the scope of License Renewal.

Thus, the referenced IA Receivers 1A, 1B, 2A, and 2B are in the scope of License Renewal for a spatial interaction, not a functional relationship. The plant does not rely on the instrument air in these receivers to accomplish the function of a safety related or a regulated event component. Failure of the identified lines would not prevent the IA System from performing its required safety functions.

Based on its review, the staff found the applicant's response acceptable because failure of the air receiver discharge lines will not result in failure of the intended safety functions of the systems. Therefore, the staff's concerns described in RAI 2.3.3.12-1 are resolved.

In RAI 2.3.3.12-2, the staff stated that license renewal boundary drawings D-70077-LR, sheet 3A, and D-07077-LR, sheet 3A, both identify the valve B32-F020, at location B-1, as being within the scope of license renewal; however, the lines connecting valve B32-F020 to the IA header are not shown as being within the scope of license renewal. Therefore, the staff requested that the applicant provide information to justify its determination to exclude the piping that connects the IA header to valve B32-F020.

In its response, by letter dated May 4, 2005, the applicant stated:

Valve B32-F020 is a recirculation sample line isolation valve, which is a safety related valve in System 2020. Per design basis document, DBD-002, "Reactor Coolant Recirculation System," Revision 9, Section 4.4.3, this valve is an air-operated globe valve, which receives automatic closure signals. This valve has alternating current solenoid pilots which de-energize to vent air from the diaphragm to allow valve closure by spring action using de-energize-to-close "fail-safe" logic.

The IA System is not required for valve B32-F020 to perform its safety related function. Failure of the IA piping would not cause loss of function of valve B32-F020. This valve fails to the safe position without IA supply. Non-safety related IA lines connecting valve B32-F020 to the IA header are correctly shown as not being within scope.

Based on its review, the staff found the applicant's response acceptable because valve B32-F020 fails to the safe position without IA supply. Failure of the IA piping would not cause loss of function of valve B32-F020. Therefore, the staff's concern described in RAI 2.3.3.12-2 is resolved.

2.3.3.12.3 Conclusion

The staff reviewed the LRA and RAI responses to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the IA system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the IA system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.13 Service Air System

2.3.3.13.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.13, the applicant described the service air (SA) system. The SA system provides compressed air from the service air header to selected auxiliary equipment and to service outlets throughout the plant. A manual cross-tie isolation valve and necessary piping connect the SA headers between units for improved reliability. The SA system has no SR functions other than containment isolation in any mode of operation as the system does not supply air to any component requiring air to perform an SR function. The containment isolation function is performed by a segment of piping that has been cut and capped inside and outside the containment wall. In addition, those portions of the system in close proximity to, and which may adversely interact with, SR equipment are designed to limited seismic qualification requirements and are within the scope of license renewal. The supports for the piping prevent the occurrence of adverse spatial interactions.

The SA system contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the SA system could potentially prevent the satisfactory accomplishment of an SR function. The SA system component types that are within the scope of license renewal and subject to an AMR are addressed as civil commodities in LRA Section 2.4.

2.3.3.13.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.13 and UFSAR Section 9.3.1 using the Tier-1 evaluation methodology described in SER Section 2.3.

In conducting its Tier-1 review of the two-tier review process, 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 did not omit from the scope of license renewal any components with intended functions delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant identified as being within the scope of license renewal to verify that the applicant did not omit any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.3.13.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the SA system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the SA system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.14 Pneumatic Nitrogen System

2.3.3.14.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.14, the applicant described the pneumatic nitrogen system (PNS). The PNS provides gaseous nitrogen to pneumatically operated components in the drywell to prevent an increase in drywell atmosphere oxygen concentration due to releases of air from valve operation and leakage. The nitrogen for PNS is provided from two cryogenic tanks, one for each unit, located in the yard area southeast of the Unit 2 reactor building. This system may be used as backup to service and instrument air. The PNS, which is the normal pneumatic supply to the drywell during plant operation, may be isolated at low power levels (including unit shutdown) to allow personnel access to the drywell. The PNS provides gaseous nitrogen needed for operation of the instrumentation and pneumatic controls in the drywell only during normal plant operation; it has no SR function. Those portions of the system in close proximity to, and which may interact with, SR equipment are designed to limited seismic qualification requirements to prevent undesirable interactions with SR equipment.

The failure of NSR SSCs in the PNS could potentially prevent the satisfactory accomplishment of an SR function. The intended function, within the scope of license renewal, is to provide structural support/seismic integrity.

In LRA Table 2.3.3-11, the applicant identified the following PNS component types that are within the scope of license renewal and subject to an AMR:

- piping (piping and fittings)
- valves (including check valves and containment isolation) (body and bonnet)
- filter (shell and access cover)

2.3.3.14.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.14 and UFSAR Section 9.3.1 using the Tier-2 evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

In reviewing LRA Section 2.3.3.14, the staff identified areas in which additional information was necessary to complete the evaluation of the applicant's scoping and screening results. Therefore, by letter to the applicant dated April 8, 2005, the staff issued RAIs concerning the specific issues to determine whether the applicant had properly applied the scoping criteria of 10 CFR 54.4 (a) and the screening criteria of 10 CFR 54.21(a)(1). The following paragraphs describe the staff's RAIs and the applicant's related responses.

In RAI 2.3.3.14-1, the staff stated that license renewal drawing D-02494-LR, sheet 1, location F-2, has a section of piping with a continuation to D-07077-LR sheet 3A, location F-6, that is not within the scope of license renewal. Note that the continuation could not be found on D-07077-LR sheet 3A, location F-6. Therefore, the staff requested that the applicant provide additional justification as to why this section of pipe is not within the scope of license renewal.

In its response, by letter dated May 4, 2005, the applicant stated:

> Pneumatic Nitrogen System (PNS) Line 2-PNS-001-3/4-167 is a non-safety related line that was brought within the scope of License Renewal because it is required to protect the safety related/non-safety related boundary at valve 2-RNA-SV-5262.
>
> The License Renewal boundary flag on Drawing D-02494-LR, Sheet 1, should have been placed upstream of the reducer (i.e., upstream of 2-RNA-V255) to match the boundary flag location on Drawing D-07077-LR, Sheet 3A.
>
> Line 2-PNS-3-1/2-154 is an NSR line that is not within the scope of License Renewal because it is upstream of the corrected License Renewal boundary flag and its failure does not affect the seismic qualification of the safety related/non-safety related boundary at valve 2-RNA-SV-5262.

Based on its review, the staff found the applicant's response acceptable. Line 2-PNS-3-1/2-154 is an NSR line that is not within the scope of license renewal because it is upstream of the corrected license renewal boundary flag and its failure does not affect the seismic qualification of the SR/NSR boundary at valve 2-RNA-SV-5262. Therefore, the staff's concern described in RAI 2.3.3.14-1 is resolved.

In RAI 2.3.3.14-2, the staff stated that license renewal drawing D-02494-LR, sheet 1, location F-3, depicts the piping, and isolation and bypass valves to 2-PNS-FLT-100 to be within the scope of license renewal. A similar piping arrangement for 2-PNS-FLT-101 (see drawing D-07077, sheet 3B, location C-3) indicates 2-PNS-FLT-101 is not within the scope of license renewal. Therefore, the staff requested that the applicant provide information as to whether 2-PNS-FLT-101 and associated piping and valves are within the scope of license renewal.

In its response, by letter dated May 4, 2005, the applicant stated that line 2-PNS-002-3/4-167 is an NSR line that was brought within the scope of license renewal because it is required to protect the SR/NSR boundary at valve 2-RNA-SV-5261. The license renewal boundary flag on drawing D-02494-LR, sheet 1, should have been placed upstream of the reducer (i.e., upstream of 2-RNA-V256) to match the boundary flag location on drawing D-07077-LR, sheet 3B. Filter 2-PNS-FLT-101 and the associated valves 2-PNS-V5006, 2-PNS-V5007, and 2 PNS V5008 are beyond the corrected license renewal boundary flag and are consequently not required to be within the scope of license renewal.

Based on its review, the staff found the applicant's response acceptable because filter 2-PNS-FLT-101 and the associated valves 2-PNS-V5006, 2-PNS-V5007, and 2 PNS V5008 are beyond the corrected license renewal boundary flag and are consequently not required to be within the scope of license renewal. Therefore, the staff's concern described in RAI 2.3.3.14-2 is resolved.

In RAI 2.3.3.14-3, the staff stated that license renewal drawing D-07077-LR, sheet 3A, location C-6, shows a license renewal boundary designator between valves V255 and 2-PNS-V5004. Drawing D-02494-LR, sheet 1, location F-3, indicates the piping between V255 and V5004 as within scope and piping and valves from PSL 5843A2, 2-PNS-V12, and 2-PNS-V8 to V255, including 2-PNS-V5004 are within the scope of license renewal. The piping between 2-PNS-V12, 2-PNS-V8, 2-PNS-V5004 is shown not shaded on D07077 sheet 3A. A similar situation exists with drawing D-02494-LR, sheet 1, and D-07077-LR, sheet 3B, from V256 through 2-PNS-V11 and 2-PNS-V7. Therefore, the staff requested that the applicant explain these apparent license renewal boundary discrepancies between drawing D-02494-LR, sheet 1, and drawing D-07077-LR, sheet 3A and B, and to provide justification for why the piping between 2-PNS-V12, 2-PNS-V8, 2-PNS-V5004 is not shown as in scope on drawing D-07077-LR sheet 3A.

In its response, by letter dated May 4, 2005, the applicant stated that the license renewal boundary flags on drawings D-07077-LR, sheet 3A and sheet 3B, are associated with the piping upstream of the SR/NSR boundaries for valves 2-RNA-SV-5262 and 2-RNA-SV-5261, respectively. As discussed in the responses to RAI 2.3.3.14-1 and RAI 2.3.3.14-2, the license renewal boundary flags shown on drawing D-02494, sheet 1 are incorrect. Placing the license renewal boundary flags in the correct location will remove the discrepancies among the three referenced drawings: D-02494-LR, sheet 1; D-07077-LR, sheet 3A; and D-07077-LR, sheet 3B.

Based on its review, the staff found the applicant's response acceptable because the license renewal boundary flags shown on drawing D-02494, sheet 1 are incorrect. Placing the license renewal boundary flags in the correct location will remove the discrepancies among the three referenced drawings: D-02494-LR, sheet 1; D 07077 LR, sheet 3A; and D-07077-LR, sheet 3B. Therefore, the staff's concerns described in RAI 2.3.3.14-3 are resolved.

2.3.3.14.3 Conclusion

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

2.3.3.15 Fire Protection System

2.3.3.15.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.15, the applicant described the fire protection system. The Fire Protection Program consists of design features, equipment, personnel, and procedures that combine to provide multi-tiered safeguards against a fire that could impact the health and safety of the public. Within the Fire Protection Program, the fire protection system uses the philosophy of defense in depth. The objectives of the fire protection system are to (1) rapidly detect, control, and promptly extinguish those fires that do occur; (2) provide protection for SSCs important to

safety so that a fire that is not promptly extinguished by the fire suppression activities will not prevent the safe shutdown of the plant; and (3) deliver extinguishing agents to areas of the plant through manually and automatically actuated devices. Both water-based and gaseous fire suppression systems are used. The gaseous systems are the CO_2 and halon systems. Water suppression from duplicate sources, powered by independent means is available from the water-based system in plain water or with foam both automatically and manually through sprinkler, deluge, and hydrant/hose stations. Portable extinguishers are also available to provide an additional level of protection. The fire protection system includes physical barriers (doors, walls, seals, etc.) to inhibit the spread of fire and detection equipment for automatic suppression in selected areas. Carbon dioxide fire suppression is used where the consequences of water damage are severe and the hazard can be mitigated readily by oxygen exclusion. Halon systems provide fire protection for several areas and buildings. Design concepts used in the Fire Protection Program provide assurance that a fire will not cause the complete loss of function of SR systems, even though limited loss of redundancy within one system may occur.

The fire protection system contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the fire protection system could potentially prevent the satisfactory accomplishment of an SR function. In addition, the fire protection system performs functions that support fire protection.

The intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary/flow
- provides flow restriction (throttle)
- provides heat transfer
- provides adequate flow in a properly-distributed spray pattern

In LRA Table 2.3.3-12, the applicant identified the following fire protection system component types that are within the scope of license renewal and subject to an AMR:

- piping and fittings (includes carbon steel fire water tank)
- filter, fire hydrants, mulsifier, pump casing, sprinkler, strainer, and valve bodies (including containment isolation valves)
- HTX - heat exchanger shell and access cover
- HTX - heat exchanger tubes
- diesel-drivel fire pump and fuel supply line
- CO_2 fire suppression (HPCI)
- Halon fire suppression installed in the diesel generator building (DGB)

2.3.3.15.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.15 and UFSAR Section 9.5.1 using the evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff also reviewed approved FP safety evaluation report dated November 22, 1977, for BSEP Unit 1 and 2, and supplements dated November 10, 1981, July 27, 1983, December 30, 1986, May 29, 1987, and August 27, 1987. This report is referenced directly in the BSEP Unit 1 and 2 fire protection current licensing basis (CLB) and summarize the FP program and commitments to 10 CFR 50.48 using the guidance of Appendix A to Branch Technical Position (BTP) Chemical and Mechanical Engineering Branch (CMEB) 9.5-1. The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff's review of LRA Section 2.3.3.15 identified areas in which additional information was necessary to complete the review of the applicant's scoping and screening results. Therefore, by letter to the applicant dated April 8, 2005, the staff issued RAIs concerning the specific issues to determine whether the applicant had properly applied the scoping criteria of 10 CFR 54.4(a) and the screening criteria of 10 CFR 54.21(a)(1). The following paragraphs describe the staff's review of the fire protection sections of the LRA:

In RAI 2.3.3.15-1, the staff stated that UFSAR Section 9.5.1.4.1.4 discusses the water fire protection system, including the fixed manual suppression system hose stations with hose racks and hose reels. LRA Section 2.3.3.15 references drawing F-02315-LR, sheet 1 "Unit 1 & 2, Charcoal Adsorber System, Miscellaneous Services, Piping & Instrumentation Diagram" for license renewal scoping boundaries for the fire protection system. Drawing F-02315-LR, sheet 1 shows hose station/hose racks AOG 59 and AOG-60, and hose station/hose reels AOG-57, AOG-58, and AOG 61 in scope. Hose station/hose reel AOG-62 is shown out of scope. Therefore, the staff requested that the applicant justify hose station/hose reel AOG-62 as being out of scope.

In its response, by letter dated May 4, 2005, the applicant stated:

> AOG-62 was incorrectly classified in the equipment data base (EDB) and, therefore, was not included in scope. However, AOG-62 is in scope and should have been marked on drawing F-02315-LR as within the scoping boundary.

Based on its review, the staff found the applicant's response acceptable because it adequately explains that the components in question 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), but were inadvertently left unhighlighted on the license renewal drawing in question, F-02315-LR. The staff concluded that the components were correctly included within the scope of license renewal and subject to an AMR. Therefore, the staff's concern described in RAI 2.3.3.15-1 is resolved.

In RAI 2.3.3.15-2, the staff stated that UFSAR Section 9.5.1.4.1.4 discusses the water fire protection system, including the fixed manual suppression system hose stations with hose racks and hose reels. In UFSAR Section 9.5.1.5, the specific fire hazards analysis for fire area MWT-1 Makeup Water Treatment states: "Manual fire fighting in the area should not be difficult. A hose line and portable fire extinguishers are available in the area to assist in manual fire fighting." LRA

Section 2.3.3.15 references drawing D-02304-LR for license renewal scoping boundaries for the fire protection system. On Drawing D-02304-LR, Hose station/hose reel 2-WT-HR-#1 is shown out of scope. Therefore, the staff requested that the applicant justify this hose station/hose reel as out of scope.

In its response, by letter dated May 4, 2005, the applicant stated:

> The EDB quality classifications for credited fire protection components are B-31, B-32, B-33, B-34, B-35, and B-42. The hose reel, 2-FP-WT-HR-1, is classified as quality class D-99 (i.e., non-seismic/non-safety related). The BSEP fire protection commitment document does not identify a commitment for hose reels within the Water Treatment Building. As such, the subject hose reel does not support a License Renewal fire protection intended function, and is correctly identified as out of scope.

Based on its review, the staff found the applicant's response to RAI 2.3.3.15-2 acceptable because it adequately explains that hose reel 2-FP-WT-HR-1 in the water treatment building is not credited to meet the requirements of 10 CFR 50.48 and is not part of the plant CLB. The staff concluded that the components were correctly excluded from within the scope of license renewal and from being subject to an AMR. Therefore, the staff's concern described in RAI 2.3.3.15-2 is resolved.

In RAI 2.3.3.15-3, the staff stated that UFSAR Section 9.5.1.4.1.4 discusses the water fire protection system, including the fixed automatic suppression system. In UFSAR Section 9.5.1.5, the specific fire hazards analysis for fire area Makeup Water Treatment (MWT)-1 states: "Fire protection includes an automatic sprinkler system with heads located at the ceiling level." LRA Section 2.3.3.15 references drawing D-02304-LR for license renewal scoping boundaries for the fire protection system. On Drawing D-02304-LR (B-8), Sprinkler nozzle 764-I-J-2 is shown out of scope. Therefore, the staff requested that the applicant justify this sprinkler nozzle as out of scope.

In its response, by letter dated May 4, 2005, the applicant stated:

> Sprinkler pipe was inadvertently not highlighted on Drawing D-02304. The sprinkler piping is in scope for License Renewal.

Based on its review, the staff found the applicant's response to RAI 2.3.3.15-3 acceptable because it adequately explains that the components in question 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), but were inadvertently not highlighted on the license renewal drawing in question, D-02304-LR. The staff concluded that the components were correctly included within the scope of license renewal and subject to an AMR. Therefore, the staff's concern described in RAI 2.3.3.15-3 is resolved.

In RAI 2.3.3.15-4, the staff stated that UFSAR Section 9.5.1.4.1.4 discusses the water fire protection system, including the fixed manual suppression system foam-water hose stations located in the diesel generator building to provide backup suppression for the four-day tank rooms and the oil bath air filters. In UFSAR Section 9.5.1.5, the specific fire hazards analysis for fire areas DG-19 Fuel Oil Tank Cell 1, DG-20 Fuel Oil Tank Cell 2, DG-21 Fuel Oil Tank Cell 3, and DG-22 Fuel Oil Tank Cell 4 states: "Manual fire fighting could be difficult should a significant

oil fire occur. Because the tanks are located below grade, access for fire fighting could be difficult. A foam standpipe is available from an adjacent area." LRA Section 2.3.3.15 references drawing D-02301-LR for license renewal scoping boundaries for the fire protection system. On Drawing D-02301-LR, the foam hose station/hose reel AFFF-HR1 is shown out of scope. Therefore, the staff requested that the applicant justify this hose station/hose reel as out of scope.

In its response, by letter dated May 4, 2005, the applicant stated:

> The CLB requires an automatic Aqueous Film Forming Foam (AFFF) System meeting the requirements of National Fire Protection Association (NFPA)-11B to protect the fuel tank bunkers. The CLB also requires two AFFF portable concentrate stations, one to be located in the DG Building and the other in the yard area for the purpose of combating fires in the day tanks, auxiliary boiler, etc. Each portable station provides 20 minutes of AFFF. The two portable AFFF concentrate stations satisfy the licensing commitment.
>
> The piping portion of the AFFF System is in scope up to the hose reel isolation valve to maintain system integrity. Fixed foam station AFFF-HR1 is shown correctly as out of scope for License Renewal.

Based on its review, the staff found the applicant's response to RAI 2.3.3.15-4 acceptable because it adequately explains that hose reel 2-FP-AFFF-HR1 in the Diesel Generator Building is not credited to meet the requirements of 10 CFR 50.48 and is not part of the plant CLB. The staff concluded that the components were correctly excluded from the scope of license renewal and from being subject to an AMR. Therefore, the staff's concern described in RAI 2.3.3.15-4 is resolved.

In RAI 2.3.3.15-5, the staff stated that UFSAR Section 9.5.1.4.1.4 discusses the water fire protection system, including the fixed manual suppression system foam-water hose stations located in the diesel generator building to provide backup suppression for the four-day tank rooms and the oil bath air filters. In UFSAR Section 9.5.1.5, the specific fire hazards analysis for fire zone DG-16 Fan Room states: "Manual fire fighting should not be difficult. Water standpipes and foam standpipes are provided to assist in manual fire fighting." LRA Section 2.3.3.15 references drawing D-02302-LR "Unit 1 & 2, Diesel Generator Building, Fire Protection Foam (AFFF) System, Piping Diagram" for license renewal scoping boundaries for the Fire Protection system. On Drawing D-02302-LR, Foam hose station/hose reels AFFF-HR2 and AFFF-HR-3 are shown out of scope. Therefore, the staff requested that the applicant justify these hose station/hose reels as out of scope.

In its response, by letter dated May 4, 2005, the applicant stated:

> The CLB requires an automatic AFFF System meeting the requirements of NFPA-11B to protect the fuel tank bunkers. Fire Protection commitment number AF-003 requires an AFFF System and oil retaining system be added to the oil air intake filters. AFFF-HR2 and AFFF-HR3 are BSEP 05-0050 manual systems and therefore not a fire protection commitment. As such, foam hose stations AFFF-HR2 and AFFF-HR3 are correctly shown out of scope.

The piping portion of the AFFF System is in scope up to the hose reel isolation valve to maintain system integrity.

Based on its review, the staff found the applicant's response to RAI 2.3.3.15-5 acceptable because it adequately explains that hose reels 2-FP-AFFF-HR2 and 2-FP-AFFF-HR3 in the Diesel Generator Building are not credited to meet the requirements of 10 CFR 50.48 and are not part of the plant CLB. The staff concluded that the components were correctly excluded from the scope of license renewal and from being subject to an AMR. Therefore, the staff's concern described in RAI 2.3.3.15-5 is resolved.

In RAI 2.3.3.15-6, the staff stated that UFSAR Section 9.5.1.4.1.4 discusses the water fire protection system, including the electric motor driven fire pump (P-2), the diesel engine driven fire pump (P-1) and the two jockey pumps (P-3 and P-4) providing water for fire suppression and fire fighting. UFSAR Section 9.5.1.4.1.5 discusses the instrumentation and control of the water supply, including the jockey pumps and the electric motor driven pump and diesel engine driven pump. LRA Section 2.3.3.15 references drawing D-04106-LR "Unit 1 & 2, Plant Fire Protection System, Piping Diagram" for license renewal scoping boundaries for the Fire Protection system. On Drawing D-04106-LR, it is unclear if the Control Panels for Pumps P-1 (Engine Driven Fire Pump), P-2 (Motor Driven Fire Pump), P-3 (Jockey Pump), and P-4 (Jockey Pump) are in scope. Therefore, the staff requested that the applicant clarify the status of these control panels, and justify exclusion if they are out of scope.

In its response, by letter dated May 4, 2005, the applicant stated that:

Electrical panels for Fire Pumps P-1 (i.e., Engine Driven), P-2 (i.e., Motor Driven) and P-3/P-4 (i.e., jockey) are in scope. The electrical enclosures are shown as managed commodities on Table 3.5.2-14 of the application.

Based on its review, the staff found the applicant's response to RAI 2.3.3.15-6 acceptable because it adequately clarifies that the components in question 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). Therefore, the staff's concern described in RAI 2.3.3.15-6 is resolved.

In RAI 2.3.3.15-7, the staff stated that UFSAR Section 9.5.1.4.3.4 discusses propagation/damage control features that are used to prevent the unhindered spread of fire and also to protect equipment from fire exposures. License renewal section 2.3.3.15 states that physical barriers are addressed in the License Renewal review as structural commodities in Section 2.4. Therefore, the staff requested that the applicant clarify that the following have been included within the scope of license renewal, or justify the exclusion from the scope of license renewal:

(1) Impingement shields installed between exposed cables of redundant trains of safe shutdown equipment when the trains are within 5 feet vertically or 3 feet horizontally of each other.

