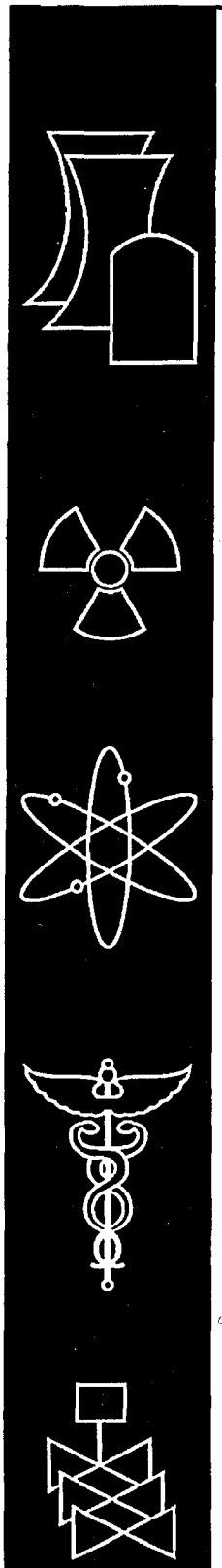
NUREG-1839



Safety Evaluation Report
Related to the License Renewal of the Point Beach Nuclear Plant, Units 1 and 2

Docket Nos. 50-266 and 50-301

Nuclear Management Company, LLC.

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

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NUREG-1839

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Related to the License Renewal of the Point Beach Nuclear Plant, Units 1 and 2

Docket Nos. 50-266 and 50-301

Nuclear Management Company, LLC.

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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 Point Beach Nuclear Plant (PBNP) Units 1 and 2 license renewal application (LRA) by the staff of the U.S. Nuclear Regulatory Commission (NRC) (the staff). By letter dated February 25, 2004, Nuclear Management Company, LLC (NMC or the applicant) submitted the LRA for PBNP in accordance with Title 10, Part 54, of the *Code of Federal Regulations* (10 CFR Part 54). NMC is requesting renewal of the operating licenses for PBNP Units 1 and 2 (Facility Operating License Numbers DPR-24 and DPR-27, respectively) for a period of 20 years beyond the current expiration dates of midnight, October 5, 2010, for Unit 1 and midnight, March 8, 2013, for Unit 2.

The PBNP units are located about 30 miles SE of Green Bay and about 90 miles NNE of Milwaukee in east central Wisconsin (Manitowoc County) on the west shore of Lake Michigan. The NRC issued the construction permit for PBNP Unit 1 on July 19, 1967, and for Unit 2 on July 25, 1968. The operating licenses were issued by the NRC on October 5, 1970, for Unit 1 and March 8, 1973 for Unit 2. The PBNP consists of two Westinghouse pressurized light-water moderated and cooled system units originally designed to generate 1518.5 megawatt thermal (MWt), or approximately 523.8 megawatt electric (MWe). Each unit has undergone a low pressure turbine retrofit modification which increases the unit design output to 537,960 kWe. In 2003, a measurement uncertainty recapture power uprate was performed increasing each unit's rated thermal power level to 1540 MWt.

This SER presents the status of the staff's review of information submitted to the NRC through August 23, 2005, the cutoff date for consideration in the SER. The staff identified open items and confirmatory items that had to be resolved before the staff could make a final determination on the application. Sections 1.5 and 1.6 of this report summarize these items and their resolutions. Section 6 presents the staff's final conclusion on the review of the PBNP application.

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ABBREVIATIONS

AAC	alternate alternating current
AC	alternating current
ACI	American Concrete Institute
ACSR	aluminum conductor steel reinforced
AEC	Atomic Energy Commission
AFW	auxiliary feedwater
AFWP	auxiliary feedwater pump
AISC	American Institute of Steel Construction
AL	action level
AMP	aging management program
AMR	aging management review
AMSAC	ATWS migrating system actuation circuit
ANSI	American National Standards Institute
APPR	Appendix R Drawing
AQ	augmented quality
AR	action request
ASME	American Society of Mechanical Engineers
ASA	American Standards Association
ASTM	American Society for Testing of Materials
ATWS	anticipated transient without scram
ATWT	anticipated transient without trip
AUX	auxiliary
B&W	Babcock and Wilcox
BDE	blowdown evaporator
BMI	bottom-mounted instrument
BOP	balance of plant
BS	boron recycle
BTP	branch technical position
BWR	boiling water reactor
BWOG	Babcock & Wilcox Owners Group
CARDS	cable and raceway data system
CASS	cast austenitic stainless steel
CB	control building
CBD	class boundary diagram
CC	component cooling
CCCW	closed-cycle cooling water
CCW	component cooling water
CD-ROM	compact disk-read only memory
CE	condition evaluation
CFR	*Code of Federal Regulations*
CHAMPS	computerized history and maintenance planning system
CIV	containment isolation valve
CLB	current licensing basis
CLRT	containment leak rate test

CMAA	Crane Manufacturers Association of America
CMS	Consumers Energy
CPCI	containment pressure condensate isolation
CR	condition report, control room, count rate, cryogenic
CRD	control rod drive
CRDM	control rod drive mechanism
CS	carbon steel, containment spray, or condensate system
CSR	cable spreading room
CST	condensate storage tank
CSUP	component supports commodity group
CUF	cumulative usage factors
CV	containment vacuum or containment vessel
CVCS	chemical and volume control system
CW	circulating water
CWPH	circulating water pump house
DAM	data acquisition modules
DBA	design-basis accident
DBD	design-basis document
DBE	design-basis event
DC	direct current
DG	diesel generator or design guide
DGB	diesel generator building
DGR	diesel generator room
DI	demineralized water
DNB	departure from nucleate boiling
DNBR	departure from nucleate boiling ratio
EBA	emergency breathing air
ECCS	emergency core cooling system
ECT	eddy current testing
EDG	emergency diesel generator
EFPY	effective full power years
EIC	Energy Information Center
EIN	equipment identification number
EL	elevation
EMPA	Swiss Federal Testing Station
EOCI	Electric Overhead Crane Institute
EOEL	end of extended life
EOL	end of life
EPA	electrical penetration assemblies
EPDM	ethylene propylene diene monomer
EPR	ethylene propylene rubber
EPRI	Electric Power Research Institute
EQ	environmental qualification
EQML	environmental qualification master list
EQSS	environmental qualification summary sheets
ESF	engineered safety feature
ESFAS	engineered safety features actuation system

F	fahrenheit
FAC	flow-accelerated corrosion
FE	flow element
FERC	Federal Energy Regulatory Commission
FHAR	fire hazards analysis report
FPER	fire protection evaluation report
FM	frequency modulation
FOA	forced oil-air
FSAR	final safety analysis report
FSER	final safety evaluation report
F/L	full length
GALL	Generic Aging Lessons Learned
GDC	general design criterion
GEIS	generic environmental impact statement
GL	generic letter
GLD	green line drawing
GSI	generic safety issues
GT	gas turbine, guide tube
GTG	gas turbine generator
GTR	generic technical report
HA	hydrazine addition
HAZ	heat-affected zone
HELB	high-energy line break
HEPA	high efficiency particulate filter
HMWPE	high molecular weight polyethylene
Hr	hour
HVAC	heating, ventilation and air conditioning
HVSAT	high voltage station auxiliary transformer
HX	heat exchanger
I&C	instrumentation & controls
I/P	current to pressure converter
IA	instrument air
IASCC	irradiation assisted stress corrosion cracking
ICMS	Insulation Consultants Management Services, Inc.
ID	identification
IE	inspection and enforcement
IEB	inspection and enforcement bulletin
IEEE	Institute of Electrical and Electronics Engineers, Inc.
IF	intended function
IGA	intergranular attack
IGSCC	intergranular stress corrosion cracking
ILRT	integrated leak rate test
IN	information notice
INEL	Idaho National Engineering Laboratories
INPO	Institute of Nuclear Power Operations
IPA	integrated plant assessment

IR	insulation resistance or inspection report
ISG	interim staff guidance
ISI	inservice inspection
ITG	issues task group
IWB	requirements for Class 1 components of light-water cooled power plants
IWC	requirements for Class 2 components of light-water cooled power plants
IWD	requirements for Class 3 components of light-water cooled power plants
IWE	requirements for Class MC and metallic liners of Class CC components if light-water cooler power plants
IWF	requirements for Class 1, 2, 3, and MC component supports of light-water cooled power plants
IWL	requirements for Class CC concrete components of light-water cooled power plants
K_{Ic}	reference stress intensity factor as a function of the metal temperature (T) and the metal references nil-ductility temperature (RTNDT)
KIP	1000 lb; or 1 kilo-pound
KIR	ASME fracture toughness curve
Ksi	one KIP per square inch, 1000 psi
K VAC	kilovolts alternating current
KWe	kilowatt electric
Lb	pound
LBB	leak-before-break
LEFM	leading edge flow meter
LER	licensee event report
LLC	limited liability company
LO	lube oil
LOCA	loss-of-coolant accident
LR	license renewal
LRA	license renewal application
LRDB	license renewal database
LRPMS	license renewal project management system
LRPP	license renewal project procedures
LTOP	low-temperature overpressure protection
LVSAT	low voltage station auxiliary transformer
LWR	light water reactor
Mat'l	material
MIC	microbiologically induced corrosion
MIRVP	master integrated reactor vessel surveillance program
Misc.	miscellaneous
MOP	modified operating procedures
MRP	materials reliability program
MRR	metering, relaying and regulation
MRV	minimum required prestressing force or value
MRule	Maintenance Rule
MS	main steam
MSIV	main steam isolation valve

MSLB	main steam line break
MT	magnetic particle test
MW	megawatts
MWD	megawatt-day
MWe	megawatt electric
MWt	megawatt thermal
N	north
NA or N/A	not applicable
NaOH	sodium hydroxide
NCR	non-conformance report
NDE	non-destructive examination
NE	northeast
NEI	Nuclear Energy Institute
NEPA	National Environmental Policy Act
NES	Nuclear Engineering Services
NFPA	National Fire Protection Association
NMC	Nuclear Management Company
NNE	north-north east
Non-VSR	non-vital switchgear room
NP	nuclear procedure
NPS	nominal pipe size
NQAP	Nuclear Quality Assurance Program
NRC	Nuclear Regulatory Commission
NSAC	Nuclear Safety Analysis Center
NSP	Northern States Power
NSR	nonsafety-related
NSSS	nuclear steam supply system
NUMARC	Nuclear Utility Management and Resource Council
NUREG	nuclear regulation document
OCCW	open-cycle cooling water program
ODSCC	outside diameter stress corrosion cracking
OEM	original equipment manufacturer
OI	open item
P&ID	piping and instrument diagram
P-T	pressure temperature
PAB	primary auxiliary building
PACV	post-accident containment ventilation system
PBNP	Point Beach Nuclear Plant
PDI	performance demonstration initiative
PLL	predicted lower limit
PM	preventive maintenance
PORV	power-operated relief valve
PPB	parts per billion
PPCS	plant process computers system
PRT	pressurizer relief tank
PS	pipe support

PSI	pounds per square inch
PSIG	pounds per square inch gauge
PSS	plant sampling system
PSPM	periodic surveillance and preventive maintenance
PT	penetrant testing
PTLR	pressure and temperature limits report
PTS	pressurized thermal shock
PVC	polyvinyl chloride
PW	potable water
PWR	pressurized water reactor
PWSCC	primary water stress corrosion cracking
PZR	pressurizer
P/L	part length
Q-List	quality list
QA	quality assurance
RAI	request for additional information
RC	reactor coolant
RCCA	rod control cluster assembly
RCP	reactor coolant pump
RCPB	reactor coolant pressure boundary
RCS	reactor coolant system
RG	regulatory guide
RH	residual heat
RHR	residual heat removal
RH/SI	residual heat/safety injection
RI-ISI	risk informed inservice inspection program
RM	radiation monitoring
RMW	reactor makeup water
RPS	reactor protection system
RPV	reactor pressure vessel
RSG	replacement steam generator
RTD	resistance temperature detectors
RT_{NDT}	reference temperature for nil ductility transition
RT_{PTS}	reference temperature for pressurized thermal shock
RV	reactor vessel or relief valve
RVH	reactor vessel head
RVI	reactor vessel internals
RWST	refueling water storage tank
S&PC	steam and power conversion
SA	service air
SBCC	site boundary control center
SBO	station blackout
SC	structure and component
SCBA	self-contained breathing apparatus
SCC	stress corrosion cracking
SE	south east

SER	safety evaluation report
SF	spent fuel
SFP	spent fuel pool
SG	steam generator
SGRP	steam generator replacement project
SGBD	steam generator blowdown
SGTR	steam generator tube rupture
SI	safety injection
SOC	statement of considerations
SOER	significant operating event report
SOV	solenoid operated valve
SPING	system-level particulate, iodine, and Nobel gas monitor
SR	safety-related
SRP	standard review plan
SRP-LR	standard review plan for license renewal
SS	stainless steel or sampling system
SSAR	safe shutdown analysis report
SSC	system, structure, or component
SSEL	safe shutdown equipment list
STP	sewage treatment plant
SW	service water
t	thickness
T	temperature
TAC	Training Advisory Committee
TAVG	RCS average temperature
TB	turbine building
TID	total integrated dose
TLAA	time-limited aging analysis
TR	technical report
TRM	training requirements manual
TS	technical specifications
TSC	technical support center
U1	Unit 1
U2	Unit 2
U.S.	United States
USC	upper support column
USAS	United States of America Standards
USE	upper shelf energy
USI	unresolved safety issue
UT	ultrasonic testing
UTS	ultimate tensile strength
UV	ultraviolet
VAC	volts-alternating current
VCT	volume control tank
VDC	volts-direct current
VHP	vessel head penetration

VNBI	PAB battery and inverter room ventilation system
VNCC	containment cooling system
VNCF	containment clean-up system
VNCOMP	computer room ventilation system
VNCR	control room ventilation system
VNCRD	control rod drive cooling system
VNCSR	cable spreading room ventilation system
VNDG	diesel generator building ventilation system
VNDRM	drumming area ventilation subsystem
VNPAB	primary auxiliary ventilation subsystem
VNPH	circulating water pumphouse ventilation subsystem
VNPSE	containment purge supply and exhaust subsystem
VNRAD	radwaste ventilation subsystem
VNRC	reactor cavity cooling subsystem
VNRF	refueling cavity ventilation subsystem
Vol.	volume
VPNPD	Vice President Nuclear Power Department
VSR	vital switchgear room
VT	visual examination
WCAP	Westinghouse Commercial Atomic Power
WD	waste disposal
WE	Wisconsin Electric
WEC	Wisconsin Energy Corporation
WEPCo	Wisconsin Electric Power Company
WL	waste liquid
WPS	Wisconsin Public Service
WO	work order
WOG	Westinghouse Owners Group
WT	water treatment
XLPE	cross-linked polyethylene
YARD	yard structures
Zn	zinc

SECTION 1

INTRODUCTION AND GENERAL DISCUSSION

1.1 Introduction

This document is a safety evaluation report (SER) on the application for license renewal for the Point Beach Nuclear Plant (PBNP) Units 1 and 2, as filed by Nuclear Management Company, LLC (NMC or the applicant). By letter dated February 25, 2004, NMC submitted its application to the U.S. Nuclear Regulatory Commission (NRC or the Commission) for renewal of the PBNP 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 PBNP license renewal review was Mr. Michael Morgan. Currently, Mr. Gregory Suber and Ms. Veronica Rodriguez are acting project managers for the PBNP license renewal review. Mr. Suber can be contacted by telephone at 301-415-1124 or electronic mail at gxs@nrc.gov. Ms. Rodriguez can be contacted by telephone at 301-415-3703 or electronic mail at vmr1@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: Mr. Suber and/or Ms. Rodriguez, Mail Stop O11-F1

In its February 25, 2004, submittal letter, the applicant requested renewal of the operating licenses issued under Section 104(b) of the Atomic Energy Act of 1954, as amended, for PBNP Units 1 and 2 (Facility Operating License Numbers DPR-24 and DPR-27, respectively), for a period of 20 years beyond the current license expiration dates of midnight, October 5, 2010, for Unit 1 and March 8, 2013, for Unit 2. The PBNP units are located about 30 miles SE of Green Bay and about 90 miles NNE of Milwaukee in east central Wisconsin (Manitowoc County) on the west shore of Lake Michigan. The NRC issued the construction permits for PBNP Units 1 and 2 on July 19, 1967, and July 25, 1968, respectively. The NRC issued the operating licenses on October 5, 1970, for Unit 1 and March 8, 1973, for Unit 2. PBNP consists of two Westinghouse pressurized light-water moderated and cooled system units, both designed to generate 1518.5 megawatt thermal (MWt), or approximately 523.8 megawatt electric (MWe). Each unit has undergone a low pressure turbine retrofit modification which increases the unit design output to 537,960 KWe. In 2003, a measurement uncertainty recapture power uprate was performed, increasing each unit's rated thermal power level to 1540 MWt. The final safety analysis report (FSAR) 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, state the requirements for these reviews. The safety review for the PBNP license renewal is based on the applicant's license renewal application (LRA) and on the responses to the staff's requests for additional information (RAIs). The applicant supplemented its responses

to the LRA and RAIs in audits, meetings, and docketed correspondence. Unless otherwise noted, the staff reviewed and considered information submitted through August 23, 2005. The staff reviewed 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 review the LRA and all pertinent information and materials, including the FSAR 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 Lester Public Library, 1001 Adams Street, Two Rivers, Wisconsin, 54241. In addition, the public may find the PBNP Units 1 and 2 LRA, as well as materials related to the license renewal review, on the NRC Web site 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 its proposed operation for an additional 20 years beyond the term of the current operating license. The staff reviewed the LRA in accordance with the 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. Section 5 is reserved for the report of the Advisory Committee on Reactor Safeguards (ACRS). Section 6 provides the conclusion of this report.

SER Appendix A is a table that identifies the applicant's commitments associated with the renewal of the operating licenses. Appendix B provides a chronology of the principal correspondence between the NRC and the applicant related to the review of the application. Appendix C presents an index of the staff's RAIs and the applicant's responses. Appendix D is a list of principal contributors to the SER. Appendix E is a bibliography of the references used during the course of the review.

In accordance with 10 CFR Part 51, the staff prepared a plant-specific supplement to the Generic Environmental Impact Statement (GEIS). This supplement discusses the environmental considerations related to renewing the licenses for PBNP Units 1 and 2. The NRC staff issued NUREG-1437, Supplement 23, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants: Regarding Point Beach Nuclear Plant, Units 1 and 2 Final Report," on August 12, 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 also manages 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 of environmental impacts of license renewal and to 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 during the period of extended operation, as well as a few other issues related to safety during the period of extended operation.

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

In implementing these two principles, 10 CFR 54.4 defines the scope of license renewal as those SSCs (1) that are safety-related; (2) whose failure could affect safety-related 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 or functions of those SCs will be maintained, consistent with the current licensing basis (CLB), for the period of extended operation. Active equipment, however, is considered to be adequately monitored and maintained by existing programs. In other words, the detrimental effects of aging that may affect active equipment are more readily detectable and are expected to 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 plant 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 FSAR. This FSAR supplement must contain a summary description of the applicant's programs and activities for managing the effects of aging and an 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 will 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 will 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 NEI 95-10, "Industry Guideline for Implementing the Requirements of 10 CFR Part 54 - The License Renewal Rule," which was issued in March 2001 by the Nuclear Energy Institute (NEI). 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, PBNP 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 will 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) 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 (*i.e.,* Category 1 issues). Appendix B to Subpart A of 10 CFR Part 51 identifies these generic findings. 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 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 NRC 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 June 15, 2004, in Mishicot (Fox Hills), Wisconsin, to identify environmental issues specific to the plant. The NRC's draft plant-specific Supplement 23 to the GEIS regarding PBNP Units 1 and 2 was issued on January 13, 2005. The NRC held another public meeting on March 3, 2005, in Mishicot (Fox Hills), Wisconsin, to discuss the draft plant-specific Supplement 23 to the GEIS regarding PBNP Units 1 and 2. The NRC's final plant-specific Supplement 23 to the GEIS regarding PBNP Units 1 and 2, which was issued on August 12, 2005, documents the results of the environmental review and includes a recommendation with respect to the license renewal action.

1.3 Principal Review Matters

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

In 10 CFR 54.19(a), the Commission requires a license renewal applicant to submit certain general information. The applicant provided this general information in LRA Section 1 for PBNP, Units 1 and 2, which it submitted to the NRC by letter dated February 25, 2004. The staff reviewed LRA Section 1 and found that the applicant submitted the information required by 10 CFR 54.19(a).

In 10 CFR 54.19(b), the Commission requires that LRAs 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 its LRA regarding this issue:

> The requirements at 10 CFR 54.19(b) state that license renewal applications must 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

current indemnity agreement No. B-41 for PBNP Units 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 revised by Amendment No. 14, lists DPR 24 and DPR 27 as the applicable license numbers. Should the license numbers be changed upon issuance of the renewed licenses, NMC requests that conforming changes be made to Item 3 of the attachment, and any other sections of the indemnity agreement as appropriate.

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

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

In 10 CFR 54.21(b), the Commission requires that each year following submission of the LRA, and at least 3 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 FSAR supplement. The applicant submitted an update to the LRA by letters dated February 23 and June 29, 2005, which summarized the changes to the CLB that have occurred at PBNP Units 1 and 2 during the staff's review of the LRA. This adequately addresses the requirement specified in 10 CFR 54.21(b).

In accordance with 10 CFR 54.22, an applicant's LRA must include any changes or additions to the technical specifications (TS) that are necessary to manage the effects of aging during the period of extended operation. In LRA Appendix D, the applicant stated that it had not identified any TS changes necessary to support issuance of the renewed operating licenses for PBNP 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 incorporates the ACRS interim report; its final report will be included once it is issued. SER Section 6 documents the findings required by 10 CFR 54.29.

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

1.4 Interim Staff Guidance

The license renewal program is a living program. The NRC staff, nuclear 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 license renewal guidance documents such as the SRP-LR and GALL Report.

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

Table 1.4-1 Interim Staff Guidance

ISG Issue (Approved ISG No.)	Purpose	SER Section
GALL Report presents one acceptable way to manage aging effects (ISG-1)	This ISG clarified that the GALL Report contains one acceptable way, and not the only way to manage aging for license renewal.	N/A
Station Blackout Scoping (SBO) (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.	2.1.2.1.1
Concrete Aging Management Program (ISG-3)	Lessons learned from the GALL demonstration project indicated that GALL is not clear whether concrete requires an AMP.	3.5.2.2.1

ISG Issue (Approved ISG No.)	Purpose	SER Section
Fire Protection (FP) System Piping **(ISG-4)**	This ISG clarifies the staff position for wall thinning of 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; disassembly can introduce oxygen into the FP piping, which can accelerate corrosion. Instead, a non-intrusive method, such as volumetric inspection, can be used. 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 automatic mode of operation test from GALL; the staff considers these test verifications to be operational activities.	**3.0.3.2.10** **3.3.2.3.7**
Identification and Treatment of Electrical Fuse Holders **(ISG-5)**	This ISG includes 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**
The ISG Process **(ISG-8)**	This ISG updates and provides clarification 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 the 2003 applicants.	N/A

1.5 Summary of Open Items

As a result of its review of the LRA for PBNP Units 1 and 2, including additional information submitted to the NRC through March 31, 2005, the staff identified five items that remained open at the time the SER with open items was published. An issue was considered open if the applicant had not presented a sufficient basis for resolution. Each open item (OI) had been assigned a unique identifying number. By letters dated April 8, April 29, June 10, July 5, July 8, and July 19, 2005, the applicant responded to these OIs. The staff reviewed these responses and closed each of the OIs. The basis for closing the OIs is as follows:

OI B2.1 (Sections 3.0.3.2.1 and 3.0.3.2.2 - ASME Section XI Inspection Programs)

Relief requests are approved by the NRC as described in 10 CFR 50.55a, Codes and Standards. Relief requests only apply to the CLB and are time-limited. Consequently, citing approved requests cannot be used as a basis for taking exception to the GALL Report since they may not be renewed. Each exception to the GALL Report must be evaluated for NRC approval based on the technical bases that are associated with aging management regardless of whether there is an approved related relief request. Citing a relief request does not provide an acceptable basis to take an exception to the GALL Report.

In RAI B2.1, dated March 30, 2005, the staff requested the applicant to provide its technical bases, as they relate to aging management, and without referencing any relief requests, for the exceptions taken to ASME Code Section XI, Subsections IWB, IWC, and IWD Inservice Inspection Program and ASME Code Section XI, Subsections IWE and IWL Inservice Inspection Program. This was identified as open item (OI) B2.1.

In its response to OI B2.1, by letter dated July 5, 2005, the applicant withdrew most of the alternatives, initially credited as exceptions. The applicant clarified in its letter that these alternatives are not exceptions to the GALL Report as they are either administrative and did not affect aging management or the aging effect was managed by another aging management program cited in the LRA. For the remaining alternatives, the applicant provided technical justifications and commitments in support of the exceptions. The staff found each of the bases provided in the applicant's RAI response acceptable. The staff's concerns with respect to the exceptions to ASME Section XI, Subsections IWB, IWC, and IWD, Subsections IWE and IWL, and Subsection IWF are resolved. Therefore, OI B2.1 is closed.

OI B2.1.4-2 (Section 3.0.3.2.4 - Bolting Integrity Program)

The GALL Report relies on industry recommendations for comprehensive bolting maintenance, as delineated in EPRI TR-104213 for pressure-retaining bolting and structural bolting. The applicant indicated that enhancements to the existing plant implementation documents dealing with bolted joints will be made to incorporate recommendations as deemed appropriate based upon review of NUREG-1339, EPRI NP-5769, and EPRI TR-104213. The applicant has not identified exceptions to these NUREG and EPRI documents.

In RAI 2.1.4-2, dated February 7, 2005, the staff requested the applicant to provide specific exceptions to the Bolting Integrity Program. The staff should be informed of, and approve specific exceptions to the bolting recommendations in these NUREG and EPRI documents.

The applicant should provide this information for staff review and approval prior to issuance of the extended license. This was identified as open item (OI) B2.1.4-2.

The staff's concern was referred to the Region III staff, which performed its AMR/AMP onsite inspection during the weeks of March 7 and 21, 2005. In its response to OI B2.1.4-2, by letter dated April 8, 2005, the applicant provided specific exceptions to EPRI NP-5769. The applicant's discussion and technical justifications were evaluated and accepted by the staff. The staff's concern is resolved; therefore, OI B2.1.4-2 is closed.

OI 3.1.1-3 (Section 3.1.2.3.6 - Steam Generators - Aging Management Evaluation - Table 3.1.2-5)

LRA Table 3.1.2-5 identifies Notes H, 21 and J, 5 for loss of material in stainless steel, carbon steel clad with stainless steel and Alloy 600/690 materials. For these AMRs only the Water Chemistry Control Program is identified as the applicable AMP. PBNP personnel have indicated that the basis for using only the mitigative Water Chemistry Control Program is that the program does not require lack of aging effect validation if the flow is moderate or high. The staff considers this a misinterpretation of the GALL AMP. The GALL Report identifies stagnant or low flow conditions as an example of when it would be appropriate to validate the effectiveness of the Water Chemistry Control Program. The GALL Report utilizes this example to demonstrate when a validation of aging management program is appropriate, but does not define, by default, when a validation should not be used. In conditions of moderate or high flow, SSCs could have crevices or other locations of low or stagnant flow. Furthermore, all systems are shut down and flow is reduced to stagnant conditions at some point in its service life. Therefore, this was identified as open item (OI) 3.1.1-3.

In its response to OI 3.1.1-3, by letter dated June 10, 2005, the applicant stated that for steam generator (SG) components in contact with primary water; the same material types in the same environments exist in the reactor vessel, the vessel internals, the pressurizer, and the Class 1 piping and components. In all of these systems and components, loss of material is proposed to be managed with the Water Chemistry Control Program. The primary side of the SG are stainless steel and nickel alloy which are corrosion-resistant materials. For these materials, industry and plant-specific operating experience has shown that loss of material is not an active degradation mechanism on primary side components, primarily due to the strict water chemistry controls used in PWRs. Other components in this same environment are routinely inspected (*i.e.*, SG tubes) and these inspections would provide leading indications to the susceptibility of these materials to loss of material.

The staff reviewed the applicant's characterization and reevaluated the GALL Report for loss of material in stainless steel, carbon steel clad with stainless steel and Alloy 600/690 materials and concluded that the applicant's response is acceptable. The staff's concern is resolved; therefore, OI 3.1.1-3 is closed.

OI 3.3-7 (Section 3.3.2.3.3 - Component Cooling Water System - Aging Management Evaluation - Table 3.3.2-2)

In LRA Table 3.3.2-2, the applicant proposed to manage cracking due to intergranular attack/intergranular stress corrosion cracking (IGA/IGSCC) of stainless steel material for heat exchanger components exposed to primary treated water with temperature

greater than 480 °F using the Water Chemistry Control Program. This line item cites Note 35, which states: "Component/material/environment is not addressed in the corresponding NUREG-1801 Chapter, but the component/material/environment is addressed in another NUREG-1801 Chapter." This line item references AMR line item 3.1.1-36, which provides the following discussion:

> Crack initiation growth due to SCC and flaw growth are identified as aging effects requiring management for the reactor vessel nozzle safe ends, CRD housing, and RCS components. Aging management programs credited for managing these effects are the Water Chemistry Program and ASME Section XI, Subsections IWB, IWC, and IWD Inservice Inspection Program.

The Note implies that ASME Section XI, Subsections IWB, IWC, and IWD Inservice Inspection Program should have also been applied to LRA Table 3.3.2-2. In RAI 3.3-7, dated March 31, 2005, the staff requested the applicant to explain this discrepancy or make a commitment to revise the line item in LRA Table 3.3.2-2 to include the Inservice Inspection Program. This was identified as open item (OI) 3.3-7.

In its response to OI 3.3-7, by letter dated June 10, 2005, the applicant committed to use the One-Time Inspection Program in conjunction with the Water Chemistry Control Program to manage IGA/IGSCC aging mechanisms. The staff found the applicant's response to RAI 3.3-7 and the addition of the One-Time Inspection Program is an acceptable approach to manage the aging effects. The staff's concern is resolved; therefore, OI 3.3-7 is closed.

OI 3.5-4 (Section 3.5.2.2.1 - PWR Containments)

The discussion column of LRA Item 3.5.1-12 refers to LRA Section 3.5.2.2.1.4 for further evaluation. In the discussion, the applicant noted that the liner corrosion was identified in both units due to borated water leakage, and that ASME Code Subsection IWE inspections would be performed in these areas. In RAI 3.5-4, dated July 27, 2004, the staff requested the applicant to provide a quantitative summary of the extent of liner corrosion found in each unit, and the corrective actions taken. The applicant was also requested to include a discussion of acceptable liner plate corrosion.

In its response, dated August 26, 2004, the applicant stated that the areas of concern include (1) the bottom containment liner plate (floor), which is covered by an eighteen-inch-thick concrete floor, and (2) SW and CCW penetrations. The penetrations have detectable pitting in the flued head region. On occasions, spilled borated water has seeped into the liner plate floor crevice. The liner plate floor receives UT measurements at selected locations.

During a meeting on February 15, 2005, the staff indicated and the applicant agreed, that this response required further clarification. The staff requested the applicant to clarify the corrective actions taken, including procedural descriptions, when loss of material is identified.

In its response, a clarification letter dated March 15, 2005, the applicant summarized that the necessity for repair has been determined on a case-by-case basis. The table provided with the response showed the liner plate base thickness reduction was as high as 46%. The response indicated that such degradation was found acceptable without repair. As this process will be

continued during the period of extended operation, the staff requested additional information regarding the basic criteria used in the engineering evaluation. Specifically, the staff requested the applicant to provide a summary of the engineering evaluations performed for CAP 22754 and CAP 13912 (designated in the applicant's response table), including the type of corrosion, loads considered in the evaluation, acceptable liner strains, and strain concentration factors considered, if applicable. The applicant was also requested to provide the procedure describing the "as left" condition of the degradation. This was identified as open item (OI) 3.5-4.

In its response to OI 3.5-4, by letter dated June 10, 2005, the applicant provided the condition reports and the engineering evaluations (CR 01-1517 and CR 01-1220) prepared for the two events. Subsequently, the staff indicated that, according to the numbers provided in CR-01-1517, the applicant would have to monitor the affected area(s) under augmented inspection (IWE-1241) and set a limit on acceptable liner corrosion. With respect to CR-01-1220 the staff stated that the report statement "under normal operating condition, the liner experiences no strain," is incorrect. The staff believes that although the liner is not accounted for in structural calculations, by virtue of its being anchored to the concrete, it experiences compressive strains due to dead load, prestressing and creep of concrete. The staff indicated that unless an analysis is performed to show that with the reduced thickness of 0.116 inches, the liner will be able to withstand the postulated loads without giving rise to different mode of failure, such corrosion without corrective action is not acceptable. By letter dated July 8, 2005, the applicant made the following commitments:

(1) An evaluation, repair or replacement requirement discussion will be included in the Acceptance Criteria element of the ASME Section XI, Subsections IWE and IWL Inservice Inspection Program of the LRA prior to the period of extended operation. If localized area thickness of the containment liner base metal is reduced by 50% or more of the nominal plate thickness, then every attempt should be made to correct by repair or replacement. If the repair or replacement option is impractical, an acceptance by engineering evaluation option may be pursued.

(2) If localized area thickness of the base metal is reduced by approximately 50 percent or more of the nominal plate thickness, then the reexaminations required by IWE 2420(b) will be continued in the succeeding inspection periods and the provisions of IWE-2420(c) will not be applied.

Based on the applicant's responses to RAI 3.5-4, the description of the process and the commitments discussed above, the staff found the overall approach in detecting and correcting the flaws and degradation in the containment liner plates acceptable. The staff's concerns are resolved; therefore, OI 3.5-4 is closed.

1.6 Summary of Confirmatory Items

As a result of its review of the LRA for PBNP Units 1 and 2, including additional information and clarifications submitted to the NRC through March 31, 2005, the staff identified the following confirmatory items. An issue was considered confirmatory if the staff and the applicant have reached a satisfactory resolution, but the resolution has not yet been formally submitted to the staff. Each confirmatory item (CI) had been assigned a unique identifying number. By letters dated April 1, April 8, April 29, June 9, June 10, June 29, and July 19, 2005, the applicant

responded to these CIs. The staff reviewed these responses and closed each of the CIs. The basis for closing the CIs is as follows:

CI 2.1-1 (Section 2.1.2.1.2 - Application of the Scoping Criteria in 10 CFR 54.4(a))

In RAI 2.1-1, dated November 16, 2004, the staff requested additional information regarding the scoping methodology associated with the 10 CFR 54.4(a)(2) evaluation. The staff requested the applicant to adequately define short term exposure duration as it relates to the evaluation of low and moderate energy piping failures that could affect safety related electrical equipment. Since this equipment may not be environmentally qualified, it could fail due to 10 CFR 54.4(a)(2) piping failures

In its response, dated January 31, 2005, the applicant stated that for the purpose of license renewal, the term "exposure duration" will be removed from LRA Section 2.1.2.1.2 and it will provide a technical justification as to why the safety-related SSCs are capable of withstanding the effects of spray and leakage. The applicant also stated that it will include a technical justification in the LRA annual update under the section "Components Qualified/Designed for Environment".

During a meeting on February 15, 2005, the staff indicated and the applicant agreed, that this response required further clarification. In its response, a clarification letter dated March 15, 2005, the applicant committed to provide details of the 10 CFR 54.4(a)(2) scoping methodology changes, including specific exceptions, and how these will impact the LRA. The staff agreed with the applicant's proposed methodology changes. However, the applicant committed to provide detailed information with regard to these changes by the end of April 2005. This was identified as confirmatory item (CI) 2.1-1.

In its response to CI 2.1-1, by letter dated April 29, 2005, the applicant provided additional information regarding its scoping methodology changes. This revised methodology invokes a plant spaces approach that assumes a spatial interaction can occur if safety-related and nonsafety-related system or component (SC) are located within the same space. For purposes of the process, a space is defined by the room in which the safety-related and nonsafety-related components are located. This revised methodology evaluates the effect of sprays and leaks on mechanical and electrical safety-related SCs, with no limitation on duration of the sprays/leaks. The applicant thus considers all liquid or steam bearing nonsafety-related SCs to be within the scope of license renewal pursuant to 10 CFR 54.4(a)(2), provided that the nonsafety-related SCs are located in the same space as a safety-related SC and that the nonsafety-related SCs are in proximity where spray or leakage from nonsafety-related SC could contact a safety-related SC.

Based on this revised 10 CFR 54.4(a)(2) methodology, the applicant re-evaluated SCs to identify configurations where the failure of nonsafety-related SCs could result in the loss of an intended function of the safety-related SCs within the space and, were therefore, considered within the scope of license renewal. This re-evaluation led to the expansion of scope for some systems, to the addition of component groups and line items to several tables in the LRA. The applicant noted that the results of the review using the new methodology discovered no new aging effects/mechanisms and aging management program assignments are consistent with those previously identified in the LRA.

Based on the above discussion, the staff found the applicant's response to RAI 2.1-1 acceptable. The staff's concern is resolved; therefore, CI 2.1-1 is closed.

CI 2.1-2 (Section 2.1.3.1.1 - Application of the Scoping Criteria in 10 CFR 54.4(a))

In RAI 2.1-2, dated November 16, 2004, the staff requested additional information regarding the scoping methodology associated with the 10 CFR 54.4(a)(2) evaluation. The staff requested the applicant to define first equivalent anchor as it relates to the evaluation of nonsafety-related piping directly connected to safety-related piping. The staff also requested the applicant to describe the methodology of its application. Additionally, in cases where plant equipment credited with providing support to nonsafety-related piping may be equivalent to an associated piping anchor as described in NUREG-1800, the staff requested the applicant to provide justification for not including this plant equipment within the scope of license renewal.

In its response, dated January 31, 2005, the applicant stated that PBNP has included all the connected nonsafety-related piping and supports, up to and including the first equivalent anchor beyond the safety/nonsafety interface, within the scope of license renewal. The applicant also stated that nonsafety-related pipe supports will be managed in a commodity "spaces" approach wherein all supports in the areas of concern are included within the scope of license renewal. The directly connected nonsafety-related piping will be age-managed using the same programs that manage the safety-related piping. This process conforms to the requirements for the nonsafety-related SSCs connected to safety-related SSCs pursuant to 10 CFR 54.4(a)(2) and the guidance of draft ISG-09. This was identified as confirmatory item (CI) 2.1-2.

Further in its response, the applicant described what is meant by first equivalent anchor and also described the analysis techniques used for evaluating the piping stress analysis boundaries for identifying the first equivalent anchor point for scoping purposes.

Based on the above discussion, the staff found the applicant's response to RAI 2.1-2 acceptable. The staff's concern is resolved; therefore, CI 2.1-2 is closed.

CI 2.1-3 (Section 2.1.2.1.2 - Flow-Accelerated Corrosion Effect on Piping Section Scoping in 10 CFR 54.4(a)(2))

In RAI 2.1-3, dated November 16, 2004, the staff requested additional information regarding the scoping methodology associated with the 10 CFR 54.4(a)(2) evaluation. The staff requested the applicant to describe how the falling of piping sections is not considered credible and why the piping section itself would not be within the scope of license renewal pursuant to 10 CFR 54.4(a)(2) due to physical impact hazard. The staff also requested the applicant to describe how the management of flow-accelerated corrosion (FAC) relates to the scoping and screening of 10 CFR 54.4(a)(2) seismic II/I piping systems that could cause these types of failures.

In its response, dated January 31, 2005, the applicant stated that for the purpose of license renewal, the nonsafety-related pipe segments, for the Criterion 2 scoping, have essentially three potential modes: (1) for nonsafety-related low or moderate energy piping, managing of the nonsafety-related supports will ensure that these supports remain intact and will not fall on safety-related components, (2) for nonsafety-related high energy piping segments, FAC failure

for components in proximity to safety-related components would be considered within the scope of license renewal as long as failure is considered credible, and (3) nonsafety-related piping sections that could have spray, leakage, or harsh environment effects on vulnerable safety-related equipment are considered within the scope of license renewal.

During a meeting on February 15, 2005, the staff indicated and the applicant agreed, that this response required further clarification. In its response, a clarification letter dated March 15, 2005, the applicant committed to remove from the response the phrase "as long as a FAC failure is considered credible." This was identified as confirmatory item (CI) 2.1-3.

In its response, a clarification letter dated March 15, 2005, the applicant removed the phrase "as long as a FAC failure in that line and impact in safety-related components is considered credible" from its original response to RAI 2.1-3.

Based on the above discussion, the staff found the applicant's response to RAI 2.1-3 acceptable. The staff's concern is resolved; therefore, CI 2.1-3 is closed.

CI 2.4-2 (Section 2.4.8 - Yard Structures)

LRA Section 2.4 does not appear to contain information about tanks and their foundations. In RAI 2.4-2, dated January 26, 2005, the staff requested the applicant to provide a list of all tanks and their foundations for each unit. Additionally, the staff requested the applicant to: (1) identify the tanks and their foundations that are in-scope and define their intended functions, (2) identify the tanks and their foundations that are not in-scope and the basis for their exclusion, and (3) specify where the AMR for each in-scope tank and tank foundation is located in the LRA.

In its response, dated February 25, 2005, the applicant stated that tanks are associated with the system in which they reside. They are addressed and scoped in the mechanical section of the LRA, Section 2.3. The tables in LRA Section 2.3 have a component group, "Tanks." The license renewal drawings for the systems are listed and tanks that are in-scope are highlighted on the drawings. Tank foundations are scoped in LRA Section 2.4 and are typically constructed of concrete or steel. Tanks foundations and intended functions are typically presented in LRA Sections 2.4.8 and 2.4.10, or individual section for the building. Tank and tank foundation AMR information is contained in the corresponding LRA Sections 3.1 through 3.5.

Based on its review, the staff finds the applicant's response to RAI 2.4-2 acceptable in that tanks are addressed and scoped in the mechanical section, LRA Section 2.3. However, the staff finds unacceptable the omission of tank foundations from LRA Section 2.4. The applicant should identify the tank foundations that are within the scope of license renewal. This was identified as confirmatory item (CI) 2.4-2.

In its response to CI 2.4-2, by letter dated June 10, 2005, the applicant identified individual tanks and their foundations that are within the scope of license renewal. Subsequently, the applicant submitted a letter, dated June 29, 2005, to clarify the intended functions and AMR information of those tank foundations that are within the scope of license renewal. This letter stated that the intended function for tank foundations is either a safety-related or a nonsafety-related support and that the AMR information is contained within the corresponding

LRA Section 3.5. Since tank foundations are not stated under the column of component types in buildings of LRA Section 3.5, the applicant uses examples to illustrate that the tank foundations within the scope of license renewal are included in either concrete or steel component types, and further stated that every in-scoped tank foundation within a building or in yard structures would be captured by those component items.

With all in-scoped tanks and their foundations identified, intended functions stated, and the AMR information clarified, the staff concluded that the applicant has properly documented the necessary information related to the tanks and their foundations and considers the applicant's response to RAI 2.4-2 to be acceptable. The staff's concern is resolved; therefore, CI 2.4-2 is closed.

CI B2.1.4-3 (Section 3.0.3.2.4 - Bolting Integrity Program)

In RAI B2.1.4-3, dated February 7, 2005, the staff requested the applicant to provide data that demonstrate that the bolting, loaded with the maximum shear stress, would not be susceptible to SCC. Additionally, the staff requested the applicant to identify the inspection history for its bolts that demonstrate that they are not susceptible to SCC.

In its response, dated March 4, 2005, the applicant stated, in part, that the Boric Acid Program takes a critical look at bolting. Whenever boric acid is found, the requirement is to look at the flow path of where the boric acid has traveled. If boric acid is found on bolting, the boric acid will be removed and a visual examination performed on the fasteners to determine if any degradation has occurred. NMC will follow plant procedures for repair or replacement if the evaluation determines the bolting is not acceptable.

The inspection history results are reported in the applicant's response to RAI B2.1.4-3. Since 1991, reactor coolant pump supports and SG supports have been inspected on numerous occasions. No recordable indications have been observed. The Region III staff, on its AMR/AMP onsite inspection during the weeks of March 7 and 21, 2005, will confirm that there were no failure of high strength bolts. This was identified as confirmatory item (CI) B2.1.4-3.

The inspection history for high strength bolts was verified by the Region III staff, during their AMR/AMP onsite inspection. Section D.1 of the DRS Aging Management Inspection Report, dated May 2, 2005, states the following:

> The inspectors requested specific searches of the plant specific operating experience and verified that the applicant performed adequate historic reviews to determine aging effects. The inspectors determined that the licensee did not have any documented occurrences of failure in high strength structural bolting. During plant walkdowns, the inspectors specifically looked for cases where structural bolting appeared loose, missing or failed; no problems were identified. Following submittal of the LRA, the licensee did identify two cases where component bolts were replaced. In one case, the licensee discovered a longitudinal crack in a reactor coolant pump seal package bolt. The licensee replaced the bolt and sent the cracked bolt off for laboratory analysis. The crack was determined to be a manufacturing defect and not related to aging degradation. The second case was replacement of all the bolting on the Unit 2 pressurizer after indications were identified during the inservice inspection. The

indication disposition report and a subsequent corrective action procedure (CAP) document analyzed the indications and determined that the majority of the indications were minor, appeared most likely due to normal installation and removal of the bolts, and did not affect the integrity of the bolting. However, one bolt had two minor "crack like" indications. The licensee did not determine the cause of these indications; however as the bolts were replaced and no pressurizer leakage had occurred during the previous operating cycle, the inspectors concluded that the licensee's inservice inspection program had adequately addressed the issue.

The staff found this acceptable since the inspectors confirmed that the applicant did not have any documented occurrences of failure in high strength structural bolting. The staff's concern is resolved; therefore, CI B2.1.4-3 is closed.

CI B2.1.11-1 (Section 3.0.3.2.11 - Flow-Accelerated Corrosion Program)

During the audit, the staff noted that for the "acceptance criteria" program element, it is unclear how the applicant calculates the minimum permitted wall thickness and how it is used in its analysis for flow-accelerated corrosion. In RAI B2.1.11-1, dated March 30, 2005, the staff requested the applicant to clarify its wall thickness calculation and its uses.

The staff's concern was referred to the Region III staff, which performed its AMR/AMP onsite inspection during the weeks of March 7 and 21, 2005. The applicant clarified its methodology. The applicant stated that the minimum wall calculations are performed using the design pressure, which is greater than the operating pressure and demonstrates that the actual measured wall thickness is greater than the minimum thickness required by the maximum hoop stress. If degradation is detected such that the wall thickness is less than or equal to 87.5 percent of nominal wall thickness for safety-related piping or 60 percent of nominal wall thickness for nonsafety-related piping, additional examinations will be performed in adjacent areas to bound the thinning and assure that the actual minimum wall is measured. In addition, the applicant will provide its justification and confirmation that the minimum wall thickness will be maintained for the period of extended operation. This was identified as confirmatory item (CI) B2.1.11-1.

In its response to CI B2.1.1-11, by letter dated June 9, 2005, the applicant stated that during the Region III AMR/AMP onsite inspection, a detailed review of the Flow-Accelerated Corrosion Program was completed. As a result of that review and discussions between the Region III staff, the License Renewal Branch, and Division of Engineering personnel, PBNP provided a clarification to LRA Section B2.1.1.11, "Flow-Accelerated Corrosion Program," by letter dated April 8, 2005. Based upon discussions with the NRC staff on May 3, 2005, a revision to the April 8, 2005, letter was identified to clarify the intent of the sample expansion criterion. By letter dated June 9, 2005, the applicant provided a modified text to clarify its program. The revised text replaced the discussion under the program element "Monitoring and Trending" in LRA Section B2.1.11 as follows:

> If degradation is detected such that the wall thickness is less than or equal to 87.5% of nominal wall thickness for safety-related piping, additional examinations will be performed in adjacent areas to bound the thinning. For both safety-related and non-safety related piping, additional examinations will be performed in adjacent areas to

bound the thinning if the remaining service life, based on the code minimum allowable wall thickness, is less than one operating cycle. The sample size will also be expanded for non-safety related piping if degradation is detected such that the wall thickness is less than or equal to 60% of nominal wall thickness. This covers situations where the code minimum allowable wall thickness may be less than 60% of nominal wall thickness for non-safety related piping. The expansion of the sample size should include a minimum of the next two most susceptible components in that CHECWORKS line, any component within two pipe diameters downstream (upstream if expander), or like components in parallel trains. If the initial expansion finds additional components with significant loss of material due to FAC, the examination scope is expanded further.

This element includes exceptions to the corresponding NUREG-1801 aging management program element. NUREG-1801 states: "If degradation is detected such that the wall thickness is less than the minimum predicted thickness, additional examinations are performed in adjacent areas to bound the thinning." Literal interpretation of this sample expansion criteria is not practical in many cases. If very little degradation is predicted, measured wall thickness may be less than the predicted thickness even though the calculated life of the affected component may exceed the operating life of the plant. In this case, sample expansion would not be warranted.

The FAC program at PBNP implements the EPRI guidelines in NSAC-202L-R2, which recommends increasing the sample size when inspections of the sample detect significant FAC wear. In the PBNP FAC program, significant FAC wear is defined as FAC resulting in a wall thickness of less than or equal to 87.5% of nominal wall thickness for safety related piping. For both safety related and non-safety related piping, additional examinations will be performed in adjacent areas to bound the thinning if the remaining service life, based on the code minimum allowable wall thickness, is less than one operating cycle. The sample size will also be expanded for non-safety related piping if degradation is detected such that the wall thickness is less than or equal to 60% of nominal wall thickness. This covers situations where the code minimum allowable wall thickness may be less than 60% of nominal wall thickness for non-safety related piping. This criterion for sample expansion is acceptable because it specifies a wall thickness criterion and requires projection of inspection results to the next inspection opportunity consistent with industry guidance. Therefore, PBNP meets the intent of this NUREG-1801 aging management program element.

The staff reviewed the responses to RAI B2.1.1-11, the exception to the GALL Report and the final text to be included in the AMP and concluded that the applicant had appropriately defined the program and demonstrated that the program as defined provides reasonable assurance that structural integrity will be maintained. The staff's concern is resolved; therefore, CI B2.1.1-11 is closed.

CI 3.1.1-1 (Section 3.1.2.1.1 - Loss of Fracture Toughness Due to Thermal Aging Embrittlement)

The staff finds that the use of leak-before-break evaluation method is not equivalent to a flaw tolerance methodology; it assumes through-wall leakage and, therefore, does not assure the safety function of pressure boundary integrity. In RAI 3.1.1-1, dated March 30, 2005, the staff

requested the applicant to clarify how it manages the aging effect of loss of fracture toughness due to thermal aging embrittlement for CASS primary loop elbows. During a telephone conference, the applicant agreed to revise its position and perform flaw tolerance evaluations. This was identified as confirmatory item (CI) 3.1.1-1.

In its response to CI 3.1.1-1, by letter dated June 9, 2005, the applicant stated that PBNP will follow the recommendation of GALL AMP XI.M12 and that it will use enhanced volumetric examination or a flaw tolerance evaluation to demonstrate that CASS primary loop elbows, potentially susceptible to thermal embrittlement, have adequate fracture toughness.

The staff found the applicant's response to RAI 3.1.1-1 acceptable as it results in the actions being consistent with the GALL Report recommendations. The staff's concern is resolved; therefore, CI 3.1.1-1 is closed.

CI 3.1.1-2 (Section 3.1.2.2.10 - Loss of Section Thickness Due to Erosion)

In RAI 3.1.1-2, dated March 30, 2005, the staff requested the applicant to justify why the SG feedrings and associated J-tubes are outside the scope of license renewal. During a telephone conference, the applicant agreed to add the SG feedrings and J-tubes to the scope of license renewal and manage the associated aging effects. This was identified as confirmatory item (CI) 3.1.1-2.

In its response to CI 3.1.1-2, by letter dated June 9, 2005, the applicant stated that J-nozzles, feedrings, and feedring supports have been added to the scope of license renewal to address a potential issue, where failures of nonsafety-related components could affect the safety-related SG tubing. Therefore, the aging management programs for these components need to ensure that the feedring components stay in-place and not fall on the SG tubes. The applicant will age-manage the SG feedrings, J-nozzles, and feedring supports using the Water Chemistry Control Program and the Steam Generator Integrity Program. The Steam Generator Integrity Program provides for various inspections of the secondary side of the SGs, which will provide verification that aging effects are not progressing, thereby ensuring that the feedring and J-nozzles remain in-place.

The staff found the applicant's response to RAI 3.1.1-2 acceptable because it brought the J-nozzles, feedrings, and feedring supports into the scope of license renewal and appropriately manages the aging effects to assure that the component will not prevent safety-related components from performing its associated safety functions. The staff's concern is resolved; therefore, CI 3.1.1-2 is closed.

CI 3.5-12 (Section 3.5.2.2.1 - PWR Containments - Cracking Due to Cyclic Loading and Stress Corrosion Cracking (SCC))

In LRA Section 3.5.2.2.1.7, the applicant stated that SCC is not an applicable aging mechanism for penetration sleeves, bellows, and dissimilar metal welds. Therefore, the applicant did not address cracking due to cyclic loading. In RAI 3.5-12, dated March 30, 2005, the staff requested the applicant to address the difference between its position and the GALL Report recommendation of enhanced inspection methods. The staff noted that the TLAA in LRA Section 4.3.11 does not detect and manage cracking due to cyclic loading. The applicant was

requested to provide further clarification for crediting this specific line item to manage cracking due to cyclic loading.

During a telephone conference, the applicant indicated that this is a TLAA and will provide information to confirm that this is adequately addressed in LRA Section 4.3.11. The staff agreed with the applicant's statement. This was identified as confirmatory item (CI) 3.5-12.

In its response to CI 3.5-12, by letter dated June 9, 2005, the applicant clarified its basis for concluding that the use of a fatigue analysis as the basis for managing fatigue is consistent with the positions stated in the GALL Report (NUREG-1801 Vol. 1, Table 5, Items 3.5.1-1 and 3.5.1-2). In addition, the applicant stated that SCC is not an applicable aging effect due to the lack of an aggressive chemical environment. Further, the applicant clarified that aging management of the containment penetration sleeves is addressed by the ASME Section XI, Subsection IWE and IWL Inservice Inspection Program and the Boric Acid Corrosion Program. Lastly, the applicant stated that PBNP does not have any penetration bellows in the scope of license renewal.

The staff found the applicant's response to RAI 3.5-12, the categorization of aging effects and its aging management, appropriate and consistent with the guidance of the GALL Report. The staff's concern is resolved; therefore, CI 3.5-12 is closed.

CI 3.5-13 (Section 3.5.2.2.1 - PWR Containments - Aggressive chemical attack)

In LRA Section 3.5.2.2.1.1, the applicant stated that concrete degradation in air due to aggressive rainwater is insignificant and that the below-grade/lake water environment is nonaggressive. In RAI 3.5-13, dated March 30, 2005, the staff requested the applicant to provide sufficient data to support this statement.

Furthermore, during the review, the staff was unable to identify how the LRA addresses the items described in ISG-03. The staff requested the applicant to provide detailed information with regard to how its AMRs address all the items described in ISG-03.

During a telephone conference, the applicant described how it will satisfy the ISG-03 criteria and agreed to provide its most recent data with respect to the below-grade/lake water. The applicant committed to provide a formal response, including a table detailing how it satisfies all the items described in ISG-03. This was identified as confirmatory item (CI) 3.5-13.

In its response to CI 3.5-13, by letter dated June 9, 2005, the applicant provided its ground water environment monitoring data and an explanation of where the LRA addresses each of the provisions of ISG-03. In addition, the applicant clarified the percentage of entrapped air in the containment concrete. As part of the response, the applicant committed to monitoring ground water chemistry (pH, chlorides, sulfates) at least once every 5 years.

The staff found the applicant's response to RAI 3.5-13 and its commitment to be consisted with the guidance of the GALL Report and ISG-03. The staff's concerns are resolved; therefore, CI 3.5-13 is closed.

CI 3.5-14 (Section 3.5.2.2.3 - Component Supports - Aging of Supports Not Covered by the Structures Monitoring Program)

In LRA Table 3.5.1, Item 3.5.1-33, the applicant stated that the Bolting Integrity Program includes the use of Inservice Inspection to evaluate and monitor crack initiation and growth due to SCC, if present, in high strength low-alloy steel bolts used in NSSS component supports. In LRA Tables 3.5.2-1 through 3.5.2-14, the applicant does not address Group B1.1, high strength low-alloy bolts. In LRA Section B2.1.4, the applicant indicated that high strength component support bolting is used in pinned connections associated with steam, reactor coolant pumps and reactor vessel supports and is loaded only in shear with no preload stress.

In RAI 3.5-14, dated March 31, 2005, the staff requested the applicant to identify how aging will be managed for the Group B1.1, high strength low-alloy bolts. During a telephone conference, the applicant stated that this RAI is similar to one previously issued for the Bolting Integrity Program, RAI B2.1.4-3. The staff reviewed the applicant's response to this RAI and found it acceptable. The applicant proposed how to manage aging and credited the Boric Corrosion Program and it plant procedures. The applicant also acknowledged that PBNP have some torqued high-strength bolts. The applicant will supplement its response to reflect this statement. This was identified as confirmatory item (CI) 3.5-14.

In its response to CI 3.5-14, by letter dated April 29, 2005, the applicant stated that the aging effect mechanism associated with line item 3.5.1-33 is "crack initiation and growth due to SCC" and that it had evaluated SCC as not being an applicable aging effect requiring management at PBNP. The aging effects requiring management for Group B1.1 bolting include line item 3.5.1-31, loss of material due to boric acid wastage, and line item 3.5.1-32, loss of material due to general corrosion. These aging effects are depicted in LRA Table 3.5.2-10, which addresses Group B1.1 bolting. The intent of the Discussion column for line item 3.5.1-33 was that "if present," cracking may be detected during ISI inspections that would evaluate any noted non-conformance.

The staff evaluated the applicant's response to RAI 3.5-14 and the technical basis provided and agreed that SCC is not an active aging mechanism requiring management in this situation. The staff's concern is resolved; therefore, CI 3.5-14 is closed.

CI 4.6.1-1.1 (Section 4.6.1 - Spent Fuel Pool Storage Rack Boraflex)

The surveillance frequency of once every 5 years for blackness testing was approved in an NRC letter dated February 21, 1990. Based on industry operating experience indicating the varying degree to which the Boraflex panels degrade, the staff requested a justification for continuing the 5-year frequency for areal density testing into the period of extended operation. In RAI 4.6.1-1, dated March 29, 2005, the staff requested the applicant to provide the most recent blackness test and SFP silica level measurements, and use this data to demonstrate that the current rate of degradation will not exceed the acceptance criteria.

During conversations with the staff, the applicant committed to enhance the Boraflex Monitoring Program, and agreed to provide the requested data to the Region III staff at their AMR/AMP onsite inspection during the weeks of March 7 and 21, 2005. The applicant's data and the Boraflex Monitoring Program enhancements are expected to ensure that the neutron absorbing

material will continue to perform its intended function during the period of extended operation. This was identified as confirmatory item (CI) 4.6.1-1.1.

In response to CIs 4.6.1-1.1 and 4.6.1-1.2, by letter dated April 1, 2005, the applicant committed to create a new procedure to schedule and perform blackness testing and areal density testing every 2 years during the period of extended operation on certain accelerated Boraflex panels. These actions are consistent with the recommendations in the August 2001 Boraflex degradation analyses reviewed by the Region III staff during the March 2005 inspection and as documented in its inspection report dated May 2, 2005. The staff found the applicant's response to RAI 4.6.1-1 and its commitment acceptable because these actions ensure that the neutron absorbing material will continue to perform its intended function in maintaining SFP subcriticality. The staff's concerns are resolved; therefore, CI 4.6.1-1.1 is closed.