(2) Impingement shields installed between the two fire pumps and between the diesel fire pump fuel tank and the fire pumps. (Discussed in UFSAR Section 9.5.1.5 fire hazard analysis writeup for fire area MWT-1 Makeup Water Treatment)

(3) Flame retardant coatings applied to conduit and cable trays in cable access ways and spreading areas.

(4) Fire stops in Cable Trays.

In its response, by letter dated May 4, 2005, the applicant stated that:

(1) Impingement shields are addressed within the "Fire Barrier Assembly" and "Sprayed on Coatings" commodity groups. See LRA Tables 2.4.2-6, 2.4.2-7, 2.4.2-9, 2.4.2-10, 2.4.2-11, and 2.4.2-13.

(2) Impingement shields installed between the two fire pumps and between the diesel fire pump fuel tank and the fire pumps are addressed within the "Fire Barrier Assembly" commodity group, see LRA Table 3.5.2-13. However, based on a walkdown inspection of the impingement barriers, the "Fire Barrier Assembly"between the diesel fire pump fuel tank and the fire pumps was observed to be masonry block. The LRA Table 3.5.2-14 identifies the material type of the impingement shield as only carbon steel; as such, the Table will be revised to identify the "Fire Barrier Assembly" material type as Carbon Steel and Masonry Block. Both Fire Barrier Assemblies are addressed with the Fire Protection Program and are managed as fire barriers.

(3) Flame retardant coatings applied to conduit and cable trays are addressed within the "Fire Barrier Assembly" and "Sprayed on Coatings" commodity groups. See LRA Tables 2.4.2-6, 2.4.2-7, 2.4.2-9, 2.4.2-10, 2.4.2-11, and 2.4.2-13.

(4) Fire stops in cable trays are addressed within the "Fire Barrier Assembly" and "Sprayed on Coatings" commodity groups. See LRA Tables 2.4.2-6, 2.4.2-7, 2.4.2-9, 2.4.2-10, 2.4.2-11, and 2.4.2-13.

Based on its review, the staff found the applicant's response to RAI 2.3.3.15-7 acceptable because it adequately clarifies that the components in question 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). Therefore, the staff's concern described in RAI 2.3.3.15-7 is resolved.

2.3.3.15.3 Conclusion

The staff reviewed the LRA and RAI responses to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the fire protection system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the fire protection system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.16 Fuel Oil System

2.3.3.16.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.16, the applicant described the fuel oil (FO) system. The FO system supplies No. 2 fuel oil for use by the auxiliary boiler, diesel fire pump, and emergency diesel engines. The FO system consists of the main diesel fuel oil storage and unloading subsystem, the fire pump diesel engine fuel oil subsystem, and the auxiliary boiler fuel oil subsystem. The main fuel oil storage tank in the main diesel fuel oil storage and unloading subsystem can supply each of the DG 4-day fuel oil storage tanks with fuel to support seven days of diesel operation. The tank is not SR; however, it is within the scope for license renewal because it supports an SR function. As discussed in the UFSAR, to ensure a 7-day supply following postulated damage to the main fuel oil storage tank, fuel oil can be readily obtained by truck or rail directly to the Brunswick plant, or by barge on the Cape Fear River or Intracoastal Waterway to local docks and off-loaded into trucks for delivery to the site.

The failure of NSR SSCs in the FO system could potentially prevent the satisfactory accomplishment of an SR function. The FO system also performs functions that support fire protection. The intended function, within the scope of license renewal, is to provide a pressure-retaining boundary/flow.

In LRA Table 2.3.3.16, the applicant identified the following FO system component types that are within the scope of license renewal and subject to an AMR:

- diesel-driven fire pump and fuel supply line
- valves body and tubing
- diesel fuel tank
- piping (aboveground pipe and fittings)
- valves (body and bonnet)
- tank (internal/external surface)

2.3.3.16.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.16 and UFSAR Section 8.3.1.1.6.2.8 using the Tier-2 evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff did not identify any omissions. The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

Staff found that both "Table 2.3.3-12 Component/Commodity groups requiring aging management review and their intended functions: fire protection systems" and "Table 2.3.3-12 Component/Commodity groups requiring aging management review and their intended functions: Fuel Oil Systems" list the Diesel-Driven Fire Pump and Fuel Supply Line as a Component/Commodity requiring aging management review, with the intended function of —1 Provide pressure retaining boundary. Staff finds that the 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).

On the basis of its review, the staff found that the applicant has identified those portions of the engine driven fire pump fuel oil system that meet the scoping requirements of 10 CFR 54.4(a) and has included them within the scope of license renewal in LRA Section 2.3.3.16. The applicant has also included engine driven fire pump fuel oil system components that are subject to an AMR in accordance with the requirements of 10 CFR 54.4(a) and 10 CFR 54.21(a)(1) in LRA Table 2.3.3.-12. The staff did not identify any omissions.

2.3.3.16.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the FO system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the FO system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.17 Radioactive Floor Drains System

2.3.3.17.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.17, the applicant described the radioactive floor drains system. Buildings at BSEP are designed and constructed to serve specific purposes and contain equipment necessary for the operation of the plant and to ensure safety to the general public. Each building is fitted with the necessary support equipment to ensure that the function of the building is fulfilled. The layout of drains and routing of drains to sumps ensures that water does not accumulate on floors and that radiologically contaminated water does not mix with non-contaminated water. The function of the radioactive floor drains system is to route all floor drains to the proper disposal facility. The contaminated floor drainage system includes all floor drains from the reactor building, turbine building, AOG building, the radwaste building, and other floor drains having a potential for radioactive spillage. The collected drainage is transferred to the radwaste facility for processing.

The radioactive floor drains system contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the radioactive floor drains system could potentially prevent the satisfactory accomplishment of an SR function. In addition, the radioactive floor drains system performs functions that support EQ.

The intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary/flow
- provides structural support/seismic integrity

In LRA Table 2.3.3-14, the applicant identified the following radioactive floor drains system component types that are within the scope of license renewal and subject to an AMR:

- piping (piping and fittings)

- valves (body and bonnet)
- flow orifice (body)
- pump (casing)
- tank (shell)
- drain system sump pumps

2.3.3.17.2 Staff Evaluation

The staff reviewed LRA 2.3.3.17 and UFSAR Section 9.3.3 using the Tier-2 evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

In reviewing LRA Section 2.3.3.17, the staff identified areas in which additional information was necessary to complete the evaluation of the applicant's scoping and screening results. Therefore, by letter to the applicant dated April 8, 2005, the staff issued RAIs concerning the specific issues to determine whether the applicant had properly applied the scoping criteria of 10 CFR 54.4 (a) and the screening criteria of 10 CFR 54.21(a)(1). The following paragraphs describe the staff's RAIs and the applicant's related responses.

In RAI 2.3.3.17-1, the staff stated that license renewal boundary drawing D-02543-LR, sheet 1B, location E-8, shows dirty radiological waste (DRW) drain piping which receives fluid from in-scope drains on the 80-foot elevation and connects to the in-scope 6-inch DRW drain to the RHR sump. The DRW drain piping is not identified as being in scope, even though it is connected to in-scope piping. Therefore, the staff requested that the applicant provide additional information to justify its determination to exclude the DRW piping at location E-8 from within the scope of license renewal.

In its response, by letter dated May 4, 2005, the applicant stated that the subject piping is within the radioactive floor drains system license renewal scoping boundary and subject to an AMR in accordance with 10 CFR 54.4(a)(2).

Based on its review, the staff found the applicant's response acceptable because the subject DRW piping is within the scope of license renewal. Therefore, the staff's concern described in RAI 2.3.3.17-1 is resolved.

In RAI 2.3.3.17-2, the staff stated that on license renewal drawing D 02533 LR, sheet 2, locations B-8 and C-8, for the lines identified below, the transition locations from out-of-scope to in-scope is inconsistent with the continuation drawings indicated. Therefore, the staff requested that the applicant provide additional information to resolve the apparent inconsistency in the license renewal boundary drawings.

- 1-G16-507-4-160 (D25043-1B, C-8)
- 1-G16-510-2-160 (D25046, C-1)
- 1-G16-511-2-160 (D25046, C-8)
- 2-G16-507-4-160 (D2543-1B, C-8)
- 2-G16-511-2-160 (D2546, C-8)

In its response, by letter dated May 4, 2005, the applicant stated:

> Lines 1-G16-503-3-160 and 2-G16-503-4-160, on drawing D-02533-LR, sheet 2, support the function of detecting leakage from the RCPB in accordance with Regulatory Guide (RG) 1.45. (See LRA page 2.3-77.) The connected piping and floor drain collection tank, highlighted on drawing D-02533-LR, sheet 2, at locations B-8 and C-8, were credited in the seismic stress analysis for RG 1.45 compliance. See the response to RAI 2.3.3.17-3 for additional information. Additionally, the portion of 1/2-G16-507 and 511 and 1-G16-510 in the reactor building as well as in the radwaste pipe tunnel in the vicinity of safety related SW valves are non-safety related components, which by virtue of their location, may cause adverse spatial interactions with safety related components and, therefore, are within the scoping boundary.

Based on its review, the staff agrees with the applicant's clarification discussed above and finds the applicant's response acceptable. Therefore, the staff's concern described in RAI 2.3.3.17-2 is resolved.

In RAI 2.3.3.17-3, the staff stated that LRA Table 2.3.3.3-14, "Component/Commodity Groups Requiring Aging Management Review and Their Intended Functions for the Radioactive Floor Drain System," identifies the pump casing and floor drain tank as within the scope of license renewal. On drawing D02533-LR, sheet 2, at location B-5, the line (213-4-161, 240-4-160) from the floor drain collector tank to the suction of the floor drain collector pump is not identified as within the scope of license renewal. Additionally, several other lines (234-6-160 at D-8, V71 to radwaste building wall, 528-3-160 at C-7, 532-3-160 at A-7, and 2-G16-958-3-160 at C-7, 223-6-160, 250-3-160) leading to and from the drain tank are not included within the scope of license renewal. Therefore, the staff requested that the applicant provide information to justify its determination to exclude these lines and the floor drain collector pump casing from within the scope of license renewal.

In its response, by letter dated May 4, 2005, the applicant stated that the floor drain collection tank, 2-G16-A006, on drawing D-02533-LR, sheet 2, at location B-5, was credited in the seismic stress analysis supporting the function of detecting leakage from the RCPB in accordance with RG 1.45. The tank and subject piping is associated with the liquid waste processing system described in LRA Section 2.3.3.24. As shown on LRA Table 2.3.3-19, tanks in the liquid waste processing system have been assigned the —1 intended function, "Provide pressure-retaining boundary." BSEP methodology typically assigned the —1 component intended function to pressure-retaining mechanical components designated in the EDB as NSR whose failure could impact an SR function. While the —4 function designation may have been more appropriate for the floor drain collection tank, the —1 function designation is conservative; and applicable AMRs are directed towards maintaining pressure boundary integrity. The portions of 2-G16-528/532-3-160 credited in the seismic analysis are within the scope of license renewal and appropriately highlighted on drawing D-02533-LR, sheet 2. The remaining NSR piping and

components noted in RAI 2.3.3.17-3 are not included in the seismic analysis terminating at 2-G16-A006 and, therefore, have no intended function.

Based on its review, the staff found the applicant's response acceptable because the applicant has provided justification as to why the components in question are not included within the seismic analysis and have no intended function and thereby do not need to be included within the scope of license renewal. Therefore, the staff's concern described in RAI 2.3.3.17-3 is resolved.

2.3.3.17.3 Conclusion

The staff reviewed the LRA, the accompanying scoping boundary drawings, and RAI responses to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the radioactive floor drains system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the radioactive floor drains system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.18 Radioactive Equipment Drains System

2.3.3.18.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.18, the applicant described the radioactive equipment drains system. The buildings at BSEP are designed and constructed to serve specific purposes and contain equipment necessary for the operation of the plant and to ensure safety to the general public. Each building is fitted with the necessary support equipment to ensure that the function of the building is fulfilled. The layout of drains and routing of drains to sumps ensure that water does not accumulate on floors and that radiologically contaminated water does not mix with non-contaminated water. The function of the radioactive equipment drains system is to route all equipment drains to the proper disposal facility. Reactor building equipment drains are collected in two separate subsystems. One handles drainage from all equipment drains located in the drywell; the other handles drainage from equipment drains located in the reactor building. Individual drywell equipment drain lines collect in branch lines and discharge to the drywell equipment drain sump; sump pumps transfer the collected fluid to the radwaste system. The system includes automatic containment isolation valves on lines penetrating the primary containment. These valves provide the primary containment isolation function following postulated DBEs.

The radioactive equipment drains system contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the radioactive equipment drains system could potentially prevent the satisfactory accomplishment of an SR function. In addition, the radioactive equipment drains system performs functions that support EQ.

The intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary/flow
- provides flow restriction (throttle)
- provides structural support/seismic integrity

In LRA Table 2.3.3-15, the applicant identified the following radioactive equipment drains system component types that are within the scope of license renewal and subject to an AMR:

- piping (piping and fittings)
- valves (body and bonnet)
- heat exchanger (shell and access cover)
- flow orifice (body)
- pump (casing)
- tank (shell)

2.3.3.18.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.18 and UFSAR Section 9.3.3.3 using the Tier-2 evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

In reviewing LRA Section 2.3.3.18, the staff identified areas in which additional information was necessary to complete the evaluation of the applicant's scoping and screening results. Therefore, by letter to the applicant dated April 8, 2005, the staff issued RAIs concerning the specific issues to determine whether the applicant had properly applied the scoping criteria of 10 CFR 54.4 (a) and the screening criteria of 10 CFR 54.21(a)(1). The following paragraphs describe the staff's RAIs and the applicant's related responses.

In RAI 2.3.3.18-1, the staff stated that LRA Table 2.3.3.3-15, "Component/Commodity Groups Requiring Aging Management Review and Their Intended Functions for the Radioactive Equipment Drains System," identified the equipment drain tank as in scope for license renewal. On drawings D-25043-LR, sheet 1A; and D-02543-LR, sheet 1A, at location A-7, the equipment drain tank shows several lines entering (8" CRW drain, 6" CV-FO11, 2" 1-160) and two exiting (4" CRW vent and 524-3-161 at A-7) that are not within the license renewal boundary. Therefore, the staff requested that the applicant provide additional information to justify its determination to exclude these lines from within the scope of license renewal.

In its response, by letter dated May 4, 2005, the applicant stated:

The Clean Radwaste (CRW) piping described in the Radioactive Equipment Drains System collects treated water from equipment leak-off for transfer to the Radwaste System. The BSEP 10 CFR 54.4(a)(2) scoping methodology allows for the exclusion from applicability of non-safety piping and components that are not normally liquid or steam-filled during operation (e.g. normally empty pipe) with a low probability of failure during actual use. Based on these considerations and operating experience, normally empty, unpressurized, non-safety CRW piping and components do not present a spatial interaction hazard for safety related components.

The Equipment Drain Tanks and connected piping, shown on drawings D-02543-LR, Sheet 1A, and D-25043-LR, Sheet 1A, illustrate this scoping approach. The Equipment Drain Tanks are normally partially filled with an overflow that vents to the atmospheric pressure Radioactive Floor Drain System through 1/2-G16-524-3-161, which has no intended function. The piping exiting the Equipment Drain Tanks and connecting to the equipment drain pumps, 1/2-G16-C007, is normally liquid-filled and within the License Renewal scoping boundary. The piping down stream of the Equipment Drain Pump is normally liquid filled, can be pressurized and is within the License Renewal scoping boundary. The only lines entering the top of the Equipment Drain Tanks shown as in-scope for License Renewal is the return line from the Equipment Drain Tank cooling heat exchanger, 1/2-G16-B002, which was conservatively assumed to be liquid-filled and pressurized.

In summary, the portion of the Radioactive Equipment Drains System marked, on D-02543-LR, Sheet 1A, and D-25043-LR, Sheet 1A at Location A-7, as being within the License Renewal scoping boundary is for compliance with 10 CFR 54.4(a)(2).

Based on its review, the staff found the applicant's response to RAI 2.3.3.18-1 acceptable, because the subject equipment drain tanks and their associated piping: are non-safety related components; do not perform an intended function which satisfies any one of the 10 CFR 54.4(a) criteria; and do not perform a spatial interaction hazard for safety related components. Therefore, the staff's concern described in RAI 2.3.3.26-1 are resolved

Based on its review, the staff found the applicant's response to RAI 2.3.3.18-1 acceptable because the subject equipment drain tanks and their associated piping are non-safety related components that do not present a spatial interaction hazard for safety related components and, thus, do not perform an intended function pursuant to the 10 CFR 54.4(a) criteria. Therefore, the staff's concern described in RAI 2.3.3.26-1 are resolved.

In RAI 2.3.3.18-2, the staff stated that license renewal drawing D-25043-LR, sheet 1A, location E-5, identifies a portion of drain piping as being within the scope of license renewal. However, the CRW line into which it flows to return to the equipment drain tank is not shown as being within scope. Therefore, the staff requested that the applicant provide additional information to justify its determination to exclude this piping from within the scope of license renewal. Also, the same drain line shown on Unit 2 drawing D-02543-LR, sheet 1A, location E-4, is not within the scope of license renewal. The applicant was also requested to provide a rationale as to why the same drain line on Unit 2 is not within the scope of license renewal.

In its response, by letter dated May 4, 2005, the applicant stated that the piping connected to hub-drain, C45HD, on drawing D-25043-LR, sheet 1A, at location E-5, was marked in error as

being within the license renewal scoping boundary. This piping is normally empty, unpressurized, NSR CRW piping with no intended function. The corresponding Unit 2 components are correctly represented on D-02543-LR, sheet 1A. Information provided in response to RAI 2.3.3.18-1 provides a more complete discussion of 10 CFR 54.4(a)(2) scoping evaluations for the radioactive equipment drains system.

Based on its review, the staff found the applicant's response acceptable, because the drawings were labeled in error. This response is consistent with RAI 2.3.3.18-1 which was also found to be acceptable. Therefore, the staff's concerns described in RAI 2.3.3.18-2 are resolved.

In RAI 2.3.3.18-3, the staff stated that license renewal drawing D-02531-LR, sheet 1, location C-7, shows the waste collector tank as being within the scope of license renewal because it provides a pressure boundary function. There are several lines that exit the tank that are not included within the scope of license renewal. Therefore, the staff requested that the applicant provide additional information to justify its reason for excluding the piping identified below and associated isolation valves from the scope of license renewal.

- Line 14-4-161 and valve F036
- Line 35-4-161 and valve F033, F143
- Line 677-1/2-161 and its first isolation valve
- Line 2G41-59-8-154
- Instrument level transmitter N026 and valve V338
- Waste collector pump suction line 1-4-152 and valve F034
- Line 9-8-160 and 2-inch CDW/SCRD cap

In its response, by letter dated May 4, 2005, the applicant stated:

> The Waste Collection Tank, 2-G16-A002, on drawing D-02531-LR, Sheet 1, at Location C-7,was credited in the seismic stress analysis as supporting the function of detecting leakage from the RCPB in accordance with RG 1.45. The tank and subject piping is associated with the Liquid Waste Processing System described in LRA Section 2.3.3.24. As shown on LRA Table 2.3.3-19, tanks in the Liquid Waste Processing System have been assigned the —1 intended function, "Provide pressure-retaining boundary." BSEP methodology typically assigned the —1 component intended function to pressure retaining mechanical components designated in the EDB as non-safety whose failure could impact a safety function. While the —4 function designation may have been more appropriate for the Waste Collection Tank, the —1 function designation is conservative and applicable aging management reviews are directed towards maintaining pressure boundary integrity. The Waste Collection Pump suction line, 2-G16-1-4-152, and isolation valve, 2-G16-F034, are within the system scoping boundary and BSEP 05-0050 Enclosure 1 Page 45 of 87 should have been highlighted on drawing D-02531-LR, Sheet 1. The remaining non-safety piping and components noted in RAI 2.3.3.18-3 are not included in the seismic analysis terminating at 2-G16-A002 and, therefore, have no intended function.

Based on its review, the staff found the applicant's response acceptable because the applicant has corrected errors with the waste collection pump suction line, 2-G16-1-4-152, and isolation valve, 2-G16-F034. The remaining components are consistent with the response for those

similar items in RAI 2.3.3.18-1 and 2 and are also acceptable. Therefore, the staff's concerns described in RAI 2.3.3.18-3 are resolved.

2.3.3.18.3 Conclusion

The staff reviewed the LRA, the accompanying scoping boundary drawings, and RAI responses to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the radioactive equipment drains system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the radioactive equipment drains system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.19 Makeup Water Treatment System

2.3.3.19.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.19, the applicant described the makeup water treatment system (MWTS). The MWTS supplies all normal requirements for demineralized water throughout the plant. The water supply to the MWTS is the county water system (formerly the supply was from the well water system). Piping in the MWTS is used to supply county water directly to the fire protection water tank for makeup. Demineralized water from the MWTS is supplied to the 200,000-gallon demineralized water storage tank from which redundant pumps distribute it through the plant demineralized water piping. The MWTS is a shared system between units providing a supply of high purity water free of materials that could become radioactive.

The MWTS contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the MWTS could potentially prevent the satisfactory accomplishment of an SR function. In addition, the MWTS performs functions that support fire protection. The intended function, within the scope of license renewal, is to provide a pressure-retaining boundary/flow.

In LRA Table 2.3.3-16, the applicant identified the following MWTS component types that are within the scope of license renewal and subject to an AMR:

- piping (piping and fittings)
- valves (body and bonnet)
- piping (piping and fittings)
- valves (body and bonnet)
- tank (shell)

2.3.3.19.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.19 and UFSAR Section 9.2.3 using the Tier-2 evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 within the scope of license renewal any components with intended functions delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

In reviewing LRA Section 2.3.3.19, the staff identified areas in which additional information was necessary to complete the evaluation of the applicant's scoping and screening results. Therefore, by letter to the applicant dated April 8, 2005, the staff issued RAIs concerning the specific issues to determine whether the applicant had properly applied the scoping criteria of 10 CFR 54.4(a) and the screening criteria of 10 CFR 54.21(a)(1). The following paragraphs describe the staff's RAIs and the applicant's related responses.

In RAI 2.3.3.19-1, the staff stated that LRA Table 2.3.3-16 identifies the intended function for demineralized water system tank (shell) components requiring aging management review as —1, "Provide pressure-retaining boundary." License renewal boundary drawings D-02040-LR, sheet 1A (quadrant C-6), and D-02040-LR, sheet 1B (quadrant C-4), show Unit 1 and 2 CST shells as being within the scope of license renewal. However, some of the Unit 1 and 2 CST shell nozzle locations are connected to non-isolable portions that are shown as not being within scope of license renewal and some isolable piping that are shown as not within scope up to and including the first isolation valve. Therefore, the staff requested that the applicant provide additional information justifying the in-scope boundaries selected for the non-isolable piping connected to CST shell nozzles.