CI 4.6.1-1.2 (Section 4.6.1 - Spent Fuel Pool Storage Rack Boraflex)

Additionally, in RAI 4.6.1-1, dated March 29, 2005, the staff requested the applicant to provide justification for the 5-year frequency for areal density testing. During conversations with the staff, the applicant committed to perform areal density and blackness tests on certain accelerated Boraflex panels once every 2 years during the period of extended operation. The applicant will revise its response to reflect this statement. This was identified as confirmatory item (CI) 4.6.1-1.2.

In response to CIs 4.6.1-1.1 and 4.6.1-1.2, by letter dated April 1, 2005, the applicant committed to create a new procedure to schedule and perform blackness testing and areal density testing every 2 years during the period of extended operation on certain accelerated Boraflex panels. These actions are consistent with the recommendations in the August 2001 Boraflex degradation analyses reviewed by the Region III staff during the March 2005 inspection and as documented in its inspection report dated May 2, 2005. The staff found the applicant's response to RAI 4.6.1-1 and its commitment acceptable because these actions ensure that the neutron absorbing material will continue to perform its intended function in maintaining SFP subcriticality. The staff's concerns are resolved; therefore, CI 4.6.1-1.2 is closed.

CI 4.6.1-2 (Section 4.6.1 - Spent Fuel Pool Storage Rack Boraflex)

The applicant indicated that a predictive code, "EPRI RACKLIFE or its equivalent," will be used to determine which panels will be subjected to full-length testing and to trend and analyze SFP silica level measurement results. The input to the predictive code includes areal density and SFP silica level measurements. The staff is unclear on the ability of the predictive code to project panel degradation if the first areal density test is completed after the beginning of the extended operation period. In RAI 4.6.1-2, dated March 29, 2005, the staff requested the applicant to provide justification regarding the ability of the predictive code to accurately project the condition of the panels to ensure the degradation does not exceed the acceptance criteria with one set of data. In addition, if this justification cannot be made, the staff requested that the applicant commit to conducting a baseline areal density test prior to entering the period of extended operation.

During conversations with the staff, the applicant committed to perform a baseline areal density inspection of the Boraflex panels prior to entering the period of extended operation for predictive code purposes. The applicant will revise its response to reflect this statement. This was identified as confirmatory item (CI) 4.6.1-2.

In its response to CI 4.6.1-2, by letter dated April 1, 2005, the applicant committed to perform a baseline areal density inspection of the Boraflex panels prior to entering the period of extended operation to support the use of a predictive code for projecting the condition of the panels between surveillance tests. In addition, the applicant committed to perform an evaluation within its corrective actions program should silica sampling and areal density trend to a value less than the acceptance criteria. The corrective actions also include an increase in the frequency of blackness testing and areal density testing. The staff found the applicant's response to RAI 4.6.1-2 acceptable and the associated commitments appropriate because these actions ensure that the predictive code will have the appropriate data for projecting the degradation of Boraflex into the period of extended operation without exceeding the acceptance criteria. The staff's concern is resolved; therefore, CI 4.6.1-2 is closed.

CI 4.6.1-3 (Section 4.6.1 - Spent Fuel Pool Storage Rack Boraflex)

For the acceptance criteria element, the applicant stated that this element is consistent with the GALL Report. The applicant committed to making appropriate changes to the program if any of the test results indicate that program improvements should be made. However, the staff finds this discussion insufficient for ensuring adequate management of Boraflex degradation. In RAI 4.6.1-3, dated March 29, 2005, the staff requested the applicant to provide more information regarding the Boraflex Monitoring Program's acceptance criteria. Additionally, the staff requested the applicant to provide a discussion regarding the specific corrective actions that will be taken if trends indicate the acceptance criteria may not be met.

During conversations with the staff, the applicant committed to complete an evaluation, within its corrective action program, and increase the frequency of blackness and areal density testing if the silica sample and the areal density trend to a value less than 5 percent subcriticality margin, or the acceptance criteria. The applicant committed to provide specific details of the corrective actions that will take place if the acceptance criteria cannot be maintained. The applicant's enhancements to the program and corrective actions are expected to ensure continued material performance. The applicant will revise its response to reflect this statement. This was identified as confirmatory item (CI) 4.6.1-3.

In response to CI 4.6.1-3, by letter dated April 1, 2005, the applicant committed to complete an evaluation within its corrective action program if silica sampling and areal density trend to a value less than the acceptance criteria. In addition, the frequency of blackness testing and areal density testing will be increased. Specifically, corrective actions will be initiated if the test results find that the 5-percent subcriticality margin cannot be maintained because of current or projected future Boraflex degradation. These corrective actions may include, but are not limited to, reanalysis, and repair and/or replacement of the neutron absorbing material. The staff found the applicant's response to RAI 4.6.1-3 acceptable because the corrective actions ensure continued material performance, consistent with the acceptance criteria, into the period of extended operation. The staff's concerns are resolved; therefore, CI 4.6.1-3 is closed.

1.7 Summary of Proposed License Conditions

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

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

The second license condition requires that the future activities identified in the FSAR supplement be completed prior to entering the period of extended operation; excluding those actions agreed to be performed after entering the period of extended operation in order to meet the requirements established in 10 CFR 50.61.

The third license condition is as follows:

> All capsules in the reactor vessel that are removed and tested must meet the test procedures and reporting requirements of ASTM E 185-82 to the extent practicable for the configuration of the specimens in the capsule. Any changes to the capsule withdrawal schedule, including spare capsules, must be approved by the NRC prior to implementation. All capsules placed in storage must be maintained for future insertion. Any changes to storage requirements must be approved by the NRC, as required by 10 CFR 50, Appendix H.

SECTION 2

STRUCTURES AND COMPONENTS SUBJECT TO AGING MANAGEMENT REVIEW

2.1 Scoping and Screening Methodology

2.1.1 Introduction

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

In LRA Section 2.1, the applicant described the scoping and screening methodology used to identify the SSCs at the Point Beach Nuclear Plant (PBNP) that are within the scope of license renewal and subject to an AMR. The staff reviewed the applicant's scoping and screening methodology to determine if it met the scoping requirements stated in 10 CFR 54.4(a) and the AMR screening requirements stated in 10 CFR 54.21.

In developing the scoping and screening methodology, the applicant considered the requirements of 10 CFR Part 54, the statements of consideration (SOCs) related to the license renewal rule, and the guidance provided by the Nuclear Energy Institute (NEI) in NEI 95-10, Revision 3, March 2001, "Industry Guideline for Implementing the Requirements of 10 CFR Part 54 - The License Renewal Rule." The applicant also considered the NRC staff's license renewal interim staff guidance (ISG) documents and related correspondence.

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 structures and components (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: Containments, Structures, and Component Supports;" and Section 2.5, "Scoping and Screening Results: Electrical and Instrumentation and Controls," provide the results of the process used to identify the SCs that are subject to an AMR.

LRA Section 3.0, "Aging Management Review Results," contains the following information:

- Section 3.1, "Aging Management of the Reactor Coolant System"
- 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 Containments, Structures and Component Supports"
- Section 3.6, "Aging Management of Electrical and Instrumentation and Controls"

LRA Section 4.0, "Time-Limited Aging Analyses," contains the applicant's identification and evaluation of time-limited aging analyses (TLAAs).

2.1.2.1 Scoping Methodology

In LRA Section 2.1, the applicant described the methodology used to scope mechanical, structural, electrical, and instrumentation and control (I&C) SSCs pursuant to the requirements of the 10 CFR 54.4(a) scoping criteria. The applicant's scoping methodology, as described in the LRA, is discussed in the sections below.

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

In LRA Section 2.1.2.1, the applicant described the general approach to scoping safety-related, nonsafety-related, and SSCs credited with demonstrating compliance with certain regulated events. The scoping approaches specific to each of the three 10 CFR 54.4(a) scoping criteria are described below.

Safety-Related Criteria Pursuant to 10 CFR 54.4(a)(1). In LRA Section 2.1.2.1.1, the applicant described the scoping methodology required by 10 CFR 54.4 as it relates to safety-related criteria in accordance with 10 CFR 54.4(a)(1). With respect to the safety-related criteria, the applicant stated that the first scoping category in 10 CFR 54.4 involves safety-related SSCs. The license renewal criteria for safety-related SSCs is consistent with the FSAR and safety-related classification criteria.

The applicant relied on the computerized history and maintenance planning system (CHAMPS) database and controlled drawings as the starting point for identifying systems within the scope of the Rule. Other document sources include the FSAR, technical specifications, and documents related to scoping for implementation of 10 CFR 50.65. Additional information sources include docketed licensing correspondence and design information related to various plant systems and technical position papers.

Nonsafety-Related Criteria Pursuant to 10 CFR 54.4(a)(2). In LRA Section 2.1.2.1.2, the applicant described the scoping methodology as related to the nonsafety-related criteria in accordance with 10 CFR 54.4(a)(2). With respect to the nonsafety-related criteria, the applicant stated that the staff issued its draft ISG, "License Renewal Issue: Scoping of seismic II/I Piping Systems," dated December 3, 2001, and clarified it with its March 21, 2002, letter on the same topic. PBNP used the draft industry guidance document on Criterion 2 (which is based on the ISG and other applicants' responses to Criterion 2 requests for additional information (RAIs)), to develop its methodology for Criterion 2 scoping. This methodology is expected to meet the intent of the draft ISG. With respect to scoping of SSCs pursuant to 10 CFR 54.4(a)(2), the applicant performed a review of plant information sources, such as the current licensing basis

(CLB) (which includes the FSAR, technical specifications and licensing commitments), design-basis events (DBEs), design-basis documents (DBDs), Q-list safety classifications, CHAMPS equipment database, and drawings.

Components meeting the scoping criterion of 10 CFR 54.4(a)(2) generally fall into three categories.

- nonsafety-related SSCs identified in the CLB
- nonsafety-related SSCs directly connected to safety-related SSCs
- nonsafety-related SSCs that are not directly connected to safety-related SSCs

Category 1 nonsafety-related SSCs identified in the CLB include events such as high-energy line break (HELB), internal/external flooding, internal/external missiles, and heavy load lifting equipment per NUREG-0612, "Control of Heavy Loads of Nuclear Power Plants." For Category 2 nonsafety-related SSCs, directly connected safety-related SSCs, the nonsafety-related piping and supports, up to and including the first equivalent anchor beyond the safety/non-safety interface, are considered within the scope of license renewal pursuant to 10 CFR 54.4(a)(2). For Category 3 nonsafety-related SSCs not directly connected to safety-related SSCs, or connected downstream of the first equivalent anchor, the applicant concluded that the nonsafety-related SSC can be within the scope of license renewal if its failure could prevent the performance of a safety-related function. Two options exist to determine which nonsafety-related SSCs may be included within scope: a mitigative option and a preventive option. The methodology for determining mitigative or preventive components is described in LRA Section 2.1.2.1.2.

The applicant's review identified that all nonsafety-related supports for non-seismic II/I piping with a potential for spatial interaction with safety-related SSCs will be included within the scope of license renewal pursuant to 10 CFR 54.4(a)(2). It further stated that these supports will be addressed in a commodity fashion within the civil structural review area.

Concerning exposure duration, the applicant concluded that long-term exposure to conditions resulting from a failed nonsafety-related SSC (such as leakage or spray) is not considered credible. The basis for this conclusion is that leakage/spray would be quickly identified by plant personnel via walkdowns, sump-level trends, or system parameter monitors and alarms. Once identified, appropriate corrective actions would be taken. Therefore, only nonsafety-related SSCs whose failure could result in a failure of a safety-related SSC due to short-term exposure would need to be considered within the scope of license renewal pursuant to 10 CFR 54.4(a)(2).

Other Scoping Pursuant to 10 CFR 54.4(a)(3). In LRA Section 2.1.2.1.3, the applicant described the scoping methodology as it relates to the regulated event criteria in accordance with 10 CFR 54.4(a)(3). The SSCs that used safety analyses or plant evaluations to perform an intended function demonstrating compliance with NRC regulations for fire protection (FP), environmental qualification (EQ), pressurized thermal shock (PTS), anticipated transients without a scram (ATWS), and station blackout (SBO) are included within the scope of license renewal.

The applicant used technical reports and equipment lists to provide input to the scoping process for each of the five applicable regulated events. The technical reports and equipment lists for

FP include: (1) Fire Protection Evaluation Report, (2) Safety Shutdown Analysis Report, (3) Safe Shutdown Equipment List, and (4) Fire Hazards Analysis Report.

Using the information sources described above, the components in the license renewal database (LRDB) were reviewed to determine which are required to support the FP functions for license renewal. The scoping of FP equipment also meets the intent of the ISG on this subject.

For EQ, the applicant determined the electrical equipment required and identified the equipment in the EQ master list (EQML). All electrical equipment identified on the EQML was verified as being identified as such in the EQ fields of the computerized CHAMPS equipment database.

The applicant determined that the PTS requirement was addressed in LRA Section 4.2.1. The only component within the scope of license renewal for this criterion was the reactor vessel.

For mitigating ATWS events, the applicant stated that this was described in detail in FSAR Section 7.4.1. If an ATWS were detected, the affected unit could be automatically shut down and the auxiliary feedwater (AFW) system initiated. A quality assurance (QA) code was used in CHAMPS to identify any components that support this event. All components associated with the ATWS QA code are considered to be within the scope of license renewal.

For the SBO regulated event, the 13.8k VAC power system has direct connection to the onsite gas turbine and provides one of the sources of alternating current (AC) power for recovery from an SBO event. The scoping process determined that the circuit switchers between the unit high-voltage station auxiliary transformers and the main switch yard bus are boundary equipment meeting ISG-02 criteria. The 345k VAC circuit switchers are the last components in the connection to offsite power. They are controlled by the PBNP operators and establish the boundary for the SBO event. The components determined to be within the scope of license renewal for supporting SBO are listed in LRA Table 2.1.2.1.3-1.

2.1.2.1.2 Documentation Sources Used for Scoping and Screening

In LRA Section 2.1.1.1, the applicant reviewed the following information sources during the license renewal scoping and screening process:

- final safety analysis report (FSAR)
- CLB information, including technical specifications, and docketed licensing correspondence
- safety (Q-list) and augmented quality assurance (AQA) classifications in the CHAMPS equipment database
- DBDs
- ISG applicable to scoping and screening methodology
- Maintenance Rule (MRule) summary reports and scoping information
- LRDB and boundary drawings

The applicant stated that this information was used to identify the functions performed by plant systems and structures. These functions were then compared to the scoping criteria in 10 CFR 54.4(a)(1), (2), and (3) to determine if the associated plant system or structure performed a license renewal intended function. These sources were also used to develop the list of structures and components subject to an AMR.

2.1.2.1.3 Plant and System Level Scoping

In LRA Section 2.1.2.2, the applicant described the scoping methodology for systems, structures and commodity groups that are safety-related or nonsafety-related. The applicant also described the scoping methodology for equipment relied upon to perform a function for any of the five regulated events described in 10 CFR 54.4(a)(3). The scoping methodology used by the applicant is consistent with guidance in NUREG-1800 and NEI 95-10. Existing plant documentation used for this review included the CLB documents, controlled drawings, and the CHAMPS database. Individual buildings/structures listed in CHAMPS as individual assets within a system were placed into the LRDB. The CHAMPS plant systems and components were sorted and tracked within CHAMPS using system identifiers. These identifiers support plant needs with respect to the maintenance work and also provide definition of license renewal system functional boundaries in a manner that is consistent with the system descriptions in the FSAR. All of this information was entered into the LRDB. In LRA Table 2.2-1, the applicant listed all major SSCs that are within the scope of license renewal.

PBNP system-level function information was obtained from numerous sources, including the FSAR, docketed correspondence with the NRC, MRule documents, and DBDs. This function information was used to create a system function list in the LRDB. CLB references were added to each system function. In LRA Section 2.1.2.3, the applicant described the application of all three 10 CFR 54.4 criteria used to generate the list of SSCs that were considered within the scope of license renewal. Some components within the system or structure are not within the scope of license renewal because not all of their components support the system's intended function(s). Therefore, where possible, boundaries are depicted on drawings with color (magenta) overlays to indicate those SSCs within the scope of license renewal.

2.1.2.1.4 Component Level Scoping

After the applicant identified the intended functions of systems or structures that were within the scope of license renewal, a review was performed to determine which components of each in-scope system and structure support license renewal intended functions. The components that support intended functions were considered within the scope of license renewal and screened to determine if an aging management review (AMR) was required. During this stage of the scoping methodology, the applicant considered three component classifications: (1) mechanical, (2) civil and structural, and (3) electrical and instrumentation & controls (I&C). The scoping methodology for each of these component classifications is discussed below.

Mechanical Component Scoping. In LRA Section 2.1.2.4, the applicant discussed the methods used to identify components in a system or structure that are within the scope of license renewal. The license renewal system boundaries were initially based on the associated CHAMPS system boundaries. CHAMPS component data were used with and compared to the green line drawings (GLDs) to ensure that system boundaries and flow paths were accurately identified within the LRDB. Some components within a system were moved to commodity

groups. For example, system pipe supports were moved to the component supports commodity group (CSUP). Within most systems, new assets or subcomponents were created within the LRDB in order to ensure that all necessary assets/components could be accurately described and addressed in the license renewal process. Some of these decisions were based on knowing what would be needed for screening and AMR. Examples of new subcomponents or assets include:

- manifold subcomponents for instruments
- bolting for carbon/low-alloy steel and stainless steel
- heat exchanger subcomponents
- piping assets created to identify combinations of material/environments
- carbon steel components that come in contact with boric acid

In some instances, components were reviewed as part of another interfacing system in order to more accurately portray system functional boundaries or to streamline the license renewal process. Additionally, in some cases, all in-scope components for a single system were reviewed as part of another interfacing system. An example of this is the plant sampling system (PSS) where only a few of the components were determined to be within the scope of license renewal. These components included three reactor coolant system (RCS) sample lines which are part of PBNP's Class 1 piping boundary. A few remaining in-scope components were found in associated interfacing systems such as the residual heat removal (RHR) sample line and valves, chemical and volume control system (CVCS) sample line and valves, and component cooling (CC) supplied heat exchanger. All in-scope PSS component reviews were completed with interfacing systems. These PSS components were described in the systems for which the component reviews were completed.

Civil/Structural Component Scoping. In LRA Section 2.1.2.5, the applicant described systems, structures and commodity groups under the purview of the civil/structural discipline. This includes plant structures; crane, hoist, and lifting device systems; the CSUP; and the fire barrier commodity group. The information sources included the FSAR, CLB documentation, DBDs, training material, CHAMPS database, drawings, specifications, codes/standards, design changes, plant procedures, and walkdowns of plant buildings. The applicable license renewal information was integrated into the LRDB.

The crane, hoist, and lifting device systems are associated with the civil/structural discipline. This system includes the containment polar cranes, the auxiliary building main crane and the turbine building main crane. All portions of the fuel handling system that were determined to be within the scope of license renewal were moved to the spent fuel cooling system, the containment Units 1 and 2 building structure, or the primary auxiliary building (PAB) structure. LRA Table 2.2-1 provides a list of civil/structural in-scope and out-of-scope systems, structures, and commodity groups.

The evaluation for a structure that was determined to not be within the scope of license renewal was documented in the LRDB either individually, by the structure's name, or grouped under the miscellaneous "Nonsafety-related Building and Structures System." Additionally, a structure's evaluation was individually documented when the structure's attributes, such as its functions or location, warranted an in-depth explanation.

Electrical and I&C Component Scoping. In LRA Section 2.1.2.6, the applicant described the electrical and instrumentation & control (I&C) systems' applicability to license renewal requirements. These systems are identified at specific voltage levels (*i.e.*, 13.8k VAC, 480 VAC, 125 VDC) or within functional performance related systems (*e.g.*, radiation monitoring, engineered safety feature actuation, reactor protection) for electrical power or I&C, respectively. Since some electrical components are contained in generic systems in the CHAMPS database, these components were identified and transferred within the LRDB into their specific electrical systems.

During the scoping process, an evaluation boundary was established for each system or commodity group in order to identify the functions associated with the system or commodity being evaluated. For power cables to equipment (*e.g.*, motors, valves), the system interfaces were assumed to be at the protective device (breaker or fuse) and the cable associated with the equipment. For interfaces between systems at different voltage levels, the interconnecting transformers were the interface and they were included in the system as identified in CHAMPS and the system drawings.

Commodity Groups Scoping. In LRA Section 2.1.2.2, the applicant stated that commodity groups were formed when component evaluations were better performed by component type than as a system or structure. Commodity groups were formed from components that were constructed from similar materials, exposed to similar environments, and performed similar intended functions regardless of the specific system or structure to which they are assigned. Each commodity group was evaluated as a separate, individual system. One exception to this was when the only in-scope portion of the system consisted of components that would receive a commodity group evaluation (*e.g.*, fire barrier, equipment supports). In this case, the applicant stated that it was acceptable to identify the system and structure as not being within the scope of license renewal; however, the basis for that determination is clearly identified. For example, the non-essential ventilation system contains components that act as fire barriers (fire dampers).

In LRA Section 2.1.2.4, the applicant discussed some components within a mechanical system that were moved to commodity groups. For example, system pipe supports were moved to the CSUP.

In LRA Section 2.1.2.5, the applicant discussed two civil/structural commodity groups which include component supports and fire barriers. The CSUP includes component and equipment supports, fasteners and anchorages used with the support, pipe restraints, electrical raceways, and electrical enclosures. The fire barrier commodity group includes fire wraps, fire penetration seals, fire damper housings, and cable tray fire stops. Fire doors and structural walls that also serve as fire barriers were not included with this commodity group since they were evaluated within the associated structure.

In LRA Section 2.1.2.6, for electrical and I&C commodity groups, the types of components that defined the commodity were determined to identify their appropriate scoping criteria and system-level functions. Junction boxes, panels, and cabinets were identified in the "PANEL" commodity and electrical penetration assemblies in the "EPA" commodity in the CHAMPS equipment database. The individual cables for the cable commodity are not in CHAMPS and were tracked using the cable and raceway data system (CARDS). Information regarding systems and commodities was identified through review of the FSAR, CHAMPS, CLB,

documentation, DBDs, plant databases and documents, procedures, drawings, specifications, codes/standards, and system walkdowns.

2.1.2.2 Screening Methodology

Following the determination of SSCs within the scope of license renewal, the applicant implemented a process for determining which structures and components would be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1). In LRA Section 2.1.3, the applicant discussed these screening activities as related to the SCs that are within the scope of license renewal. The screening process evaluated these in-scope SSCs to determine which ones were long-lived, passive and, therefore, subject to an AMR. LRA Sections 2.3, 2.4, and 2.5, provide the results of the process used to identify the SCs that are subject to an AMR. This methodology included:

- active/passive determinations
- screening of stored equipment
- screening of thermal insulation
- identification of short-lived components and consumables
- identification of component intended functions

2.1.2.2.1 Mechanical Component Screening

Following system-level scoping, the applicant performed screening to identify SCs that are within the scope of license renewal. The screening process evaluated these in-scope SSCs to determine which were long-lived, passive and, therefore, subject to an AMR. The intended functions, developed using the documentation sources discussed in SER Section 2.1.2.1.2, were used as input to the screening process to identify the passive components within the scope of license renewal. Passive component determinations were made in accordance with 10 CFR 54.21(a)(1)(i) and NEI 95-10.

Scoping also identified the evaluation boundaries for the in-scope systems or structures. The evaluation boundaries identify which components within an in-scope system or structure are within the scope of license renewal. The evaluation boundaries are depicted on the license renewal boundary drawings for mechanical systems. Not all components within an in-scope system or structure were determined to be within the scope of license renewal. The screening process took the in-scope components and performed an active/passive evaluation and a long-lived evaluation. The component function of those components subject to an AMR was also documented. The screening process was performed in accordance with LRPP 2-1, "Scoping and Screening for License Renewal." The screening process evaluations were performed and documented in the license renewal process management system (LRPMS) database.

The results of the major components screening for mechanical systems are presented in LRA Sections 2.3.1, 2.3.2, 2.3.3, and 2.3.4.

2.1.2.2.2 Civil/Structural Component Screening

The civil/structural engineering discipline was responsible for performing the screening evaluations on the in-scope structures, crane, hoist, and lifting device systems, as well as the component supports and fire barrier groups. The boundaries for in-scope systems, structures, and commodity groups were defined to determine the components that would need screening. Additionally, all structural components within the evaluation boundaries, with the exception of snubbers that supported a component-level intended function, were assumed to be long-lived, passive, and subject to an AMR.

The individual structure components are represented by generic components that identify the materials of construction and environmental exposure. Materials were placed in groups that would experience the same type of aging mechanism and effects and would, therefore, need the same type of aging management. Evaluation boundaries for the structures and components determined where substructures were assigned for evaluation and dictated the type of generic components that were to be a part of a structure or commodity. The screening process confirmed the boundary and generic component identification process and verified that all components were evaluated.

The screening process results were provided in database output reports sorted by system, structure, and commodity group. These reports were independently prepared, reviewed, and approved.

2.1.2.2.3 Electrical/I&C Component Screening

The applicant performed screening to identify those electrical and I&C components that were within the scope of license renewal. The screening process evaluated those in-scope components to determine which ones were passive, long-lived and, therefore, subject to an AMR. The applicant addressed the following electrical and I&C systems and commodity groups in LRA Section 2.5:

- 120 VAC vital instrument power system
- 125 VDC power system
- 4160 VAC power system
- 480 VAC power system
- control rod drive and indication and nuclear process instrumentation system
- miscellaneous AC power and lighting system
- offsite power system
- reactor protection system, including anticipated transient without scram
- engineered safety features actuation system
- plant communications system
- 13.8k VAC power system
- radiation monitoring system

The screening results are in the individual system scoping and screening reports. Boundary definitions excluded nonsafety-related electrical components whose failure did not prevent a safety-related system from performing its safety-related function and components that did not support a license renewal required regulated event. When the remaining components were examined and screened for active or passive functions, the majority of the components were

determined to be active in accordance with NEI 95-10, Appendix B and screened out of the scope of license renewal. The LRA categorizes the remaining components into the following passive commodities:

- electrical portions of non-EQ electrical and I&C penetration assemblies
- phase bus
- switchyard bus
- transmission conductors
- high-voltage insulators
- uninsulated ground conductors
- panels and junction boxes
- non-EQ power, instrumentation, control and communication insulated cables and connections

The LRA uses the scoping and screening process of the integrated plant assessment as required by 10 CFR 54.21(a) and applies it to PBNP electrical power, communications, and I&C systems. The applicant developed the electrical and I&C component screening methodology and results using procedure guidance in LRPP 2-1, Revision 4, "Scoping and Screening for License Renewal," and LR-TR-508, Revision 1, "Integrated Plant Assessment Methodology Report." The screening methodology and results are documented in LRA Section 2.5.

2.1.3 Staff Evaluation

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

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

As part of the review of the applicant's scoping and screening methodology, the staff reviewed the activities described in the following LRA sections using the guidance contained in NUREG-1800:

- 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), (2) and (3)
- Section 2.2, "Plant Level Scoping Results;" Section 2.3, "System Scoping and Screening Results: Mechanical Systems;" Section 2.4, "Scoping and Screening Results:

Structures;" and Section 2.5, "Scoping and Screening Results: Electrical," to verify that the applicant described a process for determining structural, mechanical, and electrical components that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1) and (a)(2).

In addition, the staff conducted a scoping and screening methodology onsite audit during the week of June 21, 2004. The focus of the audit was to verify 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. The staff also conducted detailed discussions with the applicant on the implementation and control of the license renewal program, and reviewed administrative control documentation and selected design documentation used by the applicant during the scoping and screening process. The staff further reviewed a sample of system scoping and screening result reports for the main steam and emergency power systems to ensure the methodology outlined in the administrative controls was appropriately implemented and the results are consistent with the CLB.

2.1.3.1 Scoping Methodology

The staff reviewed PBNP implementation procedures, technical basis documents and reports, engineering reports, and license renewal project procedures (LRPP) which describe the scoping and screening methodology implemented by the applicant. 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 with clear guidance on the scoping and screening implementation process to be followed during LRA activities. In addition to the implementing procedures, the staff reviewed supplemental design information including system functional descriptions, system drawings, and selected licensing documentation, which were relied upon by the applicant during the scoping and screening phases of the review. The staff found these design documentation sources useful to ensure that the initial scope of SSCs identified by the applicant are consistent with the Units 1 and 2 CLBs. The staff also reviewed the scoping process to verify that the applicant's methodology is consistent with NUREG-1800 and other documented staff positions and adequately identified SSCs within the scope of license renewal in accordance with the requirements of 10 CFR 54.4(a).

The staff reviewed PBNP implementation procedures and engineering reports that described

The applicant relied on CHAMPS and controlled drawings as the starting point for identifying systems within the scope of the Rule. Other document sources included License Renewal Project Management System (LRPMS), the FSAR, technical specifications, documents related to scoping for implementation of 10 CFR 50.65. Additional information sources included docketed licensing correspondence, and design information related to various plant systems and technical position papers.

PBNP License Renewal Project Document LR-TR-508, Revision 1, "Integrated Plant Assessment Methodology Report," provides a detailed explanation of the decision-making criteria used to determine and document the results of the PBNP license renewal process. The document describes the scoping process for the entire plant in terms of major systems and structures, and identifies their system-level functions. The determination of intended functions for systems is based on the design and licensing basis documentation. The staff review of the main steam and emergency power systems verified that even if only a portion of a system, structure, or commodity fulfilled a scoping criterion, it was identified as within the scope of license renewal.

The staff verified that the 10 CFR 54.4 criteria for safety-related SSCs is consistent with PBNP's safety-related classification criteria and with the FSAR. Additionally, the staff verified that SSCs that had a safety-related designation in the CHAMPS (Q-list) system for main steam and emergency power were considered as within the scope of license renewal. The staff also reviewed a sample of the 10 CFR 54.4(a)(1) scoping results from the LRDB and held discussions with the applicant's technical staff regarding safety-related criteria determinations.