In its response, by letter dated May 4, 2005, the applicant stated:

> The CSTs are non-safety related, located in the yard and in the scope of License Renewal under 10 CFR 54.4(a)(3), for compliance with Station Blackout (SBO) requirements. UFSAR Section 9.2.6.2 describes the configuration of the CST, specifically identifying 12 inch and 16 inch piping with connection centerlines to the tank at the 10 foot level that preserve the inventory below that point for use by the High Pressure Coolant Injection (HPCI) and Reactor Core Isolation Cooling (RCIC) systems. The UFSAR notes that the physical arrangement of the tank and associated piping assures a reserve capacity of 74,000 gallons, and that additional reserve capacity is provided by an administrative limit at the 10 foot level to provide a total HPCI/RCIC reserve inventory of 105,700 gallons. The NRC Safety Evaluation Report (SER) for SBO compliance notes that the 10 foot level assures an inventory greater than 103,380 gallons, and is therefore sufficient for the coping duration. A review of the BSEP Extended Power Uprate (EPUR) submittal confirms that these limits were not affected by uprated power conditions. Based on these considerations, BSEP is including piping connected to the Unit 1 and 2 CSTs at or below the 10 foot level in the scope of License Renewal. In addition to piping connected to nozzles –1 and –12, which are already in scope, this includes the following connected piping up to their first isolation valves:
>
> - Condensate transfer pump suction line connected to nozzle –2,
> - CRD pump condensate return line connected to –3,
> - Condensate supply line connected to nozzle –9,

- Unit 1 and 2 CST cross-connect lines connected to nozzles –8 and –13,
- HPCI/RCIC test return line connected to nozzle –14, and
- Drain line connected to nozzle –5.

The tank volume above the 10 foot level is not needed for compliance with SBO, and piping connected above this point does not satisfy any license renewal scoping criteria.

The piping and equipment included in license renewal scope, as identified above, will be managed internally with the Water Chemistry and the One-Time Inspection Programs, and externally with the Systems Monitoring and Buried Piping and Tanks Inspection Programs.

Based on its review, the staff found the applicant's response acceptable because the applicant confirmed that the tank volume below the CST 10-foot elevation required for compliance with SBO, and piping up to their first isolation valves piping connected to the Units 1 and 2 CSTs at or below the CST 10-foot elevation will be included in the scope of license renewal. Therefore, because the remaining CST nozzles and attached piping will not result in a loss of the tank shell pressure-retaining function to deliver sufficient water to the HPCI System during an SBO, the staff's concerns described in RAI 2.3.3.19-1 are resolved.

In RAI 2.3.3.19-2, the staff stated that LRA Table 2.3.3 16 identifies the intended function for MWTS piping components requiring aging management review as —1 "Provide pressure-retaining boundary." License renewal boundary drawing D-25043-LR, sheet 1A (quadrants F-4 and F-5), identifies a common drain header and selected connecting RWCU drain piping as within the scope of license renewal. For two RWCU drain lines, the in-scope boundary extends to piping shown on drawing D-25028-2B (quadrants B-2 and B-6). This is inconsistent with sheet 1A of license renewal boundary drawing D-02543-LR (quadrants F-4 and F-5) which shows this piping as not within the scope of license renewal. Drawing D-25028-2B is not identified in LRA Section 2.3.3.19 as an MWST boundary drawing for license renewal and was not made available for staff review. Therefore, the staff requested that the applicant provide additional information to explain these inconsistencies and the basis for the boundary determinations.

In its response, by letter dated May 4, 2005, the applicant stated that the common drain header to C45HD and connecting RWCU drain piping to D-25028-2B shown on D-25043-LR, sheet 1A, at coordinates F-4 and F-5, is not within the scope of license renewal and were inadvertently highlighted. The staff found the applicant's response acceptable and, therefore, the staff's concern described in RAI 2.3.3.19-2 resolved.

2.3.3.19.3 Conclusion

The staff reviewed the LRA and RAI response to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the MWTS components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the MWTS components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.20 Chlorination System

2.3.3.20.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.20, the applicant described the chlorination (CL) system. The CL system provides a means of treating the SW and CW systems against biological growth. For control room habitability considerations, chlorine detectors are mounted at the control room air intakes, and attached to the wall of the SW intake structure immediately adjacent to the rail siding where the chlorine tank car is located. In the event high chlorine is detected, local and control room alarms are activated, and the control room isolation dampers automatically close. The CL system has a total of six components that place portions of this system within the scope of license renewal. Two of the six are electrical components that actuate isolation valves required to maintain the function of an SR system (the SW system). Scoping and screening of electrical/I&C components/commodities are addressed in LRA Section 2.5. The remaining components are panels designated quality class due to seismic considerations only. The panels are classified as seismically analyzed to avoid adverse interactions with SR SSCs during an earthquake. Panels are addressed as civil commodities in LRA Section 2.4.

The CL system contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the CL system could potentially prevent the satisfactory accomplishment of an SR function. The CL system components that are within the scope of license renewal are electrical and I&C components/commodities or civil commodities, which are discussed in LRA Sections 2.5 and 2.4, respectively.

2.3.3.20.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.20 and UFSAR Section 10.4.5.2 using the Tier-1 evaluation methodology described in SER Section 2.3.

In conducting its Tier-1 review of the two-tier review process, 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 did not omit from the scope of license renewal any components with intended functions delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant identified as being within the scope of license renewal to verify that the applicant did not omit any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.3.20.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the CL system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the CL system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.21 Potable Water System

2.3.3.21.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.21, the applicant described the potable water system (PWS). The PWS supplies the necessary water for onsite drinking and sanitary services and makeup to various components in miscellaneous plant systems. This system is supplied by the county water supply. The PWS is not essential for safe shutdown of the plant and does not satisfy any SR quality criteria. Based on the license renewal review, this system has components that are within the scope of license renewal because of potential spatial interactions with SR components. A potable water line traverses the control building battery rooms to supply water in the radwaste building. These components have been included within the scope of license renewal as a result of the 10 CFR 54.4(a)(2) review.

The failure of NSR SSCs in the PWS could potentially prevent the satisfactory accomplishment of an SR function.

The intended function, within the scope of license renewal, is to provide a pressure-retaining boundary/flow.

In LRA Table 2.3.3-17, the applicant identified the following PWS component types that are within the scope of license renewal and subject to an AMR:

- piping (piping and fittings)
- valves (body and bonnet)
- tank (shell)

2.3.3.21.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.20 and USFAR Section 9.4.2 using the Tier-1 evaluation methodology described in SER Section 2.3.

In conducting its Tier-1 review of the two-tier review process, 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 did not omit from the scope of license renewal any components with intended functions delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant identified as being within the scope of license renewal to verify that the applicant did not omit any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.3.21.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the PWS components that are within the scope of license renewal, as required by

10 CFR 54.4(a), and that the applicant adequately identified the PWS components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.22 Process Radiation Monitoring System

2.3.3.22.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.22, the applicant described the process radiation monitoring (PRM) system. The PRM system is designed to continuously monitor radioactivity within the plant. A number of radiation monitors and monitoring systems are provided on process liquid and gas lines that may serve as discharge routes for radioactive materials. These include the following: (1) main steam line radiation monitoring system, (2) condenser off-gas radiation monitoring system, (3) main stack radiation monitoring system, (4) liquid process radiation monitoring system, (5) reactor building ventilation radiation monitoring system, (6) turbine building ventilation radiation monitoring system, and (7) AOG charcoal absorber system gaseous discharge monitoring system. The main steam line monitors annunciate alarms in the control room when the radiation level of the steam surpasses a certain level. The processes are continuously sampled for particulate and iodine, and the samples are routinely analyzed. SR process radiation monitors in the reactor building exhaust can initiate reactor building isolation and startup of the SGTS. Monitors in the SW system are used to assure that effluents will have radiation levels below preestablished limits.

The PRM system contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the PRM system could potentially prevent the satisfactory accomplishment of an SR function. In addition, the PRM system performs functions that support EQ. The intended function, within the scope of license renewal, is to provide a pressure-retaining boundary/flow.

In LRA Table 2.3.3-18, the applicant identified the following PRM system component types that are within the scope of license renewal and subject to an AMR: closed-cycle cooling water system (piping specialties).

2.3.3.22.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.22 and UFSAR Sections 11.5.1 through 11.5.8 using the Tier-2 evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff did not identify any omissions. The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.3.22.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the PRM system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the PRM system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.23 Area Radiation Monitoring System

2.3.3.23.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.23, the applicant described the area radiation monitoring (ARM) system. The ARM system is designed to detect, indicate, and record (as required) the radiation level of selected points throughout BSEP. Permanently mounted system instrument channels actuate annunciators in the control room when the sensed radiation level exceeds upscale or downscale trip points to warn personnel of increased radiation levels or equipment malfunction. The system consists of the following: (1) ARM system, (2) drywell high range area monitoring system, and (3) airborne radiation monitoring system. The ARM system detectors are located strategically throughout the site. These detectors are located based upon the need to furnish information relative to gamma levels in plant areas. The detectors provide a long-term, post-accident monitoring function. The airborne radiation monitoring system uses fixed instruments to monitor particulates, halogens, and noble gases in the reactor building vents and in the drywell. In addition, continuous air monitors are located in critical areas of the plant and may be moved as conditions require.

The ARM system contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the ARM system could potentially prevent the satisfactory accomplishment of an SR function. In addition, the ARM system performs functions that support EQ.

The ARM system components that are within the scope of license renewal and subject to an AMR are addressed as electrical and I&C component/commodities or civil commodities in LRA Section 2.5 or 2.4, respectively.

2.3.3.23.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.20 and UFSAR Section 112.3.4 using the Tier-1 evaluation methodology described in SER Section 2.3.

In conducting its Tier-1 review of the two-tier review process, 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 did not omit from the scope of license renewal any components with intended functions delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant identified as being within the scope of license renewal to

verify that the applicant did not omit any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.3.23.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the ARM system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the ARM system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.24 Liquid Waste Processing System

2.3.3.24.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.24, the applicant described the liquid waste processing system. The liquid waste processing system functions to collect, treat, and process potentially radioactive liquid waste for reuse or controlled discharge in compliance with established regulatory requirements. The system processes radioactive or potentially radioactive liquid wastes of different purities and chemical conditions. Principal sources of liquid wastes are equipment drains (high purity), floor drains (medium to low purity), chemical wastes (very low purity), detergent, and oily liquid drains. Liquid radwaste is classified in two categories; clean radioactive waste (CRW) and dirty radioactive waste (DRW). CRW has the following properties: low or high activities, low conductivity, low solid content and neutral pH. DRW has the following properties: low activity, moderate conductivity, moderate solid content and neutral pH. The properties of each category determine the treatment and processing of the liquid waste collected by this system.

The failure of NSR SSCs in the liquid waste processing system could potentially prevent the satisfactory accomplishment of an SR function. The liquid waste processing system also performs functions that support fire protection.

The intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary/flow
- provides structural support/seismic integrity

In LRA Table 2.3.3-19, the applicant identified the following liquid waste processing system component types that are within the scope of license renewal and subject to an AMR:

- piping (piping and fittings)
- valves (body and bonnet)
- immersion element (pressure retaining housing)
- tank (shell)

2.3.3.24.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.24 and UFSAR Section 11.2 using the Tier-2 evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff's review of LRA Section 2.3.3.24 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 2.3.3.24-1, dated April 8, 2005, the staff stated that LRA Table 2.3.3.3-19, "Component/Commodity Groups Requiring Aging Management Review and Their Intended Functions for the Liquid Waste Processing System," identified several tanks within the scope of license renewal because they provide the pressure boundary function. License renewal drawing D-02534-LR, sheet 1, locations E-3 and E-5, show waste neutralizer tanks A and C, respectively. Drawing D-02534-LR, sheet 2, locations E-4 and E-6, show waste neutralizer tanks B and D, respectively. Drawing D-02492-LR, location B-3, shows the concentrated waste tank. Each drawing shows several lines that enter each tank that are not identified as within scope for license renewal. Therefore, the staff requested that the applicant provide additional information to justify its reason for excluding the lines, identified below, up to the closest isolation valve from within the scope of license renewal.

"A" Waste Neutralizer Tank

- Line 297-6-161 and valves F224A, V1379
- Line 302-3-Z-5 and valves, V14A, F231A, V1086
- Line 338-8-161
- Line 292-4-161, valve F222A
- Line 337-8-161 (cross tie between A and C tanks)

"C" Waste Neutralizer Tank

- Line 291-4-161, valve F222C
- Line 296-6-161, valve F224C
- Line 301-3-Z-5, valves V14C, V13C, F231C
- Line 336-8-161

"B" Waste Neutralizer Tank

- Line 299-6-161, valve F224B
- Line 304-3-Z-5, valves V14B, V13B,V1087, F231B

- Line 338-8-161
- Line 292-4-161, valve F222B
- Line 339-8-161 (cross tie between B and D tanks)

"D" Waste Neutralizer Tank

- Line 293-4-161, valve F222D
- Line 296-6-161, valve F224D
- Line 303-3-Z-5, valves V14D, V13D, F231D
- Line 336-8-161

Concentrated Waste Tank Drawing

- Line 997-2-162
- Line 353-1 ½-162, valve F281
- Line 355-3-160
- Valve V5019

In its response, by letter dated May 4, 2005, the applicant stated that the stainless steel waste neutralizer tanks, 2-G16-A025A/B/C/D, on drawings D-2534-LR, sheets 1 and 2, and concentrated waste tank, 2-G16-A026, on drawing D-02492-LR are NSR components in the liquid waste processing system. BSEP conservatively brought these tanks within the scope of license renewal on the basis of their being seismically analyzed to assure continued function during an earthquake. A review of the licensing basis of these tanks shows (1) the applicant agreed to a seismic design with the Atomic Energy Commission/Division of Reactor Licensing during evaluation of the radwaste system design against 10 CFR Part 20 limits, and (2) that their failure would not result in exceeding 10 CFR Part 100 limits or adversely impacting any SR function. The license renewal boundaries reflected in the license renewal boundary drawings are limited to the tanks and connected piping included in the seismic design, consistent with the design and licensing basis.

Based on its review, the staff found the applicant's response acceptable because NSR piping and components noted in RAI 2.3.3.24-1 are not included in the seismic analysis and do not perform any intended function within the meaning of the 10 CFR 54.4(a) criteria. Therefore, the staff's concern described in RAI 2.3.3.24-1 is resolved.

2.3.3.24.3 Conclusion

The staff reviewed the LRA and RAI response to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the liquid waste processing system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the liquid waste processing system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.25 Spent Fuel System

2.3.3.25.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.25, the applicant described the spent fuel system. The spent fuel system includes the new fuel racks, spent fuel racks, underwater equipment storage racks; the spent fuel shipping cask; and associated handling equipment. The new and spent fuel storage racks are designed to maintain their structural integrity in the event of an earthquake and to avoid criticality of the fuel. The spent fuel storage racks are classified as SR. In the license renewal review, the spent fuel storage racks and equipment storage racks are evaluated as structures and are addressed in SER Section 2.4. The new fuel storage racks do not perform any intended functions for license renewal.

The spent fuel system components that are within the scope of license renewal and subject to an AMR are evaluated as structural components in LRA Section 2.4.

2.3.3.25.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.25 and UFSAR Sections 9.1.2 and 2.4 using the Tier-2 evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff did not identify any omissions. The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.3.25.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the spent fuel system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the spent fuel system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.26 Fuel Pool Cooling and Cleanup System

2.3.3.26.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.26, the applicant described the fuel pool cooling and cleanup system. The fuel pool cooling and cleanup system cools the spent fuel storage pool by transferring decay heat through heat exchangers to the reactor building closed cooling water system. During

refueling operations, the system is also capable of cooling the reactor cavity and dryer separator storage pit. Water purity and clarity in the storage pool, reactor well, and dryer-separator storage pit are maintained by filters and demineralizers. The system consists of two fuel pool cooling pumps, two heat exchangers, two filter demineralizers, two skimmer surge tanks, and associated piping, valves, and instrumentation. The pumps circulate the pool water in a closed loop, taking suction from the skimmer surge tanks, through the heat exchangers, circulating the water through the filter demineralizer and discharging it through diffusers at the bottom of the fuel pool and reactor well.

The fuel pool cooling and cleanup system contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the fuel pool cooling and cleanup system could potentially prevent the satisfactory accomplishment of an SR function.

The intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary/flow
- provides flow restriction (throttle)

In LRA Table 2.3.3-20, the applicant identified the following fuel pool cooling and cleanup system component types that are within the scope of license renewal and subject to an AMR:

- piping (piping, fittings, and flanges)
- valves (check and hand valves) (body and bonnet)
- heat exchanger (shell and access cover)
- heat exchanger (channel head and access cover)
- pump (casing)

2.3.3.26.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.26 and UFSAR Section 9.1.3 using the Tier-2 evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff's review of LRA Section 2.3.3.26 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 2.3.3.26-1, dated April 8, 2005, the staff stated that UFSAR Section 9.1.3.3 states that there are non-seismic drain connections located in the refueling canal between the fuel pool inner gate and the barrier that could drain the fuel pool below the top of the stored fuel if a seismic event occurred when the fuel pool gates are removed for refueling. Plugs are installed in

these drain connections during refueling to prevent loss of water below the elevation of the top of the barrier after a seismic event. However, the drain lines in question, G41-75-1-1/2-161, G41-108-3-161, 111-1 and ½-161, 107-1 and ½-161, and 82-1-161, shown on drawings D-25049, Sheet 1B, location D-4, and D-02549 sheet 1B, location D-4, respectively, are not identified as being within scope for license renewal. Therefore, the staff requested that the applicant provide additional information to justify its reason for excluding these sections of drain piping from the scope of license renewal.

In its response, by letter dated May 4, 2005, the applicant stated:

> As noted in USFAR Section 9.1.3.3, the design of the fuel pool places the top of the stored fuel at a lower elevation than the top of the barrier located between the reactor well and the fuel storage pool. However, non-seismic drain connections located in the refueling canal between the fuel pool inner gate and the barrier could drain the fuel pool below the top of the stored fuel if a seismic event occurred when the fuel pool gates are removed for refueling.
>
> Because the subject lines are non-safety and not seismically designed, plugs are installed into G41-75-1-1/2-161 and G41-108-3-161 during refueling to prevent the loss of fuel pool water below the elevation of the top of the barrier after a seismic event. G41-111-1-1/2-161, in each unit, is on the vessel side of this barrier and drain well above the required level. There is a baffle on top of the barrier between G41-75-1-1/2-161 and G41-111-1-1/2-161 that ensures the fuel pool water level is adequate without plugging of G41-111-1-1/2-161. G41-82-1-161 is a 1-inch stainless steel leak-off monitoring line entirely imbedded in concrete that drains back into fuel pool leak-off monitoring. Even if these non-safety drain lines were to experience age-related degradation, no loss of intended function would occur.

Based on its review, the staff finds the applicant's response to RAI 2.3.3.26-1 acceptable, because, the subject lines are non-safety related components and do not present a spatial interaction hazard for safety related components, thus, do not perform an intended function within the meaning of the 10 CFR 54.4(a) criteria. Furthermore, these lines are not filled with liquid or steam during plant operation. Therefore, the staff's concerns described in RAI 2.3.3.26-1 are resolved.

2.3.3.26.3 *Conclusion*

The staff reviewed the LRA and RAI response to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the fuel pool cooling and cleanup system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the fuel pool cooling and cleanup system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.27 HVAC Diesel Generator Building

2.3.3.27.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.27, the applicant described the HVAC diesel generator building. The purpose of the HVAC diesel generator building is to maintain temperature conditions to allow for optimum operation of equipment located in the diesel generator building and fuel oil storage tank vault while providing comfort and safety for attendant personnel even during design-basis conditions. This system supplies ventilation for the DG cells, associated 4160 VAC emergency switchgear rooms, 480 VAC emergency switchgear rooms, diesel generator building basement area, and the tank vault area.

The HVAC diesel generator building contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the HVAC diesel generator building could potentially prevent the satisfactory accomplishment of an SR function. In addition, the HVAC diesel generator building performs functions that support fire protection and SBO.

The intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary/flow
- provides structural support/seismic integrity

In LRA Table 2.3.3-21, the applicant identified the following HVAC diesel generator building component types that are within the scope of license renewal and subject to an AMR:

- piping (piping and fittings)
- valves (including check valves and containment isolation) (body and bonnet)
- air receiver (shell and access cover)
- duct (duct fittings, access doors, and closure bolts)
- duct (equipment frames and housing)
- duct (seals in dampers and doors)

2.3.3.27.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.27 and UFSAR Section 9.4.7 using the evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1) . The staff did not identify any omissions.

2.3.3.27.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the HVAC diesel generator building components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the HVAC diesel generator building components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.28 HVAC Reactor Building

2.3.3.28.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.28, the applicant described the HVAC reactor building. The HVAC reactor building system consists of two basic systems: the normal system and the emergency cooling system. During normal operation, the HVAC reactor building equipment provides a suitable ambient temperature for plant personnel and equipment by providing "once through" ventilation and cooling using outside air. The system maintains a negative pressure on the reactor building. The primary containment cooling system uses NSR fan coil cooling units, cooled by RBCCW, to provide drywell cooling during normal reactor operation. The drywell and torus purge subsystem can be used to purge primary containment via either a purge system exhaust fan or the standby gas treatment system. The reactor building emergency cooling subsystem provides SR cooling for the RHR, HPCI, RCIC, and CS rooms to maintain the environment in those areas required for operation of equipment during emergency operation. Dampers in the system operate to maintain secondary containment integrity in response to an accident signal. In the accident mode, the reactor building ventilation normal supply and exhaust equipment is shut down and the duct isolation dampers at the reactor building pressure boundaries are closed (secondary containment isolation). The SGTS is operated to maintain a negative pressure in the reactor building. During this mode, the reactor building HVAC system performs an SR function; since it supports limiting the release of radioactivity and provides cooling to SR equipment of the core standby cooling systems following DBEs.

The HVAC reactor building contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the HVAC reactor building could potentially prevent the satisfactory accomplishment of an SR function. In addition, the HVAC reactor building performs functions that support fire protection and EQ.

The intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary/flow
- provides structural support/seismic integrity
- provides heat transfer

In LRA Table 2.3.3-22, the applicant identified the following HVAC reactor building component types that are within the scope of license renewal and subject to an AMR:

- piping (piping and fittings)
- valves (including check valves and containment isolation) (body and bonnet)
- air receiver (shell and access cover)
- duct (duct fittings, access doors, damper housings, and closure bolts)
- duct (equipment frames and housing, including fan housings)
- duct (flexible collars between ducts and fans)
- duct (seals in dampers and doors)
- air handler heating/cooling (heating/cooling coils)
- piping (piping and fittings)
- filters (housing and supports)
- filters (elastomer seals)

2.3.3.28.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.28 and UFSAR Sections 9.4.2, 9.4.3, and 9.4.6 using the evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1) and need to be identified in LRA Table 2.3.3-22. The staff did not identify any omissions.

2.3.3.28.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the HVAC reactor building components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the HVAC reactor building components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.29 HVAC Service Water Intake Structure

2.3.3.29.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.29, the applicant described the HVAC service water intake structure. The HVAC service water intake structure consists of two 100-percent capacity independent ventilation systems (one for each unit). Each independent system contains discharge fans, discharge dampers, associated electrical equipment, instrumentation and controls, and supply air openings with bird screens. The system is necessary to control the environment in SR equipment areas so that contained SR equipment can perform its SR function. The HVAC

service water intake structure provides ventilation and cooling of the SW intake structure for proper operation of SW system equipment; however, the fans are not ducted and do not have an associated pressure boundary.

The HVAC service water intake structure contains SR components that are relied upon to remain functional during and following DBEs.

The HVAC service water intake structure components that are within the scope of license renewal and subject to an AMR are addressed as electrical and I&C component/commodities or civil commodities in Sections 2.5 and 2.4, respectively.

2.3.3.29.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.29 and UFSAR Section 9.4.10.2.7 using the evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff's review of LRA Section 2.3.3.29 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 2.3.3.29-1, dated May 18, 2005, the staff requested that the applicant clarify whether all the system components, including discharge fan housings, discharge damper housings, screens (bird screens) for air intake (supply air) and exhaust structures 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).

In its response, by letter dated June 14, 2005, the applicant stated:

> SWIS fans 1-VA-1A-EF-SWIS and 2-VA-2A-EF-SWIS, including fans, dampers, bird screens, and mountings/supports are within the scope of license renewal in accordance with 10 CFR 54.4(a). The SWIS fans, dampers, and bird screens are not ducted, but are mounted in a shrouded housing directly into an opening in the SWIS wall. Considering this configuration, the initial aging management approach reflected in the LRA was to consider that the fans and dampers were active, and the passive features were essentially mounting/support features and would be addressed as part of the SWIS building structure. BSEP has revised this approach to specifically address the subcomponents that the NRC has identified (i.e., fan and damper housings and bird screens) in the AMR for SWIS Auxiliary Systems.

This revision modifies the discussion for the Heating, Ventilation, and Air Conditioning (HVAC) system for the SWIS described in LRA Section 2.3.3.29 to reflect that the system includes fan and damper housings, bird screens, and mountings/supports that are passive, long-lived features requiring AMR in accordance with 10 CFR 54.21(a)(1). Accordingly, three line items (i.e., one for fan housings, one for damper housings, and one for bird screens) will be added to the AMR associated with LRA Table 3.3.2-24.

The Systems Monitoring Program is described in LRA Subsection B.2.29, and includes criteria applicable to the components and aging effects addressed herein. Structural supports and mounting of the fan/damper housing will continue to be addressed as structural commodities within the SWIS building structure in LRA Table 3.5.2-7, with the Structures Monitoring Program specified for aging management.

Based on its review, the staff found the applicant's response acceptable because the applicant clarified that all applicable system components consisting of discharge fan housings, discharge damper housings, screens (bird screens) for air intake (supply air) and exhaust structures are within the scope of license renewal in accordance with 10 CFR 54.4(a), and are subject to an AMR in accordance with 10 CFR 54.21(a)(1).

2.3.3.29.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the HVAC service water intake structure components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the HVAC service water intake structure components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.30 HVAC Turbine Building

2.3.3.30.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.30, the applicant described the HVAC turbine building. The HVAC turbine building is designed to provide effective control of airflow throughout the turbine building to maintain all areas at the temperature conditions which provide optimum operation of equipment and comfort and safety of personnel, to limit the spread of contamination during power and shutdown operations of the plant, and to minimize radioactive releases. The system is a recirculating system, designed to operate during startup, normal operation, and shutdown of the plant. The turbine building is maintained at a slight negative pressure by a separate air filtration exhaust system to prevent buildup of radioactivity in the building and to ensure that no unfiltered leakage occurs. The treatment of exhaust air by filters and charcoal absorption filters removes airborne particulates and gaseous radioactivity that might be present before discharging this air to the atmosphere. A separate ventilation system is provided for the reactor recirculation pumps motor generator set room, which maintains the motor generator set room at a higher pressure than the turbine building, thereby, preventing leakage of radioactivity into the room.

The failure of NSR SSCs in the HVAC turbine building could potentially prevent the satisfactory accomplishment of an SR function.

The HVAC turbine building components that are within the scope of license renewal and subject to an AMR are addressed as civil commodities in LRA Section 2.4.

2.3.3.30.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.20 and UFSAR Section 9.4.5 using the evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1) . The staff did not identify any omissions.

2.3.3.30.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the HVAC turbine building components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the HVAC turbine building components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.31 HVAC Radwaste Building

2.3.3.31.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.31, the applicant described the HVAC radwaste building. The HVAC radwaste building limits the spread of contamination within the radwaste building, ensuring air movement from clean areas to areas with progressively higher contamination potential. The system also keeps the building at a slight negative static pressure to prevent the exfiltration of potentially radioactive air through other-than-normal exhaust paths connected to the plant stack.

The failure of NSR SSCs in the HVAC radwaste building could potentially prevent the satisfactory accomplishment of an SR function.

The HVAC radwaste building component types that are within the scope of license renewal and subject to an AMR are addressed as civil component/commodities in LRA Section 2.4.

2.3.3.31.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.31 and UFSAR Section 9.4.5 using the evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1). The staff did not identify any omissions.

2.3.3.31.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the HVAC radwaste building components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the HVAC radwaste building components that are subject to an AMR, as required by 10 CFR 54.21(a)(1) . No omissions were identified.

2.3.3.32 Torus Drain System

2.3.3.32.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.32, the applicant described the torus drain system. The torus drain system functions as part of the primary containment pressure boundary, and it supports retention of the suppression pool inventory following postulated fires and SBO events.

The torus drain system contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the torus drain system could potentially prevent the satisfactory accomplishment of an SR function. In addition, the torus drain system performs functions that support fire protection and SBO. The intended function, within the scope of license renewal, is to provide a pressure-retaining boundary/flow.

In LRA Table 2.3.3-23, the applicant identified the following torus drain system component type that is within the scope of license renewal and subject to an AMR: piping and fittings (misc. auxiliary and drain piping and valves).

2.3.3.32.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.32 and UFSAR Section 6.2 using the evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff did not identify any omissions. The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.3.32.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the torus drain system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the torus drain system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.33 Civil Structure Auxiliary Systems

2.3.3.33.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.33, the applicant described the civil structure auxiliary systems. Most civil structures have support systems that provide auxiliary services for the structure, such as floor drains, sump pumps, and associated discharge piping and valves. These systems may be within the scope of license renewal because they contain components that perform license renewal intended functions. These systems have been evaluated to identify mechanical or electrical/I&C components that support license renewal intended functions. Applicable components include: (1) primary containment auxiliary system, (2) SW intake structure auxiliary system, (3) reactor building auxiliary system, (4) AOG building auxiliary system, (5) auxiliary boiler house auxiliary system, (6) diesel generator building auxiliary system, (7) control building auxiliary system, and (8) radwaste building auxiliary system.

The civil structure auxiliary systems contain SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the civil structure auxiliary systems could potentially prevent the satisfactory accomplishment of an SR function. The intended function, within the scope of license renewal, is to provide a pressure-retaining boundary/flow.

In LRA Table 2.3.3-24, the applicant identified the following civil structure auxiliary systems component types that are within the scope of license renewal and subject to an AMR:

- piping (piping and fittings)
- valves (body and bonnet)
- pump (casing)
- gauge glasses (pressure-retaining housing)

2.3.3.33.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.33 using the Tier-2 evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff's review of LRA Section 2.3.3.33 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 April 8, 2005, the staff stated that the civil structure auxiliary systems are not described in the UFSAR. The LRA states that civil structure auxiliary systems are within the scope of license renewal. LRA Table 2.3.3 24, which lists component commodity groups requiring an AMR and their intended functions, identifies several components and commodity groups that are within the scope of license renewal; however, no license renewal drawings were provided to determine if the list is complete. Therefore, the staff requested that the applicant provide additional information to allow for a determination that the appropriate civil structure auxiliary systems have been included within the scope of license renewal.

In its response, by letter dated May 4, 2005, the applicant stated that the components noted in the civil/structural auxiliary system consist of miscellaneous equipment database (EDB) entries of a mechanical type without a corresponding system designation or piping and instrument drawing. The civil/structural auxiliary system components identified as within the scope of license renewal provide a mechanical function in support of a structure (e.g., sump pumps for a building). All pressure-retaining mechanical components associated with these civil/structural auxiliary systems were included in LRA Table 2.3.3-24.

Based on its review, the staff found the applicant's response acceptable because a summary of determinations for structure-systems 8020, 8230, 8340, and 8355 can be found in BNP-LR-103 - "Mechanical Screening for Aux. Systems Calculation," and was found to be complete. 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 and RAI response to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were

identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the civil structure auxiliary systems components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the civil structure auxiliary systems components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.34 Non-Contaminated Water Drainage System

2.3.3.34.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.34, the applicant described the non-contaminated water drainage system (NCWDS). The NCWDS is part of the sewage, sanitary, and roof drains system that collects storm water, non-contaminated drainage, and sanitary wastes, and transports them to collection and processing points for treatment prior to off-site discharge. The overall system is not essential for safe shutdown of the plant and does not satisfy any SR quality criteria; however, the NCWDS has components (roof drain piping) that are within the scope of license renewal because of potential spatial interactions with SR components. These components have been included within the scope of license renewal as a result of the 10 CFR 54.4(a)(2) review.

The failure of NSR SSCs in the NCWDS could potentially prevent the satisfactory accomplishment of an SR function. The intended function, within the scope of license renewal, is to provide a pressure-retaining boundary/flow.

In LRA Table 2.3.3-25, the applicant identified piping (piping and fittings) as the NCWDS component type that is within the scope of license renewal and subject to an AMR.

2.3.3.34.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.34 and USFAR Section 9.3.3.2.3 using the Tier-1 evaluation methodology described in SER Section 2.3.

In conducting its Tier-1 review of the two-tier review process, 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 did not omit from the scope of license renewal any components with intended functions delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant identified as being within the scope of license renewal to verify that the applicant did not omit any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.3.34.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately

identified the NCWDS components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the NCWDS components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.4 Steam and Power Conversion Systems

In LRA Section 2.3.4, the applicant identified the structures and components of the steam and power conversion systems that are subject to an AMR for license renewal.

The applicant described the supporting structures and components of the steam and power conversion systems in the following sections of the LRA:

- 2.3.4.1 main steam system
- 2.3.4.2 extraction steam system
- 2.3.4.3 moisture separator reheater drains system and reheat steam system
- 2.3.4.4 auxiliary boiler
- 2.3.4.5 feedwater system
- 2.3.4.6 heater drains and miscellaneous vents and drains
- 2.3.4.7 condensate system
- 2.3.4.8 turbine building sampling system
- 2.3.4.9 main condenser gas removal system
- 2.3.4.10 turbine electro-hydraulic control system
- 2.3.4.11 turbine generator lube oil system
- 2.3.4.12 stator cooling system
- 2.3.4.13 hydrogen seal oil system

The corresponding subsections of this SER (2.3.4.1 – 2.3.4.13, respectively) present the staff's review findings with respect to the steam and power conversion systems for Units 1 and 2.

2.3.4.1 Main Steam System

2.3.4.1.1 Summary of Technical Information in the Application

In LRA Section 2.3.4.1, the applicant described the main steam (MS) system. The MS system delivers steam from the nuclear steam supply system (NSSS) piping downstream of the outermost primary containment isolation valve to the turbine throttle over the full range of reactor power operation. This system also conveys steam to the second stage reheaters, condenser steam-jet air ejectors, turbine steam seal regulators, main turbine bypass, and reactor feed pump drive turbines. The turbine stop and control valves, control isolation valves, turbine bypass valves, and associated hydraulic operators (hydraulic fluid supplied by the electro-hydraulic control (EHC) system) are included in this system. There are four main steam lines conveying steam to the turbine stop valves, with cross connections to the turbine bypass system and other equipment as required. This system interfaces with the RCPB (but is not part of the RCPB) and does not penetrate the primary containment.

The failure of NSR SSCs in the MS system could potentially prevent the satisfactory accomplishment of an SR function. The MS system also performs functions that support fire protection.

The intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary/flow
- provides post-accident containment, holdup, and plateout of MSIV bypass leakage

In LRA Table 2.3.4-1, the applicant identified the following MS system component types that are within the scope of license renewal and subject to an AMR:

- piping and fittings [steam lines to main turbine (Group B)]
- piping and fittings (steam drains)
- valves (check, control, hand, motor operated, safety valves) (body and bonnet)

2.3.4.1.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.1 and UFSAR Section 10.3.2 using the Tier-2 evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff did not identify any omissions. The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.4.1.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the MS system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the MS system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.4.2 Extraction Steam System

2.3.4.2.1 Summary of Technical Information in the Application

In LRA Section 2.3.4.2, the applicant described the extraction steam system. The extraction steam system provides steam heating to two strings (A and B) of five feedwater heaters which progressively increase the feedwater temperature before it enters the reactor. The system also provides steam to the heater drains deaerator to remove non-condensable gases from the condensate. This system consists of the piping and valves that extract steam from selected stages of the high pressure (HP) and low pressure (LP) turbines and supply the steam to the

shell side of the feedwater heaters. Non-return valves are used to prevent overspeed of the turbine due to flashback of the condensate in the heaters after a turbine trip.

The failure of NSR SSCs in the extraction steam system could potentially prevent the satisfactory accomplishment of an SR function. The extraction steam system component types that are within the scope of license renewal and subject to an AMR are addressed as civil commodities in Section 2.4.

2.3.4.2.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.2 and USFAR Section 10.3.2 using the Tier-1 evaluation methodology described in SER Section 2.3.

In conducting its Tier-1 review of the two-tier review process, 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 did not omit from the scope of license renewal any components with intended functions delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant identified as being within the scope of license renewal to verify that the applicant did not omit any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.4.2.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the extraction steam system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the extraction steam system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.4.3 Moisture Separator Reheater Drains System and Reheat Steam System

2.3.4.3.1 Summary of Technical Information in the Application

In LRA Section 2.3.4.3, the applicant described the moisture separator reheater (MSR) drains system and reheat steam system. The MSR drains system and reheat steam system returns large quantities of saturated water, removed in the moisture separator and condensed from the reheat steam system in the first and second stage reheater tubes, to the condensate cycle to improve cycle efficiency, operating stability, and reliability. System components include moisture separator drain tanks, first-stage reheater drain tanks, second-stage reheater drain tanks, and the valves and piping necessary to remove liquid from the MSRs and direct it to the condensate system for reuse.

The failure of NSR SSCs in the MSR drains system and reheat steam system could potentially prevent the satisfactory accomplishment of an SR function.

The MSR drains system and reheat steam system component types that are within the scope of license renewal and subject to an AMR are addressed as civil commodities in LRA Section 2.4.

2.3.4.3.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.3 and UFSAR Section 10.2.2 using the Tier-1 evaluation methodology described in SER Section 2.3.

In conducting its Tier-1 review of the two-tier review process, 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 did not omit from the scope of license renewal any components with intended functions delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant identified as being within the scope of license renewal to verify that the applicant did not omit any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.4.3.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the MSR drains system and reheat steam system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the MSR drains system and reheat steam system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.4.4 Auxiliary Boiler

2.3.4.4.1 Summary of Technical Information in the Application

In LRA Section 2.3.4.4, the applicant described the auxiliary boiler. The auxiliary boiler system provides a source of non-contaminated steam independent of the NSSS. This is a unit-shared system providing: (1) steam for operation of the CAC vaporizer and (2) steam to Unit 1 and 2 for HPCI, RCIC, and reactor feed pump turbine testing prior to start up. Auxiliary steam is supplied by one packaged, fire tube boiler and distributed to the plant via a network of headers and piping. This system consists of the auxiliary boiler and the following principal subsystems: fuel oil, combustion air, burner control, exhaust, feedwater, chemical addition, blowdown, and deaerator.

The failure of NSR SSCs in the auxiliary boiler could potentially prevent the satisfactory accomplishment of an SR function.

The intended function, within the scope of license renewal, is to provide a pressure-retaining boundary/flow.

In LRA Table 2.3.4-2, the applicant identified the following auxiliary boiler component types that are within the scope of license renewal and subject to an AMR:

- piping and fittings (steam drains)
- valves (check, control, hand, motor operated, safety valves) (body and bonnet)

2.3.4.4.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.4 and UFSAR Section 10.4.8 using the Tier-2 evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff did not identify any omissions. The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.4.4.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the auxiliary boiler components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the auxiliary boiler components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.4.5 Feedwater System

2.3.4.5.1 Summary of Technical Information in the Application

In LRA Section 2.3.4.5, the applicant described the feedwater (FW) system. The FW system receives demineralized water from the condensate system and delivers this water to the reactor at increased temperature and pressure. Condensate is pumped from the condenser hotwell through the three LP heaters to the common suction header for the two, 50 percent capacity, turbine-driven reactor feed pumps. FW heaters receive shell-side steam and preheat the tube-side feedwater, thus increasing the heat cycle efficiency. All FW heaters and drain coolers are included in the FW system, and this system ends at the interfacing system SR outermost primary containment isolation valves.

The FW system contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the FW system could potentially prevent the satisfactory accomplishment of an SR function. In addition, the FW system performs functions

that support fire protection and SBO. The intended function, within the scope of license renewal, is to provide a pressure-retaining boundary/flow.

In LRA Table 2.3.4-3, the applicant identified the following FW system component types that are within the scope of license renewal and subject to an AMR:

- main feedwater line (pipe and fittings (Group B or D))
- valves (control, check, and hand valves) (body and bonnet)

2.3.4.5.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.5 and UFSAR Section 10.4.7 using the Tier-2 evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff's review of LRA Section 2.3.4.5 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 2.3.4.5-1, dated April 8, 2005, the staff stated that license renewal drawing D-25021-LR, sheet 1C, locations B-7 and C-7, and drawing D-02521 LR, sheet 1C, locations B-8 and C-8, have LRA flags in the middle of a section of pipe. Therefore, the staff requested that the applicant explain how the LRA boundary can occur in the middle of a section of pipe.

In its response, by letter dated May 4, 2005, the applicant stated:

> Failure of the referenced portion of the non-safety related feedwater system lines, shown on drawing D-25021-LR, sheet 1C, locations B-7 and C-7, and drawing D-02521-LR, sheet 1C, locations B-8 and C-8, have been evaluated. The evaluation was performed as part of the stress analysis of the interface between the non-safety related feedwater system piping boundary shown with the license renewal flag and the piping boundary at the safety related F032A/B outside containment isolation valves which are part of the reactor vessel and internals system. The intended function of —1 was conservatively chosen for this portion of the feedwater system piping. The license renewal boundary flag is shown correctly on drawings D-25021-LR, sheet 1C, and D-02521-LR, sheet 1C.
>
> The subject Unit 1 and Unit 2 non-safety related feedwater piping is in scope since it is seismically analyzed, connected to safety related reactor vessel and internals system components, and could have spatial interactions with safety related components. Failure of feedwater piping outside the license renewal boundary flag has been evaluated and will not affect the safety related intended function of reactor vessel and internals system

components. The BSEP scoping methodology included piping as in-scope where piping failure could affect nearby safety related components through spray, falling down, or being seismically connected. The subject in-scope feedwater piping is seismically connected but is also located in the reactor building and, therefore, cannot be allowed to spray or fall on safety related components in the reactor building. The intended function of —1 for the subject in-scope feedwater system piping was conservatively chosen to provide an aging management program for both the piping internal and external surface. ISG-9 recommends that if the in-scope connected non-safety related component is of a similar material/environment combination, a similar aging management program should be applied for the connected safety related component. For the subject piping, similar aging management programs were chosen as those of the connected safety related reactor vessel and internals system components. In summary, the license renewal boundary flag is shown correctly on D-25021-LR, Sheet 1C, and D-02521-LR, sheet 1C, with a pressure boundary mechanical intended function.

Based on its review, the staff found the applicant's response to RAI 2.3.4.5-1 acceptable because the subject portions of the feedwater system lines are non-safety related, and the applicant performed analysis to demonstrate that the failure of these subject portions of the feedwater system lines would not have spatial interactions with safety related components. Therefore, the staff's concern described in RAI 2.3.4.5-1 is resolved.

2.3.4.5.3 Conclusion

The staff reviewed the LRA, the accompanying scoping boundary drawings, and RAI response to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the FW system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the FW system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.4.6 Heater Drains and Miscellaneous Vents and Drains

2.3.4.6.1 Summary of Technical Information in the Application

In LRA Section 2.3.4.6, the applicant described the heater drains and miscellaneous vents and drains systems. The heater drains (HD) system is a cascading drain system. Extraction steam enters the heater shell side, gives up its energy to the condensate/feedwater passing through the tubes and is gravity-drained to the next lower pressure heater. This system maintains the feedwater heaters and deaerator level, removes non-condensable gases from the feedwater heaters, supplies heating steam to the Number 3 feedwater heaters, and recovers the steam used for heating in the feedwater heaters. The miscellaneous vents and drains (MVD) system provides equipment drainage and vent paths to collection locations, including the main condenser. MVD piping includes drains from the main steam system, miscellaneous condensate header, turbine building area equipment, the HPCI steam supply drain pot, and the RCIC steam supply drain pot.

The failure of NSR SSCs in the HD and MVD systems could potentially prevent the satisfactory accomplishment of an SR function.

The intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary/flow
- provides structural support/seismic integrity
- provides post-accident containment, holdup, and plateout of MSIV bypass leakage

In LRA Table 2.3.4-4, the applicant identified the following HD and MVD systems component types that are within the scope of license renewal and subject to an AMR:

- piping and fittings (lines to feedwater heaters)
- piping and fittings (steam drains)
- valves (body and bonnet)

2.3.4.6.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.6 and UFSAR Section 10.4.7.2.5 using the Tier-1 evaluation methodology described in SER Section 2.3.

In conducting its Tier-1 review of the two-tier review process, 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 did not omit from the scope of license renewal any components with intended functions delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant identified as being within the scope of license renewal to verify that the applicant did not omit any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.4.6.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the HD and MVD systems components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the HD and MVD systems components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.4.7 Condensate System

2.3.4.7.1 Summary of Technical Information in the Application

In LRA Section 2.3.4.7, the applicant described the condensate system. Condensate originates in the main condenser hotwells and comes primarily from exhaust steam exiting the main turbine and the reactor feed pump turbines. The condensate pumps take suction from the hotwells, pump the condensate forward through the tube side of several equipment condensers, and

maintain balanced condensate flow to the feedwater heaters. Downstream, the condensate is processed through the condensate filter demineralizers to condensate deep-bed demineralizers (CDDs), and the condensate booster pumps. BSEP Units 1 and 2 are each equipped with a 500,000 gallon capacity condensate storage tank (CST) providing suction to condensate transfer pumps, makeup water to the main condenser hotwells, alternate suction source to the CS and CRD hydraulic systems, and normal suction source to the RCIC and HPCI systems. The main condenser provides a heat sink for the turbine exhaust steam, turbine bypass steam, and reactor feed pump turbine exhaust steam, and it is cooled by the circulating water system. The main condenser is credited in alternative source term analyses.

The condensate system contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the condensate system could potentially prevent the satisfactory accomplishment of an SR function. In addition, the condensate system performs functions that support fire protection and SBO.

The intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary/flow
- provides post-accident containment, holdup, and plateout of MSIV bypass leakage

In LRA Table 2.3.4-5, the applicant identified the following condensate system component types that are within the scope of license renewal and subject to an AMR:

- condensate lines (piping and fittings)
- valves (body and bonnet)
- condensate storage (tank)
- condensate cleanup system (piping and fittings)
- valves (body and bonnet)
- condensate coolers/condensers (tubes)
- condensate coolers/condensers (tubesheet)
- condensate coolers/condensers (shell)

2.3.4.7.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.7 and UFSAR Sections 3.4.2.6, 9.2.6, and 10.4.2 using the Tier-2 evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff's review of LRA Section 2.3.4.7 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 2.3.4.7-1, dated April 8, 2005, the staff stated that UFSAR Section 3.4.2.6 states that various flood-level alarms in the circulation water condenser pits warn the operator that an abnormal condition exists and that water is entering the pit. The UFSAR further states that a set of three level alarms installed 9 feet above the pit floor will, when activated, automatically shut off the circulating water pumps. In light of the fact that the main condenser will not be designated to serve as a pressure-retaining boundary for license renewal, the staff requested that the applicant provide additional information to address whether any SR equipment or equipment that supports a safety function could be affected by flooding in this area.

In its response, by letter dated May 4, 2005, the applicant stated that a review of flood susceptibility noted that the failure of the expansion joints in the circulating water condenser pits had the potential to result in the automatic shutdown of both reactors, and NSR leak detection equipment was installed in the condenser pits to address this concern. The applicant also stated that while such a failure might represent a challenge to SR equipment, it would not impair any SR function and is not the basis for including SSCs in the scope of license renewal.