Conclusion. The staff reviewed the applicant's methodology for identifying systems and structures meeting the scoping criteria of 10 CFR 54.4(a)(1). The staff also reviewed a sample of the LRDB 10 CFR 54.4(a)(1) scoping results, 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 identified and used pertinent engineering and licensing information in order to determine the SSCs required to be within scope in accordance with the 10 CFR 54.4(a)(1) criteria. On the basis of this review, the staff concluded that the applicant's methodology for identifying systems and structures meeting the scoping criteria of 10 CFR 54.4(a)(1) is 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 nonsafety-related SSCs whose failure could prevent satisfactory accomplishment of any of the functions identified in paragraphs 10 CFR 54.4(a)(1)(i), (ii), and (iii), to be within the scope of license renewal. By letters dated December 3, 2001, and March 15, 2002, the NRC issued a staff position to NEI which provides staff expectations for determining which SSCs meet the 10 CFR 54.4(a)(2) criterion.

The December 3, 2001, letter (ML013380013) provides specific examples of operating experience that 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 for determining which piping systems should be included as within scope, based on the 10 CFR 54.4(a)(2) criterion. The March 15, 2002, letter (ML020770026) further describes the staff's expectations for the evaluation of non-piping SSCs to determine which additional nonsafety-related 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 judgment and analyses, and relevant operating experience. The paper further describes operating experience as all documented plant-specific and industry-wide experience that can be used to determine if a failure is possible. Documentation includes NRC generic communications and event reports, plant-specific condition reports, industry reports such as significant operating event reports (SOERs), and engineering evaluations.

The applicant's methodology for performing 10 CFR 54.4(a)(2) scoping of nonsafety-related SSCs is documented in PBNP License Renewal Process Document LR-TR-508, "Integrated Plant Assessment Methodology Report," and LR-TR-514, "Criterion 2 Scoping Methodology and Results." These documents describe the current regulations and the interim staff position regarding scoping of SSCs with respect to the 10 CFR 54.4(a)(2) criteria and the applicant's methodology, discussion, and results regarding scoping in accordance with the Rule criteria. In keeping with the NEI draft position on nonsafety-related SSCs that could adversely affect safety-related SSCs, the applicant developed guidance for interpreting and applying the 10 CFR 54.4(a)(2) criteria, including nonsafety-related SSCs spatially oriented near safety-related components, seismic II/I components, nonsafety-related piping connected to safety-related piping, internal/external flooding, internal/external missiles, HELB, and heavy load lifting equipment.

Nonsafety-related SSCs identified in the CLB included HELBs, internal/external flooding, internal/external missiles, and heavy load lifting equipment. For systems and components containing air/gas (non-liquids), the applicant identified neither any spray or leakage concerns nor any industry operating experience indicating a loss of safety function for systems containing air/gas. Also, nonsafety-related non-liquid-containing components are not within scope for 10 CFR 54.4(a)(2) unless related to a seismic II/I concern or nonsafety-related SSCs connected to safety-related SSCs. For systems containing liquids or steam, the applicant considered a "high energy" state if conditions exceeded 275 psig or 200 °F.

For nonsafety-related SSCs directly connected to safety-related SSCs, the applicant concluded that the nonsafety-related piping and supports, up to and including the first equivalent anchor beyond the safety/non-safety interface, are within the scope of license renewal pursuant to 10 CFR 54.4(a)(2). The piping segments are not uniquely identified on the license renewal boundary drawings, but the applicable aging effects on these segments are managed along with the adjoining piping.

For the nonsafety-related SSCs not directly connected to safety-related SSCs, or that are connected downstream of the first equivalent anchor, the nonsafety-related SSCs may be considered in-scope if their failure could prevent the performance of the system safety function for which the safety-related SSC is required. To determine which nonsafety-related SSC is in-scope, the applicant used either the mitigative or the preventive approach. A mitigative approach means that the effects of failures of a nonsafety-related SSC are mitigated by other SSCs. If the mitigative approach is used, the mitigative features are included within the scope of license renewal pursuant 10 CFR 54.4(a)(2) and the non-safety system can be excluded from the scope of license renewal. These mitigative factors are typically associated with the structure and are addressed in the civil/structural review.

If the mitigative features are not installed, or cannot be shown to adequately protect the safety-related SSCs, then the preventive option is used. It is a concern that age-related degradation of nonsafety-related SSCs could lead to interactions with safety-related SSCs that were not previously considered. The applicant provided guidance for system/component applicability for system components containing air/gas (non-liquid), high-energy systems, low/moderate energy systems, and piping supports.

As part of the methodology for determining mitigative or preventive components, the applicant determined and identified vulnerable safety-related equipment housed in plant structures. A safety-related SSC was considered vulnerable if there were nonsafety-related SSCs in the vicinity whose failure could prevent accomplishment of the safety-related SSC's safety function. Consideration for exposure duration, fail-safe components, and components qualified/designed for the environment was also used in determining vulnerable safety-related equipment. The applicant identified the safety-related switchgear, batteries, pump motors, panels, and complex equipment (*i.e.*, diesel generators) as the only vulnerable equipment.

The staff's review of LRA Section 2.1 identified areas in which additional information was necessary to complete the screening and methodology evaluation. The applicant responded to the staff's RAIs as discussed below.

RAI 2.1-1. The LRA and page 13 of LR-TR-514 did not adequately define short-term exposure duration for low and moderate energy piping failures covered under 10 CFR 54.4(a)(2) that could affect safety-related electrical equipment under the scope of 10 CFR 54.4(a)(1). Specifically, the staff found that some safety-related electrical equipment may exist in the turbine building or other parts of the plant and may be subject to harsh environments from low or moderate energy pipe breaks but are not environmentally qualified. Since this equipment may not be environmentally qualified, it could fail due to 10 CFR 54.4(a)(2) piping failures.

In RAI 2.1-1, dated November 16, 2004, the staff requested the applicant to adequately define short-term exposure duration for low and moderate energy piping failures and how it relates to scoping and screening of 10 CFR 54.4(a)(2) piping that could cause these types of failures.

In its response, dated January 31, 2005, the applicant stated that for the purpose of license renewal, the term "exposure duration" will be removed from LRA Section 2.1.2.1.2 and provide a technical justification for why the safety-related SSCs are capable of withstanding the effects of spray and leakage. The applicant also stated that it will include a technical justification in the LRA annual update under the section "Components Qualified/Designed for Environment."

During a meeting on February 15, 2005, the staff indicated and the applicant agreed, that this response required further clarification. In its response, a clarification letter dated March 15, 2005, the applicant committed to provide details of the 10 CFR 54.4(a)(2) scoping methodology changes, including specific exceptions, and how these will impact the LRA. The applicant committed to provide the staff this information by the end of April 2005. This was identified as confirmatory item (CI) 2.1-1.

In its response to CI 2.1-1, by letter dated April 29, 2005, the applicant provided additional information regarding its scoping methodology changes. This revised methodology invokes a plant spaces approach that assumes a spatial interaction can occur if safety-related and nonsafety-related systems or components (SCs) are located within the same space. For

purposes of the process, a space is defined by the room in which the safety-related and nonsafety-related components are located. This revised methodology evaluates the effect of sprays and leaks on mechanical and electrical safety-related SCs, with no limitation on duration of the sprays/leaks. The applicant thus considers all liquid- or steam-bearing nonsafety-related SCs to be within the scope of license renewal pursuant to 10 CFR 54.4(a)(2), provided that the nonsafety-related SCs are located in the same space as a safety-related SC and in such proximity that spray or leakage from the nonsafety-related SC could contact the safety-related SC.

Based on this revised 10 CFR 54.4(a)(2) methodology, the applicant re-evaluated SCs to identify configurations where the failure of nonsafety-related SCs could result in the loss of an intended function of the safety-related SCs within the space and, therefore, be considered within the scope of license renewal. This re-evaluation led to the expansion of scope for some systems, to the addition of component groups and line items to several tables in the LRA, and to the addition of new tables for the plant sampling system. The plant sampling system had already been included within the scope of license renewal and described in the LRA, but the previously identified in-scope SCs were addressed within other systems, and new tables were required. The applicant noted that the results of the review using the new methodology discovered no new aging effects/mechanisms and; therefore, the aging management program assignments are consistent with those previously identified in the LRA.

The applicant's re-evaluation using the new scoping methodology also identified a number of configurations where the failure of nonsafety-related SCs would not result in the loss of intended functions of safety-related SCs located in the same space. These configurations were identified as exceptions in the April 29, 2005, letter. The basis was clearly documented for each of the identified exceptions; however, the staff requested some clarifications. By letter, dated July 19, 2005, the applicant responded to the staff's concerns. Further discussion on this subject is documented in SER Section 2.3.

Based on the above discussion, the staff found the applicant's response to RAI 2.1-1 acceptable. The staff's concern is resolved; therefore, CI 2.1-1 is closed.

RAI 2.1-2. LRA Section 2.1.2.1.2, page 2-19, states that "For NSR SSCs directly connected to safety-related SSCs (typically piping systems), the NSR piping and supports, up to and including the first equivalent anchor beyond the safety/non-safety interface, are within the scope of license renewal pursuant to 10 CFR 54.4(a)(2). Although these piping segments are not uniquely identified on the license renewal boundary drawing, applicable aging effects on these piping segments are managed along with the adjoining SR piping."

In RAI 2.1-2, dated November 16, 2004, the staff requested the applicant to describe and define what is meant by the first equivalent anchor and how it relates to the scoping and screening of 10 CFR 54.4(a)(2) nonsafety-related piping and supports.

In its response, dated January 31, 2005, the applicant stated that PBNP has included all the connected nonsafety-related piping and supports, up to and including the first equivalent anchor beyond the safety/non-safety interface, within the scope of license renewal pursuant to 10 CFR 54.4(a)(2). The applicant also stated that nonsafety-related pipe supports will be managed in a commodity "spaces" approach wherein all supports in the areas of concern are included within the scope of license renewal. The connected nonsafety-related piping will be

managed using the same programs that manage the safety-related piping. This process conforms to the requirements for the nonsafety-related SSCs connected to safety-related SSCs pursuant to 10 CFR 54.4(a)(2) and draft ISG-09. This was identified as confirmatory item (CI) 2.1-2.

Further in its response, the applicant described what is meant by first equivalent anchor and also described the analysis techniques used for evaluating the piping stress analysis boundaries for identifying the first equivalent anchor point for scoping purposes.

Based on the above discussion, the staff found the applicant's response to RAI 2.1-2 acceptable. The staff's concern is resolved; therefore, CI 2.1-2 is closed.

RAI 2.1-3. LRA Section 2.1.2.1.2, pages 2-20 and 2-21, states that "All nonsafety-related supports for non-seismic or seismic II/I piping systems with a potential for spatial interaction with safety-related SSC, will be included within the scope of license renewal pursuant to 10 CFR 54.4(a)(2). These supports will be addressed in a commodity fashion, within the civil/structural area review. As long as the effects of aging on the supports for these piping systems are managed, falling of piping sections, except for flow-accelerated corrosion (FAC) failures, is not considered credible. The piping section itself would not be in-scope for 10 CFR 54.4(a)(2) due to physical impact hazard (although the leakage or spray may still apply)."

In RAI 2.1-3, dated November 16, 2004, the staff requested the applicant to describe how the falling of piping sections is not considered credible and why the piping section itself would not be in-scope for 10 CFR 54.4(a)(2) due to physical impact hazard. The staff also requested the applicant to describe how the management of FAC relates to the scoping and screening of 10 CFR 54.4(a)(2) seismic II/I piping systems that could cause these types of failures.

In its response, dated January 31, 2005, the applicant stated that for the purpose of license renewal Criterion 2 scoping, nonsafety-related pipe segments have essentially three potential failure modes: (1) for nonsafety-related low or moderate energy piping, all nonsafety-related supports with any potential spatial interaction with safety-related SSCs will be included within the scope of license renewal and age managed. Managing of the nonsafety-related supports will ensure that these supports remain intact and will not fall on safety-related components, (2) for nonsafety-related high energy piping segments, a FAC failure for components in proximity of safety-related components would be considered within the scope of license renewal as long as a FAC failure in that line and impact on safety-related components is considered credible, and (3) for nonsafety-related piping (either high, moderate or low energy) that could fail and result in leakage or spray on nearby safety-related components or high energy piping that has the potential of creating harsh environment (high humidity and high temperature) effects on vulnerable safety-related equipment, are considered within the scope of license renewal.

During a meeting on February 15, 2005, the staff indicated and the applicant agreed, that this response required further clarification. The applicant stated that the phrase "as long as the FAC failure is considered credible" will be removed from the LRA. This was identified as confirmatory item (CI) 2.1-3.

In its response, a clarification letter dated March 15, 2005, the applicant removed the phrase "as long as a FAC failure in that line and impact on safety-related components is considered credible" from its original response to RAI 2.1-3.

Based on the above discussion, the staff found the applicant's response to RAI 2.1-3 acceptable. The staff's concern is resolved; therefore, CI 2.1-3 is closed.

Conclusion. The staff reviewed the applicant's methodology for identifying systems and structures meeting the scoping criteria of 10 CFR 54.4(a)(2). The staff also reviewed a sample of the license renewal database 10 CFR 54.4(a)(2) scoping results, 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 identified and used pertinent engineering and licensing information in order to determine the SSCs required to be in-scope in accordance with the 10 CFR 54.4(a)(2) criteria. On the basis of this review, and review of the applicant's revised scoping process, the staff concluded that the applicant's methodology for identifying systems and structures meeting the scoping criteria of 10 CFR 54.4(a)(2) is adequate.

Application of the Scoping Criteria in 10 CFR 54.4(a)(3). Paragraph (a)(3) of 10 CFR 54.4 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 the NRC's regulations for FP, EQ, PTS, ATWS, and SBO, to be within the scope of license renewal.

The staff reviewed technical report LR-TR-509, Revision 0, "Regulated Events Functional Requirements Report," which described the methodology used to determine how SSCs support the regulated events for license renewal. The methodology considers the following:

- Fire Protection (10 CFR 50.48) - Systems and functions of those systems relied upon to support the Fire Protection Program at PBNP are described in the Fire Hazard Analysis Report (FHAR) and/or the Safe Shutdown Analysis Report (SSAR). The applicant performed a detailed review of these system descriptions to identify specific system requirements.
- Environmental Qualification (10 CFR 50.49) - The applicant stated that the only system functional requirement for EQ is to maintain the function of electrical components. The specific electrical equipment requirement for the EQ program was identified in the Equipment Qualification Master List (EQML). Each system containing equipment from the EQML was identified with an EQ functional requirement. EQ summary sheets (EQSS) were also prepared and include an evaluation of the worst-case environmental parameters the equipment may be exposed to and the environmental parameters the equipment is qualified to operate in.
- Pressurized Thermal Shock (10 CFR 50.61) - The event programmatic requirements for operation and inspection of equipment to minimize and monitor pressurized thermal transients to pressurized vessels are described in the License Renewal Aging Management Program documents. The only system relied on for PTS is the reactor vessel.
- Anticipated Transient Without Scram (10 CFR 50.62) - The systems and functions of the systems relied upon to support the ATWS event were described in FSAR Section 7.4.

The event of concern was a loss of feedwater without a unit trip. A review of the components in CHAMPS database was performed to identify components that supported the event.

- Station Blackout (10 CFR 50.63) - FSAR Appendix A.1 provides the licensing criteria that comprise the CLB for SBO. The SBO rule at PBNP is satisfied by providing an alternate AC source in the form of a gas turbine generator (GTG) capable of supplying either or both units. The components identified in the CHAMPS database were reviewed to determine which were required to support the coping duration and subsequent starting and loading of the GTG for an SBO event.

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, 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.

Conclusion. The staff reviewed the applicant's methodology for identifying systems and structures meeting the scoping criteria of 10 CFR 54.4(a)(3). The staff also reviewed a sample of the license renewal database 10 CFR 54.4(a)(3) scoping results, 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 identified and used pertinent engineering and licensing information in order to determine the SSCs required to be in-scope in accordance with the 10 CFR 54.4(a)(3) criteria. On the basis of this sample review, the staff concluded that the applicant's methodology for identifying systems and structures meeting the scoping criteria of 10 CFR 54.4(a)(3) is adequate.

2.1.3.1.2 Plant Level Scoping of Systems and Structures

The applicant's methodology for performing the scoping of systems and structures in accordance with 10 CFR 54.4(a) is documented in PBNP License Renewal Project Document LR-TR-508, Revision 1, "Integrated Plant Assessment Methodology Report." The approach used by the applicant for system and structure scoping is consistent with the methodology described in LRA Sections 2.1.1, 2.1.2.4, 2.1.2.5, and 2.1.2.6. Specifically, the technical report states that personnel performing license renewal scoping use CLB documents and list all functions that the system or structure is required to accomplish. Sources of information regarding the CLB for systems and structures included the FSAR, DBDs, system descriptions, CHAMPS database, MRule information, and plant drawings. After the preliminary identification of potential in-scope systems/structures, the screening process reviewed each potential in-scope system/structure in detail to confirm the preliminary determinations made during the scoping process. The applicant first identified all plant systems using the CLB, CHAMPS, and plant drawings and then evaluated them against the scoping criteria of 10 CFR 54.4(a)(1), (2), and (3) to identify those systems that perform one or more intended functions. A system or structure was presumed to be within the scope of license renewal if it performed one or more safety-related functions or met other scoping criteria per the Rule, as determined by CLB review and walkdown by engineering personnel. Identified system or structure functions were then compared to a list of scoping criteria to determine the functions which met the scoping criteria of 10 CFR 54.4(a). The applicant documented the results of the scoping process in LR-TR-508 Attachments 2 through 7, which include descriptions, 10 CFR 54.4(a) scoping criteria met by the system or structure, and references. The staff reviewed a sampling of the applicant's

scoping documentation and concluded that they contained an appropriate level of detail to document the scoping process.

Conclusion. The staff reviewed the applicant's methodology for identifying systems and structures meeting plant-level scoping criteria as defined in the Rule. The staff also reviewed a sample of the scoping methodology implementation procedures and results and discussed the methodology and results with the applicant. The staff verified that the applicant identified and used pertinent engineering and licensing information in order to determine the SSCs required to be in-scope in accordance with the 10 CFR 54.4(a) criteria. On the basis of this sample review, the staff concluded that the applicant's methodology for identifying plant level systems and structures meeting the scoping criteria of 10 CFR 54.4(a) is adequate.

2.1.3.1.3 Component Level Scoping

The staff reviewed license renewal procedures LRPP 1-1, Revision 0, "License Renewal Project Procedure," and LRPP 2-1, Revision 2, "Scoping and Screening for License Renewal." In these and other procedures referenced in this section, the applicant identified the intended functions of SSCs within the scope of license renewal and performed a review to determine which components of each in-scope system and structure supported license renewal intended functions. The components that support intended functions were considered within the scope of license renewal and screened to determine if an AMR was required. During this stage of the scoping methodology, the applicant considered three component classifications: mechanical, civil and structural, and electrical. The scoping methodology for each of these component classifications is discussed below.

Mechanical Scoping. LRA Section 2.1.2.4 describes the methods used to identify mechanical components in a system or structure that are within the scope of license renewal. All of the mechanical systems contain some electrical and structural components. The license renewal system boundaries were initially based on the associated CHAMPS system boundaries. The plant systems were identified within CHAMPS using system identifiers. Different system boundaries are defined for license renewal, some containing multiple CHAMPS systems. License renewal systems account for and contain all of the CHAMPS systems and do so in a manner that is consistent with the system descriptions in the FSAR.

The staff reviewed the mechanical scoping methodology as described in Section 2.3 of PBNP License Renewal Process Document, LR-TR-508, Integrated Plant Assessment Methodology, Revision 1, dated January 26, 2004. The mechanical scoping methodology describes four scoping methods used to complete mechanical system component scoping:
(1) discipline-specific scoping process, (2) system/commodity groups, (3) evaluation boundaries, and (4) system-level functions.

The discipline-specific scoping process describes how the CHAMPS component data were used with and compared to the plant drawings to ensure that system boundaries and flow paths are accurately identified in the LRDB. Components were moved to commodity groups, as applicable. Within most systems, new assets or subcomponents were created in the LRDB in order to ensure that all components were adequately addressed within the license renewal process. System/commodity groups examples used in mechanical scoping are described

above in SER Section 2.1.2.1.4. All new subcomponents or assets were assigned a license renewal scoping criterion equal to their parent asset's criterion.

For evaluation boundaries, the applicant described instances where components were reviewed as part of another interfacing system in order to describe the system function boundaries or to streamline the license renewal process.

System-level functions where components were reassigned to commodity groups or generic systems are also described. The system functions associated with those components would also move to the new commodity system and that function would be deleted from the original system. Using this method, some systems were de-populated of in-scope functions and, therefore, shown to be out-of-scope.

The main and auxiliary steam system transport the steam produced in the steam generator to the main turbine for the production of electricity. The system also provides heat removal from the RCS during normal, accident, and post-accident conditions. In addition, it provides steam to the turbine-driven auxiliary feedwater pumps.

The main steam system contains seven intended functions that are within the scope of license renewal. These intended functions include:

- performs its primary design system function as detecting, initiating, and actuating automatic safety functions
- provides emergency heat removal from the RCS using secondary heat removal capability
- provides a primary containment boundary
- nonsafety-related SSCs whose failure could prevent satisfactory accomplishment of a safety-related function
- SSCs relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the regulations for fire protection (10 CFR 50.48)
- SSCs relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the regulations for environmental qualification (10 CFR 50.49)
- SSCs relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the regulations for station blackout (10 CFR 50.63).

The staff reviewed and evaluated documents describing these scoping methods for the main steam system. The documents reviewed included the main steam system DBDs, CLB, and license renewal implementation procedures. A complete list of documents reviewed is contained in Appendix B of this report.

Conclusion. The staff reviewed the applicant's methodology for identifying systems and structures meeting mechanical scoping criteria as defined in the Rule. The staff also reviewed a sample of the scoping methodology implementation procedures and discussed the methodology and results with the applicant. The staff verified that the applicant 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) criteria. On the basis of this sample review, the staff concluded that the applicant's methodology for identifying mechanical systems and structures meeting the scoping criteria of 10 CFR 54.4(a) is adequate.

Civil/Structural Scoping. The applicant's methodology for performing the scoping of systems and structures in accordance with 10 CFR 54.4(a) was documented in license renewal Technical Report LR-TR-508, Revision 1, "Integrated Plant Methodology Assessment Report," and LRA Section 2.4. The approach used by the applicant for system and structure scoping is consistent with the methodology described in LRA Section 2.1.2.5. Specifically, LR-TR-508 states that personnel performing license renewal scoping use CLB documents and list all functions that the system or structure is required to accomplish. Sources of information regarding the CLB include the FSAR, system descriptions, CHAMPS database, MRule information, training materials, walkdowns of plant buildings, and plant drawings.

The systems, structures, and commodity groups within license renewal under the purview of the civil/structural discipline include all plant structures; the crane, hoist, and lifting device systems; and the component supports and fire barriers commodity groups. The applicant identified plant systems, structures and commodity group components in the attachments of LR-TR-508, then evaluated them against the scoping criteria of 10 CFR 54.4(a)(1), (2), and (3) to identify those systems, structures and components in the commodity groups, that perform one or more intended functions. A system, structure or commodity group component was presumed to be within the scope of license renewal if it performed one or more safety-related functions or met other scoping criteria per the Rule as determined by CLB review and walkdown by technical personnel. Identified functions were then compared to a list of scoping questions to determine the functions which met the scoping criteria of 10 CFR 54.4(a). A structure's evaluation that was determined to be not within the scope of license renewal was individually documented in the license renewal database with an in-depth explanation. A scoping matrix for each system, structure, and commodity group listed the specific scoping group, screening group, and AMR group, as applicable.

The staff found, in reviewing commodity group classifications, that similar component types were dispositioned to one commodity group with a single aging management review. The basis for the grouping was determined by similar design and material construction considerations. The CSUP included component and equipment supports, fasteners and anchors used in supports, and electrical enclosures. The fire barriers group included fire wraps, fire penetration seals, and cable tray fire stops. The staff reviewed a sample of the components identified by the scoping process as listed in LR-TR-508, Attachment 8.

The staff also reviewed LR-TR-508, Section 2.6, which summarizes the results of the structure evaluations performed for the scoping process. The results were provided in separate database output reports by system, structure, and commodity group. Additionally, the reports contain system and boundary descriptions, system-level functions, references, and comments. The staff also found that the reports were independently prepared, reviewed, and approved.

Conclusion. The staff reviewed the applicant's methodology for identifying systems and structures meeting civil/structural scoping criteria as defined in the Rule. The staff also reviewed a sample of the scoping methodology implementation procedures and results and discussed the methodology and results with the applicant. The staff verified that the applicant identified and used pertinent engineering and licensing information in order to determine the

SSCs required to be in-scope in accordance with the 10 CFR 54.4(a) criteria. On the basis of this sample review, the staff concluded that the applicant's methodology for identifying civil/structural systems and structures meeting the scoping criteria of 10 CFR 54.4(a) is adequate.

Electrical and I&C Scoping. The staff reviewed the Scoping Output Process Report which documented the results of the scoping process at the system or structure level for electrical and I&C scoping. The plant systems were identified within CHAMPS using system identifiers. Different system boundaries were defined for license renewal, with some containing multiple CHAMPS systems. The scoping process was performed in accordance with LRPP 2-1, "Scoping and Screening for License Renewal." The systems were identified at specific voltage levels for electrical (*e.g.*, 13k VAC, 480 VAC) or within functional performance-related systems (*e.g.*, reactor protection, radiation monitoring) for instrumentation and control. The staff also reviewed LR-TR-508, "License Renewal Technical Report," Attachment 3, which lists the systems within the scope of license renewal and the commodity groups that were created for the common components within the scope of license renewal.

The staff reviewed specific documentation for the emergency power system. The emergency power system consists of four emergency diesel generators (EDGs) and a GTG. The normal source of power to safety-related 4160 VAC and 480 VAC buses is from offsite power through the station low-voltage auxiliary transformers. In the unlikely event of a loss of offsite power, the GTG can power required loads until the EDG or offsite power is restored. The 125 VDC, 480 VAC and 13.8k VAC power systems interface with the offsite power supply. The emergency power system also contains components credited for use in safe shutdown following SBO events and some plant fires.

The staff reviewed LR-SCOPE-631, which identifies the emergency power system scoping functions. The Scoping Output Report, Attachment 6.1, "Emergency Power," provides all the system functions within the scope of license renewal for the emergency power system. The emergency power system functions include:

- senses or provides process conditions and generate signal for reactor trip and engineered safety features actuation
- provides electrical power to safety Class 1, 2, and 3 components
- provides signals for RG 1.97 Type D post-accident monitoring variables during accidents
- nonsafety-related SSCs whose failure could prevent satisfactory accomplishment of safety-related functions
- SSCs relied upon in safety analysis in regulated events

The staff reviewed the identified functions in the emergency power system DBDs and the methodology used in LR-SCOPE-631 to identify other electrical/I&C components within the scope of license renewal. The staff found that LR-SCOPE-631 identifies all the in-scope emergency power system functions for license renewal and is consistent with the DBDs and the LRA.

Conclusion. The staff reviewed the applicant's methodology for identifying systems and structures meeting the electrical and I&C scoping criteria as defined in the Rule. The staff also reviewed a sample of the scoping methodology implementation procedures and discussed the methodology and results with the applicant. The staff verified that the applicant identified and used pertinent engineering and licensing information in order to determine the SSCs required to be in-scope in accordance with the 10 CFR 54.4(a) criteria. On the basis of this sample review, the staff concluded that the applicant's methodology for identifying electrical and I&C systems and structures meeting the scoping criteria of 10 CFR 54.4(a) is adequate.

2.1.3.2 Screening Methodology

The staff reviewed the screening methodology used by the applicant to determine if mechanical systems, structures, and electrical/I&C components within the scope of license renewal would be subject to an AMR. The applicant described the screening process in LRA Section 2.1.3. The initial scoping effort described in LRA Section 2.1.1 identifies the plant systems and structures that are candidates for inclusion within the scope of license renewal. Screening was performed in accordance with the guidance provided in NEI 95-10, Revision 3, and applicable ISG.

The applicant implemented a process for determining which structures and components would be subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1). In LRA Section 2.1.3, the applicant discussed these screening activities as they related to the SCs that are within the scope of license renewal. The screening process evaluated these in-scope SSCs to determine which were passive, long-lived and, therefore, subject to an AMR. LRA Sections 2.3, 2.4, and 2.5, provided the results of the process used to identify the SCs that are subject to an AMR. Specific methodology for mechanical, electrical, and structural component screening is discussed below.

2.1.3.2.1 Mechanical Component Screening

The staff reviewed the methodology used by the applicant to determine if mechanical systems, identified within the scope of license renewal, were screened to determine the in-scope boundary and the passive components that would be subject to further AMR. LRA Section 2.1.3, described the screening methodology used to make these determinations. Additionally, LR-TR-508, Revision 1, Section 3.2, "Integrated Plant Assessment Methodology Report," provided detailed guidance on mechanical screening methodology.

The mechanical screening discipline-specific methodology included guidance on components that are screened into the license renewal program and subject to an AMR. This includes guidance on evaluation boundaries and components that were uniquely screened as active (*e.g.*, temperature elements, solenoid valves) or passive (*e.g.*, valve bodies, pipe fittings). LR-TR-508 Section 3.2 also includes guidance on screening of stored equipment, screening of thermal insulation, and assigning of component-level intended functions. For mechanical components, a screening process was applied to determine the types of mechanical component commodities within the scope of license renewal, and the various materials and environments to be considered in the AMR. As discussed previously in SER Section 2.1.2.2.1, valuation boundaries were established for the various plant mechanical components in order to further identify individual mechanical components for review. Information sources included design and

licensing basis documents, plant drawings, license renewal technical reports, and discussion with license renewal system engineers.