The staff found the applicant's response acceptable because flooding of this area would be addressed by the existing leak detection equipment and because a flood in this area would not impair any SR function. Therefore, the staff's concern described in RAI 2.3.4.7-1 is resolved.

Also, as stated in RAI 2.3.4.7-1, the main condenser will not be designated to serve as a pressure-retaining boundary for license renewal. This is an intended revision to the —1 designation given to it in LRA Table 2.3.4-5. The main condenser will however retain the —7 designation of "Provide post-accident containment, holdup, and plateout of MSIV bypass leakage." It is the applicant's intention to revise LRA Table 2.3.4-5 accordingly. The staff discussed this issue with the applicant during a March 2005 site visit. The applicant stated that the main condenser is not needed to perform any function post-accident that would require it to retain pressure. The main condenser in fact operates at a slight vacuum during normal operation. The applicant stated that integrity of the main condenser is continuously monitored during normal operation and that loss of vacuum would cause a plant shut down. The applicant stated that the —7 designation is placed on the main condenser due to application of the alternative source term.

The staff found the deletion of the —1 designation to be acceptable because there is no post-accident function of the main condenser which requires that it be capable of serving as a pressure-retaining boundary and because the integrity of the main condenser is continuously monitored during normal operation for its ability to operate sub-atmospheric.

2.3.4.7.3 Conclusion

The staff reviewed the LRA and RAI response to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the condensate system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the condensate system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.4.8 Turbine Building Sampling System

2.3.4.8.1 Summary of Technical Information in the Application

In LRA Section 2.3.4.8, the applicant described the turbine building sampling system. In the turbine building, there is a central sample station, essentially a package of sample conditioning and analyzing sections and a sample hood. Samples can be taken continuously or obtained as grab samples for laboratory analysis and consist of three basic types: liquid sampling, steam sampling, and gaseous sampling. Grab samples are taken at the hood, which is designed for constant recovery and splashless withdrawal. The purpose of plant process sampling is to monitor the plant and equipment performance and to determine routine chemical properties and radiation levels necessary to provide information for equipment operation, corrosion control, and radiation activity. The system is not required either for safe shutdown or following an accident and is, therefore, not classified as an essential system. A small amount of tubing in the turbine building sampling system is credited in alternative source term analyses for mitigation of radioactive releases following postulated accidents.

The failure of NSR SSCs in the turbine building sampling system could potentially prevent the satisfactory accomplishment of an SR function.

The intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary/flow
- provides post-accident containment, holdup, and plateout of MSIV bypass leakage

In LRA Table 2.3.4.6, the applicant identified the following turbine building sampling system component types that are within the scope of license renewal and subject to an AMR: piping and fittings (steam drains).

2.3.4.8.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.6 and UFSAR Section 9.3.2 using the Tier-1 evaluation methodology described in SER Section 2.3.

In conducting its Tier-1 review of the two-tier review process, 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 did not omit from the scope of license renewal any components with intended functions delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant identified as being within the scope of license renewal to verify that the applicant did not omit any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.4.8.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its

review, the staff concluded that there is reasonable assurance that the applicant adequately identified the turbine building sampling system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the turbine building sampling system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.4.9 Main Condenser Gas Removal System

2.3.4.9.1 Summary of Technical Information in the Application

In LRA Section 2.3.4.9, the applicant described the main condenser gas removal system. During normal plant operation, non-condensable gases are produced and entrained in the reactor steam cycle and must be continuously removed to maintain turbine efficiency. These gases include hydrogen and oxygen from the radiolytic decomposition of water, fission products, activation products, and air from condenser in-leakage. The mixture is drawn from the main condenser via the steam jet air ejectors (SJAEs). Motive force for the SJAE flow is provided by steam taken off the HP steam supply to the reactor feedwater pump turbines. Two mechanical vacuum pumps are used primarily during startup when there is insufficient reactor steam to operate the SJAE to maintain a condenser vacuum. The steam and non-condensable mixture that exits the SJAE is mixed with oxygen injected from the hydrogen water chemistry system. This is done to insure sufficient oxygen is available for scavenging all free hydrogen in the offgas mixture during the recombination process. The mixture is then passed through an offgas recombiner where hydrogen and oxygen are catalytically recombined to form water. After recombination, the off-gas is routed to a condenser to remove moisture and then through a 30-minute delay pipe before entering the AOG charcoal adsorber system.

The failure of NSR SSCs in the main condenser gas removal system could potentially prevent the satisfactory accomplishment of an SR function. The main condenser gas removal system also performs functions that support fire protection and SBO.

The intended function, within the scope of license renewal, is to provide a pressure-retaining boundary/flow.

In LRA Table 2.3.4-7, the applicant identified the following main condenser gas removal system component types that are within the scope of license renewal and subject to an AMR:

- condensate lines (piping and fittings)
- valves (body and bonnet)

2.3.4.9.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.9 and UFSAR Section 10.4.2 using the Tier-2 evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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

delineated under 10 CFR 54.4(a). The staff did not identify any omissions. The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.4.9.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the main condenser gas removal system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the main condenser gas removal system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.4.10 Turbine Electro-Hydraulic Control System

2.3.4.10.1 Summary of Technical Information in the Application

In LRA Section 2.3.4.10, the applicant described the turbine EHC system. The turbine EHC system maintains a fixed load or speed of the turbine, depending on requirements, and provides turbine overspeed protection in the event of excessive unbalanced energy input to the turbine shaft. The objective of the system is to provide an energy control system that coordinates turbine generator load and reactor output power. The system operates the turbine stop valves, bypass valves, control valves, combined intermediate valves, and other protective devices and provides for mechanical and electrical trips of the turbine. The turbine pressure regulator manipulates turbine control valves and turbine bypass valves, individually or in parallel, to maintain constant reactor pressure at a chosen value. The turbine controls combine standard solid-state electronic operational amplifier elements with HP hydraulic actuators to produce a quick response speed-load control system. The turbine EHC system supplies clean, cool, HP hydraulic fluid necessary for turbine valve operation. The system uses a pump that takes suction on a hydraulic reservoir to supply all components requiring EHC fluid for operation.

The failure of NSR SSCs in the turbine EHC system could potentially prevent the satisfactory accomplishment of an SR function.

The turbine EHC system component types that are within the scope of license renewal and subject to an AMR are addressed as civil commodities in LRA Section 2.4.

2.3.4.10.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.10 and UFSAR Section 10.2.2 using the Tier-1 evaluation methodology described in SER Section 2.3.

In conducting its Tier-1 review of the two-tier review process, 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 did not omit from the scope of license renewal any components with intended functions delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant identified as being within the scope of license renewal to verify that the applicant did not omit any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.4.10.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the turbine EHC system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the turbine EHC system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.4.11 Turbine Generator Lube Oil System

2.3.4.11.1 Summary of Technical Information in the Application

In LRA Section 2.3.4.11, the applicant described the turbine generator lube oil (LO) system. The turbine generator LO system provides a reliable, continuous supply of clean, cool oil to the turbine generator bearings, hydrogen sealing system, and turbine instrumentation during all modes of operation. System equipment includes oil coolers, pumps, strainers, filters and piping.

The failure of NSR SSCs in the turbine generator LO system could potentially prevent the satisfactory accomplishment of an SR function.

The turbine generator LO system component types that are within the scope of license renewal and subject to an AMR are addressed as civil commodities in LRA Section 2.4.

2.3.4.11.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.11 and UFSAR Section 10.2.2 and 10.2.4 using the Tier-2 evaluation methodology described in SER Section 2.3. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.3.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff's review of LRA Section 2.3.4.11 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 2.3.4.11-1, dated April 8, 2005, the staff stated that LRA section 2.3.4.11 states that the turbine generator LO system is within the scope of license renewal because it contains components which are NSR whose failure could prevent satisfactory accomplishment of SR functions. Previous BWR applicants have identified the following component groups and their intended functions within the turbine generator LO system as being within the scope of license renewal and subject to an AMR:

- closure bolting (pressure boundary)
- filters/strainers (spatial interaction)
- piping and fittings (spatial interaction)
- piping and fittings (structural integrity/attached support)
- pump casings (spatial interaction)
- tanks (spatial interaction)
- valves (spatial interaction)
- valves (structural integrity/attached support)

LRA section 2.3.4.11 states that the turbine generator LO system components that are subject to AMR are addressed as civil commodities in LRA Section 2.4 with no clarifying information provided. Therefore, the staff requested that the applicant provide additional information to confirm that all turbine generator LO system components within the scope of license renewal and subject to an AMR have been identified.

In its response, by letter dated May 4, 2005, the applicant stated that the turbine generator LO system supplies lubricating oil for proper operation of the main turbine; however, operation of the main turbine is not necessary to support any intended function for license renewal. The applicant stated that the entire turbine generator LO system is NSR; however, there are selected active electrical switches that must be seismically analyzed to prevent undesirable interactions with SR equipment and that the supports for components having this quality classification are within the scope of license renewal as civil commodities and are identified as an electrical enclosure commodity listed in LRA Table 2.4.2-10. The applicant also stated that the review conducted at BSEP pursuant to 10 CFR 54.4(a)(2) determined that the pressure boundary components and commodities of the turbine generator LO system are not within the scope of license renewal either for potential spatial interactions with in-scope equipment or for providing support for the seismically analyzed portions of systems within the scope of license renewal.

The staff found the applicant's response acceptable because the BSEP turbine generator LO system is NSR and does not perform an intended function within the meaning of the 10 CFR 54.4(a) criteria. Therefore, the staff's concerns described in RAI 2.3.4.11-1 are resolved.

2.3.4.11.3 Conclusion

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

On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the turbine generator LO system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the turbine generator LO system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.4.12 Stator Cooling System

2.3.4.12.1 Summary of Technical Information in the Application

In LRA Section 2.3.4.12, the applicant described the stator cooling system. The stator cooling system automatically regulates the temperature and flow of clean, low conductivity water to cool the main generator stator windings and the power rectifiers of the generator exciter. The cooling water is in direct contact with the stator windings which enhance the heat transfer rate from the copper windings and enable the generator to assume varying loads while eliminating most of the thermal stresses induced in the winding insulation. The system consists of a closed cooling loop that is, in turn, cooled by the TBCCW system. The scope of this system includes the stator leak monitoring system (SLMS). The SLMS monitors the leakage of hydrogen into the stator cooling water. Additionally, the SLMS provides for the proper oxygenation of the stator cooling water to promote the formation of cupric oxide, a tough and durable coating, on the stator bar internal surfaces.

The failure of NSR SSCs in the stator cooling system could potentially prevent the satisfactory accomplishment of an SR function.

The stator cooling system component types that are within the scope of license renewal and subject to an AMR are addressed as civil commodities in LRA Section 2.4.

2.3.4.12.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.12 using the Tier-1 evaluation methodology described in SER Section 2.3.

In conducting its Tier-1 review of the two-tier review process, the staff evaluated the system functions described in the LRA in accordance with the requirements of 10 CFR 54.4(a) to verify that the applicant did not omit from the scope of license renewal any components with intended functions delineated under 10 CFR 54.4(a). The staff did not identify any omissions. The staff then reviewed those components that the applicant identified as being within the scope of license renewal to verify that the applicant did not omit any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.4.12.3 *Conclusion*

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately

identified the stator cooling system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the stator cooling system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.4.13 Hydrogen Seal Oil System

2.3.4.13.1 Summary of Technical Information in the Application

In LRA Section 2.3.4.13, the applicant described the hydrogen seal oil system. The hydrogen seal oil system supplies sealing oil to the generator shaft seal rings to prevent the escape of hydrogen from the generator casing. The seal oil, supplied from the turbine main bearing oil header, is vacuum-treated to remove air and moisture, and boosted in pressure above that of the hydrogen pressure in the generator casing. NSR components in the system have been classified as seismically analyzed to avoid adverse interactions with SR SSCs during an earthquake.

The failure of NSR SSCs in the hydrogen seal oil system could potentially prevent the satisfactory accomplishment of an SR function.

The hydrogen seal oil system component types that are within the scope of license renewal and subject to an AMR are addressed as civil commodities in LRA Section 2.4.

2.3.4.13.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.13 using the Tier-1 evaluation methodology described in SER Section 2.3.

In conducting its Tier-1 review of the two-tier review process, the staff evaluated the system functions described in the LRA in accordance with the requirements of 10 CFR 54.4(a) to verify that the applicant did not omit from the scope of license renewal any components with intended functions delineated under 10 CFR 54.4(a). The staff did not identify any omissions. The staff then reviewed those components that the applicant identified as being within the scope of license renewal to verify that the applicant did not omit any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.3.4.13.3 Conclusion

The staff reviewed the LRA to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the hydrogen seal oil system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the hydrogen seal oil system components that are subject to an AMR, as required by 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 the following structures:

- containment
- other Class 1 and in-scope structures

In accordance with the requirements of 10 CFR 54.21(a)(1), the applicant must identify and list SSCs that are within the scope of license renewal and subject to an AMR. To verify that the applicant properly implemented its methodology, the staff focused its review on the implementation results. This approach allowed the staff to confirm that there are no omissions of structures and components that meet the scoping criteria and are subject to an AMR.

Staff Evaluation Methodology. The staff's evaluation of the information provided in the LRA was performed in the same manner for all structures. The objective of the review was to determine if the components and supporting structures for a specific structure, that appeared to meet the scoping criteria specified in the Rule, were identified by the applicant as within the scope of license renewal, in accordance with 10 CFR 54.4. Similarly, the staff evaluated the applicant's screening results to verify that all long-lived, passive components were subject to an AMR in accordance with 10 CFR 54.21(a)(1).

Scoping. To perform its evaluation, the staff reviewed the applicable LRA section and associated component drawings, focusing its review on components that had not been identified as within the scope of license renewal. The staff reviewed relevant licensing basis documents, including the UFSAR, for each structure and component to determine if the applicant had omitted components with intended functions delineated under 10 CFR 54.4(a) from the scope of license renewal. The staff also reviewed the licensing basis documents to determine if all intended functions delineated under 10 CFR 54.4(a) were specified in the LRA. If omissions were identified, the staff requested additional information to resolve the discrepancies.

Screening. Once the staff completed its review of the scoping results, the staff evaluated the applicant's screening results. For those structures and components with intended functions, the staff sought to determine (1) if the functions are performed with moving parts or a change in configuration or properties, or (2) if they are subject to replacement based on a qualified life or specified time period, as described in 10 CFR 54.21(a)(1). For those that did not meet either of these criteria, the staff sought to confirm that these structures and components were subject to an AMR as required by 10 CFR 54.21(a)(1). If discrepancies were identified, the staff requested additional information to resolve them.

2.4.1 Containment

2.4.1.1 Primary Containment

2.4.1.1.1 Summary of Technical Information in the Application

In LRA Section 2.4.1.1, the applicant described the primary containment. The primary containment for each BSEP unit is a pressure suppression system consisting of a drywell and a

pressure suppression chamber. The drywell houses the reactor vessel, the reactor coolant recirculation loops, and other branch connections of the RCS. In the event of a process system piping failure, reactor water and steam will be released into the drywell atmosphere. The resulting increased drywell pressure will then force a mixture of drywell atmosphere, steam, and water through the vents which open beneath the surface of the pool of water stored in the suppression chamber. The steam will condense in the water resulting in a rapid pressure reduction in the drywell. The primary containment is designed to contain the energy released during the design-basis LOCA and to limit the fission products associated with this accident that are released to the reactor building (secondary containment). Primary containment is classified as a seismic Class 1 structure and must remain functional and protect vital equipment and systems both during and following the most severe natural phenomenon postulated to occur at the site. The primary containment is a BWR Mark 1 design located in the reactor building of each BSEP unit. Unlike other BWRs which employ a Mark 1 containment fabricated of steel, the primary containment is constructed of reinforced concrete with a steel liner. The major structural components of the primary containment are the drywell, sacrificial shield, reactor pedestal, suppression chamber (also called the torus or wetwell), and a connecting venting system.

The primary containment contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the primary containment could potentially prevent the satisfactory accomplishment of an SR function. In addition, the primary containment performs functions that support fire protection, EQ, ATWS, and SBO.

The intended functions within the scope of license renewal include the following:

- provides pressure boundary and/or fission product barrier
- provides structural and/or functional support to SR equipment
- provides shelter/protection to SR equipment
- provides source of cooling water for plant shutdown
- provides missile barrier
- provides structural and/or functional support to NSR equipment
- provides a protective barrier for internal/external flood event
- provides structural support and/or shelter to components required for fire protection, ATWS, and/or SBO
- provides pipe whip restraint and/or jet impingement protection
- provides heat sink during SBO or DBAs
- provides spray shield or curbs for directing flow

In LRA Table 2.4.1-1, the applicant identified the following primary containment component types that are within the scope of license renewal and subject to an AMR:

- anchorage/embedment

- anchorage/embedments - exposed (at the AMR stage, this commodity was consolidated within the proper support group: piping supports, electrical supports, equipment supports, HVAC supports, instrument support, etc.)
- bellows (refueling)
- cable tray and conduit
- concrete above grade
- sacrificial shield wall
- concrete curbs
- doors and framing/hardware
- downcomers (open-ended pipes attached to torus vent header)
- drywell head
- drywell liner
- electrical enclosure
- electrical support
- equipment support
- floor drains
- HVAC support
- instrument support
- insulation
- liner (sump)
- moisture barrier
- penetration (mechanical and electrical)
- drywell personnel airlock, equipment hatch, CRD hatch
- pipe support
- reactor pressure vessel support
- seals and gaskets (manways, airlocks, doors, hatches)
- side bearing plate
- structural steel: platforms stairways, mezzanines and hardware
- torus liner
- vent header (drywell to torus vent lines and ring header)
- vent line bellows
- whip restraints (includes jet impingement shields)

2.4.1.1.2 Staff Evaluation

The staff reviewed LRA Section 2.4.1.1 and UFSAR Sections 3.8 and 6.2.1 using the evaluation methodology described in SER Section 2.4. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.4, "Scoping and Screening Results - Structures."

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff's review of LRA Section 2.4.1.1 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 2.4-1, dated April 25, 2005, the staff noted that BSEP primary containment encloses the reactor vessel and a number of other structures, such as the concrete pedestal and seismic bracing for the drywell. LRA Table 2.4.1-1 does not indicate that these structures are within the scope of license renewal. These structures perform SR functions; therefore, the staff requested that the applicant address the following: (1) if the structures are not included through an oversight, the staff requested that the applicant provide a description of their scope and AMR; (2) if they are covered somewhere else in the LRA, the staff requested that the applicant provide the relevant information; and (3) if they are excluded from within the scope of license renewal, the staff requested that the applicant provide the basis for excluding these items from the scope of license renewal.

In its response, by letter dated May 11, 2005, the applicant indicated that the concrete pedestal is within the scope of license renewal and is addressed within the "Concrete Above Grade" commodity group. Seismic stabilizers utilized between the RPV and the biological shield wall are within the scope of license renewal, and are addressed within the "RPV Support" commodity group. Seismic ties utilized between the biological shield wall and the drywell wall are within the scope of license renewal, and are addressed within the "Structural Steel" commodity group.

Based on the inclusion of the structures, identified in the RAIs, as part of the commodity group considered in LRA Table 2.4.1.1, the staff's concern described in RAI 2.4-1 is resolved.

In RAI 2.4-2, dated April 25, 2005, the staff noted that in the information provided in LRA Section 2.4.1, it was not clear whether all drywell and torus supports are within the scope of license renewal. The staff stated that (1) if the drywell and torus supports were not included as an oversight, the staff requested that the applicant provide a description of their scope and aging management review; (2) if they were covered somewhere else in the LRA, the staff requested that the applicant indicate the location; and (3) if they were excluded from within the scope of license renewal, the staff requested that the applicant provide the basis for excluding these items from within the scope of license renewal.

In its response, by letter dated May 11, 2005, the applicant stated that all drywell and torus supports are within the scope of license renewal. The subject supports are addressed within a variety of commodity groups such as: "Electrical Support," "Equipment Support," "HVAC Support," "Instrument Support," "Pipe Support," "Structural Steel," and "Whip Restraints," as shown in LRA Table 2.4.1-1. Although pipe supports are identified by a single commodity group in LRA Table 2.4.1-1, they are sub-categorized by American Society of Mechanical Engineers (ASME) Code Class designation, as shown in LRA Table 3.5.2-1. The structural components identified in the RAI are included as part of various commodity groups; therefore, the staff's concern described in RAI 2.4-2 is resolved.

2.4.1.1.3 *Conclusion*

The staff reviewed the LRA, and RAI responses to determine whether any structure and structural components that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the primary containment components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the primary containment components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2 Other Class 1 and In-Scope Structures

In LRA Section 2.4.2, the applicant identified the structures and components of the other Class 1 and in-scope structures that are subject to an AMR for license renewal.

The applicant described the supporting structures and components of the other Class 1 and in-scope structures in the following sections of the LRA:

- 2.4.2.1 intake and discharge canals
- 2.4.2.2 refueling system
- 2.4.2.3 switchyard and transformer yard structures
- 2.4.2.4 monorail hoists
- 2.4.2.5 bridge cranes
- 2.4.2.6 gantry cranes
- 2.4.2.7 service water intake structure
- 2.4.2.8 reactor building
- 2.4.2.9 augmented off-gas building
- 2.4.2.10 diesel generator building
- 2.4.2.11 control building
- 2.4.2.12 turbine building
- 2.4.2.13 radwaste building
- 2.4.2.14 water treatment building
- 2.4.2.15 miscellaneous structures and out-buildings

The corresponding subsections of this SER (2.4.2.1 – 2.4.2.15, respectively) present the staff's review findings with respect to the other Class 1 and in-scope structures for Units 1 and 2.

Staff Evaluation. The staff reviewed LRA Sections 2.4.2.1 through 2.4.2.15, and related UFSAR sections using the evaluation methodology described in SER Section 2.4. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.4.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff's review of LRA Sections 2.4.2.1 through 2.4.2.15 and identified areas in which additional information was necessary to complete the review of the applicant's scoping and screening results. In addition to the review results discussed in the specific sections of this SER, the following paragraphs summarize staff review findings that cover multiple component groups.

In RAI 2.4-4, dated April 25, 2005, the staff stated that as a result of its review of LRA Section 2.4, "Scoping and Screening Results - Structures," and LRA Figure 2.2-1, the staff found that some structures are not considered within the scope of license renewal. These structures include the circulating water intake structure, chlorination building, auxiliary boiler house, auxiliary surge tank, diesel generator fuel oil tank vault, radioactive material container storage, and service building. The staff questioned whether all these structures serve no intended function as defined in 10 CFR 54.4(a)(1); therefore, the staff requested that the applicant provide a detailed description of these structures (including their function), and describe the technical bases for their exclusion from the scope of license renewal. Also, the staff requested that the applicant verify that none of these structures serves a seismic II/I intended function as defined in 10 CFR 54.4(a)(2).

In its supplemental response, by letter dated July 18, 2005, the applicant provided a description (including structural function) for each of the above mentioned structures and stated that the determination whether a structure is within the scope of license renewal is based on the information provided in the UFSAR, DBD, EDB, Maintenance Rule database, and license renewal scoping evaluations. As such, if a structure contains any components within the scope of license renewal or if the structure supports a license renewal intended function, this structure is considered within the scope of license renewal. Those structures that contain no license renewal components and support no license renewal intended functions are outside the scope of license renewal. The applicant's justification and basis for excluding these structures from the license renewal scope are discussed below:

Circulating Water Intake Structure. The circulating water intake structure, as stated in the UFSAR, is located a sufficient distance from SR structures such that any failure of this structure during a hurricane or tornado will not affect those SR structures. In addition, this structure is classified as an NSR structure in the EDB, and does not contain any components

that are within the scope of license renewal nor does it support a license renewal intended function. Therefore, this building is not within the scope of license renewal.

Chlorination Building. The chlorination building is an unclassified sheet metal structure attached to the south side of the service water intake structure which is a Class I reinforced concrete structure designed for seismic, tornado, and hurricane loads. The chlorination building does not contain any components that are within the scope of license renewal, nor does it support a license renewal intended function. Based on the lightweight design of the chlorination building compared to the robust design of the service water intake structure, any loading due to failure of the chlorination building on the service water intake structure would be enveloped by the Class I design criteria. As such, the chlorination building is not a seismic II/I risk for the service water intake structure. Therefore, this building is not within the scope of license renewal.

Auxiliary Boiler House. The auxiliary boiler house (a steel frame structure with a reinforced concrete foundation mat and insulated metal sidings and built-up roofing) is located a sufficient distance from all Class I structures. This building is an non-classified structure. SSCs within the building do not support any license renewal intended functions based on review of the EDB safety classifications. This structure is not within the scope of license renewal.

Auxiliary Surge Tank. The auxiliary surge tank (a stainless steel tank mounted on a concrete foundation) is located east of the Unit 2 reactor building and is not directly adjacent to any Class I structure. This tank contains radioactive wastes in excess of normal operational quantities. Radioactive levels within this tank are procedurally controlled to a limit of less than 10 curies in accordance with Technical Specification (TS) Section 5.5.8; as such, the failure of this tank would not exceed limits associated with 10 CFR 54.4(a)(1)(iii). Therefore, the auxiliary surge tank, tank foundations and supports do not support license renewal intended function and are outside the scope of license renewal.

Diesel Generator Oil Tank Vault. The diesel generator oil tank vault is a reinforced concrete building for housing the underground diesel fuel storage tank, and is located to the east of the diesel generator building. Although it is not listed in LRA Table 2.4.2-9, "Component Commodity Groups Requiring Aging Management Review and Their Intended Functions: Diesel Generator Building," this tank building is considered as part of the diesel generator building, and is within the scope of license renewal.

Radioactive Material Container Storage Building. The radioactive material container storage building is located north of the Unit 1 turbine and reactor buildings, and is not adjacent to any Class I structure. This building does not contain any components that are within the scope of license renewal, and does not support any license renewal intended function. Therefore, it is not within the scope of license renewal.

Service Building. The service building (a steel frame structure with insulated metal siding and roof panels) is not adjacent to any Class I structure, and does not support any SR functions. Also, this building does not contain any components that are within the scope of license renewal, nor does it support a license renewal intended function. Therefore, this building is not within the scope of license renewal.

The staff reviewed the applicant's response and found that it provides an adequate technical basis for the scoping determination. On the basis of the above discussion, the staff's concerns described in RAI 2.4-4 are resolved.

In RAI 2.4-8, dated April 25, 2005, the staff stated that in review of LRA Tables 2.4.2-1 through 2.4.2-14, it found that some of these tables indicate that structural steel includes platforms, stairways, mezzanines, and hardware. It was not clear to the staff whether the term "structural steel" covers major structural components, such as beams, columns, and roof frames. Therefore, the staff requested that the applicant respond to the following questions: (1) what is covered under the word "hardware," (2) which structural steel components are considered "hardware," (3) are the major structural steel components (e.g., beams, columns, roof frames, other steel frames, etc.) considered hardware, and (4) if not, in which table (or tables) are these structural components listed for the AMR?

In its letter responses, dated May 11, 2005 and June 21, 2005, the applicant clarified that the term "hardware" is associated with connection components, such as, nuts, bolts, washers, etc. The applicant noted that major structural steel components, such as, beams, columns, roof frames, and other steel frames were not listed specifically in the summary tables of aging management evaluation; however, these steel components were considered to be structural steel components and were addressed within the "Structural Steel" commodity group. The staff considered the applicant's response reasonable and acceptable. Therefore, the staff's concern described in RAI 2.4-8 is resolved.

In RAI 2.4-10, dated April 25. 2005, the staff stated that LRA Section 2.4 identifies that masonry walls located in the service water intake structure, reactor building, augmented off-gas building, diesel generator building, control building, and turbine building are within the scope of license renewal. Therefore, the staff requested that the applicant identify whether there are masonry walls located in other in-scope building structures, such as the radwaste building, water treatment building, HPCI CO_2 bottle storage building, etc. If there are masonry walls located in these buildings, the applicant was also requested to include these masonry walls in the component commodity groups requiring AMR or provide justification for their exclusion from within the scope of license renewal.

In its response, by letter dated May 11, 2005, the applicant clarified that there are no masonry walls in the HPCI CO_2 bottle storage building. The masonry wall located in the water treatment building is used as a fire protection impingement barrier between the diesel fire pump and the fuel oil tank, and it is within the scope of license renewal. There are masonry walls located in the radwaste building; however, these walls do not support any license renewal intended function (including the II/I issue) and, therefore, have been screened out from license renewal. The staff found that the license's clarification is sufficient; therefore, the staff's concerns described in RAI 2.4-10 are resolved.

In RAI 2.4-11, dated April 25, 2005, regarding the scoping and screening of the crane/rail systems, the staff requested that the applicant clarify the treatment of cranes and hoists in the scoping and screening, and in the AMR. In addition, the staff requested that the applicant provide the following information:

(a) A list of all cranes/hoists/rails and associated components in the scope of license renewal.

(b) A list of all cranes/hoists/rails and associated components requiring an AMR (i.e., passive, long-lived).

(c) A list of all cranes/hoists/rails and associated components requiring aging management and/or TLAA.

In its response, by letter dated May 11, 2005, the applicant provided its scoping and screening results of cranes systems (monorail hoists, bridge cranes, gantry cranes, etc,) as follows:

> The Units 1 and 2 refueling platforms are considered cranes within the scope of license renewal. Monorail hoists are categorized as "Structural Steel" for the purpose of license renewal and are managed by the Structures Monitoring Program.

The applicant also stated that the commodity groups of bridge cranes and gantry crane are within the scope of license renewal. There are nine bridge cranes and two gantry cranes in the BSEP nuclear plant (Units 1 and 2): Units 1 and 2 reactor building bridge cranes, Units 1 and 2 turbine building bridge cranes, Unit 1 jib crane, four diesel generator bridge cranes, intake structure gantry crane, and the heater bay gantry crane. As a result of the screening process, only the reactor building bridge cranes, Unit 1 jib crane, diesel generator building bridge cranes, and intake structure gantry crane are within the scope of license renewal. The others are not within the scope of license renewal, because the turbine building bridge cranes and heater bay gantry crane perform no license renewal intended functions.

In its response, the applicant further indicated that the cranes and monorails that involved a TLAA include Units 1 and 2 refueling platforms, Units 1 and 2 reactor building bridge cranes, intake structure gantry crane, diesel generator bridge cranes, and miscellaneous monorails/hoists. The Units 1 and 2 refueling platforms, Units 1 and 2 reactor building bridge cranes, and the intake structure gantry crane are managed by the Inspection of Overhead Heavy Load and Light Load Handling Systems Program; the diesel generator bridge cranes and miscellaneous monorails/hoists are managed as structural steel under the Structures Monitoring Program.

The staff reviewed the applicant's response and found that the information provided by the applicant is comprehensive and sufficient to answer the three questions posed by the staff. Therefore, the staff's concerns described in RAI 2.4-11 are resolved.

In RAI 2.4-12, dated April 25, 2005, the staff requested that the applicant provide additional information regarding the following Class I Group 6 structures:

(a) With respect to the intake pumping station, identify items such as hatches and plugs, structural steel embedments, carbon steel boltings, reinforced concrete foundation footings, grouted concrete, and water proofing membrane materials that require an AMR.

(b) Regarding the condensate water storage tank foundations and trenches, confirm that the equipment supports and foundations as well as the trenches consist of reinforced concrete components. As appropriate, identify items such as structural steel embedments, carbon steel boltings, grouted concrete, and water proofing membrane materials that require an AMR.

In its response, by letter dated May 11, 2005, the applicant provided the following information:

(a) Hatches and plugs associated with the service water intake structure are considered subcomponents of the "Concrete Above Grade" commodity group. Structural steel embedments are addressed within the "Anchorage/Embedment- Embedded" commodity group. Carbon steel bolting is addressed as a subcomponent of the respective commodity group; such as, "Electrical Support," "Equipment Support," "HVAC Support," etc. Reinforced concrete foundation footings are addressed within the "Concrete Below Grade" commodity group. Grouted concrete is addressed within the "Concrete Above Grade" commodity group. Water proofing membranes are addressed within the "Roof-Membrane/Built-Up" commodity group. These commodities are with the scope of license renewal and require an AMR.

(b) The condensate storage tank (CST) foundation was correlated to a GALL Group 8 structure, not Group 6, and is within the scope of license renewal as addressed in LRA Section 2.4.2.15, "Miscellaneous Structures and Out-Buildings." The commodity groups associated with the CST are: "Anchorage/Embedment –Embedded," "Anchorage/Embedment- Exposed," "Tank Foundation," "Electrical Enclosure," and "Instrument Support." There is no water proofing membrane associated with CST foundation.

The staff verified the information discussed above with the related LRA sections and tables, and found that these components are within the scope of license renewal. On this basis, the staff considers the applicant's response acceptable; therefore, RAI 2.4-12 is resolved.

In RAI 2.4-13, dated April 25, 2005, the staff stated that based on information provided in LRA Section 2.4, the staff could not identify the insulation and insulation jacketing included in the license renewal scope nor the specific subsets of the insulation and insulation jacketing that are included in LRA Section 2.4 tables. Also, it was unclear to the staff whether the insulation and jacketing on the reactor coolant system has been included within scope. In order to allow the staff to complete the review for the insulation and insulation jacketing, the staff requested that the applicant provide the following information:

(a) Specifically 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.

(b) List all insulation and insulation jacketing materials associated with item (a), above, that require an AMR and the results of the AMR. Also, identify the AMPs credited to manage aging.

(c) List insulation and insulation jacketing materials associated with item (a) above that do not require aging management, and include a justification for their exclusion in relation to plant-specific operating experience.

In its response, by letter dated May 11, 2005, the applicant stated that the only insulation credited within LRA Section 2.4 is associated with the drywell hot penetrations (LRA Table 2.4.1-1). Insulation and jacketing of the reactor coolant system was not credited in LRA Section 2.4, since drywell internal temperatures are controlled by TSs. The drywell bulk

average temperature is managed under TS 3.6.1.4, which requires the plant to enter limiting condition for operation actions if the drywell bulk average temperature exceeds 150 °F.

The applicant also stated that the insulation on hot penetrations is within the scope of license renewal and identified for an AMR in LRA Table 3.5.2-1. No aging effects were identified, based on operating experience; no AMP was specified. Hot penetration temperatures, recorded on chart paper, were reviewed back to 1997. No penetration temperatures exceeded 200 °F, with the highest recorded temperature,185 °F, being on one of the main steam lines. As such, the insulation has proven effective in maintaining hot penetration temperatures below 200 °F.

Based on the applicant's response, the staff found that the applicant has provided sufficient information in response to the staff's request and considers RAI 2.4-13 resolved.

In RAI 2.4-14, dated April 25, 2005, the staff stated that for some in-scope building structures, the applicant identified the "Fire Barrier Assembly" as one of the commodity groups requiring an AMR. Therefore, the staff requested that the applicant provide a list of buildings within the scope of license renewal with fire proofing material applied to some of their structural steel members or components as part of fire barriers. The applicant was also requested to discuss how and where these fire proofing materials are included in the AMR as part of the fire barrier review.

In its response, by letter dated May 11, 2005, the applicant stated that the BSEP in-scope buildings with fire proofing material applied to some of their structural steel members or components are the service water intake structure, reactor buildings, diesel generator building, and control building. In LRA Tables 2.4.2-6, 2.4.2-7, 2.4.2-9, and 2.4.2-10, the applicant indicated that the fire proofing material is addressed within the "Sprayed on Coatings" commodity group and is managed by the Fire Protection Program. The staff verified the applicant's response with the LRA sections and tables as well as related UFSAR sections, and found that the applicant had properly addressed this issue. On this basis, the staff's concern described in RAI-2.4-14 is resolved.

Conclusion. The staff reviewed the LRA, related structural components, and RAI responses to determine whether any SSCs that should be within the scope of license renewal had not been identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR had not been identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant had adequately identified the components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and the components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2.1 Intake and Discharge Canals

2.4.2.1.1 Summary of Technical Information in the Application

In LRA Section 2.4.2.1, the applicant described the intake and discharge canals. The intake and discharge canals are part of the circulating water system in which water is taken from the Cape Fear River and discharged into the Atlantic Ocean. The inlet canal begins at the Cape

Fear Estuary and terminates at the plant intake structures. Adjacent to the service water intake structure and the circulating water intake structure, within the intake and discharge canals system, are circular sheet-pile caissons acting as a transition between the earthen intake canal and the concrete intake structures. The discharge canal, originating at the southwest area of the plant site, at the discharge weir, travels southwest, crossing under the intracoastal waterway through reinforced concrete pipes. The concrete pipes discharge into a stilling basin, which terminates at the Caswell Beach Pumping Facility.

The failure of NSR SSCs in the intake and discharge canals could potentially prevent the satisfactory accomplishment of an SR function.

The intended functions within the scope of license renewal include the following:

- provides source of cooling water for plant shutdown
- provides structural and/or functional support to NSR equipment

In LRA Table 2.4.2-1, the applicant identified the following intake and discharge canals component types that are within the scope of license renewal and subject to an AMR: canal (intake canal only) and sheet piles.

2.4.2.1.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.1 and UFSAR Section 10.4.5.2 using the evaluation methodology described in SER Section 2.4. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.4.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff's review of LRA Section 2.4.1.1 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 2.4-6, dated April 25, 2005, the staff stated that as described in UFSAR Section 10.4.5.2, an expanded metal fence and eight traveling screens (four for each unit) are installed in the intake canal to prevent marine life and debris from entering the system. From its review of LRA Section 2.4.2.1, the staff also found that these items are not subject to aging management. Therefore, the staff requested that the applicant submit a more detailed description of these items, including their functions, and describe the technical bases for their exclusion from the scope of license renewal.

In its response, by letter dated May 11, 2005, the applicant indicated that the expanded metal fence is associated with the fish diversion structure. A fish diversion screen is located across the intake canal to keep fish from entering the intake canal, thus minimizing impingement and

improving traveling screen reliability. There are no credible DBEs associated with the structure that would prevent or mitigate the completion of an SR function. As such, the fish diversion structure, along with the expanded metal fence, supports no license renewal function and are not considered within the scope of license renewal.

With regard to the eight traveling screens identified in UFSAR Section 10.4.5.2, the applicant stated that these traveling screens are associated with the circulating water system and are located in the circulating water intake structure. Since the intake bays of the circulating water system are classified in the equipment database as NSR structures, and the circulating water intake structure does not contain any components within the scope of license renewal nor support a license renewal intended function, the traveling screens are not within the scope of license renewal.

Based on the applicant's response, the staff concurs with the applicant's assessment that the fish diversion structure, along with the expanded metal fence, and the traveling screens support no license renewal function and thus, considers RAI 2.4-6 resolved.

2.4.2.1.3 Conclusion

The staff reviewed the LRA, related structural/component information, and RAI response to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the intake and discharge canals components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the intake and discharge canals components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2.2 Refueling System

2.4.2.2.1 Summary of Technical Information in the Application

In LRA Section 2.4.2.2, the applicant described the refueling system. The refueling system comprises the refuel platforms, the auxiliary work platform, and various tools, equipment, and structures associated with fuel handling for both new and spent fuel. The refuel platform is unique to each unit; however, the auxiliary work platform and various tools are shared between units. The refuel platform for each unit runs on rails over the fuel pool and reactor well at the 117-foot elevation of the reactor building. The passive physical crane structures, such as the main structural members, bridge, trolley, structural girders, rail system, and anchorage brackets, are considered subcomponents of the refuel platform. The auxiliary work platform is common to both units and is disassembled and moved to support the unit being refueled. Fuel preparation machines are suspended from the side of the spent fuel pools and are used to load new fuel into the fuel pool and to serve as a workstation from which irradiated fuel is de-channeled for inspection.

The failure of NSR SSCs in the refueling system could potentially prevent the satisfactory accomplishment of an SR function.

The intended function, within the scope of license renewal, is to provide structural and/or functional support to NSR equipment.

In LRA Table 2.4.2-2, the applicant identified the following refueling system component types that are within the scope of license renewal and subject to an AMR: fuel preparation machines, auxiliary work platform, and refueling platforms.

2.4.2.2.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.2 and Table 2.4.2-2 using the evaluation methodology described in SER Section 2.4. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.4.

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 delineated under 10 CFR 54.4(a). The staff did not identify any omissions. The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

In addition to RAI 2.4-11 (screening of crane/rail systems) discussed in Section 2.4.2 above, no other RAI was identified.

2.4.2.2.3 Conclusion

The staff reviewed the LRA, related structural/component information, and RAI response to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concludes that there is reasonable assurance that the applicant adequately identified the refueling system components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the refueling system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2.3 Switchyard and Transformer Yard Structures

2.4.2.3.1 Summary of Technical Information in the Application

In LRA Section 2.4.2.3, the applicant described the switchyard and transformer yard structures. The relay building and structures in the switchyard and transformer yard have been combined under the one structural system: switchyard and transformer yard structures. These structures are located west of the turbine building. The relay building is shared between units, and each unit has its own switchyard and transformer yard. The design function of these structures is to support, house, and protect components associated with the switchyard, transformer yard, and relay building.

The switchyard and transformer yard structures perform functions that support SBO.

The intended function, within the scope of license renewal, is to provide structural support and/or shelter to components required for fire protection, ATWS, and/or SBO.

In LRA Table 2.4.2-3, the applicant identified the following switchyard and transformer yard structures component types that are within the scope of license renewal and subject to an AMR:

- anchorage/embedment - embedded
- anchorage/embedments - exposed (at the AMR stage, this commodity was consolidated within the proper support group: piping supports, electrical supports, equipment supports, HVAC supports, instrument supports, etc.)
- cable tray and conduit
- concrete above grade
- concrete below grade
- electrical enclosure
- electrical support
- equipment support
- piles
- siding
- structural steel: platforms, stairways, mezzanines, and hardware

2.4.2.3.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.3 using the evaluation methodology described in SER Section 2.4. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.4.

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 delineated under 10 CFR 54.4(a). The staff did not identify any omissions. The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

2.4.2.3.3 Conclusion

The staff reviewed the LRA and related structural/component information to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the

applicant. No omissions were identified. On the basis of its review, the staff concludes that there is reasonable assurance that the applicant adequately identified the switchyard and transformer yard structures components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the switchyard and transformer yard structures components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2.4 Monorail Hoists

2.4.2.4.1 Summary of Technical Information in the Application

In LRA Section 2.4.2.4, the applicant described the monorail hoists. The monorail hoists are structural/mechanical systems used during plant maintenance to move or remove equipment. The monorail hoist system is not shared between units and is not required for abnormal or accident plant operating modes.

The failure of NSR SSCs in the monorail hoists could potentially prevent the satisfactory accomplishment of an SR function.

Monorails are considered to be structural steel within the license renewal civil screening process. The basis for this is that monorails are fixed, permanent, structural members upon which removable hoists are installed when maintenance is required. The hoisting apparatus is typically removed from the monorail when not required for maintenance; however, in some cases the hoists are moved to a safe location on the monorail and secured to prevent inadvertent movement or interaction with SR components. Therefore, only the structural members and anchorages associated with monorail hoists are considered to be license renewal commodities, and the AMR results for monorail hoists are documented under the review of the structural steel commodity in the structures containing the hoists.

2.4.2.4.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.4 using the evaluation methodology described in SER Section 2.4. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.4.

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 delineated under 10 CFR 54.4(a). The staff did not identify any omissions. The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

In addition to RAI 2.4-11 (screening of crane/rail systems) discussed in Section 2.4.2 above, no other RAI was identified.

2.4.2.4.3 Conclusion

The staff reviewed the LRA,, and RAI response to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the monorail hoists components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the monorail hoists components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2.5 Bridge Cranes

2.4.2.5.1 Summary of Technical Information in the Application

In LRA Section 2.4.2.5, the applicant described the bridge cranes. The bridge cranes are structural/mechanical systems used during plant maintenance to move or remove equipment. The bridge cranes within scope of license renewal are the 125-ton reactor building bridge cranes; the diesel generator bridge cranes; and the refueling jib cranes. Two of the refueling jib cranes have been removed from service. The remaining refueling jib crane and the diesel generator bridge cranes have been screened as structural steel with monorail hoists in the previous subsection. The passive physical crane structures, such as the main structural members, bridge, trolley, structural girders, rail system, and anchorage brackets, are considered subcomponents of the reactor building bridge cranes. The reactor building bridge cranes were designed to Crane Manufacturers Association of America (CMAA) Specification No. 70 (CMAA-70), with a service class of A1, corresponding to a cyclic loading of between 20,000 and 100,000 cycles.

The bridge cranes contain SR components that are relied upon to remain functional during and following DBEs. The intended function, within the scope of license renewal, is to provide structural and/or functional support to SR equipment.

In LRA Table 2.4.2-4, the applicant identified the following bridge cranes component types that are within the scope of license renewal and subject to an AMR: Unit 1 reactor building bridge crane and Unit 2 reactor building bridge crane.

2.4.2.5.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.5 and the referenced UFSAR using the evaluation methodology described in SER Section 2.4. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.4.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not

omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

In addition to RAI 2.4-11 (screening of crane/rail systems) discussed in Section 2.4.2 above, no other RAI was identified.

2.4.2.5.3 Conclusion

The staff reviewed the LRA, related structural/component information, and RAI response to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the bridge cranes components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the bridge cranes components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2.6 Gantry Cranes

2.4.2.6.1 Summary of Technical Information in the Application

In LRA Section 2.4.2.6, the applicant described the gantry cranes. The gantry cranes are structural/mechanical components used during plant maintenance to move or remove equipment. Gantry cranes are not required for abnormal or accident plant operating modes. The gantry cranes are shared between units and consist of the heater bay gantry crane and the intake structure gantry crane. The gantry cranes are designed in accordance with CMAA-70 and American National Standards Institute (ANSI) B30.2.0-67. Only the intake structure gantry crane is within scope for license renewal, because it has the potential to impact the Class 1 service water intake structure should a structural failure occur. The passive physical crane structures, such as the main structural members, bridge, trolley, structural girders, rail system, and anchorage brackets, are considered subcomponents of the intake structure gantry crane.

The failure of NSR SSCs in the gantry cranes could potentially prevent the satisfactory accomplishment of an SR function.

The intended function, within the scope of license renewal, is to provide structural and/or functional support to NSR equipment. In LRA Table 2.4.2-5, the applicant identified the intake structure gantry crane as the gantry cranes component type that is within the scope of license renewal and subject to an AMR.

2.4.2.6.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.6 and the referenced UFSAR using the evaluation methodology described in SER Section 2.4. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.4.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

In addition to RAI 2.4-11 (screening of crane/rail systems) discussed in Section 2.4.2 above, no other RAI was identified.

2.4.2.6.3 Conclusion

The staff reviewed the LRA, related structural/component information, and RAI response to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the gantry cranes components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the gantry cranes components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2.7 Service Water Intake Structure

2.4.2.7.1 Summary of Technical Information in the Application

In LRA Section 2.4.2.7, the applicant described the service water (SW) intake structure. The SW intake structure is located west of the intake canal and east of the augmented off-gas building. The SW intake structure is a seismic Class 1 structure approximately 104 feet long by 72 feet wide that directs cooling water to the service water pumps via four intake bays from the intake canal. In the SW intake structure, a separate chamber is provided for the 10 SW pumps, and two chambers are provided for the four screen wash water pumps with two pumps per chamber. The purpose of the SW intake structure is to house and protect SW system components. The structure is common to both units. The scope of the SW intake structure initially included the circulating water intake structure concrete and other concrete wetted structures in close proximity to the SW intake structure. However, the seismic Class 2 circulating water intake structure was screened out, because it is located a sufficient distance from the SW intake structure to preclude adverse interactions. The intake structure gantry crane is located within the physical boundary of the SW intake structure; and the crane, crane rails, and associated hardware have been screened with other gantry cranes, above. The concrete structure supporting the crane rails in the vicinity of the SW intake structure is addressed with the SW intake structure.