The staff also reviewed LR-SCRN-714, "License Renewal Screening Report, Main and Auxiliary Steam," Revision 0, dated August 6, 2003, for the main steam system. LR-SCRN-714 and the LRPMS database identified a total of 3259 components in the main and auxiliary steam system. LR-SCRN-714 and the LRPMS database included 549 components within the scope of license renewal. LR-SCRN-714 and the LRPMS database also determined that 318 components in the main and auxiliary steam system were screened into the license renewal program and subject to an AMR. The database screened out 231 active, periodically replaced, and other in-scope components with no license renewal intended function.

Conclusion. The staff reviewed and evaluated the overall mechanical component screening methodology as described and documented in the license renewal application and implementation procedures. The staff concluded that the screening methodology is consistent with the requirements of the Rule; that implementation of the methodology identified mechanical components that met the screening criteria of 10 CFR 54.21(a)(1); that the applicant's mechanical component screening methodology is consistent with the guidance contained in NUREG-1800; and that the methodology is capable of identifying those passive, long-lived components within the scope of license renewal that are subject to an AMR.

2.1.3.2.2 Structural Component Screening

The staff reviewed LR-TR-508, Revision 1, "Integrated Plant Assessment Methodology Report," which describes the screening methodology that the applicant used to determine the discipline-specific screening process for structural components. The civil/structural engineering discipline was responsible for performing the screening evaluations on the in-scope structures; crane, hoist, and lifting device systems; as well as the component supports and fire barrier commodity groups. The boundaries for in-scope systems, structures, and commodity groups were defined to determine the components that would need screening. The staff reviewed the attachments to LR-TR-508 which describe the screening process results and found the screening methodology described in LRA Section 2.1.3 adequate to identify structural components subject to an AMR.

Additionally, the staff found that the methodology used to screen structural components within evaluation boundaries, with the exception of snubbers that supported a component-level intended function, were assumed to be long-lived and passive and, therefore, would require an AMR. Individual structure components are represented by generic components that identify the materials of construction and environmental exposure. Materials were placed in groups that would be expected to experience the same type of aging mechanism and effects and would, therefore, need the same type of aging management. Evaluation boundaries for the SCs determined where substructures were assigned for evaluation and dictated the type of generic components that were to be a part of a structure or commodity group. The screening process that confirmed the boundary and generic component identification process and verified all components was evaluated. The staff reviewed a sample of boundary, substructure, and generic component determinations and found them to be adequate and in accordance with the process described in the LRA.

The staff also reviewed a sample of the screening process results which were listed in database output reports sorted by system, structure, and commodity group, and were independently prepared, reviewed and approved. The staff found the results of the sample reviewed to be adequate to identify structural components subject to an AMR.

Conclusion. The staff reviewed and evaluated the civil/structural component screening methodology as described in the license renewal application and implementation procedures. The staff concluded that the screening methodology is consistent with the requirements of the Rule; that implementation of the methodology for civil/structural components meets the screening criteria of 10 CFR 54.21(a)(1); that the applicant's structural component screening methodology is consistent with the guidance contained in NUREG-1800, and that the methodology is capable of identifying those passive, long-lived components within the scope of license renewal that are subject to an AMR.

2.1.3.2.3 Electrical and I&C Component Screening

The staff reviewed LR-TR-508, Revision 1, "Integrated Plant Assessment Methodology Report," which describes the screening methodology that the applicant used to determine the discipline-specific screening process for electrical and I&C components. The applicant's license renewal project electrical engineers were responsible for performing the screening evaluation on the in-scope electrical and I&C system components. The LRA identifies three commodity groups for passive, long-lived components subject to an AMR. Specifically, (1) panels, racks, cabinets, and junctions boxes were placed into the "PANEL" commodity group; (2) the electrical penetration assemblies were placed into the "EPA" commodity group; and (3) cables and connections were placed into the "CABLE" commodity group.

The applicant used the LRDB sorting capabilities and active component types identified in NEI 95-10, Appendix B, to identify components that screened out of license renewal and were not subject to an AMR pursuant to 10 CFR 54.21(a)(1). The passive components remaining in the systems were transferred into one of the three commodity groups. Since some electrical components are contained in generic systems within the database, or were not uniquely identified in CHAMPS, specific generic components were developed to represent and track these items in the LRDB. These generic components included non-EQ low- and medium-voltage cables, splices, fuse holders, terminal blocks, low- and medium-voltage phase buses, switchgear buses, high voltage insulators and transmission conductors. The staff found this screening methodology acceptable for identifying passive and long-lived electrical components that were screened into license renewal and subject to an AMR, as required by 10 CFR 54.21(a)(1).

The staff also reviewed screening documents related to the emergency power system, which included LR-SCRN-722, "License Renewal Screening Report Emergency Power," and the Screening Output Report, Attachment 6.1, "Emergency Power." The staff found that the emergency power system components which were passive and long-lived were determined by the applicant to be subject to an AMR. The screening process was performed in accordance with LRPP 2-1, "Scoping and Screening for License Renewal." The screening process evaluations were performed and documented in the LRPMS database. LRPP 1-1, "License Renewal Project Procedure," discussed the use of the LRPMS database. In addition, LR-TR-508 documented that the emergency power system was considered within the license

renewal scope because it contained components from the original CHAMPS system codes for the diesel generator (DG), diesel starting air (DA), gas turbine (GT), and fuel oil components.

LR-SCRN-722, Attachment 6.1 was a copy of the output document from the LRPMS which documented the results of the screening process performed at the component level. The subsystems and components in the attachment were part of the mechanical and electrical component scoping and screening methodology for the LRA. Additionally, in LR-SCRN-722, Attachment 6.1, the staff found that the applicant scoped and screened in passive and long-lived mechanical components that are subject to an AMR, including: air motors, flame arresters, instrumentation, sight glasses, and turbo-chargers.

The staff also noted that report LR-SCRN-722, Attachment 6.1, included emergency power system components such as motors, pumps, engines, circuit breakers, batteries, and relays which were screened-out active components not subject to an AMR.

Conclusion. The staff reviewed and evaluated the electrical and I&C component screening methodology as described and documented in the LRA and implementation procedures. The staff concluded that the screening methodology is consistent with the requirements of the Rule; that implementation of the methodology identified electrical and I&C components meets the screening criteria of 10 CFR 54.21(a)(1); that the applicant's electrical and I&C component screening methodology is consistent with the guidance contained in NUREG-1800, and that the methodology is capable of identifying those passive, long-lived components within the scope of license renewal that are subject to an AMR.

2.1.4 Conclusion

The staff's review of the information presented in LRA Section 2.1, the supporting information in the scoping and screening implementation procedures and reports, the information presented during the scoping and screening methodology audit, and the applicant's responses to the staff's RAIs, form the basis of the staff's safety determination. The staff verified that the applicant's revised scoping and screening methodology is consistent with the requirements of the Rule and the staff's position on the treatment of nonsafety-related SSCs. On the basis of the review discussed above, the staff concluded that the applicant's methodology for identifying SSCs within the scope of license renewal and SCs requiring an AMR is consistent with the requirements of 10 CFR 54.4 and 10 CFR 54.21(a)(1).

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 properly identified all plant-level systems and structures relied upon to mitigate design basis events (DBEs), as required by 10 CFR 54.4(a)(1), or whose failure could prevent satisfactory accomplishment of any of the safety-related functions, as required by 10 CFR 54.4(a)(2), as

well as the systems and structures relied on safety analyses or plant evaluations to perform a function that is required by one of the regulations referenced in 10 CFR 54.4(a)(3).

2.2.2 Summary of Technical Information in the Application

In LRA Table 2.2-1, the applicant provided a list of plant systems and structures, identifying those that are within the scope of license renewal and those that are not within the scope of license renewal. Based on the DBEs considered in the plant's CLB, other CLB information relating to nonsafety-related systems and structures, and certain regulated events, the applicant identified those plant-level systems and structures within the scope of license renewal, as defined in 10 CFR 54.4.

As documented under RAI 2.1-1 in SER Section 2.1, by letter dated April 29, 2005, the applicant changed the methodology used to determine the nonsafety-related SSCs that are within the scope of license renewal in accordance with the requirements of 10 CFR 54.4(a)(2). As a result of the implementation of the scoping methodology changes, the applicant identified no new plant-level systems or structures within the scope of license renewal.

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 Table 2.2-1, to confirm that there was no omission 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 identified as not falling within the scope of license renewal to verify whether those systems and structures have any intended functions that fall within the scope of license renewal. The staff's review of the applicant's implementation was conducted in accordance with the NUREG-1800, Section 2.2.

The staff sampled the contents of the FSAR based on the listing of systems and structures in LRA Table 2.2-1 to determine whether there were systems or structures that may have intended functions as defined by 10 CFR 54.4, but were not included within the scope of license renewal. The staff did not identify any omissions.

2.2.4 Conclusion

The staff reviewed LRA Section 2.2 and the supporting information in the FSAR to determine whether any systems and structures within the scope of license renewal had not been identified by the applicant. No omissions were identified. On the basis of this review, the staff concluded that the applicant had appropriately identified the systems and structures that are within the scope of license renewal in accordance with 10 CFR 54.4.

2.3 System 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 system

In accordance with the requirements of 10 CFR 54.21(a)(1), the applicant must identify and list passive, long-lived mechanical systems and components 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 mechanical systems 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 license renewal application (LRA) was performed in the same manner for all mechanical systems. The objective of the review was to determine if the components and supporting structures for a specific mechanical 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 FSAR, for each mechanical system component to determine whether the applicant had omitted system 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.

As documented under RAI 2.1-1 in SER Section 2.1, by letter dated April 29, 2005, the applicant changed the methodology used to determine the nonsafety-related SCs that are within the scope of license renewal in accordance with the requirements of 10 CFR 54.4(a)(2). As a result of the implementation of the scoping methodology changes, the applicant identified the following, previously excluded, mechanical systems component types:

(1) Engineered Safety Features (LRA Section 2.3.2)

- Safety Injection System (LRA Table 2.3.2-1)
  - level gauges
- Containment Spray System (LRA Table 2.3.2-2)
  - level gauges

(2) Auxiliary Systems (LRA Section 2.3.3)

- Chemical and Volume Control System (LRA Table 2.3.3-1)
  - level gauges
- Spent Fuel Pool Cooling System (LRA Table 2.3.3-3)
  - filters and strainers
  - tanks
- Waste Disposal System (LRA Table 2.3.3-4)
  - compressor casing
  - drain traps
  - filters and strainers
  - level gauges
  - pump casing
  - restricting orifices
  - sight glass
  - tank
- Treated Water System (LRA Table 2.3.3-11)
  - filters and strainers
  - heat exchangers
- Plant Sampling System (LRA Table 2.3.3-14)
  - filters and strainers
  - level gauges
  - piping and fittings
  - restricting orifices
  - tanks
  - valve bodies

(3) Steam and Power Conversion System (LRA Section 2.3.4)

- Main and Auxiliary Steam System (LRA Table 2.3.4-1)
  - filters and strainers
  - heat exchangers
  - level gauges
  - pump casing
  - tanks
- Feedwater and Condensate System (LRA Table 2.3.4-2)
  - level gauges
  - pump casing
  - steam traps
  - tanks

In its letter, dated April 29, 2005, the applicant provided additional information regarding results of the revised scoping methodology, with specific exceptions for special cases. The staff's review of this letter identified several exceptions for which clarification was needed. During telephone conferences held on June 30 and July 8, 2005, the staff requested the applicant to clarify these exceptions. In its response, dated July 19, 2005, the applicant clarified these exceptions, and as a result, more components were added within the scope of license renewal. Feedwater heaters 4 and 5, on the 26-feet elevation of the turbine hall for both Units 1 and 2, have been included within the scope of license renewal. These heaters fall under component type of "piping and fittings" in LRA Table 2.3.4-2.

The staff found the letters dated April 29 and July 19, 2005, to be acceptable on the basis that they adequately identified all nonsafety-related structures and components that were added to the scope of license renewal. The staff did not identify any omission related to the changed methodology.

Screening. After completing its scoping evaluation, the staff reviewed the applicant's screening results. For those SCs with intended functions, the staff sought to determine: (1) if the

function(s) are performed with moving parts or involve a change in configuration or properties, or (2) if they are subject to replacement based on a qualified life or specific time period, as described in 10 CFR 54.21(a)(1). For those that did not meet any of these criteria, the staff sought to confirm that these mechanical 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.

The corresponding sections of this SER (2.3.1 - 2.3.4) present the staff's review findings with respect to the scoping and screening of the mechanical systems for both Units 1 and 2.

2.3.1 Reactor Vessel, Internals, and Reactor Coolant System

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

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

- 2.3.1.1 Class 1 piping/components system
- 2.3.1.2 reactor vessel
- 2.3.1.3 reactor vessel internals
- 2.3.1.4 pressurizer
- 2.3.1.5 steam generators
- 2.3.1.6 non-Class 1 RCS components system

The corresponding subsections of this SER (2.3.1.1 – 2.3.1.6) present the staff's review findings with respect to the reactor vessels, internals, and reactor coolant systems for both Units 1 and 2.

2.3.1.1 Class 1 Piping/Components System

2.3.1.1.1 Summary of Technical Information in the Application

In LRA Section 2.3.1.1, the applicant described the Class 1 piping/components system. The Class 1 piping/components system consists of the main RCS loops, and interconnecting piping from various other systems, typically extending to the second isolation valve off of the main RCS loop. The RCS consists of two heat transfer loops connected in parallel to the reactor pressure vessel (RPV). Each reactor coolant loop contains a reactor coolant pump (RCP) and a steam generator (SG). In addition, the RCS includes a pressurizer that is connected to loop B hot leg, interconnecting piping and valves, and instrumentation necessary for protection and control.

Functions associated with the Class 1 portions of the RCS include the following:

- maintains the reactor core assembly geometry by supporting the fuel and fuel assemblies
- uses boron injection paths to introduce emergency negative reactivity and make the reactor subcritical

- provides a reactor coolant pressure boundary by containing the coolant for heat transfer
- serves as a closed pressure boundary that limits leakage to the containment building Units 1 and 2 building structure and interconnecting systems
- provides emergency heat removal from the reactor coolant system during normal or abnormal operations by using secondary heat removal capability
- provides heat removal from the RCPs through the system's thermal barriers
- provides a primary containment boundary to limit the release of radioactive material to the environment through piping that penetrates the containment
- supports/houses safety Class 1, 2, or 3 components

In addition, the Class 1 piping/components system performs functions that support fire protection (FP), station blackout (SBO), pressurized thermal shock (PTS), and environmental qualification (EQ).

Intended functions within the scope of license renewal include the following:

- provides for mechanical closure integrity on bolted joints
- provides a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered
- provides for flow restriction (throttle)
- provides structural support

In LRA Table 2.3.1-1, the applicant identified the following Class 1 piping/components system component types that are within the scope of license renewal and subject to an AMR:

- bolting for flanged piping joints
- orifices and reducers
- piping and fittings less than four inches, nominal pipe size (NPS)
- piping and fittings greater than or equal to four inches, NPS
- piping welds and vent connections (nickel alloys)
- primary loop elbows
- reactor coolant pump lugs
- reactor coolant pumps (casing and main flange)
- reactor coolant pumps (thermal barrier flange)
- thermal barrier heat exchanger tubing
- thermowells
- valves less than four inches, NPS
- valves greater than or equal to four inches, NPS

2.3.1.1.2 Staff Evaluation

The staff reviewed LRA Section 2.3.1.1 and FSAR Sections 3.1, 3.2, 4.1, 4.2, 5.2, 6.1, and 9.1. The staff's review, using the evaluation methodology described in SER Section 2.3, was conducted in accordance with the guidance described in the Standard Review Plan for License Renewal (SRP-LR) (NUREG-1800), Section 2.3, "Scoping and Screening Results: Mechanical Systems."

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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 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 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.

RAI 2.3.1.1-1. In LRA Tables 2.3.1-1, 2.3.1-6, and 2.3.3-1, heat exchangers (HXs) have been identified as a component type within the scope of license renewal. However, specifically for these HXs, the pressure boundary function, but not the heat transfer function, was identified as an intended function requiring aging management. In RAI 2.3.1.1-1, dated November 17, 2004, the staff requested the applicant to clarify why the heat transfer function need not be identified as within the scope of license renewal and requiring aging management.

In its response, dated December 21, 2004, the applicant stated that none of the HX components represented in LRA Tables 2.3.1-1, 2.3.1-6 and 2.3.3-1 have a license renewal intended function of heat transfer based on the CLB. Therefore, heat transfer function was not listed, and only the pressure boundary function was identified for these HXs. It was further stated that LRA Table 2.3.1-1 refers to the RCP thermal barrier HXs. The CLB shows that heat transfer from the RCP HX thermal barrier is not a safety-related function (reference letter NPL 97-0401 dated July 7, 1997, from Wisconsin Electric to NRC). Therefore, heat transfer is not an intended function for these HXs. LRA Table 2.3.1-6 refers to the RCP motor oil coolers. The RCPs are powered from nonsafety-related power supplies and are assumed to be lost during some accident scenarios. Heat transfer from the RCP motor oil coolers is not a safety-related function; therefore, heat transfer is not an intended function for these HXs. LRA Table 2.3.3-1 refers to miscellaneous HXs in the chemical and volume control system (CVCS), including the regenerative, the non-regenerative, the excess letdown, the seal water, the boric acid evaporator, and the boric acid evaporator condensate HXs. All of these HXs are non-essential loads, and heat transfer from these HXs is not relied upon for any safety-related function. The applicant, therefore, concluded that the heat transfer function is not an intended function for the subject HXs.

The staff found the applicant's response to RAI 2.3.1.1-1 acceptable. The applicant provided justification as to why the heat transfer function of the subject components need not be included within the scope of license renewal and require aging management. Therefore, the staff's concern described in RAI 2.3.1.1-1 is resolved.

2.3.1.1.3 Conclusion

The staff reviewed the LRA and the RAI response described above 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 of the 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 Class 1 piping/components 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 Class 1 piping/components system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.1.2 Reactor Vessel

2.3.1.2.1 Summary of Technical Information in the Application

In LRA Section 2.3.1.2, the applicant described the reactor vessel (RV). The RV, as the principal component of the RCS, contains the heat-generating core and associated supports, instrumentation and controls, and coolant circulating channels. Primary outlet and inlet nozzles provide for the exit of heated coolant and its return to the RV for recirculation through the core. Subcomponents included for evaluation with the RV include: control rod drive mechanism (CRDM) penetrations and housings, bottom mounted instrument (BMI) penetrations and external guide tubing, head vent penetration, seal table pressure boundary fittings, and head closure bolting.

The primary function of the RV is to provide a reactor coolant pressure boundary (RCPB) and to support the vessel internals and instrumentation. In addition, the RV performs functions that support pressurized thermal shock.

Intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered
- provides structural and/or functional support to the thimble tubes
- provides structural and/or functional support to the RV internals
- provides for mechanical closure integrity of bolted joints
- provides structural and/or functional support for some RV subcomponent assemblies

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

- BMI guide tubes
- closure head dome
- closure head dome (including lifting lugs)
- closure head flange
- bottom head torus
- bottom head dome
- closure studs, nuts, and washers
- core support pads
- CRDM housings and flanges (rod travel and latch)
- CRDM housing tubes (head adapters)
- intermediate shell (including circumferential beltline weld)
- instrumentation tubes and safe ends
- lower shell
- nozzle support pads and external support brackets
- primary inlet nozzles
- primary nozzle safe ends
- primary outlet nozzle
- refueling seal ledge
- RV components (in contact with primary water)
- seal table fittings
- upper shell
- vent pipe
- ventilation shroud support ring
- vessel flange

2.3.1.2.2 Staff Evaluation

The staff reviewed LRA Section 2.3.1.2 and FSAR Sections 3 and 4. The staff's review, using the evaluation methodology described in SER Section 2.3, was conducted in accordance with the guidance described in NUREG-1800, Section 2.3.

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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 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 2.3.1.2 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.

RAI 2.3.1.2-1. The staff position on reactor vessel flange leak-off lines is that unless a plant-specific justification is provided, the components fall within the scope of license renewal and will require aging management. In RAI 2.3.1.2-1, dated November 17, 2004, the staff requested the applicant to clarify whether any of the component types listed in LRA Table 2.3.1-2 (Reactor Vessel) or Table 2.3.1-6 (Non-Class 1 Reactor Coolant System Components System) include the subject components. If not, then the subject components should be identified as within the scope of license renewal, and requiring aging management. In the alternative, the applicant may provide a plant-specific justification for excluding the components.

In its response, dated December 21, 2004, the applicant stated that the reactor vessel flange leak detection lines do not perform or support any license renewal system intended functions that satisfy the scoping criteria of 10 CFR 54.4 and, therefore, are not within the scope of license renewal. It further stated that each of the reactor vessel flange leak detection lines includes a 3/16-inch diameter orifice in the reactor pressure vessel (RPV) flange which would limit any potential RCS leakage to within the capacity of a charging pump in the unlikely event of leakage past the inner O-ring. Since the leak detection lines are nonsafety-related and their potential failure would not prevent satisfactory accomplishment of any safety-related functions, the leak detection lines do not perform or support any license renewal intended functions that meet the scoping criteria of 10 CFR 54.4(a) and, therefore, an AMR is not required. Since they are not in-scope, the leak detection lines are not included in any component types listed in LRA Tables 2.3.1-2 or 2.3.1-6.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.1.2-1 acceptable. The applicant provided justification as to why the component did not meet the scoping and screening criteria outlined in 10 CFR 54.4(a) and 10 CFR 54.21(a)(1); therefore, is not required to be within the scope of license renewal. The staff's concern described in RAI 2.3.1.2-1 is resolved.

2.3.1.2.3 Conclusion

The staff reviewed the LRA and the RAI response described above 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 of the 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 RV components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the RV components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.1.3 Reactor Vessel Internals

2.3.1.3.1 Summary of Technical Information in the Application

In LRA Section 2.3.1.3, the applicant described the reactor vessel internals (RVI). The RVI consist of two basic assemblies: (1) an upper internals assembly that is removed during each refueling operation to obtain access to the reactor core; and (2) a lower internals assembly that can be removed following a complete core unload. Subcomponents evaluated with the RVI include: support columns and plates, core barrel, baffle former assembly and bolting, and the instrument and control guides and supports.

The primary functions of the RVI are to support the core, provide flow distribution throughout the core, shield the vessel, and guide and support any instrumentation and controls.

Intended functions within the scope of license renewal include the following:

- provides a passageway for the distribution of reactor coolant flow to the reactor core
- provides gamma and neutron shielding for the reactor pressure vessel
- provides for support and orientation of the reactor core
- provides a secondary core support for limiting the core support structure downward displacement
- provides a passageway for support, guidance, and protection of in-core instrumentation
- provides for support, orientation, guidance, and protection of the control rod assemblies
- provides a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered

In LRA Table 2.3.1-3, the applicant identified the following RVI component types that are within the scope of license renewal and subject to an AMR:

- baffle and former plates
- baffle/barrel - former bolts
- bottom mounted instrumentation (BMI) column cruciforms
- BMI columns
- clevis insert bolt locking mechanisms
- clevis insert bolts
- clevis inserts
- core barrel - plates
- core barrel flange – ring forging, core barrel (guide key)
- core barrel outlet nozzle - nozzle

forgings
- exposed surfaces and crevice locations
- guide tube (GT) support pin (split pin)
- flux thimbles
- head and vessel alignment pins
- high temperature and neutron fluence locations
- hold down spring
- lower core plate
- lower core plate fuel alignment pins
- lower support columns, sleeves
- lower support forging
- lower support plate column bolts/nuts
- radial support keys
- rod control cluster assembly (RCCA) flexures
- RCCA guide tube bolts
- RCCA guide tubes, inserts, and flow downcomers
- secondary core support - base plate, energy absorber, diffuser plate (flow mixer plate)
- secondary core support assembly - guide post, housing
- head cooling spray nozzle bodies and nozzle tips
- thermal shield - plate material, flexures, dowel pin
- upper core plate
- upper core plate alignment pin
- upper core plate fuel alignment pin
- upper instrumentation column, conduit (tubing and supports), spacers/clamps
- upper support column (USC) and bottom nozzles
- USC instrumentation fittings
- USC base castings
- USC bolts
- upper support plate, deep beam weldment, top plate, ribs, hollow rounds

2.3.1.3.2 Staff Evaluation

The staff reviewed LRA Section 2.3.1.3 and FSAR Sections 3 and 4. The staff's review, using the evaluation methodology described in SER Section 2.3, was conducted in accordance with the guidance described in NUREG-1800, Section 2.3.

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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 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 of the 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 RVI components that are within the scope of license renewal, as

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

2.3.1.4 Pressurizer

2.3.1.4.1 Summary of Technical Information in the Application

In LRA Section 2.3.1.4, the applicant described the pressurizer. The pressurizer is part of the reactor coolant system (RCS) and is located inside the containment. It is used for RCS pressure control and consists of the pressurizer vessel equipped with electric heaters, safety valves, relief valves, spray nozzle, and all of the interconnecting piping and instrumentation. During operation, the pressurizer contains saturated water and steam that is maintained at the desired saturation temperature and pressure through the use of electric heaters and the spray nozzle.

The pressurizer scope is limited to the pressure boundary up to and including the nozzles, nozzle safe ends, nozzle-to-safe end welds, and the support skirt and flange. Boundaries between the pressurizer and associated systems and components are typically drawn at the pressurizer interface. As such, the following systems and components are not considered as part of the pressurizer: Class 1 piping and the attachment welds to the pressurizer nozzles/safe ends; and instrument piping/tubing, valves, manifolds and instrumentation beyond the Class 1 boundary. The support skirt and support flange, which are welded to the lower pressurizer head, are considered to be part of the pressurizer; however, the support attachment bolting is not part of the pressurizer.

The pressurizer maintains the required reactor coolant pressure during steady-state operation and normal heatup and cooldown. The pressurizer also limits pressure changes, to an allowable range, that are the result of reactor coolant thermal expansion and contraction during normal plant load changes and transients.

Intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered
- provides for mechanical closure integrity on bolted joints
- provides structural and/or functional support for some pressurizer subcomponent assemblies
- provides thermal shielding to minimize nozzle low-cycle thermal fatigue

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

- heater well and heater sheath
- instrument nozzles
- lower head
- manway cover
- manway cover bolts
- relief nozzle
- relief nozzle safe end
- safety nozzle
- safety nozzle safe end
- shell
- spray nozzle
- spray nozzle safe end

- spray nozzle thermal sleeve
- support skirt and flange
- surge nozzle
- surge nozzle safe end
- surge nozzle thermal sleeve
- upper head

2.3.1.4.2 Staff Evaluation

The staff reviewed LRA Section 2.3.1.4 and FSAR Section 4. The staff's review, using the evaluation methodology described in SER Section 2.3, was conducted in accordance with the guidance described in NUREG-1800, Section 2.3.

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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 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 2.3.1.4 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.

RAI 2.3.1.4-1. Drawings 541 FO91, sheet 2 and 541 F445, sheet 2 show that the pressurizer relief tank (PRT) is within the scope of license renewal, whereas its subcomponents, such as the PRT spray, rupture disk, and associated piping are shown to be outside the scope of license renewal. The staff believes that failure of PRT spray, rupture disk, and/or the associated piping can result in failure of the PRT itself to perform its intended function. Therefore, in RAI 2.3.1.4-1, dated November 17, 2004, the staff requested the applicant to include the PRT spray, rupture disk, and the associated piping within the scope of license renewal, or to provide an explanation as to how failure of the PRT subcomponents will not degrade the intended functions of the PRT.

In its response, dated December 21, 2004, the applicant stated that the PRT was conservatively included within the scope of license renewal due to pressurizer safety valve/power operated relief valve (PORV) discharge header being in-scope for the 10 CFR 50.48 regulated event. The discharge header was included as an Appendix R flow boundary to assure availability of a pressurizer safety valve for reactor coolant pressure control. Since the discharge header terminates inside of the PRT, the applicant conservatively included the PRT in-scope. Neither the discharge header nor the PRT are safety-related components. The PRT is designed to accommodate leakoffs/flows from various relief valves inside of containment for cleanliness/contamination control concerns. It is also designed to handle a "design discharge" from a pressurizer safety valve, which equates to 110 percent of the steam volume above the full-power pressurizer water level setpoint. This steam volume was established as the design sizing basis because it corresponds to a reasonable occurrence and because it is not practical to design the tank to contain the largest conceivable discharge. If a discharge should occur that exceeds this limit, the relief device (*i.e.*, rupture disk) on the tank would pass the discharge through the tank to containment. The rupture disk is fail-safe (*i.e.*, it is designed to fail), and age-related degradation could not prevent this function.

The applicant further stated in the response that the PRT subcomponents (PRT spray, the rupture disk, and other associated piping) were not included within the scope of license renewal as they do not meet any of the 10 CFR 54.4 scoping criteria. None of these subcomponents is safety-related (Criterion 1). The PRT is nonsafety-related and, therefore, a failure of these subcomponents would not affect the function of any safety-related components (Criterion 2). For the Appendix R scenario (regulated event - Criterion 3), none of these subcomponents is required to function in order to maintain the availability of the pressurizer safety valve. In the Appendix R scenario, the primary goal is to minimize loss of RCS inventory during cooldown, so boundary valves (like the pressurizer PORVs) are assumed to fail closed. The pressurizer safety valve is not expected to be used in this scenario, but only needs to be available to protect the integrity of the RCS in case the heat sink is lost. Based on this reasoning, the PRT subcomponents were determined by the applicant to be out-of-scope.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.1.4-1 acceptable. The applicant provided justification as to why the subject components did not meet the scoping and screening criteria outlined in 10 CFR 54.4(a) and 10 CFR 54.21(a)(1) and, therefore, are not required to be within the scope of license renewal. The staff's concern described in RAI 2.3.1.4-1 is resolved.