The SW intake structure contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the SW intake structure could potentially prevent the satisfactory accomplishment of an SR function. In addition, the SW intake structure performs functions that support fire protection.

The intended functions within the scope of license renewal include the following:

- provides structural and/or functional support to SR equipment
- provides shelter/protection to SR equipment
- provides rated fire barrier
- provides source of cooling water for plant shutdown
- provides missile barrier
- provides structural and/or functional support to NSR equipment
- provides a protective barrier for internal/external flood event
- provides structural support and/or shelter to components required for fire protection, ATWS, and/or SBO
- provides spray shield or curbs for directing flow

In LRA Table 2.4.2-6, the applicant identified the following SW intake structure component types that are within the scope of license renewal and subject to an AMR:

- anchorage/embedment - embedded
- anchorage/embedments - exposed (at the AMR stage, this commodity was consolidated within the proper support group: piping supports, electrical supports, equipment supports, HVAC supports, instrument supports, etc.)
- cable tray and conduit
- concrete above grade
- concrete below grade
- concrete submerged
- doors and framing/hardware
- electrical enclosure
- electrical support
- equipment support
- fire hose station
- floor drains
- HVAC support
- instrument racks
- instrument support
- masonry walls
- penetration
- pipe support

- roof-membrane / built-up
- seals and gaskets
- spray shield
- sprayed on coatings
- structural steel: platforms, stairways, mezzanines, and hardware

2.4.2.7.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.7 and the UFSAR using the evaluation methodology described in SER Section 2.4. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.4.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

In addition to RAIs 2.4-8, 2.4-10, 2.4-12, and 2.4-14 discussed in Section 2.4.2 above, no other RAI was identified.

2.4.2.7.3 Conclusion

The staff reviewed the LRA, and RAI responses to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the SW intake structure components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the SW intake structure components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2.8 Reactor Building

2.4.2.8.1 Summary of Technical Information in the Application

In LRA Section 2.4.2.8, the applicant described the reactor building. The reactor building encloses the primary containment which consists of the drywell and pressure suppression chamber. The reactor building houses the refueling and reactor service equipment, new and spent fuel storage facilities, and other reactor services and auxiliary equipment. The reactor building serves as a secondary containment during normal plant operation when the primary containment is functional. In addition, the reactor building serves as the containment boundary during reactor refueling and maintenance operations, when the primary containment is open.

Each unit has a reactor building; it is not a common or shared structure. The secondary containment system includes the secondary containment (reactor building) structure and the SR systems provided to control the ventilation and cleanup of potentially contaminated volumes, exclusive of the primary containment, following a design-basis accident. The safety objective of the secondary containment is to limit the release of radioactivity to the environs after an accident so that the resulting exposures are kept to a practical minimum and are within regulatory limits. The secondary containment minimizes the consequences of an accident by providing a controlled release of the reactor building atmosphere through filters at an elevated point.

The reactor building contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the reactor building could potentially prevent the satisfactory accomplishment of an SR function. In addition, the reactor building performs functions that support EQ, ATWS, and SBO.

The intended functions within the scope of license renewal include the following:

- provides pressure boundary and/or fission product barrier
- provides structural and/or functional support to SR equipment
- provides shelter/protection to SR equipment
- provides rated fire barrier
- provides missile barrier
- provides structural and/or functional support to NSR equipment
- provides a protective barrier for internal/external flood event
- provides structural support and/or shelter to components required for fire protection, ATWS, and/or SBO
- provides pipe whip restraint and/or jet impingement protection
- provides spray shield or curbs for directing flow

In LRA Table 2.4.2-7, the applicant identified the following reactor building component types that are within the scope of license renewal and subject to an AMR:

- anchorage/embedment - embedded
- anchorage/embedments - exposed (at the AMR stage, this commodity was consolidated within the proper support group: piping supports, electrical supports, equipment supports, HVAC supports, instrument supports, etc.)
- bellows (RCIC line bellows - MSIV pit)
- blow-out panel
- cable tray and conduit
- concrete above grade
- concrete below grade

- concrete curbs
- damper mounting
- doors and framing/hardware (includes airlock doors)
- electrical enclosure
- electrical support
- equipment support
- fire barrier assembly
- fire hose station
- floor drains
- HVAC support
- instrument racks
- instrument support
- liner (reactor cavity and spent fuel pool)
- masonry walls
- penetration (mechanical and electrical)
- pipe support
- roof-membrane / built-up
- seals and gaskets
- siding (pressure boundary)
- slide bearing plate (torus radial beams and spent fuel rack support)
- spent fuel storage rack
- spray shield
- sprayed on coatings
- structural steel: platforms, stairways, mezzanines, and hardware
- tendons (concrete girders spanning the reactor building)
- whip restraints

2.4.2.8.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.8 and the UFSAR using the evaluation methodology described in SER Section 2.4. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.4.

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

delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff's review of LRA Section 2.4.2.8 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 2.4-3, dated April 25, 2005, the staff stated that Group 2 structures defined in GALL Report, Chapter III, include the BWR reactor building with steel superstructure (enclosure building) and should be included within the scope of license renewal. As shown in LRA Table 2.4.2-7, it was not clear to the staff whether the entire enclosure building (including the metal structure, metal panels) was within the scope of license renewal. Therefore, the staff requested that the applicant clarify the extent to which the enclosure building is within the scope of license renewal, and to identify the location(s) of all its components in the LRA.

In its response dated May 11, 2005, the applicant indicated that the entire reactor building, including the metal superstructure, is within the scope of license renewal. The structural steel associated with the superstructure is addressed within the "Structural Steel" commodity group, the metal panels are addressed within the "Siding" and "Blow-Out Panel" commodity groups, and the roof is addressed within the "Roof-Membrane/Built-Up" commodity group, in LRA Table 2.4.2-7. With confirmation that the metal superstructure and metal panels are within the scope of license renewal, the staff's concern described in RAI 2.4-3 is resolved.

In RAI 2.4-5, dated April 25, 2005, the staff stated that in LRA Section 2.4.1.1, the applicant provided a discussion of the scoping and screening results for the primary containment structure. It was the staff's understanding that this LRA section addresses not only the primary containment (drywell, pressure suppression chamber, and vent system connecting the two structures), but all the structures inside the primary containment, all attachments to the containment, and the containment supports. LRA Table 2.4.1-1 identifies the primary containment component types requiring an AMR and the associated component intended function(s). Since LRA Table 2.4.1-1 combines many components under a single component type, the staff requested that the applicant identify the component type intended to cover the specific components listed below as (a) through (f); or to identify the locations in the LRA where these specific components are addressed. If these specific components are not considered to be within the scope of license renewal, the staff requested that the applicant provide the technical bases for their exclusion:

(a) stabilizers between the reactor vessel and biological shield wall

(b) stabilizer between the biological shield wall and drywell wall

(c) biological shield wall anchor bolts

(d) reactor vessel anchor bolts

(e) reactor vessel support ring girder including anchor bolts and reactor vessel support pedestal

(f) drywell head closure bolts and double gasket, tongue-and-groove seal arrangement

In its response, by letter dated May 11, 2005, the applicant responded to the staff's question as follows:

(a) RPV stabilizers, located between the RPV and the biological shield wall, are within the scope of license renewal and are addressed within the "RPV Support" commodity group.

(b) Stabilizers between the biological shield wall and drywell wall are seismic ties. These stabilizers are within the scope of license renewal and are addressed within the "Structural Steel" commodity group.

(c) Biological shield wall anchor bolts associated with the biological shield wall are considered subcomponents of the "Sacrificial Shield Wall" commodity group, which is within the scope of license renewal.

(d) Reactor vessel anchor bolts associated with the reactor vessel support are considered subcomponents of the "RPV Support" commodity group, which is within the scope of license renewal.

(e) Reactor vessel support ring girder and anchor bolts are subcomponents of the "RPV Support" commodity group. The reactor vessel support pedestal is addressed within the "Concrete Above Grade" commodity group, which is within the scope of license renewal.

(f) The drywell head closure bolts and double gasket, tongue-and-groove seal arrangement are subcomponents of the "Drywell Head" commodity group, which is within the scope for license renewal. The associated seals are for the drywell head are addressed within the "Seals and Gaskets" commodity group, which is also within the scope of license renewal.

The staff found the applicant's response reasonable and acceptable. Therefore, the concerns described in RAI 2.4-5 are resolved.

In RAI 2.4-7, dated April 25, 2005, the staff stated that in its review of LRA Table 2.4.2-7, the staff found that a number of components are not listed. Therefore, the staff specifically requested that the applicant provide a description of the neutron-absorbing sheets used for the spent fuel storage racks, and confirm that they are part of the spent fuel storage racks that are within the scope of license renewal.

In its response, by letter dated May 11, 2005, the applicant stated that boral plates are an integral non-structural part of the basic fuel storage tube. These plates are sandwiched between the inner and outer wall of the storage tube and are not subject to dislocation, deterioration, or removal. Boral is considered a subcomponent of the "Spent Fuel Storage Rack" commodity group. As indicated in LRA Table 3.5.2-8, the boral sandwiched between two stainless steel tubes is within the scope of license renewal. Based on the above response, the staffs concern described in RAI 2.4-7 is resolved.

In RAI 2.4-9. dated April 25, 2005, the staff stated that, as a result of its review of LRA Section 2.4.2.8 and Table 2.4.2-7, the staff requested that the applicant clarify whether the reactor building pipe penetrations include some type of silicone rubber seals that allow for pipe movement while providing a seal between the pipe and the reactor buildings to maintain the

differential pressure. In addition, the applicant was requested to confirm whether these penetration seals are designated within the scope of license renewal and are included in LRA Table 2.4.2.7.

In the response, by letter dated May 11, 2005, the applicant indicated that the reactor building pipe penetrations are sealed around the piping by installation of an expandable rubber seal or other suitable fill material. These penetrations are within the scope of the AMR and are included in LRA Table 2.4.2-7. On this basis, the staff's concern described in RAI 2.4-9 is resolved.

2.4.2.8.3 Conclusion

The staff reviewed the LRA, and RAI responses to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the reactor building components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the reactor building components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2.9 Augmented Off-Gas Building

2.4.2.9.1 Summary of Technical Information in the Application

In LRA Section 2.4.2.9, the applicant described the AOG building. The AOG building, also known as the nitrogen and off-gas services building, is located east of the Unit 1 reactor building and west of the SW intake structure. The AOG building is constructed of reinforced concrete with three working elevations. The primary purpose of the AOG building is to house SR SSCs that provide a makeup source of nitrogen to control combustible gases in the reactor containment following a LOCA. The primary system providing the combustible gas control is the CAD subsystem of the CAC system, which is an ESF. Portions of the CAD are located in the AOG building. The AOG building is a seismic Class 1 structure designed to meet seismic, tornado, hurricane, and flooding requirements.

The AOG building contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the AOG building could potentially prevent the satisfactory accomplishment of an SR function. In addition, the AOG building performs functions that support fire protection.

The intended functions within the scope of license renewal include the following:

- provides structural and/or functional support to SR equipment
- provides shelter/protection to SR equipment
- provides rated fire barrier
- provides missile barrier

- provides structural and/or functional support to NSR equipment
- provides a protective barrier for internal/external flood event
- provides structural support and/or shelter to components required for fire protection, ATWS, and/or SBO

In LRA Table 2.4.2-8, the applicant identified the following AOG building component types that are within the scope of license renewal and subject to an AMR:

- anchorage/embedment - embedded
- anchorage/embedments - exposed (at the AMR stage, this commodity was consolidated within the proper support group: piping supports, electrical supports, equipment supports, HVAC supports, instrument supports, etc.)
- cable tray and conduit
- concrete above grade
- concrete below grade
- doors and framing/hardware
- electrical enclosure
- electrical support
- equipment support
- fire hose station
- instrument racks
- instrument support
- masonry walls
- penetrations (mechanical and electrical)
- pipe support
- slide bearing plate (nitrogen tank supports)
- structural steel: platforms, stairways, mezzanines, and hardware

2.4.2.9.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.8 and the UFSAR using the evaluation methodology described in SER Section 2.4. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.4.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not

omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

In addition to RAIs 2.4-8 and 2.4-10, discussed in Section 2.4.2 above, no other RAI was identified.

2.4.2.9.3 Conclusion

The staff reviewed the LRA and RAI responses to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the AOG building components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the AOG building components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2.10 Diesel Generator Building

2.4.2.10.1 Summary of Technical Information in the Application

In LRA Section 2.4.2.10, the applicant described the DG building. The DG building is located east of the radwaste building and the reactor buildings. The diesel generator building is a reinforced concrete structure consisting of three levels housing an electrical spreading area, four diesel generator units, auxiliary equipment, electrical switchgear, diesel generator intake and exhaust equipment, and building ventilating equipment. The DG exhaust silencers are located on the DG building roof. After passing through the silencers, exhaust gases are routed away from DG building structures and do not impinge on any structures that could fall and block the DG exhaust flow path. Underground diesel fuel storage tanks are located to the east of the building in a reinforced concrete vault (i.e., the tank building).

The DG building contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the DG building could potentially prevent the satisfactory accomplishment of an SR function. In addition, the DG building performs functions that support fire protection and SBO.

The intended functions within the scope of license renewal include the following:

- provides structural and/or functional support to SR equipment
- provides shelter/protection to SR equipment
- provides rated fire barrier
- provides missile barrier
- provides structural and/or functional support to NSR equipment
- provides a protective barrier for internal/external flood event

- provides structural support and/or shelter to components required for fire protection, ATWS, and/or SBO
- provides spray shield or curbs for directing flow

In LRA Table 2.4.2-9, the applicant identified the following DG building component types that are within the scope of license renewal and subject to an AMR:

- anchorage/embedment - embedded
- anchorage/embedments - exposed (at the AMR stage, this commodity was consolidated within the proper support group: piping supports, electrical supports, equipment supports, HVAC supports, instrument supports, etc.)
- blow-out panel
- cable tray and conduit
- concrete above grade
- concrete below grade
- concrete curbs
- damper mounting
- doors and framing/hardware
- electrical enclosure
- electrical support
- equipment support
- fire barrier assembly
- fire hose station
- floor drains
- HVAC support
- instrument racks
- instrument support
- masonry walls
- penetrations (mechanical and electrical)
- pipe support
- roof-membrane/built-up
- siding
- spray shield
- sprayed on coatings
- structural steel: platforms, stairways, mezzanines, and hardware

- vibration isolators (at the AMR stage, this commodity was consolidated within the proper support group: piping supports or HVAC supports)

2.4.2.10.2 Staff Evaluation

The staff reviewed LRA Section 2.4.1.10 and the UFSAR using the evaluation methodology described in SER Section 2.4. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.4.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

In addition to RAIs 2.4-8, 2.4-10, and 2.4-14, discussed in Section 2.4.2 above, no other RAI was identified.

2.4.2.10.3 Conclusion

The staff reviewed the LRA and RAI responses to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the DG building components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the DG building components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2.11 Control Building

2.4.2.11.1 Summary of Technical Information in the Application

In LRA Section 2.4.2.11, the applicant described the control building. The control building is a reinforced concrete structure located inside the protected area, between the two reactor buildings. The control building is a shared structure between the two units and is subdivided into the following principal areas: (1) cable spreading areas and battery rooms, (2) control room and electronic equipment rooms, and (3) HVAC equipment room located in a one-story penthouse. The control building is a seismic Class 1 structure designed to support, house, and protect SR systems and components. In addition, the control building supports the post-accident habitability function by providing radiation shielding and a barrier to fission products for control room operating staff.

The control building contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the control building could potentially prevent

the satisfactory accomplishment of an SR function. In addition, the control building performs functions that support fire protection, ATWS, and SBO.

The intended functions within the scope of license renewal include the following:

- provides pressure boundary and/or fission product barrier
- provides structural and/or functional support to SR equipment
- provides shelter/protection to SR equipment
- provides rated fire barrier
- provides missile barrier
- provides structural and/or functional support to NSR equipment
- provides a protective barrier for internal/external flood event
- provides structural support and/or shelter to components required for fire protection, ATWS, and/or SBO

In LRA Table 2.4.2-10, the applicant identified the following control building component types that are within the scope of license renewal and subject to an AMR:

- anchorage/embedment - embedded
- anchorage/embedments - exposed (at the AMR stage, this commodity was consolidated within the proper support group: piping supports, electrical supports, equipment supports, HVAC supports, instrument supports, etc.)
- battery rack
- cable tray and conduit
- concrete above grade
- concrete below grade
- control room ceiling
- damper mounting
- doors and framing/hardware
- electrical enclosure
- electrical support
- equipment support
- fire barrier assembly
- fire hose station
- HVAC support
- instrument racks
- instrument support

- masonry walls
- penetration (mechanical and electrical)
- pipe support
- raised floor
- roof-membrane/built-up
- seals and gaskets
- sprayed on coatings
- structural steel: platforms, stairways, mezzanines, and hardware

2.4.2.11.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.11 and the UFSAR using the evaluation methodology described in SER Section 2.4. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.4.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

In addition to RAIs 2.4-8, 2.4-10, and 2.4-14, discussed in Section 2.4.2 above, no other RAI was identified.

2.4.2.11.3 Conclusion

The staff reviewed the LRA and RAI responses to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the control building components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the control building components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2.12 Turbine Building

2.4.2.12.1 Summary of Technical Information in the Application

In LRA Section 2.4.2.12, the applicant described the turbine building. The turbine building is located north of the service building and west of reactor and control buildings, within the protected area. The turbine building and adjacent auxiliary bay houses the turbine generators,

condensers, reactor feedwater systems, as well as other turbine plant auxiliary equipment, electrical switchgear and reactor recirculation pump motor generator sets. The building is supported on spread footings founded on structural backfill and is constructed of reinforced concrete up to and including the operating floor. Reinforced concrete shield walls for equipment are provided above the operating floor for radiation protection. The superstructure above the operating floor is a steel-framed crane bay with panel siding and roof constructed of metal deck, insulation, and membrane roofing. The turbine building is a seismic Class 2 structure that provides support for equipment credited in the performance of the AST function.

The turbine building contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the turbine building could potentially prevent the satisfactory accomplishment of an SR function. In addition, the turbine building performs functions that support fire protection, ATWS, and SBO.

The intended functions within the scope of license renewal include the following:

- provides structural and/or functional support to SR equipment
- provides shelter/protection to SR equipment
- provides rated fire barrier
- provides structural and/or functional support to NSR equipment
- provides a protective barrier for internal/external flood event
- provides structural support and/or shelter to components required for fire protection, ATWS, and/or SBO

In LRA Table 2.4.2-11, the applicant identified the following turbine building component types that are within the scope of license renewal and subject to an AMR:

- anchorage/embedment
- anchorage/embedments - exposed (at the AMR stage, this commodity was consolidated within the proper support group: piping supports, electrical supports, equipment supports, HVAC supports, instrument supports, etc.)
- cable tray and conduit
- concrete above grade
- concrete below grade
- concrete curbs
- doors and framing/hardware
- electrical enclosure
- electrical support
- equipment support
- fire barrier assembly
- fire hose station

- instrument racks
- instrument support
- masonry walls
- penetrations (mechanical and electrical)
- pipe support
- roof-membrane/built-up
- siding
- structural steel: platforms, stairways, mezzanines, and hardware

2.4.2.12.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.12 and the UFSAR using the evaluation methodology described in SER Section 2.4. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.4.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

In addition to RAIs 2.4-8 and 2.4-10, discussed in Section 2.4.2 above, no other RAI was identified.

2.4.2.12.3 Conclusion

The staff reviewed the LRA and RAI responses to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the turbine building components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the turbine building components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2.13 Radwaste Building

2.4.2.13.1 Summary of Technical Information in the Application

In LRA Section 2.4.2.13, the applicant described the radwaste building. The radwaste building is located inside the protected area and is constructed on a reinforced concrete mat founded on structural fill. The building consists of two principal levels constructed with reinforced

concrete walls and slabs. The thickness of the walls and slabs was determined by shielding and structural requirements. The radwaste building was designed as a Class 2 structure; however, to ensure the integrity of the Class 1 control building and Class 1 storage tanks in the radwaste building basement, the radwaste building was designed for Class 1 seismic loads. The radwaste building foundation mat supports the following augmented quality equipment: (1) concentrated waste tank, (2) waste collector tank, and (3) waste neutralizer tanks. The radwaste building is a shared structure between the two units. The design function of the radwaste building is to support, house, and protect radwaste systems and components.

The radwaste building contains SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the radwaste building could potentially prevent the satisfactory accomplishment of an SR function. In addition, the radwaste building performs functions that support fire protection.

The intended functions within the scope of license renewal include the following:

- provides structural and/or functional support to SR equipment
- provides shelter/protection to SR equipment
- provides missile barrier
- provides structural and/or functional support to NSR equipment
- provides a protective barrier for internal/external flood event
- provides structural support and/or shelter to components required for fire protection, ATWS, and/or SBO

In LRA Table 2.4.2-12, the applicant identified the following radwaste building component types that are within the scope of license renewal and subject to an AMR:

- anchorage/embedment - embedded
- anchorage/embedments - exposed (at the AMR stage, this commodity was consolidated within the proper support group: piping supports, electrical supports, equipment supports, HVAC supports, instrument supports, etc.)
- cable tray and conduit
- concrete above grade
- concrete below grade
- doors and framing/hardware
- electrical enclosure
- electrical support
- fire hose station
- instrument support
- pipe support
- roof-membrane/built-up

2.4.2.13.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.13 and the UFSAR using the evaluation methodology described in SER Section 2.4. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.4.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

In addition to RAI 2.4-10, discussed in Section 2.4.2 above, no other RAI was identified.

2.4.2.13.3 Conclusion

The staff reviewed the LRA and RAI responses to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the radwaste building components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the radwaste building components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2.14 Water Treatment Building

2.4.2.14.1 Summary of Technical Information in the Application

In LRA Section 2.4.2.14, the applicant described the water treatment building. The water treatment building is a steel frame structure located within the protected area north of the Unit 1 reactor building. The water treatment building contains fire protection pumps and other fire protection-related SSCs, which support BSEP fire protection commitments. The water treatment building is a single structure that contains both Units 1 and 2 components. It is a seismic Class 2 structure that does not support any SR components or functions.

The water treatment building performs functions that support fire protection.

The intended functions within the scope of license renewal include the following:

- provides rated fire barrier
- provides structural support and/or shelter to components required for fire protection, ATWS, and/or SBO

In LRA Table 2.4.2-13, the applicant identified the following water treatment building component types that are within the scope of license renewal and subject to an AMR:

- anchorage/embedment - embedded
- anchorage/embedments - exposed (at the AMR stage, this commodity was consolidated within the proper support group: piping supports, electrical supports, equipment supports, HVAC supports, instrument supports, etc.)
- battery rack
- cable tray and conduit
- concrete above grade
- concrete below grade
- electrical enclosure
- electrical support
- equipment support
- fire barrier assembly
- instrument support
- pipe support
- siding
- structural steel: platforms, stairways, mezzanines, and hardware

2.4.2.14.2 Staff Evaluation

The staff reviewed LRA Section 2.4.1.14 and the UFSAR using the evaluation methodology described in SER Section 2.4. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.4.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

In addition to RAI 2.4-12, discussed in Section 2.4.2 above, no other RAI was identified.