RAI 2.3.1.4-2. In LRA Table 2.3.1-4, the pressurizer spray head was not listed as a component type subject to an AMR. But drawings 541 FO91 sheet 1 and 541 F445 sheet 1 showed that the pressurizer spray head is within the scope of license renewal. In RAI 2.3.1.4-2, dated November 17, 2004, the staff requested the applicant to clarify this inconsistency. The staff determined that loss of the spray head due to aging will result in the failure of the pressure control function of the pressurizer which may be relied upon during and following design-basis events (DBE) and/or regulated events. If the spray head was to be excluded from the scope, then the following additional information was requested:

- A justification for how the components (spray head and associated piping inside pressurizer) which are relied upon for pressure control function during plant transients, as stated in the LRA (page 2-79), do not require any aging management during the period of extended operation.
- A clarification as to whether the CLB for fire protection (FP) complies with certain sections of Appendix R, particularly Section III.G, which provides the requirements for the fire protection safe shutdown capability. The applicant was requested to discuss whether the pressurizer spray head and associated piping are credited and relied upon in the FP safe shutdown analysis to bring the plant to cold shutdown conditions within a given time for compliance with Appendix R. If it is credited in the FP safe shutdown analysis, the pressurizer spray head and associated piping would satisfy 10 CFR 50.48, Appendix R requirements; and therefore, should be included within the scope of license renewal.

  The specific intended function of the subject components which meets the 10 CFR 54.4(a)(3) requirements is the spray function, and the particular components which help perform this function are the section of piping and the spray head located inside the pressurizer. The subject components do not have a pressure boundary function. The applicant was requested to describe whether the loss of spray function would make it impossible to bring the plant to cold shutdown conditions within the given time for compliance with Appendix R. If so, then the staff requested that the spray head

and the associated piping inside pressurizer having the spray function be included within the scope requiring aging management so that it would provide a reasonable assurance that an adequate spray function will be maintained inside the pressurizer during the period of extended operation.

In its response, dated December 21, 2004, the applicant stated the following:

- The pressurizer (PZR) spray head (made of austenitic stainless steel casting) is a non-pressure boundary subcomponent and is secured in place by a locking bar. The associated PZR internal piping is also made of austenitic stainless steel. A detailed discussion of the function of these subcomponents during normal operation and an Appendix R transient is presented below in the answer to the second question. These subcomponents were initially placed within the scope of license renewal due to their affiliation with the PZR, but were determined not to require aging management because they do not serve a PZR component intended function.
- The PZR spray function is necessary for RCS PZR pressure control. As noted in WCAP-14574-A, "Aging Management Evaluation for Pressurizers," the RCS pressure control function of the PZR is not relied on to prevent or mitigate any of the consequences of DBE. The PZR spray function is, however, credited in the Appendix R safe shutdown analysis to cool and depressurize the RCS at less than 25 °F per hour using auxiliary spray.

On the basis of an analysis discussed below, the applicant also concluded that since the Fire Protection 10 CFR Part 50 Appendix R criteria allow up to 72 hours to achieve cold shutdown, the spray function using the spray head is not required. The applicant stated the following:

> The spray heads are attached to the spray nozzles inside the PZRs and do not perform a pressure boundary function. The function of the spray heads is to enhance the efficiency (*i.e.*, RCS pressure control response time) of PZR spray during plant transients by dispersing the spray flow in the steam space, and thereby maximizing condensation of the steam bubble. Failure of the spray head would not prohibit the 120 °F spray water from entering the PZR, and consequently condensing a portion of the steam, and also cooling the bulk liquid volume. It should be recognized that the design PZR spray flow is 400 gallons per minute (gpm), whereas auxiliary spray flow with one charging pump is only 30 gpm. Therefore, the effectiveness of the spray head is diminished during its use in the auxiliary spray mode. Nonetheless, assuming the anticipated liquid level of the PZR for the Appendix R fire scenario condition (30%), the entire pressurizer liquid volume (approximately 2500 gallons) could be replaced in less than 1.5 hours during a plant cooldown. During the Appendix R fire scenario time period, this volume could be replaced multiple times, if required. This injection of cold water into the PZR, in combination with securing the normally energized proportional heaters, will result in significant cooling of the lower PZR shell. As a result, the lower shell will act as a heat sink and cool the upper portion of the shell by direct conduction, in addition to its heat losses to the containment environment. Condensation of the steam will occur by heat transfer to the internal walls of the PZR and to the liquid surface at the vapor/water interface. Although some temperature stratification of the liquid volume may occur near the surface (*i.e.*, vapor/water interface) as the steam condenses, the introduction of cold water into the top of the PZR will provide for mixing

as the bulk fluid is drawn out of the bottom through the surge line. The heat losses to the containment environment are compensated for by the proportional heaters which have a rated capacity of >123 Kilowatts (KW). Approximately, 25KW of this capacity is required to make up for the ambient heat losses. Thus, the PZR ambient heat losses are approximately 100,000 Btu/Hr. This supports the conclusion that the Appendix R fire scenario time period provides ample time to reduce PZR pressure.

In addition, the applicant stated in its response that the use of auxiliary pressurizer spray is the preferred procedural method for RCS pressure reduction in an Appendix R fire scenario. An alternate method is also available to accommodate RCS pressure reduction. In the alternate approach, the pressurizer is taken to solid conditions, and pressure control is established using the CVCS system directly. Use of auxiliary spray for pressure control is not credited in the alternate method.

The applicant, therefore, concluded that the pressurizer spray heads at PBNP are not relied on to demonstrate compliance with Appendix R postulated fire events, and that the components have no intended function for license renewal and, therefore, do not require aging management.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.1.4-2 acceptable. The applicant explained why the subject components have no intended functions as delineated in 10 CFR 54.4(a). The applicant provided justification as to why the subject components did not meet the scoping and screening criteria outlined in 10 CFR 54.4(a) and 10 CFR 54.21(a)(1) and, therefore, are not required to be within the scope of license renewal. The staff's concern described in RAI 2.3.1.4-2 is resolved.

2.3.1.4.3 Conclusion

The staff reviewed the LRA, accompanying scoping boundary drawings, and RAI responses described above 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 of the 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 pressurizer components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the pressurizer components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.1.5 Steam Generators

2.3.1.5.1 Summary of Technical Information in the Application

In LRA Section 2.3.1.5, the applicant described the steam generators (SGs). The SGs form the boundary between the radioactive RCS and the non-radioactive secondary systems. There are two, essentially identical, SGs installed in each containment. There is one SG in each RCS loop.

Functions associated with the SG system include the following:

- provide a pressure boundary between the primary and secondary systems
- remove heat from the RCS
- provide structural support

In addition, the SGs perform functions that support fire protection and station blackout.

Intended functions within the scope of license renewal include the following:

- provides structural support to safety-related components
- provides a passageway for the distribution of reactor coolant flow
- provides for flow restriction
- provides a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered

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

- anti-vibration bars
- blowdown piping nozzles and secondary side shell penetrations
- components (in contact with primary water)
- divider plate
- feedwater nozzle
- primary channel head
- primary inlet and outlet nozzle safe ends
- primary inlet and outlet nozzles
- primary manway bolting
- primary manways
- secondary closures
- secondary side closure bolting
- seismic lugs
- steam flow limiter
- tube plugs (mechanical)
- steam outlet nozzle
- support pads
- transition cone girth weld
- tube bundle wrapper and wrapper support system
- tube support plates
- tubesheet
- upper and lower shell, elliptical head and transition cone
- U-tubes

2.3.1.5.2 Staff Evaluation

The staff reviewed LRA Section 2.3.1.5 and FSAR Section 4. The staff's review, using the evaluation methodology described in SER Section 2.3, was conducted in accordance with the guidance described in NUREG-1800, Section 2.3.

The staff's review of LRA Section 3.1.2.2.10 identified an area where additional information with regard to the scoping of SG feedrings and J-tubes was necessary. This discussion is documented under RAI 3.1.1-2 in SER Section 3.1.2.2.10.

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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 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 of the 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 SG components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the SG components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.1.6 Non-Class 1 RCS Components System

2.3.1.6.1 Summary of Technical Information in the Application

In LRA Section 2.3.1.6, the applicant described the non-Class 1 reactor coolant system (RCS) components system. The non-Class 1 RCS components system includes all safety Class 2, Class 3, and non-nuclear safety grade equipment used to functionally support the RCS's intended functions.

Functions associated with the non-Class 1 RCS include the following:

- uses its instrumentation to detect, initiate, and actuate automatic safety functions for reactor trip and engineered safety features actuation
- removes heat from the RCPs
- provides a primary containment boundary to limit the release of radioactive material to the environment through piping that penetrates the containment
- provides Regulatory Guide (RG) 1.97, Type A post-accident monitoring variables for instruments in the system

In addition, the non-Class 1 RCS components system performs functions that support environmental qualification, fire protection and station blackout.

Intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered
- provides for mechanical closure integrity on bolted joints
- provides for flow control or distribution, as through a spray nozzle
- provides a passageway for support, guidance, and protection of in-core instrumentation

In LRA Table 2.3.1-6, the applicant identified the following non-Class 1 RCS components system items that are within the scope of license renewal and subject to an AMR:

- carbon steel (CS) components
- fasteners and bolting
- flow indicators
- flywheel
- heat exchanger
- instrument valve assemblies
- piping and fittings
- seal table
- tanks
- valve bodies
- valve operator

2.3.1.6.2 Staff Evaluation

The staff reviewed LRA Section 2.3.1.6 and FSAR Sections 4.2, 5.1, 5.2, 7.0, and 9.1. The staff's review, using the evaluation methodology described in SER Section 2.3, was conducted in accordance with the guidance described in NUREG-1800, Section 2.3.

The PRT is one portion of the non-Class 1 RCS components system containing components subject to an AMR. However, the staff identified an area of concern related to the PRT while reviewing LRA Section 2.3.1.4. This discussion is documented under RAI 2.3.1.4-1 in SER Section 2.3.1.4.

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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 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).

2.3.1.6.3 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 of the 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 non-Class 1 RCS components 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 non-Class 1 RCS components system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.2 Engineered Safety Features

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

The applicant described the supporting structures and components of the engineered safety features in the following LRA sections:

- 2.3.2.1 safety injection system
- 2.3.2.2 containment spray system
- 2.3.2.3 residual heat removal system
- 2.3.2.4 containment isolation components system

The corresponding subsections of this SER (2.3.2.1 – 2.3.2.4) present the staff's review findings with respect to the engineered safety features for both Units 1 and 2.

2.3.2.1 Safety Injection System

2.3.2.1.1 Summary of Technical Information in the Application

In LRA Section 2.3.2.1, the applicant described the safety injection (SI) system. The SI system supports the RCS inventory and reactivity control during accident and post-accident conditions by automatically delivering borated water to the reactor vessel for cooling under conditions of high and low reactor coolant pressure. The Class 1 boundary components that carry an SI equipment designation are addressed in the Class 1 piping/components system. The SI system is a standby system during normal plant operation.

The portions of the SI system containing components subject to an AMR extend from the accumulators and refueling water storage tank (RWST) to the RCS and include the high-head SI pumps.

Functions associated with the SI system include the following:

- introduces emergency negative reactivity to make the reactor subcritical by increasing the boron concentration, or by delivering borated water
- maintains the reactor coolant pressure boundary integrity during all modes of plant operation
- provides emergency core coolant by delivering borated cooling water to the RCS during the injection phase of SI to support core cooling
- provides heat removal through the seal water heat exchangers
- provides a primary containment boundary through containment isolation valves that assure that an unrestricted release of radiation does not occur
- provides the liquid capacity to provide emergency heat removal from the primary containment
- provides containment pressure control

The failure of nonsafety-related SSCs in the system could prevent the satisfactory accomplishment of a safety-related function. In addition, the SI system performs functions that support environmental qualification and fire protection.

Intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered
- provides for mechanical closure integrity on bolted joints
- provides for heat transfer
- provides for flow restriction

In LRA Table 2.3.2-1, as modified by letter dated April 29, 2005, the applicant identified the following SI system component types that are within the scope of license renewal and subject to an AMR:

- CS components
- fasteners and bolting
- flow elements
- heat exchanger
- instrument valve assemblies
- level elements
- piping and fittings
- pump casing
- restricting orifices
- tanks
- valve bodies
- level gauges

2.3.2.1.2 Staff Evaluation

The staff reviewed LRA Section 2.3.2.1 and FSAR Sections 4.1, 5.2, 6.2, and 9.1.1. The staff's review, using the evaluation methodology described in SER Section 2.3, was conducted in accordance with the guidance described in NUREG-1800, Section 2.3.

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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). As a result of the implementation of the scoping methodology changes, by letter dated April 29, 2005, the applicant identified additional component types within the scope of license renewal. 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).

2.3.2.1.3 Conclusion

The staff reviewed the LRA and the April 29, 2005, letter 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 of the 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 SI 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 SI system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.2.2 Containment Spray 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 spray (CS) system. The CS system is designed to remove sufficient heat from the containment atmosphere following an accident condition in order to maintain the containment pressure within design limits. The CS system, in conjunction with the sodium hydroxide (NaOH) tank, is also capable of reducing the iodine in the containment atmosphere such that the offsite radiation exposure resulting from a loss-of-coolant accident (LOCA) is within the guidelines established by 10 CFR Part 100. The addition of NaOH is also credited to reduce the pH levels within the containment sump in order to prevent chloride stress corrosion cracking (SCC). The system initially takes suction from the refueling water storage tank (RWST). When a low level is reached in the tank, the spray pump suction is fed from the discharge of residual heat removal (RHR) pumps if continued spray is required.

The portions of the CS system containing components subject to an AMR extend from the pump suction supplies, the RWST or the RHR pump discharge, to the spray headers. The system also includes the NaOH tank, eductors, and spray pumps.

Functions associated with the CS system include the following:

- provides heat removal and/or a pressure boundary for the safety-related seal water heat exchangers
- provides a primary containment boundary that can prevent the release of radioactivity into the environment
- delivers buffered cooling water to the containment spray headers during the injection phase of safety injection to support containment cooling and ensure that containment pressure does not exceed its design value
- delivers water during the injection phase for removal of elemental iodine from the containment atmosphere in the event of a LOCA

In addition, the CS system performs functions that support environmental qualification and fire protection.

Intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered
- provides for mechanical closure integrity on bolted joints
- provides for heat transfer
- provides for flow restriction
- provides for flow control or distribution, as through a spray nozzle

In LRA Table 2.3.2-2, as modified by letter dated April 29, 2005, the applicant identified the following CS system component types that are within the scope of license renewal and subject to an AMR:

- eductor
- fasteners and bolting
- flow elements
- heat exchanger
- instrument valve assemblies
- piping and fittings
- pump casing
- restricting orifices
- spray nozzle
- tanks
- valve bodies
- CS components
- level gauges

2.3.2.2.2 Staff Evaluation

The staff reviewed LRA Section 2.3.2.2 and FSAR Sections 5.2, 6.4, 9.1.1, and Appendix C. The staff's review, using the evaluation methodology described in SER Section 2.3, was conducted in accordance with the guidance described in NUREG-1800, Section 2.3.

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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). As a result of the implementation of the scoping methodology changes, by letter dated April 29, 2005, the applicant identified additional component types within the scope of license renewal. 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).

2.3.2.2.3 Conclusion

The staff reviewed the LRA and the April 29, 2005, letter 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 of the 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).

2.3.2.3 Residual Heat Removal System

2.3.2.3.1 Summary of Technical Information in the Application

In LRA Section 2.3.2.3, the applicant described the residual heat removal (RHR) system. The RHR system is a dual-purpose system, as it operates as a portion of the SI system during normal operations and also operates by removing reactor decay heat during plant cooldown, shutdown, and refueling operations. The RHR system's pumps and valves automatically deliver

borated water to the reactor vessel for cooling under low RCS pressure conditions. After the injection phase, the RHR pumps will take suction from the containment sump, circulate the spilled coolant through the RHR heat exchangers, and return the coolant to the reactor via the reactor vessel nozzles. For normal plant cooldown and shutdown, the RHR system is designed to transfer the fission product decay heat and other residual heat from the reactor core to the component cooling water system. There are Class 1 boundary components within the high temperature RCS envelope that carry RHR equipment designations. These components are addressed in the Class 1 piping/components system. The RHR system is a standby system during normal plant operation.

The portions of the RHR system containing components subject to an AMR extend from the RHR pump suction supplies from the RWST, or the containment sump, to the system inter-connections to the RCS, and, for recirculation operation, to the SI and CS pump suction supply.

Functions associated with the RHR system include the following:

- maintains a reactor coolant pressure boundary during all modes of operation
- removes residual heat from the RCS
- removes decay heat from the RCS for mitigating the radiological consequences of the rupture of a control rod mechanism housing (rod control cluster assembly (RCCA) ejection), locked rotor, main steam line break, SG tube rupture accident
- delivers borated cooling water to the RCS during the emergency core cooling system (ECCS) injection phase to support core cooling
- provides for heat removal from the safety-related seal water heat exchangers
- provides a primary containment boundary that can prevent the release of radioactivity into the environment
- provides emergency heat removal from the primary containment
- provides containment pressure control by supplying water to the suction of the containment spray pumps when in recirculation mode

In addition, the RHR system performs functions that support environmental qualification and fire protection.

Intended functions within the scope of license renewal include the following:

- provides for heat transfer
- provides a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered
- provides for flow restriction

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

- heat exchanger
- instrument valve assemblies
- piping and fittings
- pump casing
- restricting orifice
- sump screen

- tanks
- thermowells
- valve bodies
- valve operator
- CS components
- fasteners and boltings
- filters and strainers
- flow elements

2.3.2.3.2 Staff Evaluation

The staff reviewed LRA Section 2.3.2.3 and FSAR Sections 5.2, 6.2, 6.4.2, 9.1.1, and 9.2. The staff's review, using the evaluation methodology described in SER Section 2.3, was conducted in accordance with the guidance described in NUREG-1800, Section 2.3.

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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 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).

2.3.2.3.3 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 of the 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).

2.3.2.4 Containment Isolation Components System

2.3.2.4.1 Summary of Technical Information in the Application

In LRA Section 2.3.2.4, the applicant described the containment isolation components system. The containment isolation components system was created as a virtual system for those systems whose only safety-related function is to provide a containment isolation function. Each system whose piping penetrates the containment leakage-limiting boundary is designed to maintain or establish isolation of the containment from the outside environment under any accident condition, for which isolation is required. Piping penetrating the containment is designed for pressures at least equal to the containment design pressure. Containment isolation boundaries are provided, as necessary, in lines penetrating the containment to ensure that no unrestricted release of radioactivity can occur. Components addressed within the containment isolation components system include: containment penetration isolation valves, test flanges, caps, and associated piping and valves to support the system's intended functions. The system also includes: demineralized water penetrations, radiation monitoring system containment air sample penetrations, spare containment penetrations, and tubing and valves that support air-lock testing.

The portions of the containment isolation components system containing items subject to an AMR extend between the penetration isolation valves. These include penetration test valves, flanges, and piping for demineralized water subsystem penetrations, radiation monitoring system containment air sample penetrations, spare containment penetrations, and associated airlock support equipment.

The containment isolation components system provides a primary containment boundary to prevent the release of radioactivity into the environment. In addition, the containment isolation components system performs functions that support environmental qualification.

Intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered
- provides for mechanical closure integrity on bolted joints

In LRA Table 2.3.2-4, the applicant identified the following containment isolation system component types that are within the scope of license renewal and subject to an AMR:

- CS components
- fasteners and bolting
- piping and fittings
- valve bodies

2.3.2.4.2 Staff Evaluation

The staff reviewed LRA Section 2.3.2.4 and FSAR Section 5.2. The staff's review, using the evaluation methodology described in SER Section 2.3, was conducted in accordance with the guidance described in NUREG-1800, Section 2.3.

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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 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 of the 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 components 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 components system 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 (SCs) of the auxiliary systems that are subject to an AMR for license renewal.

The applicant described the supporting SCs of the auxiliary systems in the following LRA sections:

- 2.3.3.1 chemical volume and control system
- 2.3.3.2 component cooling water system
- 2.3.3.3 spent fuel cooling system
- 2.3.3.4 waste disposal system
- 2.3.3.5 service water system
- 2.3.3.6 fire protection system
- 2.3.3.7 heating steam system
- 2.3.3.8 emergency power system
- 2.3.3.9 containment ventilation system
- 2.3.3.10 essential ventilation system
- 2.3.3.11 treated water system
- 2.3.3.12 circulating water system
- 2.3.3.13 fuel handling system
- 2.3.3.14 plant sampling system
- 2.3.3.15 plant air system
- 2.3.3.16 containment hydrogen detectors and recombiner system

The corresponding subsections of this SER (2.3.3.1 – 2.3.3.16) present the staff's review findings with respect to the auxiliary systems for both Units 1 and 2.

2.3.3.1 Chemical Volume and Control System

2.3.3.1.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.1, the applicant described the chemical volume and control system (CVCS). The CVCS controls and maintains the RCS inventory and purity through the process of charging and letdown. The system also provides seal injection flow to the reactor coolant pump (RCP) seals. In addition to the reactivity control achieved by the control rods, the CVCS also provides reactivity control by regulating the concentration of boric acid solution in the RCS. In order to perform the above functions, a continuous feed-and-bleed process (charging and letdown) is maintained between the RCS and the CVCS.

The portions of the CVCS containing components subject to an AMR extend from the RWST to the RCS, and also from the RCS to system containment isolation valves (CIVs), including the pumps, heat exchangers (HXs), piping, and valves.

The in-scope portion of the CVCS system includes the flow path from the RWST, through the charging pumps, into the RCS. CVCS lines coming from the RCS are in-scope through the CIVs.

Functions associated with the CVCS include the following:

- provides a reactor coolant pressure boundary
- provides for heat removal and/or a pressure boundary for the safety-related heat exchangers (excess letdown, nonregenerative, and RCP seal water HXs)
- provides a primary containment boundary that isolates the containment

The failure of nonsafety-related SSCs in the system could prevent the satisfactory accomplishment of a safety-related function. In addition, the CVCS system performs functions that support environmental qualification, fire protection, and station blackout.

Intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered
- provides for mechanical closure integrity on bolted joints
- provides for filtration

In LRA Table 2.3.3-1, as modified by letter dated April 29, 2005, the applicant identified the following CVCS component types that are within the scope of license renewal and subject to an AMR:

- CS components
- fasteners and bolting
- filters and strainers
- flow elements
- heat exchanger
- instrument valve assemblies
- piping and fittings
- pump casing
- tanks
- thermowells
- valve bodies
- level gauges

2.3.3.1.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.1 and the FSAR. The staff's review, using the evaluation methodology described in SER Section 2.3, was conducted in accordance with the guidance described in NUREG-1800, Section 2.3.

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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). As a result of the implementation of the scoping methodology changes, by letter dated April 29, 2005, the applicant identified additional component types within the scope of license renewal. 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).

2.3.3.1.3 Conclusion

The staff reviewed the LRA and the April 29, 2005, letter 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 of the 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 CVCS components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the CVCS components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.2 Component Cooling Water System

2.3.3.2.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.2, the applicant described the component cooling water (CCW) system. The CCW system provides heat removal capability to support the operation of Units 1 and 2.

The CCW system removes residual and sensible heat from the RCS via the RHR heat exchangers during the recirculation phase of safety injection in order to support long-term core cooling.

Functions associated with the CCW system include the following:

- removes heat from the residual heat, safety injection, and containment spray pump seal coolers to maintain the integrity of the pump seals
- precludes containment leakage through the CCW system piping penetrations following accidents in order to limit the release of radioactive materials
- removes heat from the reactor coolant pump (RCP) thermal barrier cooling coils in order to ensure RCS integrity
- removes heat from the RHR heat exchangers to mitigate the consequences of a postulated main steam line break (MSLB) or steam generator tube rupture (SGTR) accident

A spare component cooling (CC) pump motor with power cables is provided for a repair if a fire causes damage to all four CC pumps. It should be noted that these Appendix R components are addressed in the electrical AMR. The CC system is seismic Class 1 design with the exception of the CC branch lines to various radwaste components. Recent leak-before-break (LBB) analyses have allowed the CC system to be classified as a closed loop inside containment.

The portions of the CCW system containing components subject to an AMR extend from the supply header to the return header, and include pumps, heat exchangers, equipment coolers, surge tanks, piping, and valves.

The CCW system provides heat removal from safety-related heat exchangers. The failure of nonsafety-related SSCs in the system could prevent the satisfactory accomplishment of a

safety-related function. In addition, the CCW system performs functions that support fire protection, environmental qualification, and station blackout.

Intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered
- provides for mechanical closure integrity on bolted joints
- provides for heat transfer

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

- CS components
- fasteners and bolting
- flow elements
- heat exchanger
- instrument valve assemblies
- piping and fittings
- pump casing
- radiation monitor
- tanks
- thermowells
- valve bodies

2.3.3.2.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.2 and FSAR Sections 9.1 and 5.2. The staff's review, using the evaluation methodology described in SER Section 2.3, was conducted in accordance with the guidance described in NUREG-1800, Section 2.3.

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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 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 2.3.3.2 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.

RAI 2.3.3.2-1. FSAR Section 9.1 states that the CCW system removes heat from the RCP thermal barrier cooling coils to ensure reactor coolant system integrity. Drawings LR-110E029, sheet 2 (quadrants B-5 and B-8), Note 3 and LR-110E018, sheet 2 (quadrants B-5 and B-8), Note 6, indicate a Swagelock 1 ¼-inch diameter, stainless steel, flexible metal hose is used as a piping component on the inlet and outlet of the RCPs. This flexible metal hose is shown on the drawings as within the scope of license renewal. If these hoses have been screened in and included as passive components, then LRA Table 3.3.2-2 (Auxiliary Systems - Component Cooling Water System - Summary of Aging Management Evaluation) should have included an entry for stainless steel piping and fittings in this environment. No such entry could be found. Therefore, it is not clear if these flexible metal hose connectors are included in LRA

Table 2.3.3-2 as part of the piping and fittings component group. A degraded flexible metal hose connector could adversely impact the pressure boundary function of the CCW system. In RAI 2.3.3.2-1, dated November 10, 2004, the staff requested the applicant to clarify whether these flexible metal hose connectors are included in LRA Table 2.3.3-2 as part of the piping and fittings component group and are considered to be within the scope of license renewal and subject to an AMR.

In its response, dated December 14, 2004, the applicant stated that since the flexible metal hoses did not have a unique component identification number, these components were not included in LRA Table 3.3.2-2 during the initial reviews for license renewal. The applicant further stated that these flexible metal hoses are within the scope of license renewal and subject to aging management. As part of its LRA annual update, the applicant will add line items to Table 3.3.2-2 to include stainless steel material under the component type "Piping and Fittings" to address this flexible tubing. The applicant also stated that the flexible tubing will be age-managed similar to other stainless steel components in the CCW system, via a combination of the Closed Cycle Cooling Water Program and the One-Time Inspection Program.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.2-1 acceptable. The staff also agreed that adding additional line items to the "Piping and Fitting" component type category in LRA Table 3.3.2-2 is appropriate for stainless steel flexible hoses. The flexible stainless steel tubing AMR is addressed in SER Section 3.3. The staff's concern described in RAI 2.3.3.2-1 is resolved.

2.3.3.2.3 Conclusion

The staff reviewed the LRA, accompanying scoping boundary drawings, and the RAI response described above 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 of the 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 CCW 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 CCW system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.3 Spent Fuel Cooling System

2.3.3.3.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.3, the applicant described the spent fuel (SF) cooling system. The SF cooling system is designed to remove decay heat produced by irradiated fuel assemblies stored in the spent fuel pool (SFP). The SF cooling system consists of two separate trains that share a common suction and return header. Each system possesses an identical heat exchanger and pump and the associated piping and valves to support the system's intended functions. Water from the pool is pumped through one or both heat exchangers for cooling and returned to the pool. When purification is required, a portion of the flow is diverted through the interconnecting

SF purification subsystem. Service water (SW) is provided to the heat exchangers for removal of decay heat, although SW can be interrupted during accident conditions.

Portions of the SF cooling system containing components subject to an AMR extend from the suction header to the return header and include the pumps, heat exchangers, piping and valves (including the fuel transfer tube isolation valves).

The SF cooling system ensures that SFP is adequately cooled by removing decay heat from the irradiated fuel assemblies. The failure of nonsafety-related SSCs in the system could prevent the satisfactory accomplishment of a safety-related function. In addition, the SF cooling system performs functions that support fire protection.

Intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered
- provides for mechanical closure integrity on bolted joints
- provides for heat transfer

In LRA Table 2.3.3-3, as modified by letter dated April 29, 2005, the applicant identified the following SF cooling system component types that are within the scope of license renewal and subject to an AMR:

- CS components
- fasteners and bolting
- flow element
- heat exchanger
- instrument valve assemblies
- piping and fittings
- pump casing
- valve bodies
- filters and strainers
- tanks

2.3.3.3.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.3 and FSAR Section 9.9. The staff's review, using the evaluation methodology described in SER Section 2.3, was conducted in accordance with the guidance described in NUREG-1800, Section 2.3.

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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). As a result of the implementation of the scoping methodology changes, by letter dated April 29, 2005, the applicant identified additional component types within the scope of license renewal. 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 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.

RAI 2.3.3.3-1. FSAR, Section 9.9.2, System Design and Operation (paragraph 2) states, "The spent fuel pool cooling system piping and service water system piping supplying the spent fuel pool heat exchangers are classified as safety-related, seismic Class 1." SFP drawing LR-110E018, sheet 4 (quadrant H-5) shows that the SW discharge piping from the SFP cooling heat exchangers (HX-13A and HX-13B), downstream of the flow control valves, as not within the scope of license renewal. This is inconsistent with SW system drawing LR-M-207, sheet 3 that shows the piping downstream of the discharge flow control valves as in-scope. In RAI 2.3.3.3-1, dated November 10, 2004, the staff requested the applicant to clarify whether this section of the SW piping at the boundaries of the SF cooling system is within the scope of license renewal or to provide justification for its exclusion from the scope.