2.4.2.14.3 Conclusion

The staff reviewed the LRA, related structural/component information, and RAI response to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not

identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the water treatment building components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the water treatment building components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2.15 Miscellaneous Structures and Out-Buildings

2.4.2.15.1 Summary of Technical Information in the Application

In LRA Section 2.4.2.15, the applicant described the miscellaneous structures and out-buildings. The miscellaneous structures and out-buildings consist of those structures and outbuildings that are stand-alone structures and not part of, or attached to, one of the major building systems. The miscellaneous structures and out-buildings evaluated for license renewal include foundations and structural support arrangements for mechanical system equipment such as outside tanks, electrical racks, and oil loading stations. Typically, the license renewal classification for miscellaneous structures or out-buildings is the same as the classification of the electrical or mechanical SCs that the miscellaneous structures or out-buildings support. The following miscellaneous structures and out-buildings were determined to be within the scope of license renewal: (1) HPCI CO_2 bottle storage buildings, Units 1 and 2, (2) condensate storage tank foundations, Units 1 and 2, (3) diesel generator building oil tank room foam system concentrate tank, (4) SW valve pits, Units 1 and 2, (5) fuel oil storage tank foundation, (6) fire protection water tank foundation, (7) stack and filter house, (8) manholes and duct banks, and (9) demineralized water tank.

The miscellaneous structures and out-buildings contain SR components that are relied upon to remain functional during and following DBEs. The failure of NSR SSCs in the miscellaneous structures and out-buildings could potentially prevent the satisfactory accomplishment of an SR function. In addition, the miscellaneous structures and out-buildings perform functions that support fire protection and SBO.

The intended functions within the scope of license renewal include the following:

- provides structural and/or functional support to SR equipment
- provides shelter/protection to SR equipment
- provides structural and/or functional support to NSR equipment
- provides a path for release of filtered or unfiltered gaseous discharge
- provides structural support and/or shelter to components required for fire protection, ATWS, and/or SBO

In LRA Table 2.4.2-14, the applicant identified the following miscellaneous structures and out-buildings component types that are within the scope of license renewal and subject to an AMR:

- anchorage/embedment - embedded
- anchorage/embedments - exposed

- cable tray and conduit
- concrete above grade
- concrete below grade
- concrete BWR vent stack
- tank foundation
- electrical enclosure
- electrical support
- instrument support
- manholes (addressed under concrete below grade)
- piles
- siding
- structural steel: platforms, stairways, mezzanines, and hardware

2.4.2.15.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2.15 and the UFSAR using the evaluation methodology described in SER Section 2.4. The staff conducted its review in accordance with the guidance described in SRP-LR Section 2.4.

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 delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant had identified as being within the scope of license renewal to verify that the applicant had not omitted any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

In addition to RAI 2.4-10, discussed in Section 2.4.2 above, no other RAI was identified.

2.4.2.15.3 Conclusion

The staff reviewed the LRA and RAI response to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the miscellaneous structures and out-buildings components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the miscellaneous structures and out-buildings components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.5 Scoping and Screening Results – Electrical & Instrumentation and Controls Systems

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 the electrical and instrumentation and controls component commodity groups system.

In accordance with the requirements of 10 CFR 54.21(a)(1), the applicant must identify and list SSCs that are within the scope of license renewal and subject to an AMR. To verify that the applicant properly implemented its methodology, the staff focused its review on the implementation results. This approach 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.

Staff Evaluation Methodology: The staff's evaluation of the information provided in the LRA was performed in the same manner for all electrical and I&C systems. The objective of the review was to determine if the components and supporting structures for a specific electrical and I&C system, that appeared to meet the scoping criteria specified in the Rule, were identified by the applicant as within the scope of license renewal, in accordance with 10 CFR 54.4. Similarly, the staff evaluated the applicant's screening results to verify that all long-lived, passive components were subject to an AMR in accordance with 10 CFR 54.21(a)(1).

Scoping: To perform its evaluation, the staff reviewed the applicable LRA section and associated component drawings, focusing its review on components that had not been identified as within the scope of license renewal. The staff reviewed relevant licensing basis documents, including the updated final safety analysis report (UFSAR), for each electrical and I&C system component to determine if the applicant had omitted components with intended functions delineated under 10 CFR 54.4(a) from the scope of license renewal. The staff also reviewed the licensing basis documents to determine if all intended functions delineated under 10 CFR 54.4(a) were specified in the LRA. If omissions were identified, the staff requested additional information to resolve the discrepancies.

Screening: Once the staff completed its review of the scoping results, the staff evaluated the applicant's screening results. For those systems and components with intended functions, the staff sought to determine if the functions are performed with moving parts or a change in configuration or properties, or if they are subject to replacement based on a qualified life or specified time period, as described in 10 CFR 54.21(a)(1). For those that did not meet either of these criteria, the staff sought to confirm that these electrical and I&C systems and components were subject to an AMR as required by 10 CFR 54.21(a)(1). If discrepancies were identified, the staff requested additional information to resolve them.

After applying the scoping and screening methodology, the applicant categorized the components requiring an AMR into passive commodity groups. In LRA Section 2.5.1, the applicant identified the SCs of the electrical and I&C systems that are subject to an AMR for license renewal.

2.5.1 Electrical and Instrumentation and Controls Component Commodity Groups

The applicant performed the screening for electrical/I&C components on a generic component commodity group basis for the electrical/I&C systems within the scope of license renewal. The in-scope electrical/I&C component commodity group systems and structures identified at BSEP in LRA Section 2.5.1 are listed below:

ELECTRICAL/I&C COMPONENT COMMODITY GROUPS FOR IN-SCOPE SYSTEMS AND STRUCTURES AT BSEP			
Alarm Units	Electrical portions of Electrical/I&C Penetration Assemblies	Light Bulbs	Solenoid Operators
Analyzers		Load Centers	Signal Conditioners
		Loop Controllers	Solid-State Devices
Annunciators	Elements	Meters	Splices
Batteries	Fuses	Motor Control Centers	Surge Arresters
Phase bus	Generators	Motors	Switches
Chargers	Heat Tracing	Power Distribution Panels	Switchgear
Circuit Breakers	Heaters	Power Supplies	Switchyard Bus
Converters	High-voltage Insulators	Radiation Monitors	Terminal Blocks
Communication Equipment	Indicators	Recorders	Thermocouples
	Insulated Cables and Connections	Regulators	Transducers
Electrical Controls and Panel Internal Component Assemblies		Relays	Transformers
	Inverters	RTDs	Transmitters
	Isolators	Sensors	Transmission Conductors

The applicant described the supporting structures and components of the electrical/I&C component commodity groups in the following sections of the LRA:

- 2.5.3.1 non-EQ insulated cables and connections
- 2.5.3.2 phase bus
- 2.5.3.3 non-EQ electrical/I&C penetration assemblies
- 2.5.3.4 high voltage insulators
- 2.5.3.5 switchyard bus
- 2.5.3.6 transmission conductors

The corresponding subsections of this SER (2.5.1.1 – 2.5.1.6, respectively) present the staff's review findings with respect to the electrical/I&C component commodity groups for Units 1 and 2. SER Section 2.5.1.7 addresses the SBO, which is presented in LRA Section 2.1.4.2.

In its RAIs 2.5-1 and 2.5.1-1, dated May 18, 2005, the staff requested that the applicant clarify why switchyard bus connections and transmission conductor connections are not included in the electrical/I&C component commodity groups table.

In its response, by letter dated June 14, 2005, the applicant stated that the connections associated with the commodity groups "Switchyard Bus" and "Transmission Conductors" are included in these commodity groups.

The terminology shown in the table was selected for consistency with previous LRAs and to standardize electrical/I&C component commodity group terminology. Connections were evaluated as part of the AMR for the commodity groups. Switchyard bus connections were evaluated as shown in LRA Table 3.6.2-1, plant-specific note 607; while transmission conductor connections were evaluated as shown in LRA Table 3.6.2-1, plant-specific note 608.

Based on the above information, the staff found that the applicant adequately identified the switchyard bus and the transmission conductors connections that are subject to an AMR. Therefore, the staff's concerns described in RAIs 2.5-1 and 2.5.1-1 are resolved.

2.5.1.1 Non-EQ Insulated Cables and Connections

2.5.1.1.1 Summary of Technical Information in the Application

The function of insulated cables and connections is to electrically connect specified sections of an electrical circuit to deliver voltage, current or signals. Electrical cables and their connections are reviewed as a single component commodity group. The types of connections included in this review are splices, connectors, fuse holders, and terminal blocks.

In LRA Section 2.5.3.1, the applicant stated that numerous insulated cables and connections are included in the EQ Program and, therefore, are not subject to an AMR in accordance with the screening criteria of 10 CFR 54.21(a)(1)(ii). Insulated cables and connections that perform an intended function within the scope of license renewal, but are not included in the EQ Program, meet the criterion of 10 CFR 54.21(a)(1)(ii) and are subject to an AMR. However, insulated cables and connections inside the enclosure of an active device (e.g., motor leads and connections, and cables and connections internal to relays, chargers, switchgear, transformers, power supplies, etc.) are maintained along with the other subcomponents and piece-parts inside the enclosure and are not subject to an AMR.

In LRA Section 2.5.3.1, the applicant identified the non-EQ insulated cables and connections component types that are within the scope of license renewal and subject to an AMR such as splices, connectors, fuse holders, and terminal blocks.

In LRA Section 2.1.4.5, the applicant stated that ISG-5 for screening of fuse holders determined that fuse holders that are not part of an active component or assembly, such as switchgear, power supplies, power inverters, battery chargers, and circuit boards, are considered to be passive electrical components and, therefore, require an AMR. Such fuse holders are evaluated for license renewal in the same manner as terminal blocks and other types of electrical connections. ISG-5 also determined that fuse holders that are piece parts of an active assembly are not subject to an AMR, because they would be subject to periodic inspection and maintenance in accordance with the maintenance and surveillance activities applicable to the active assembly.

The applicant performed a review of fuse holders, using the guidance of ISG-5, and determined that those fuse holders are part of a larger (active) assembly. Therefore, it was concluded that no fuse holders require an AMR.

2.5.1.1.2 Staff Evaluation

The staff reviewed LRA Section 2.5.3.1 using the evaluation methodology described in SER Section 2.5. The staff conducted its review in accordance with the guidance described in SRP-LR, Section 2.5.

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 did not omit from the scope of license renewal any components with intended functions delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant identified as being within the scope of license renewal to verify that the applicant did not omit any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The applicant performed a review of fuse holders, using the guidance of ISG-5, and determined that those fuse holders are part of a larger (active) assembly. Therefore, the staff concluded that no fuse holders require an AMR.

The staff found that the applicant correctly identified the cables and connections as component commodity group that perform their function without moving parts or a change in configuration or properties (passive and long lived) and are, therefore, subject to an AMR.

2.5.1.1.3 Conclusion

The staff reviewed the LRA and the UFSAR to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified those cables and connectors that are within the scope of license renewal, as required by 10 CFR 54.4(a), and subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.5.1.2 Phase Bus

2.5.1.2.1 Summary of Technical Information in the Application

In LRA Section 2.5.3.2, the applicant described the phase bus. A phase bus is used to connect two or more elements (electrical equipment such as switchgear and transformers) of an electrical circuit. Isolated phase bus is an electrical bus in which each phase conductor is enclosed by an individual metal housing separated from adjacent conductor housings by an air space. Non-segregated phase bus is an electrical bus constructed with all phase conductors in a common enclosure without barriers (only air space) between the phases.

The phase bus contains SR components that are relied upon to remain functional during and following DBEs.

The intended function, within the scope of license renewal, is to provide electrical continuity.

In LRA Section 2.5.3.2, the applicant identified the following phase bus component types that are within the scope of license renewal and subject to an AMR:

- portions of the isolated phase bus used for backfeeding offsite power to the main transformers and unit auxiliary transformers (UATs) during recovery from an SBO event
- 4.16 kilovolt (kV), non-segregated phase bus connecting site auxiliary transformer (SAT) #1 disconnect links to 4.16 kV buses 1C and 1D
- 4.16 kV, non-segregated phase bus connecting SAT #2 disconnect links to 4.16 kV buses 2C and 2D
- 4.16 kV, non-segregated phase bus connecting UAT #1 to buses 1C and 1D
- 4.16 kV, non-segregated phase bus connecting UAT #2 to buses 2C and 2D
- 4.16 kV, non-segregated phase bus connecting emergency switchgear E1 and E2
- 4.16 kV, non-segregated phase bus connecting emergency switchgear E1 and E3
- 4.16 kV, non-segregated phase bus connecting emergency switchgear E2 and E4
- 4.16 kV, non-segregated phase bus connecting emergency switchgear E3 and E4
- 480V, non-segregated phase bus connecting unit substations E5 and E6
- 480V, non segregated phase bus connecting unit substations E7 and E8

2.5.1.2.2 *Staff Evaluation*

The staff reviewed LRA Section 2.5.3.2 using the evaluation methodology described in SER Section 2.5. The staff conducted its review in accordance with the guidance described in SRP-LR, Section 2.5.

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 did not omit from the scope of license renewal any components with intended functions delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant identified as being within the scope of license renewal to verify that the applicant did not omit any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The phase buses identified by the applicant consist of non-segregated phase buses that are used for backfeeding offsite power during recovery from an SBO event, 4.16 kV, and 480 V plant-wide to conduct electrical power (voltage and current), either continuously or intermittently between various equipment and components.

2.5.1.2.3 Conclusion

The staff reviewed the LRA and the UFSAR to determine whether any SSCs that should be within the scope of license renewal were not identified by the applicant. No omissions were identified. In addition, the staff performed a review to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the phase bus that are within the scope of license

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

2.5.1.3 Non-EQ Electrical/I&C Penetration Assemblies

2.5.1.3.1 Summary of Technical Information in the Application

In LRA Section 2.5.3.3, the applicant described the non-EQ electrical/I&C penetration assemblies. Many electrical/I&C penetration assemblies are included in the EQ Program and, therefore, do not meet the criterion of 10 CFR 54.21(a)(1)(ii) and are not subject to an AMR. A review of the remaining, non-EQ, electrical/I&C penetration assemblies demonstrated that most were not within the scope of license renewal because they either did not contain any electrical circuits (such as, spare penetrations) and therefore did not support an electrical intended function, or they did not contain electrical circuits that supported a system-level electrical/I&C intended function for license renewal. After eliminating these penetration assemblies from further consideration, a small number of non-EQ Program penetrations remained. These were determined to meet the screening criterion of 10 CFR 54.21(a)(1)(ii) and are, therefore, subject to an AMR.

The non-EQ electrical/I&C penetration assemblies contain SR components that are relied upon to remain functional during and following DBEs.

The intended function, within the scope of license renewal, is to provide electrical continuity.

2.5.1.3.2 Staff Evaluation

The staff reviewed LRA Section 2.5.3.4 using the evaluation methodology described in SER Section 2.5. The staff conducted its review in accordance with the guidance described in SRP-LR, Section 2.5.

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 did not omit from the scope of license renewal any components with intended functions delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant identified as being within the scope of license renewal to verify that the applicant did not omit any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The electrical penetrations identified by the applicant requiring an AMR are non-EQ related and used plant-wide to conduct electrical power (voltage and current), either continuously or intermittently between two sections of the electrical I&C circuits supplying power to various equipment in the containment.

2.5.1.3.3 Conclusion

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

identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified non-EQ electrical/I&C penetration assemblies that are within the scope of license renewal, as required by 10 CFR 54.4(a), and subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.5.1.4 High Voltage Insulators

2.5.1.4.1 Summary of Technical Information in the Application

In LRA Section 2.5.3.4, the applicant described the high-voltage insulators. The high-voltage insulators are provided on the circuits used to supply power from the switchyard to plant buses during recovery from an SBO. The function of high-voltage insulators is to insulate and support electrical conductors.

The high-voltage insulators contain SR components that are relied upon to remain functional during and following DBEs. In addition, the high-voltage insulators perform functions that support SBO.

The intended function, within the scope of license renewal, is to insulate and support an electrical conductor.

In LRA Section 2.5.3.4, the applicant identified the high-voltage insulators component types that are within the scope of license renewal and subject to an AMR.

2.5.1.4.2 Staff Evaluation

The staff reviewed LRA Section 2.5.3.4 using the evaluation methodology described in SER Section 2.5. The staff conducted its review in accordance with the guidance described in SRP-LR, Section 2.5.

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 did not omit from the scope of license renewal any components with intended functions delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant identified as being within the scope of license renewal to verify that the applicant did not omit any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

As identified by the applicant, the high-voltage insulators are associated with the in-scope portion of the offsite power system as station post insulators providing support for the switchyard bus connecting the high-voltage station auxiliary transformers and the circuit switchers. In addition, they support the circuit switches themselves.

2.5.1.4.3 Conclusion

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

should be subject to an AMR were not identified by the applicant. No omissions were identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the high-voltage insulators that are within the scope of license renewal, as required by 10 CFR 54.4(a), and subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.5.1.5 Switchyard Bus

2.5.1.5.1 Summary of Technical Information in the Application

In LRA Section 2.5.3.5, the applicant described the switchyard bus. The switchyard bus provides a portion of the circuits supplying power from the switchyard to plant buses during recovery from an SBO. The function of the switchyard bus is to provide electrical connections to specified sections of an electrical circuit to deliver voltage, current, or signals.

The switchyard bus contains SR components that are relied upon to remain functional during and following DBEs.

The intended function, within the scope of license renewal, is to provide electrical continuity.

In LRA Section 2.5.3.5, the applicant identified the switchyard bus component types that are within the scope of license renewal and subject to an AMR.

2.5.1.5.2 Staff Evaluation

The staff reviewed LRA Section 2.5.3.5 using the evaluation methodology described in SER Section 2.5. The staff conducted its review in accordance with the guidance described in SRP-LR, Section 2.5.

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 did not omit from the scope of license renewal any components with intended functions delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant identified as being within the scope of license renewal to verify that the applicant did not omit any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

As identified by the applicant, the switchyard bus associated within the scope of license renewal is the portion of the offsite power system interconnections between the Unit 1 circuit switcher and the high-voltage station auxiliary transformer, and between the Unit 2 circuit switcher and the high-voltage station auxiliary transformer.

2.5.1.5.3 Conclusion

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

identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the switchyard bus that are within the scope of license renewal, as required by 10 CFR 54.4(a), and subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.5.1.6 Transmission Conductors

2.5.1.6.1 Summary of Technical Information in the Application

In LRA Section 2.5.3.6, the applicant described the transmission conductors. The transmission conductors provide a portion of the circuits used to supply power from the switchyard to plant buses during recovery from an SBO. The function of transmission conductors is to provide electrical connections to specified sections of an electrical circuit to deliver voltage, current, or signals.

The transmission conductors contain SR components that are relied upon to remain functional during and following DBEs. The intended function, within the scope of license renewal, is to provide electrical continuity.

In LRA Section 2.5.3.6, the applicant identified the transmission conductor components that are within the scope of license renewal and subject to an AMR.

2.5.1.6.2 Staff Evaluation

The staff reviewed LRA Section 2.5.3.6 using the evaluation methodology described in SER Section 2.5. The staff conducted its review in accordance with the guidance described in SRP-LR, Section 2.5.

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 did not omit from the scope of license renewal any components with intended functions delineated under 10 CFR 54.4(a). The staff then reviewed those components that the applicant identified as being within the scope of license renewal to verify that the applicant did not omit any passive and long-lived components that should be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The transmission conductors identified by the applicant that are within the scope of license renewal are the short connections from each unit's high-voltage station auxiliary transformer surge arresters to sections of aluminum switchyard bus. These conductors are aluminum jumper cables with a steel core (ACSR) in short sections between rigidly supported connecting equipment.

2.5.1.6.3 Conclusion

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

identified. On the basis of its review, the staff concluded that there is reasonable assurance that the applicant adequately identified the transmission conductors that are within the scope of license renewal, as required by 10 CFR 54.4(a), and subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.5.1.7 Station Blackout (SBO)

2.5.1.7.1 Summary of Technical Information in the Application

In LRA Section 2.1.4.2, the applicant stated that staff guidance ISG-2 clarifies that the SSCs relied on for recovery from an SBO, in addition to SSCs relied on for coping with an SBO, should be within the scope of license renewal. The staff position is that the plant system portion of the offsite power system should be included within scope. Including SBO recovery equipment within the scope of license renewal brings into scope various electrical components and associated structures associated with providing offsite power via the switchyard to plant electrical buses.

The following specific systems support recovery from an SBO event and have been included in the scope of license renewal in accordance with ISG-2.

- 230KV switchyard system (includes the main power transformers)
- startup auxiliary transformers and unit auxiliary transformers
- generator iso-phase bus system
- switchyard relay building
- structural components/commodities that support the above systems.

The passive, long-lived electrical components composing the restoration power path for offsite power that are subject to an AMR are as follows:

- generator isolated phase (iso-phase) bus duct
- non-segregated 4.16KV & 480V bus duct
- high-voltage insulators
- switchyard bus
- insulated cables and connections
- transmission conductors and connections

2.5.1.7.2 *Staff Evaluation*

The staff reviewed LRA Section 2.1.4.2 using the evaluation methodology described in SER Section 2.5. The staff conducted its review in accordance with the guidance described in SRP-LR, Section 2.5.

In RAI 2.1.4.2.1, dated May 18, 2005, the staff requested that the applicant (1) identify whether there are any underground power circuits used in the SBO recovery paths; (2) provide a detailed description of the SBO recovery path; and (3) confirm whether the motor-operated disconnect (MOD) qualified as a first breaker in the SBO recovery path.

In its response, by letter dated June 14, 2005, the applicant stated:

(1) There are no underground power circuits used in the SBO recovery path.

(2) There are two offsite sources of auxiliary power available when recovering from an SBO event. The first (i.e., preferred) source of offsite power is via the Startup Auxiliary Transformer (SAT). The SAT is fed from the 230KV Switchyard, which has multiple sources of supply from the 230KV transmission and distribution system. The BSEP Unit 1 and Unit 2 230KV Switchyards are electrically independent of each other and have no crosstie capabilities. The second (i.e., alternate) source of offsite power when recovering from an SBO event is obtained by backfeeding through the Main Transformers from the 230KV Switchyard to the Unit Auxiliary Transformer (UAT). Prior to backfeeding the Main Transformers, the no-load disconnect switch to the Main Generator must be opened. See Figure 2.1-2 of the LRA for a drawing of the SBO recovery path.

(3) Unit 2 Switchyard MOD M15 and MOD M16 have been replaced with 230KV gas-filled power circuit breakers (PCBs). PCB M15 and PCB M16 represent the first breaker used for the preferred source of offsite power in the Unit 2 SBO recovery path.

The License Renewal boundary for the Unit 1 SBO recovery path is currently MOD M11 and MOD M12. These MODs are scheduled to be replaced with circuit breakers during the spring of 2006. Pending installation of the Unit 1 circuit breakers, the License Renewal boundary for the Unit 1 SBO recovery path will be at the circuit breakers for the individual offsite feeders.

For both Unit 1 and Unit 2, the License Renewal boundary for the SBO recovery path will be at the first circuit breaker, consistent with ISG-2.

For a detailed description of the SBO recovery path, see the response to RAI 2.1.4.2-1.b above.

The staff concurred with the applicant's response. Therefore, the staff's concern described in RAI 2.1.4-1 is resolved.

2.5.1.7.3 Conclusion

The staff reviewed the LRA and the above RAI response for scoping and screening results of SBO components to determine whether any SCCs that should be within the scope of license renewal were not identified by the applicant. No omissions were found. On the basis of this review, the staff concluded that the applicant had adequately identified the components of the SBO system that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the components of the SBO system that are subject to an AMR, as required by 10 CFR 54.21(a)(1).