In its response, dated December 14, 2004, the applicant stated that drawing LR-110E018, sheet 4 (quadrant H-5) was in error, and that the SW discharge piping from the SF cooling heat exchangers (HX-13A and HX-13B), downstream of the flow control valves, is within the scope of license renewal and subject to aging management. The applicant further stated that drawing LR-110E018, sheet 4 was revised and the error is being tracked in its corrective action program.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.3-1 acceptable. The applicant sufficiently clarified that the SW discharge piping from the SF cooling heat exchangers (HX-13A and HX-13B), downstream of the flow control valves, is within the scope of license renewal. Therefore, the staff's concern described in RAI 2.3.3.3-1 is resolved.

RAI 2.3.3.3-2. The SF cooling piping network downstream of the heat exchangers has a branch going to out-of-scope piping and components leading from the skimmer pump. Drawing LR-110E018, sheet 4 (quadrant F-2) shows the in-scope boundary stopping in the middle of a piping run and not including skimmer pump discharge isolation valve 793A. Other branch lines leading off of the SF cooling system include at least one isolation valve within the scope of license renewal. Failure of the out-of-scope piping or the out-of-scope skimmer pump system may affect the pressure boundary integrity intended function of this piping segment. In RAI 2.3.3.3-2, dated November 10, 2004, the staff requested the applicant to justify the determination to exclude the piping up to and including valve 793A from the scope of license renewal.

In its response, dated December 14, 2004, the applicant stated that the in-scope portion of the branch connection referred to in RAI 2.3.3.3-2 includes isolation valve #28 (LR-110E018, sheet 4, location G-3), which functions as a safety-related license renewal boundary valve for this system. The applicant stated that, should leakage develop in either the skimmer pump branch piping or the demineralizer return branch piping, valve #28 can be shut to maintain the intended functions of the SF cooling system (pumps, HXs, etc.). Also, portions of these branch connections were included in-scope for 10 CFR 54.4(a)(2) because of the potential for leakage or spray to affect the safety-related SFP pumps. The in-scope portions of these nonsafety-related branch connections were determined during plant walkdowns, and the transition from in-scope to out-of-scope piping are shown at the points where the branch lines exited the SF pump room/area. According to the applicant, the failure of the out-of-scope piping or skimmer pump subsystem will have no effect on the intended functions of the SF cooling system.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.3-2 acceptable. The applicant verified by plant walkdown that the in-scope portions of the nonsafety-related branch connections, identified on drawing LR-110E018, were consistent with plant as-built configurations, and that failure of the out-of-scope piping and valve #793A would not impact the intended functions of the SF cooling system. Therefore, the staff's concern described in RAI 2.3.3.3-2 is resolved.

2.3.3.3.3 Conclusion

The staff reviewed the LRA, accompanying scoping boundary drawings, the April 29, 2005, letter, and the RAI responses described above 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 of the 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 SF 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 SF cooling system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.4 Waste Disposal System

2.3.3.4.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.4, the applicant described the waste disposal (WD) system. The WD system provides all the equipment necessary to collect, process, and prepare for the disposal all potentially radioactive liquid, gaseous, and solid wastes produced as a result of plant operation. Radioactive fluids entering the WD system are collected in sumps and tanks until determination of subsequent treatment methods can be made. Design of the WD system is based on assurance that the consequences of a radioactive release from a subsystem or component do not pose a hazard to public health and safety.

The portions of the WD system containing components subject to an AMR include the waste gas and waste liquid containment penetration isolation components, heat exchangers with CCW interfaces, and the essential piping and valves credited for flood control and SW system isolation from WD system components.

Functions associated with the WD system include the following:

- provides for pressure boundary of safety-related heat exchangers
- provides a primary containment boundary to prevent the release of radioactivity into the environment

The failure of nonsafety-related SSCs in the system could prevent the satisfactory accomplishment of a safety-related function. In addition, the WD system performs functions that support environmental qualification.

Intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered
- provides for mechanical closure integrity on bolted joints

In LRA Table 2.3.3-4, as modified by letter dated April 29, 2005, the applicant identified the following WD system component types that are within the scope of license renewal and subject to an AMR:

- CS components
- fasteners and bolting
- flow indicators
- heat exchanger
- instrumentation
- piping and fittings
- radiation monitor
- valve bodies
- compressor casing
- drain traps
- restricting orifices
- filters and strainers
- level gauges
- pump casing
- sight glass
- tanks

2.3.3.4.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.4 and FSAR Sections 5.2, 11.1, 11.2, and 11.3. The staff's review, using the evaluation methodology described in SER Section 2.3, was conducted in accordance with the guidance described in NUREG-1800, Section 2.3.

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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). As a result of the implementation of the scoping methodology changes, by letter dated April 29, 2005, the applicant identified additional component types within the scope of license renewal. 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 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.

RAI 2.3.3.4-1. The FSAR states that the WD system discharge to the SW system has an automatic isolation function to prevent exceeding 10 CFR Part 20 and 10 CFR Part 100 limits due to high effluent radioactivity. LRA Section 2.3.3.4 states that piping and valves credited for SW isolation from WD system components are within the scope of license renewal. However, drain isolation valve WL-1785A and its inter-tie piping to the WD system are shown as not within the scope of license renewal on drawing LR-684J971, sheet 2, (Unit 1 & 2 Waste & Blowdown Evaporator Distillate Process System), at location A-9. Failure of valve WL-1785A and its associated piping could cause a loss of this 10 CFR Part 20 and 10 CFR Part 100 required function. In RAI 2.3.3.4-1, dated November 16, 2004, the staff requested the applicant

to justify its determination to exclude valve WL-1785A and its associated piping from the scope of license renewal.

In its response, dated December 22, 2004, the applicant stated that the failure to identify drain isolation valve WL-1785A and its associated piping as in-scope on drawing LR-684J971, sheet 2 was a highlighting error. The applicant stated that these components are within the scope of license renewal, subject to aging management, and represented by the "Valve Bodies" and "Piping and Fittings" component types in LRA Table 3.3.2-4. The applicant further stated that the above drawing was revised and the error is being tracked in its corrective action program. Based on this discussion, the staff found the applicant's response to RAI 2.3.3.4-1 acceptable, and resolved.

RAI 2.3.3.4-2. The FSAR states WD system discharge to the SW system has an automatic isolation function to prevent exceeding 10 CFR Part 20 and 10 CFR Part 100 limits due to high effluent radioactivity. LRA Section 2.3.3.4 states that piping and valves credited for SW system isolation from WD components are within the scope of license renewal. However, drawing LR-PBM-231, sheet 1 (Units 1 and 2 de-ionized and reactor water makeup water) at location F-7, indicates that valve RWM1249A and its downstream piping is not within the scope of license renewal. Failure of valve RWM1249A and its downstream piping could cause a loss of the 10 CFR Part 20 and 10 CFR Part 100 required function. In RAI 2.3.3.4-2, dated November 16, 2004, the staff requested the applicant to justify its determination to exclude valve RWM1249A and its downstream piping from the scope of license renewal.

In its response, dated December 22, 2004, the applicant stated that valve RMW-1249A and its associated piping are within the scope of license renewal and subject to aging management. These components are represented by the "Valve Bodies" and "Piping and Fittings" component types in LRA Table 3.3.2-4. The applicant explained that failure to highlight these components as within the scope of license renewal on drawing LR-PBM-231, sheet 1 was an error. However, these components are highlighted on another (continuation) drawing LR-684J971, sheet 2 depicting that they are within the scope of license renewal. According to the applicant, the drawing LR-PBM-231, sheet 1 was revised and the error is being tracked in its corrective action program. Based on this discussion, the staff found the applicant's response acceptable. The staff's concern described in RAI 2.3.3.4-2 is resolved.

RAI 2.3.3.4-3. LRA Section 2.3.3.4 states that principal components of the WD system within the scope of license renewal include the heat exchangers with CCW system interfaces and the piping and valves that are credited for SW system isolation from WD system components. Drawing LR 684J971, sheet 1, Units 1 and 2, at location C-3 indicates that the following components are not within the scope of license renewal: the SW supply to HX 702 (boric acid waste evaporator vacuum system heat exchanger), the interface with the HX, and the interface isolation valve BS VA37. This is contrary to the information provided in the LRA and drawing LR-M-2207, sheet 1, Unit 2 service water at location A-9, which indicate these components are within the scope of license renewal. Failure of these components could adversely impact the isolation functions between the WD system and other interfacing systems. In RAI 2.3.3.4-3, dated November 16, 2004, the staff requested the applicant to justify its determination for not considering these components to be within the scope of license renewal.

In its response, dated December 22, 2004, the applicant stated that the heat exchanger HX-702, the valve BS-VA37, and associated piping are within the scope of license renewal as

highlighted on drawing LR-2207, sheet 1 and are subject to aging management. The applicant explained that failure to identify these components as in-scope on drawing LR-684J971, sheet 1 was a highlighting error. The applicant also stated that valve BS VA37 and the tubes in HX-702 provide the in-scope boundary between SW and WD systems. These components are represented by the "Heaters/Coolers" and "Valve Bodies" component types in LRA Table 3.3.2-5. According to the applicant, drawing LR-684J971, sheet 1 was revised and the error is being tracked in its corrective action program.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.4-3 acceptable. Also, since there are no other SW/WD interface components identified on drawing LR-PBM-231, sheet 1, the staff's concern described in RAI 2.3.3.4-3 is resolved.

RAI 2.3.3.4-4. The following inconsistencies within the WD system designations (shown on the drawings) were identified:

- The print-to-print inter-tie designator from drawing LR-684J971, sheet 2, location A-8 to the service water overboard piping on drawing LR-M-207, sheet 3 is not designated as within the scope of license renewal.
- Drawing LR-684J971, sheet 2, at location C-8 indicates that the piping upstream of valve RWM-1249A as within the scope of license renewal. This is not consistent with drawing LR-PBM-231, sheet 1.
- Drawing LR-684J971, sheet 1, identifies the piping segment upstream of line 1-inch-WD-151R-15 at location E-9 and the piping segment downstream of isolation valve 1708 at location F-9 as within the scope of license renewal. The basis for this determination needs to be explained.

Failure of the above components currently designated as outside the scope of license renewal could have an adverse impact on the intended functions of the WD system. In RAI 2.3.3.4-4, dated November 16, 2004, the staff requested the applicant to clarify its determination as to which WD system components, as described above, are within the scope of license renewal.

In its response, dated December 22, 2004, the applicant stated the following:

- The print-to-print inter-tie designator on drawing LR-684J971, sheet 2 at location A-8, should have been highlighted to show it as within the scope of license renewal. The applicant explained that failure to identify these components as in-scope on the above drawing was an error, and that the continuation on LR-M-207 shows all necessary components that are in-scope. According to the applicant, drawing LR-684J971, sheet 2 was revised and the error is being tracked in its corrective action program.
- Failure to identify the piping upstream of valve RWM-1249A as in-scope on drawing LR-PBM-231, sheet 1, was a drawing error. The valve RWM-1249A and its associated piping are within the scope of license renewal and represented by the "Valve Bodies" and "Piping and Fittings" component types in LRA Table 3.3.2-4.
- Based on 10 CFR 54.4(a)(2) criteria, these piping segments were identified to be within the scope of license renewal during a plant walkdown, and are shown in LRA Table 2.1.2.1-1, page 2-28, second line-item from the bottom. The applicant determined that there was a potential for leakage or spray that could affect the safety-related

equipment. Additionally, the transition from in-scope to out-of-scope piping shown on drawing LR-684J971, sheet 1 is intended to show the points where the branch lines exit the room or area containing safety-related equipment.

Based on the above discussion, the staff found the applicant's responses to RAI 2.3.3.4-4 acceptable. The applicant clarified that failure to identify the discussed components as within the scope of license renewal was a drawing error. Therefore, the staff's concerns described in RAI 2.3.3.4-4 are resolved.

2.3.3.4.3 Conclusion

The staff reviewed the LRA, accompanying scoping boundary drawings, the April 29, 2005, letter, and the RAI responses described above 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 of the 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 WD 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 WD system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.5 Service 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 service water (SW) system. The SW system provides cooling water to various essential and non-essential services throughout the plant. The six motor-driven SW pumps take their suction from the pump bays in the circulating water pump house (CWPH), draw raw water from Lake Michigan, and discharge it into a loop supply header. This supply header is capable of being split, via isolation valves, into two separate headers. Essential services are capable of being supplied from either header. Non-essential services are capable of being automatically isolated from the supply headers. The return lines discharge to the cooling water discharge in Unit 1 and/or Unit 2. Under the conditions of a LOCA, the SW system can provide the necessary cooling capacity for the essential heat loads of the affected unit and supply SW for the normal operation of the unaffected unit (this situation describes the most limiting heat load for the SW system).

The portions of the SW system containing components subject to an AMR extend from the pump bays to the circulating water discharge, including connections to the suction of the auxiliary feedwater (AFW) pumps, or the fire protection system; and includes pumps, heat exchangers, strainers, piping, and valves.

Functions associated with the SW system include the following:

- provides an emergency supply of water to the AFW pumps when the normal condensate supply is exhausted
- provides heat removal from and/or a pressure boundary for safety-related heat exchangers
- provides a primary containment boundary to prevent the release of radioactivity into the environment
- provides for emergency heat removal from the primary containment
- provides pressure control
- maintains emergency temperatures within areas containing safety Class 1, 2, and 3 components, including the primary auxiliary building battery room and HVAC heat exchangers in the essential ventilation system
- provides cooling water to spent fuel pool cooling water heat exchanges for decay heat removal

The failure of nonsafety-related SSCs in the system could prevent the satisfactory accomplishment of a safety-related function. In addition, the SW system performs functions that support fire protection.

Intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered
- provides for mechanical closure integrity on bolted joints
- provides for filtration
- provides for heat transfer
- provides for flow restriction

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

- CS components
- expansion joints
- fasteners and bolting
- filters and strainers
- flow elements
- flow indicators
- heat exchanger
- heaters and coolers
- hose reel
- instrument valve assemblies
- piping and fittings
- pump casing
- radiation monitor
- restricting orifices
- sight glass
- thermowells
- valve bodies

2.3.3.5.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.5 and FSAR Section 9.6. The staff's review, using the evaluation methodology described in SER Section 2.3, was conducted in accordance with the guidance described in NUREG-1800, Section 2.3.

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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 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 2.3.3.5 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.

RAI 2.3.3.5-1. FSAR Section 9.6 states that the SW system shall provide sufficient flow to support the heat removal requirements of components required to mitigate the consequences of a LOCA in one unit, while supporting the normal flow of the unaffected unit. Drawing LR-M-207, sheet 1A shows three pipe stubs without isolation valves off the SW pressure boundary (listed below) as not within the scope of license renewal. LRA Section 2.3.3.5 states that the SW piping and fittings are in-scope as a pressure boundary. Failure of these sections of piping could affect the pressure boundary function of the SW system. In RAI 2.3.3.5-1, dated November 10, 2004, the staff requested the applicant to justify why the three piping areas listed below are not within the scope of license renewal and subject to an AMR:

(1) cap on 4-inch-JB-2 piping, location G-5
(2) pipe stub and cap downstream of valve SW-48, location C-4
(3) pipe stub and cap downstream of valve SW-57, location D-4

In its response, dated December 14, 2004, the applicant stated that the piping and fittings in RAI-2.3.3.5-1 not shown as within the scope of license renewal on drawing LR-M-207, sheet 1A are highlighting errors. According to the applicant, these components are considered to be in-scope and are represented in LRA Table 3.3.2-5 under the "Piping and Fittings" component type, and managed by the open-cycle cooling water system aging management program. Additionally, the applicant stated that the above drawing was revised and the errors are being tracked in its corrective action program.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.5-1 acceptable. The applicant confirmed that three piping areas identified in the RAI are within the scope of license renewal. Therefore, the staff's concerns described in RAI 2.3.3.5-1 are resolved.

RAI 2.3.3.5-2. SW drawing LR-M-207, sheets 1, 2, and 3, show seven valve actuators as outside the scope of license renewal. LRA Section 2.3.3.5 states that the SW valve bodies are in-scope as a pressure boundary. The seven valve actuators are not shown in a manner that is consistent with other similar valves in the SW system. In RAI 2.3.3.5-2, dated November 10, 2004, the staff requested to clarify which portions of these seven valves (listed below) have pressure boundary functions, and should be within the scope of license renewal and subject to an AMR.

(1) Actuator for BS-2911, drawing LR-M-207, sheet 1, location G-3
(2) Actuator for valve SW-1-401G, drawing LR-M-207, sheet 2, location F-7

(3) Actuator for strainer Z-104A, drawing LR-M-207, sheet 2, location G-6
(4) Actuator for valve SW-12A, drawing LR-M-207, sheet 3, location E-9
(5) Actuator for valve TCV-12B, drawing LR-M-207, sheet 3, location E-7
(6) Actuator for valve TCV-12C, drawing LR-M-207, sheet 3, location E-7
(7) Actuator for valve SW-12D, drawing LR-M-207, sheet 3, location E-6

In its response, dated December 14, 2004, the applicant stated that the pressure boundary portion (valve body or strainer body) of all the valves listed in RAI-2.3.3.5-2, Items 1-7 are identified as within the scope of license renewal and are being age-managed as noted in the applicable line items of LRA Table 3.3.2-5. The applicant also stated that the actuators would not affect the pressure boundary function of these components and that these actuators were originally shown to be out-of-scope based on their CLB functions. The applicant provided the following details:

1 The motor operators for Zurn strainers BS-2911 and BS-2912 were originally considered to be outside the scope of license renewal based on the PBNP Q-list (*i.e.*, CLB). According to the applicant, this CLB position is being evaluated, and should this change in the future to show these operators/actuators as within the scope of license renewal, no aging management would be required as these operators are active components. However, the bodies of these strainers were originally included within the scope of license renewal, and are represented in LRA Table 3.3.2-5 by the 'Filters/Strainers' component type, which have both a "Pressure Boundary" and a "Provide Filtration" component intended function.

2, 3 These two actuators are associated with the nonsafety-related Zurn strainer that supplies non-essential SW to the Unit 1 Turbine Hall loads. Because of their location in the auxiliary feedwater (AFW) pump room and their potential to affect safety-related equipment in this room via water leakage, spray, or flooding, these components were shown to be within the scope of license renewal due to 10 CFR 54.4(a)(2) criterion. The only license renewal intended function, therefore, is pressure boundary, which is addressed in LRA Table 3.3.2-5 under the "Valve Bodies" and "Filters/Strainers" component types. These actuators have no effect on the pressure boundary and are, therefore, outside the scope of license renewal and not subject to an AMR.

4 - 7 These four actuators are for flow control valves SW-12A, TCV-12B, TCV-12C, and SW-12D that are used to control CCW outlet temperatures by throttling SW flow through the CCW heat exchangers. All these actuators are fail-open, and were determined not to have the potential to affect the pressure boundary of respective valve body. According to the applicant, even if these actuators were considered to be within the scope of license renewal, since they are active components, no aging management would be required. The pressure boundary portions (*i.e.*, valve bodies) for all four of these valves are in-scope, and are represented by the "Valve Bodies" component type in LRA Table 3.3.2-5.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.5-2 acceptable. The applicant clarified that each of the valve actuators listed in the RAI is non-pressure retaining active component, and their failure will not affect the pressure retaining capabilities of the associated components. The staff also agrees that because these motor operators/actuators are non-pressure retaining active components, no passive component

aging management program is required. Therefore, the staff's concerns described in RAI 2.3.3.5-2 are resolved.

RAI 2.3.3.5-3. FSAR Section 9.6.2 states that the SW system, serving both units, supplies cooling water to equipment in the steam plant, to the containment ventilation coolers and to reactor auxiliary systems. Non-essential services in each unit receive water from their respective SW header (north or south). Drawing LR-M-207, sheet 2 shows equipment around strainer Z-104A as within the scope of license renewal. LRA Section 2.3.3.5 states that portions of the SW system contain components subject to an AMR. These components extend from the pump bays to the circulating water discharge, including connections to the suction of the AFW pumps, or the fire protection system, including pumps, heat exchangers, strainers, piping, and valves. The staff determined that the transition location from out-of-scope to in-scope is not clearly marked for the following two locations:

(1) 3-inch-JB-1, drawing LR-M-207, sheet 2, location F-6
(2) 6-inch-JB-1, drawing LR-M-207, sheet 2, location F-7

In RAI 2.3.3.5-3, dated November 10, 2004, the staff requested the applicant to clarify the exact locations of these two transitions and which sections are within the scope of license renewal.

In its response, dated December 14, 2004, the applicant stated that the piping sections identified in RAI 2.3.3.5-3, Items 1 and 2 are associated with the nonsafety-related Zurn strainer Z-104A that supplies non-essential SW to the Unit 1 turbine hall loads. Because of their location in the AFW pump room and their potential to affect safety-related equipment in this room via leakage, spray, or flooding, the applicant stated that these piping and associated components were shown to be within the scope of license renewal pursuant to 10 CFR 54.4(a)(2). The applicant stated that the in-scope portions of these nonsafety-related piping sections, although difficult to show on a drawing, were determined by plant walkdown, and the transition locations shown on drawing LR-M-207, sheet 2 represent the points where the piping exited the AFW pump room.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.5-3 acceptable. The applicant verified, by plant walkdown, that the in-scope portions of the non-essential SW piping and components identified on drawing LR-M-207, sheet 2 were consistent with plant as-built configurations, and that the failure of the out-of-scope piping pressure boundary will not impact the intended functions of the safety-related equipment in the AFW pump room. Therefore, the staff's concerns described in RAI 2.3.3.5-3 are resolved.

RAI 2.3.3.5-4. FSAR Section 9.6.1 states that the SW system shall provide sufficient flow to the spent fuel pool heat exchangers to provide adequate heat removal of spent fuel decay heat. On drawing LR-M-207, sheet 3, with regard to the piping downstream of valve SW-750, location C-7, the marking is not legible as to whether this piping is within, or outside the scope of license renewal. In RAI 2.3.3.5-4, dated November 10, 2004, the staff requested the applicant to clearly show which sections are within the scope of license renewal and which are not within the scope of license renewal.

In its response, dated December 14, 2004, the applicant stated that the piping components downstream of valve SW-750 are a pipe stub and cap. SW-750 is a normally closed valve, and the downstream pipe stub and cap are not within the scope of license renewal, since they have no license renewal intended function.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.5-4 acceptable, and is consistent with accepted practices for establishing scope transition boundaries. Therefore, the staff's concern described in RAI 2.3.3.5-4 is resolved.

RAI 2.3.3.5-5. FSAR Section 9.6 states that the return from the SW system is directed to the return line of the circulating water (CW) system. Drawing LR-M-207, sheet 1 shows SW system piping 20-inch-JB-2 returning to the CW system as within the scope of license renewal. LRA Section 2.3.3.5 states that much of the SW return header is not safety-related, but it was included in-scope up to manual isolation valves, pursuant 10 CFR 54.4(a)(2). The transition location from in-scope (SW system) to out-of-scope (CW system) is not clearly marked at the following two locations:

(1) 20-inch-JB-2, drawing LR-M-212, sheet 1, location F-8
(2) 20-inch-JB-2, drawing LR-M-2212, location A-7

In RAI 2.3.3.5-5, dated November 10, 2004, the staff requested the applicant to clarify the exact locations of these two transitions to clearly show which sections are within, and which are outside the scope of license renewal.

In its response dated December 14, 2004, the applicant identified a highlighting error on drawings LR-M-212, sheet 1 and LR-M-2212 where the two transition locations identified were not clearly marked to depict the in-scope and out-of-scope sections of the piping. According to the applicant, the SW return header is within the scope of license renewal up to the CW system return header. This transition is not a valve, since the CW return header is buried underground. Regarding the statement ". . . much of the SW return header is not safety-related, but was included in-scope up to manual isolation valves per Criterion 2 (10 CFR 54.4(a)(2))," the applicant stated that it was intended for above-ground piping components where there could be leakage, spray, or flooding effects. The drawings LR-M-212, sheet 1 and LR-M-2212 were revised and the errors are being tracked in the applicant's corrective action program. The applicant further stated that the CW return header is outside the scope of license renewal as there is no credible age-related failure of the CW return header that could affect the SW system.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.5-5 acceptable. The applicant adequately identified those SW system return header sections that are within the scope of license renewal. Also, the applicant addressed its corrective action program in updating its drawings for the two in-scope transition locations. Therefore, the staff's concerns described in RAI 2.3.3.5-5 are resolved.

2.3.3.5.3 *Conclusion*

The staff reviewed the LRA, accompanying scoping boundary drawings, and the RAI responses described above 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 of the 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).

2.3.3.6 Fire Protection System

2.3.3.6.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.6, the applicant described the fire protection (FP) system. The FP system provides assurance, through defense-in-depth design, that a fire will not prevent the performance of necessary safe-shutdown functions, or significantly increase the risk of the release of radioactivity to the environment during a fire. The FP system provides fire suppression by fixed water-spray and sprinkler systems, fixed gas systems, hose stations, and portable extinguishers located in various areas of the PBNP site. A fire detection and alarm subsystem locally alerts selected areas of the plant and transmits various alarm, supervisory, and trouble signals to the control room. The FP system receives its water supply from Lake Michigan.

The FP system also provides alternate sources of backup water to other plant systems. The FP system supports SBO activities by providing a backup supply of bearing cooling water to the turbine-driven auxiliary feedwater pumps. It can also provide a backup source of water inventory to the spent fuel pool, or a backup supply of feedwater through the use of the diesel-driven fire pump and routing of a fire hose between existing connections on the fire header and the condensate storage tanks. These secondary functions of the FP system do not prohibit the system from performing its primary functions.

The portions of the FP system subject to an AMR include: pumps, piping, valves, accumulator, hose stations, hydrants, spray/sprinkler heads, nozzles, fuel oil day-tank, fuel oil supply to the diesel-driven fire pump, halon gas cylinders, and reactor coolant pump (RCP) oil collection components.

The failure of nonsafety-related SSCs in the system could prevent the satisfactory accomplishment of a safety-related function.

Intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered
- provides for mechanical closure integrity on bolted joints
- provides for filtration
- provides fire protection, as through flame suppression
- provides for heat transfer
- provides for flow control or distribution, as through a spray nozzle

In LRA Table 2.3.3-6, the applicant identified the following FP system component types that are within the scope of license renewal and subject to an AMR:

- accumulators and cylinders
- compressor casing
- CS components
- expansion joints
- fasteners and bolting
- filters and strainers
- fire hydrant
- flame arrestors
- heat exchanger
- hose reel
- instrument valve assemblies
- piping and fittings
- pump casing
- RCP oil collection
- sight glass
- spray nozzles
- sprinkler heads
- tanks
- valve bodies

2.3.3.6.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.6, FSAR Section 9.10, and Fire Protection Evaluation Report (FPER), Revision 3. The staff's review, using the evaluation methodology described in SER Section 2.3, was conducted in accordance with the guidance described in NUREG-1800, Section 2.3.

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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 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, the staff reviewed the Units 1 and 2 FPER, Revision 3, April 2004, approved fire protection SER, dated August 2, 1979, and its fire protection SER supplements. These reports are referenced in its fire protection CLB, which summarizes the fire protection program and its commitments to 10 CFR 50.48 using the guidance of Branch Technical Position (BTP) Auxiliary and Power Conversion Systems Branch (APCSB) 9.5-1, Appendix A, dated August 23, 1976.

The staff's review of LRA Section 2.3.3.6 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.

RAI 2.3.3.6-1. The NRC's "Fire Protection Safety Evaluation Report" dated August 2, 1979, Section 4.3.1, addresses 13 hose stations in various areas of the plant, which do not appear in the LRA drawings. In RAI 2.3.3.6-1, dated September 10, 2004, the staff requested the applicant to verify whether these stations 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). If they are, they should be included in LRA Tables 2.3.3-6 and 3.3.2-6. If they are excluded from the scope of license renewal and not subject to an AMR, then the applicant was requested to provide justification for the exclusion.

In its response, dated October 8, 2004, the applicant stated that the 13 hose stations identified in Section 4.3.1 of the above referenced NRC SER are hose reels HR-35 through HR-47. All 13 of these hose stations are identified on drawing LR-M-208 sheet 2, locations B5, B6, C8, D7, and E4. All of these hose reels are shown to be within the scope of license renewal in accordance with 10 CFR 54.4(a), subject to an AMR in accordance with 10 CFR 54.21(a)(1), and are represented in LRA Tables 2.3.3-6 and 3.3.2-6 under the component type "hose reel."

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.6-1 acceptable. Hose stations have been identified, located and discussed; additionally, the AMR requirements have been identified. Therefore, the staff's concern described in RAI 2.3.3.6-1 is resolved.

RAI 2.3.3.6-2. The NRC's "Fire Protection Safety Evaluation Report" dated August 2, 1979, Sections 4.3.1 and 4.5 addresses floor drains. In drawings LR-M-208 sheet 1, floor drains at location D3 and LR-M-208 sheet 15, floor drains at locations C6, C7, E6, E7, E8, F6, F8, and F9 are not highlighted as portions of the flow diagram within the scope of license renewal and subject to an AMR. In RAI 2.3.3.6-2, dated September 10, 2004, the staff requested the applicant to verify whether these floor drains 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). If they are, the staff requested that they be included in LRA Tables 2.3.3-6 and 3.3.2-6. If they are excluded from the scope of license renewal and not subject to an AMR, the applicant was requested to provide justification for the exclusion.

In its response, dated October 8, 2004, the applicant stated that the drains identified on drawings, LR-M-208 sheet 1 and LR-M-208 sheet 15 are drains from the piping system, not floor drains. These are not within the scope of license renewal in accordance with 10 CFR 54.4(a) because they are downstream of normally shut isolation valves.

The applicant further stated that floor drains are considered in the flooding analysis review that was performed as part of Criterion 2, scoping methodology (reference LRA Section 2.1.2.1.2). This resulted in the highlighted drain lines being included within the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to aging management in accordance with 10 CFR 54.21(a)(1) (reference LRA Table 2.1.2.1-1, pages 2-25 and 2-26).

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.6-2 acceptable. Pipe drains serve no pressure boundary function and they are downstream of normally closed isolation valves; therefore, they are not subject to an AMR. The staff's concern described in RAI 2.3.3.6-2 is resolved.

RAI 2.3.3.6-3. The NRC's "Fire Protection Safety Evaluation Report" dated August 2, 1979, Section 4.3.1, addresses the dry pipe automatic sprinkler systems for "Warehouse" and "Compressor Building" and deluge automatic sprinkler with fusible-link actuation in "Control Room Emergency Ventilation System Charcoal Filters," which do not appear in the LRA drawings. In RAI 2.3.3.6-3, dated September 10, 2004, the staff requested the applicant to verify whether these fire suppression systems and components are within the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1). If they are, the staff requested that they be included in LRA Tables 2.3.3-6 and 3.3.2-6. If they are excluded from the scope of license renewal and not subject to an AMR, the applicant was requested to provide justification for the exclusion.

In its response, dated October 8, 2004, the applicant stated that, as described in the referenced SER, the dry pipe automatic sprinkler systems were in the following buildings: "Warehouse" and "Compressor Building." These equate to warehouse #1 and warehouse #2 in PBNP current terminology. Warehouse #1 is no longer a dry pipe system, as it was converted to a wet pipe system, as shown on drawing LR-M-208 sheet 1, location B4. Warehouse #2 is still a dry pipe system, as shown on drawing LR-M-208 sheet 1, location B8.

The deluge automatic sprinkler with fusible-link actuation in the control room emergency ventilation system charcoal filters is shown on drawing LR-M-208 sheet 2, location F7 (F-16 Charcoal Filter).

As shown on the referenced drawings, these portions of the FP system 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). These are represented in LRA Tables 2.3.3-6 and 3.3.2-6 by component types "piping and fittings" and "valve bodies."

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.6-3 acceptable. The applicant adequately explained that the sprinkler systems in question 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). Therefore, the staff's concern described in RAI 2.3.3.6-3 is resolved.

RAI 2.3.3.6-4. The NRC's "Fire Protection Safety Evaluation Report" dated August 2, 1979, Section 4.3.1, addresses the foam extinguishing system for two above-ground fuel oil storage tanks, which does not appear in the drawings. In RAI 2.3.3.6-4, dated September 10, 2004, the staff requested the applicant to verify whether this foam suppression system and components are within the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1). If they are, the staff requested that they be included in LRA Tables 2.3.3-6 and 3.3.2-6. If they are excluded from the scope of license renewal and not subject to an AMR, the applicant was requested to provide justification for the exclusion.

In its response, dated October 8, 2004, the applicant stated that the foam extinguishing system for the above-ground fuel oil storage tanks has been removed and, therefore, is not within the scope of license renewal.

The foam extinguishing system was removed via a plant modification (MR 94-075), which included a 10 CFR 50.59 evaluation (SER 95-078). A fire protection technical evaluation was also performed with this modification in order to determine the impact of this modification on the previously approved NRC fire protection configurations. This evaluation concluded that although the foam extinguishing system was installed and referenced at the time of the NRC's fire protection safety evaluation report, it was not considered necessary to meet the guidelines of Appendix A to Branch Technical Position (BTP) 9.5-1. The guidelines specified a separation distance between fuel oil storage tanks and structures that house safety-related equipment. This criterion was met without the need of the foam extinguishing system.

Additionally, the above-ground fuel oil storage tanks no longer supply fuel oil to the safety-related diesel generators. Two below-ground fuel oil storage tanks were installed during

the modification to add two new diesel generators. These below-ground tanks are capable of supplying fuel oil to any and all of the four diesel generators in the event of an Appendix R fire.

Alternative fire protection methods in the form of manual fire fighting using portable foam generating equipment is considered to provide an acceptable and adequate level of fire protection for the potential fire hazard presented by the fuel oil storage tanks.

The FSAR and FPER were updated when this modification was completed. FPER Section 7.3.10 details the current configuration of the fuel oil storage areas at the plant.

The foam extinguishing system for the two above-ground fuel oil storage tanks no longer exists and, therefore, is not considered to be within the scope of license renewal in accordance with 10 CFR 54.4(a) and is not subject to an AMR in accordance with 10 CFR 54.21(a)(1).

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.6-4 acceptable. The applicant adequately explained that the foam system for two above-ground fuel oil storage tanks in question is not within the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR accordance with 10 CFR 54.21(a), because it was removed. Therefore, the staff's concern described in RAI 2.3.3.6-4 is resolved.

RAI 2.3.3.6-5. The NRC's "Fire Protection Safety Evaluation Report" dated August 2, 1979, Section 4.3.2, addresses the carbon dioxide (CO_2) suppression system in the remote gas turbine building and the Halon 1301 suppression system in the record storage vault, which do not appear in the LRA drawings. In RAI 2.3.3.6-5, dated September 10, 2004, the staff requested the applicant to verify whether these gaseous fire suppression systems and components are within the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1). If they are, the staff requested that they be included in LRA Tables 2.3.3-6 and 3.3.2-6. If they are excluded from the scope of license renewal and not subject to an AMR, the applicant was requested to provide justification for the exclusion.

In its response, dated October 8, 2004, the applicant stated that the record storage vault that had a Halon 1301 suppression system was located in the original energy information center building. This building was demolished to make way for a new training building and nuclear engineering services (NES) building. A record storage vault now exists in the NES building, but it no longer has a Halon suppression system (reference Section 7.3.16 of PBNP FPER, Revision 3). The above-referenced Halon 1301 suppression system no longer exists and, therefore, is not within the scope of license renewal. The NES and training buildings are supplied with firewater sprinkler systems fed from the plant fire header (reference drawing LR-M-208 sheet 1, location E2). However, since these buildings are more than 500 feet away from the plant protected area (such that fires in these buildings could not affect safety-related equipment within the plant) and have the capability to be isolated from the plant fire header, the FP systems for these buildings were judged to be not within the scope of license renewal.

The CO_2 suppression system in the gas turbine building was removed (for safety reasons) and replaced with a pre-action water sprinkler system. This is shown on LR-M-208 sheet 9, location E10. This pre-action water sprinkler system is within the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1). This pre-action water sprinkler system is represented in LRA

Tables 2.3.3-6 and 3.3.2-6 by component types "piping and fittings," "sprinkler heads," and "valve bodies."

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.6-5 acceptable. The applicant adequately explained that the CO_2 suppression system in question, was removed and replaced with a pre-action water sprinkler system. The new system is within the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR accordance with 10 CFR 54.21(a). The staff concluded that the pre-action water sprinkler system components were correctly included within the scope of license renewal and subject to an AMR. Therefore, the staff's concern described in RAI 2.3.3.6-5 is resolved.

RAI 2.3.3.6-6. PBNP "Fire Protection Evaluation Report," Revision 3, April 2004, Section 5.1.4, states that "protection of exposed structural steel in other plant areas is provided by sprayed-on fire proofing material." No reference is made to it in the LRA Section 2.3.3.6, "Fire Protection Systems" or Section 2.4.11, "Fire Barrier Commodity Group." This appears to be a PBNP license condition. In RAI 2.3.3.6-6, dated September 10, 2004, the staff requested the applicant to clarify where this fire proofing material is addressed in the LRA scoping, screening, and AMR sections.

In its response, dated October 8, 2004, the applicant stated that LRA Section 2.4.11, "Fire Barrier Commodity Group," discusses fire stops and fire wraps. The term fire wrap is associated with fire barriers and their penetrations. The term fire stop is associated with an enveloping construction of fireproofing material. During original plant design, where structural steel fireproofing was required, masonry brick was applied. Subsequently, modifications have been performed where the masonry brick was replaced with a rigid board wrap at some locations. The LRA represents these materials with a calcium silicate board or ceramic fiberboard component group designation.

More recent plant modifications have employed a fire wrap using a cementitious fireproofing that is spray applied. LRA Section 2.4.11 uses the generic silicone-based material component group to represent all sprayed-on mastic fireproofing materials. The number of applications of this type of fireproofing is limited. The aging management review for the fire-proofing materials is presented in LRA Table 3.5.2-11.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.6-6 acceptable. The applicant adequately explained that the sprayed-on fire-proofing materials on structural steel in question are within the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR accordance with 10 CFR 54.21(a). LRA Section 2.4.11 uses the generic silicone-based material component group to represent all sprayed-on mastic fireproofing materials. Therefore, the staff's concern described in RAI 2.3.3.6-6 is resolved.

RAI 2.3.3.6-7. PBNP "Fire Protection Evaluation Report," Revision 3, April 2004, Section 5.1.9, addresses the Units 1 and 2 fire suppression system for outdoor transformers. However, drawing LR-M-208 sheet 9 depicts the fire suppression system for "1, 2-X04 Transformers." In RAI 2.3.3.6-7, dated September 10, 2004, the staff requested the applicant to explain whether the above drawing includes the fire suppression system for the Units 1 and 2 outdoor transformers.

In its response, dated October 8, 2004, the applicant stated that drawing LR-M-208 sheet 9, location C2, references "1, 2-X04 Transformers." This refers to the Unit 1 and Unit 2 X04 transformers, which are the outdoor, low-voltage station auxiliary transformers, located west of the primary auxiliary building. Both units' transformers are protected by this portion of the FP system shown on this drawing due to their close proximity to each other.

Additionally, as noted in PBNP FPER Section 5.1.9, the deluge systems for the Unit 1 main and auxiliary transformers are shown on drawing LR-M-208 sheet 2, location F1, and deluge systems for the Unit 2 main and unit auxiliary transformers are shown on drawing LR-M-208 sheet 2, location D9.

All of the piping and components for these transformers' deluge systems are within the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1).

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.6-7 acceptable. The applicant identified and explained the fire suppression system for "1, 2-X04 Transformers," which are the outdoor low-voltage station auxiliary transformers, located west of the primary auxiliary building. The staff concluded that the fire suppression systems in question were correctly included within the scope of license renewal and subject to an AMR. Therefore, the staff's concern described in RAI 2.3.3.6-7 is resolved.

RAI 2.3.3.6-8. PBNP "Fire Protection Evaluation Report," Revision 3, April 2004, Section 5.5.1, addresses a fixed smoke and heat removal system for computer and instrument rack room, control room, and cable spreading, which does not appear in the LRA drawings. In RAI 2.3.3.6-8, dated September 10, 2004, the staff requested the applicant to verify whether this smoke and heat removal system and its components are within the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1). If they are, the staff requested that they be included in LRA Tables 2.3.3-6 and 3.3.2-6. If they are excluded from the scope of license renewal and not subject to an AMR, the applicant was requested to provide justification for the exclusion.

In its response, dated October 8, 2004, the applicant stated that the smoke and heat removal system is essentially a ventilation system, as shown on drawing LR-M-144 sheet 2, location H2. This smoke and heat removal system is within the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1). The essential ventilation system is represented by component types "ductwork" and "fan/blower housing" in LRA Section 2.3.3.10 and Table 3.3.2-9.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.6-8 acceptable. The applicant adequately explained and identified that the smoke and heat removal system in question is within the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a). The staff concluded that the smoke and heat removal system in question was correctly included within the scope of license renewal and subject to an AMR in the drawing LR-M-144 sheet 2, location H2 and LRA Tables 2.3.3.10 and 3.3.2-9. Therefore, the staff's concern described in RAI 2.3.3.6-8 is resolved.

RAI 2.3.3.6-9. PBNP "Fire Protection Evaluation Report," Revision 3, April 2004, Section 6.4.1, addresses the Halon 1301 suppression system for the plant battery rooms, which does not appear in the drawings. In RAI 2.3.3.6-9, dated September 10, 2004, the staff requested the applicant to verify whether the Halon 1301 suppression system and its components are within the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1). If they are, they should be included in LRA Tables 2.3.3-6 and 3.3.2-6. If they are excluded from the scope of license renewal and not subject to an AMR, the applicant was requested to provide justification for the exclusion.

In its response, dated October 8, 2004, the applicant stated that the battery rooms referenced in Section 6.4.1 of the PBNP FPER are the two small battery rooms adjacent to the vital switchgear room. Although drawing LR-M-208 sheet 5, location E10, does not specifically mention "Battery Rooms," the Halon 1301 suppression system for the vital switchgear room also covers the battery rooms. This Halon suppression system is within the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1). This system is represented in LRA Tables 2.3.3-6 and 3.3.2-6 by component types "piping and fittings" and "valve bodies" with an air/gas internal environment.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.6-9 acceptable. The applicant adequately identified and explained that the Halon 1301 suppression system and its components in question are within the scope of license renewal and subject to an AMR. The Halon 1301 suppression system for the vital switchgear room also covers the battery rooms. The staff concluded that the battery rooms Halon 1301 suppression system in question was correctly included within the scope of license renewal and subject to an AMR. Therefore, the staff's concern described in RAI 2.3.3.6-9 is resolved.

RAI 2.3.3.6-10. PBNP "Fire Protection Evaluation Report," Revision 3, April 2004, Section 6.5.1, addresses the dry chemical suppression system for the plant turbine-generator bearings and the gas turbine-generator exhaust, which does not appear in the LRA drawings. In RAI 2.3.3.6-10, dated September 10, 2004, the staff requested the applicant to verify whether the dry chemical suppression system and its components are within the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1). If they are, the staff requested that they be included in LRA Tables 2.3.3-6 and 3.3.2-6. If they are excluded from the scope of license renewal and not subject to an AMR, the applicant was requested to provide justification for the exclusion.

In its response, dated October 8, 2004, the applicant stated that the dry chemical suppression system for the turbine-generator bearings and the gas turbine exhaust bearing are not shown on a plant drawing and, therefore, were not included in the drawings. The applicant stated that the dry chemical suppression system for the turbine-generator bearings and the gas turbine exhaust bearing, however, are within the scope of license renewal in accordance with 10 CFR 54.4(a). The dry chemical containers are managed similar to a fire extinguisher, where they are routinely monitored, and replaced as needed (reference LRA Section 2.1.3.1.3, "Identification of Short-lived Components and Consumables"). The fixed components subject to aging management are represented by component types "piping and fittings," "spray nozzles," and "valve bodies" in LRA Tables 2.3.3-6 and 3.3.2-6.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.6-10 acceptable. The applicant adequately explained the dry chemical suppression system for the

turbine-generator bearings and the gas turbine exhaust bearing in question are within the scope of license renewal and subject to an AMR. The dry chemical containers are managed similar to a fire extinguisher; they are routinely monitored, and replaced as needed. The staff agreed that the dry chemical containers are short-lived components and consumables and are not subject to an AMR. Therefore, the staff's concern described in RAI 2.3.3.6-10 is resolved.

RAI 2.3.3.6-11. PBNP "Fire Protection Evaluation Report," Revision 3, April 2004, Section 6.5.2, addresses fixed CO_2 hose reel stations in the control room, which do not appear in the drawings. In RAI 2.3.3.6-11, dated September 10, 2004, the staff requested the applicant to verify whether the CO_2 hose reel stations and components are within the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1). If they are, the staff requested that they be included in LRA Tables 2.3.3-6 and 3.3.2-6. If they are excluded from the scope of license renewal and not subject to an AMR, the applicant was requested to provide justification for the exclusion.

In its response, dated October 8, 2004, the applicant stated that the CO_2 hose reel stations in the control room are not shown on a plant piping and instrumentation diagram (P&ID) and, therefore, were not included in the drawings. These stations are within the scope of license renewal in accordance with 10 CFR 54.4(a) but are not subject to an AMR in accordance with 10 CFR 54.21(a)(1). The CO_2 containers are managed similar to a fire extinguisher; they are routinely monitored, and replaced as needed (reference LRA Section 2.1.3.1.3, Identification of Short-lived Components and Consumables).

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.6-11 acceptable. The components in question (CO_2 hose reel stations in the control room) are short-lived and consumable, routinely monitored, replaced as needed and, therefore, not subject to an AMR. The staff's concern described in RAI 2.3.3.6-11 is resolved.

RAI 2.3.3.6-12. Electric, diesel, and jockey fire pumps are highlighted on drawing LR-M-208 sheet 1 as falling within the scope of license renewal. However, the highlighting does not trace the outline of the fire pumps and associated strainers. In RAI 2.3.3.6-12, dated September 10, 2004, the staff requested the applicant to verify whether the fire pump strainers 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). If they are, the staff requested that they be included in LRA Tables 2.3.3-6 and 3.3.2-6. If they are excluded from the scope of license renewal and not subject to an AMR, the applicant was requested to provide justification for the exclusion.

In its response, dated October 8, 2004, the applicant stated that suction strainers on the pumps and other filters and strainers throughout the FP system, are shown as falling within the scope of license renewal in accordance with 10 CFR 54.4(a) on the drawings, and subject to an AMR in accordance with 10 CFR 54.21(a)(1). They are represented by the component type "filters/strainers" in LRA Tables 2.3.3-6 and 3.3.2-6.

Based on the above discussion, the staff found applicant's response to RAI 2.3.3.6-12 acceptable. The components in question (fire pump strainers and filters) throughout the FP systems are within the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a). 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 2.3.3.6-12 is resolved.

RAI 2.3.3.6-13. Drawings LR-M-208 sheets 10 through 14 show the FP system, but do not indicate any reference to areas of protection provided or type of FP system (*i.e.*, sprinkler system or other as applicable). In RAI 2.3.3.6-13, dated September 10, 2004, the staff requested the applicant to identify the areas served by the FP system(s).

In its response, dated October 8, 2004, the applicant stated that LR-M-208 sheets 10 through 14 are for the north service building FP system. The original P&ID indicated as such in the title, but the title block was changed for the drawing; therefore, that description was lost. The north service building borders the north end of the Unit 2 turbine building and is within the plant protected area. The north service building FP system is supplied from the plant fire header (reference the drawing LR-M-208 sheet 2, location E10).

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.6-13 acceptable. The applicant adequately described the drawings referenced to areas of protection. Therefore, the staff's concern described in RAI 2.3.3.6-13 is resolved.

2.3.3.6.3 Conclusion

The staff reviewed the LRA, accompanying scoping boundary drawings, and the RAI responses described above 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 of the 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 FP 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 FP system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.7 Heating Steam System

2.3.3.7.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.7, the applicant described the heating steam system. The heating steam system supports habitability and equipment reliability by maintaining plant area temperatures within acceptable boundaries. In addition to supporting ventilation functions, the heating steam system also provides process steam for other plant support functions. The principal components of the heating steam system consist of the boiler, tanks, pumps, heaters, and associated piping and valves. The heating steam is provided from the house boilers or from a connection on the main and auxiliary steam system.

The portions of the heating steam system containing components subject to an AMR include the heating steam supply and condensate return piping in the primary auxiliary building (PAB), which includes the heat exchangers, piping, and valves.

The failure of nonsafety-related SSCs in the system could prevent the satisfactory accomplishment of a safety-related function.

Intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered
- provides for mechanical closure integrity on bolted joints

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

- CS components
- fasteners and bolting
- filters and strainers
- heaters and coolers
- piping and fittings
- pump casing
- steam traps
- tanks
- valve bodies

2.3.3.7.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.7 and the FSAR. The staff's review, using the evaluation methodology described in SER Section 2.3, was conducted in accordance with the guidance described in NUREG-1800, Section 2.3.

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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 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 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.

RAI 2.3.3.7-1. As described in the LRA, the heating steam system does not perform any safety-related functions. However, certain portions of the heating steam system are within the scope of license renewal in accordance with 10 CFR 54.4(a)(2). Portions of the nonsafety-related heating steam system in the PAB have the potential to affect the function of safety-related equipment. Drawing LR-M-214, sheet 1 depicts heat exchangers HX-97A, HX-97B, HX-86A, HX-86B, HX-35A, HX-35B, 1HX-77A, and 1HX-77B as being within the scope of license renewal. However, LRA Table 2.3.3-7 does not indicate that heating steam system heat exchangers are components requiring an AMR. Since the heating steam system heat exchangers are shown as being within the scope of license renewal on the drawings, in RAI 2.3.3.7-1, dated November 10, 2004, the staff requested the applicant to explain the reasons for not listing these heat exchangers in LRA Tables 2.3.3-7 and 3.3.2-15.

In its response, dated December 14, 2004, the applicant stated that all of these heating steam heat exchangers are simple industrial area heaters, which consist of a fan blowing across an open coil. The applicant stated that these components are within the scope of license renewal and subject to aging management, and are represented under the "Heaters/Coolers" component type in LRA Tables 2.3.3-7 and 3.3.2-15.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.7-1 acceptable. The design of these heat exchanger components is consistent with the "Heater/Cooler" component type classification in LRA Tables 2.3.3.7 and 3.3.2-15. Therefore, the staff's concerns described in RAI 2.3.3.7-1 are resolved.

2.3.3.7.3 Conclusion

The staff reviewed the LRA, accompanying scoping boundary drawing, and the RAI response described above 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 of the 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 heating 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 heating steam system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.8 Emergency Power System

2.3.3.8.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.8, the applicant described the emergency power system. The emergency power system is designed to provide emergency or backup power to the station following the loss of normal power. The emergency power system consists of four diesel generators and a gas turbine generator (GTG). The normal source of power to the safety-related 4160 volts-alternating current (VAC) and 480 VAC buses is from offsite power through the station's low-voltage auxiliary transformers. If this normal source fails, the standby source of power is provided by the emergency diesel generators (EDGs). The diesel generator portion of the emergency power system is composed of four diesel generators that directly supply the safety-related 4160 VAC power system. In the unlikely event of a loss of all offsite and onsite AC power, the GTG is available to power the required loads until a power supply is restored from a diesel generator or from offsite power.

The portions of the emergency power system subject to an AMR are the diesel generator and GTG subsystems. This includes the turbochargers, tanks, expansion joints, heat exchangers, piping, and valves.

Functions associated with the emergency power system include the following:

- senses or provides process conditions
- generates signals for reactor coolant trip and engineered safety features actuation
- provides electrical power to the safety-related 4160 VAC power system

The failure of nonsafety-related SSCs in the system could prevent the satisfactory accomplishment of a safety-related function. In addition, the emergency power system performs functions that support fire protection and station blackout.

Intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered
- provides for mechanical closure integrity on bolted joints
- provides for filtration
- provides for fire protection, as through flame suppression
- provides for heat transfer
- provides for flow restriction

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

- air motor
- drain trap
- expansion joints
- fan/blower housing
- fasteners and bolting
- filters and strainers
- flame arrestors
- flow elements
- flow indicator
- heat exchanger
- heaters and coolers
- instrumentation
- instrument valve assemblies
- piping and fittings
- pump casing
- restricting orifices
- sight glass
- silencer
- tanks
- turbine casing
- turbo-charger
- valve bodies

2.3.3.8.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.8 and FSAR Sections 8.0, 8.8, and 8.9. The staff's review, using the evaluation methodology described in SER Section 2.3, was conducted in accordance with the guidance described in NUREG-1800, Section 2.3.

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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 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 RAIs as discussed below.

RAI 2.3.3.8-1. FSAR Section 8.8 states that in order to perform its safety-related function, the DG system has several auxiliary support systems that must function, including the air intake and exhaust system. Drawing LR-M-226 shows the air intake oil bath filters inside the DG building with air intake screens shown on the building wall. The air intake screens on the DG building walls are shown as outside the scope of license renewal on drawing LR-M-226, sheets 1 and 2 at location E-3. LRA Section 2.4.4 states that the DG building is a safety-related seismic Class 1 structure but does not specifically address the air intake screens. In RAI 2.3.3.8-1, dated November 16, 2004, the staff requested the applicant to justify its determination to not include the diesel generator air intake screens within the scope of license renewal and subject to an AMR.

In its response, dated December 22, 2004, the applicant stated that the failure to identify the air intake screens on the DG building walls as in-scope on sheets 1 and 2 of drawing LR-M-226 was a drawing error. The applicant stated that the air intake screens are within the scope of license renewal. The applicant also stated that the air intakes are a chevron design, which are part of the structure and, therefore, are addressed as part of the civil/structural review in LRA Table 3.5.2-4, by "Structural Carbon Steel/Outdoor" component type. The applicant further stated that the drawing LR-M-226, sheets 1 and 2, were revised, and the error is being tracked in its corrective action program.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.8-1 acceptable. The applicant confirmed that the air intake screens on the DG building walls are within the scope of license renewal, and the drawings were revised and the error is being tracked. Therefore, the staff's concerns described are RAI 2.3.3.8-1 is resolved.

RAI 2.3.3.8-2. FSAR Section 8.8 states that in order to perform its safety-related function, the DG system has several auxiliary support systems that must function, including the fuel oil system. The instrument CS P105 and associated line on the gas turbine fuel oil supply pump P-105 is shown as outside the scope of license renewal on drawing LR-M-219, sheet 1 at location B-9. This is inconsistent with instruments CS P70A and CS P70B for fuel oil transfer pumps P-70A and P-70B. These instruments and their associated lines are shown as falling within the scope of license renewal. Failure of this instrument and its associated line may adversely impact the integrity of the gas turbine fuel oil transfer pump. A degraded gas turbine fuel oil transfer pump could adversely impact the SBO function of the GTG. In RAI 2.3.3.8-2, dated November 16, 2004, the staff requested the applicant to explain its determination to not include the instrument CS P105 and its associated line as within the scope of license renewal.

In its response, dated December 22, 2004, the applicant stated that failure to identify instrument CS P105 and its associated line on the gas turbine fuel oil supply pump P-105 as within the scope of license renewal, on sheet 1 of drawing LR-M-219, was a drawing (highlighting) error. The applicant also stated that this control switch CS P105 is within the scope of license renewal, but it is not subject to aging management because it is an active component. The applicant further stated that the drawing LR-M-219, sheet 1 was revised, and the error is being tracked in its corrective action program.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.8-2 acceptable. The applicant confirmed that the instrument CS P105 (and its associated line) is within the scope of license renewal. Therefore, the staff's concern described in RAI 2.3.3.8-2 is resolved.

RAI 2.3.3.8-3. FSAR Section 8.8 states that in order to perform its safety-related function, the DG system has several auxiliary support systems that must function, including the fuel oil system. The instruments, position switch (POS) 3930 and control switch (CS) 3930, and their associated lines on the DG day tank T-31A are shown as outside the scope of license renewal on drawing LR-M-219, sheet 1, location G-3. This is inconsistent with instruments POS 3931 and CS 3931 for DG day tank T-31B. These instruments and their associated lines are shown as falling within the scope of license renewal. Failure of these instruments and their associated lines may adversely impact the integrity of the supply lines to the DG day tank. A degraded DG day tank supply could adversely impact the safety-related function of the G01 diesel generator. In RAI 2.3.3.8-3, dated November 16, 2004, the staff requested the applicant to explain its determination to not include the instruments POS 3930 and CS 3930 and their associated lines as within the scope of license renewal.

In its response, dated December 22, 2004, the applicant stated that failure to identify instruments POS 3930 and CS 3930 and their associated lines as within the scope of license renewal, on sheet 1 of drawing LR-M-219, was a highlighting error. The applicant also stated that these instruments POS 3930 and CS 3930 are within the scope of license renewal, but they are not subject to aging management because they are active components.

In a telephone conference on January 18, 2005, the applicant stated that the lines/wiring associated with POS 3930 and CS 3930 are represented under the commodity group, "Electrical Cables and Connectors Not Subject to 10 CFR 50.49 EQ Requirements," in LRA Table 2.5-1. The applicant further stated that the drawing LR-M-219, sheet 1 was revised, and the error is being tracked in its corrective action program. In its response, dated February 7, 2005, the applicant confirmed the previous statement provided during the telephone conference.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.8-3 acceptable. The applicant confirmed that the instruments POS 3930 and CS 3930 (and their associated lines) are within the scope of license renewal. Therefore, the staff's concerns described in RAI 2.3.3.8-3 are resolved.

RAI 2.3.3.8-4. FSAR Section 8.8 states that in order to perform its safety-related function, the DG system has several auxiliary support systems that must function, including the fuel oil system. The solenoid vent valve FO 3922 S on flow control valve FC 3922 is shown as within the scope of license renewal on drawing LR-M-219, sheet 1 at location G-4. The line to this solenoid vent valve is shown as outside the scope of license renewal. In addition, the solenoid vent valve FO 3923 S on flow control valve FC 3923 is shown as out-of-scope at location E-9. A degraded DG fuel oil supply system could adversely impact the safety-related function of the diesel generators. In RAI 2.3.3.8-4, dated November 16, 2004, the staff requested the applicant to clarify why only solenoid vent valve FO 3922 S on FC 3922 is shown as in-scope, while the associated lines and the similar vent valve configuration on FC 3923 are not shown within the scope of license renewal.

In its response, dated December 22, 2004, the applicant stated that failure to identify the solenoid vent valve FO 3923 S on flow control valve FC 3923 as within the scope of license renewal (on sheet 1 of the drawing LR-M-219) was a drawing error. The applicant stated that solenoid valve FO 3923 S is an active component and, although within the scope of license renewal, it is not subject to aging management. Additionally, the applicant stated that the air

lines between the solenoid valves (FO 3922 S and 3923 S) and the air-operated control valves (FC 3922 and FC 3923) are not shown as being within the scope of license renewal, because these air lines have no license renewal intended function. Should either of these air lines fail, the associated air operated control valve (FC 3922 or FC 3923) will fail to their closed position and thereby satisfy their intended function. The drawing LR-M-219, sheet 1 was revised, and the error is being tracked in its corrective action program.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.8-4 acceptable. The applicant confirmed that the solenoid vent valve FO 3923 S is within the scope of license renewal. The staff agreed that the vent lines upstream of solenoid vent valves FO 2922 S and FO 3923 S may be considered outside the scope of license renewal. Therefore, the staff's concerns described in RAI 2.3.3.8-4 are resolved.

RAI 2.3.3.8-5. FSAR Section 8.8 states that in order to perform its safety-related function, the DG system has several auxiliary support systems that must function, including the fuel oil system. The 20-inch manway, SAX 7907, 3-inch vent lines, and LS 3942 on the emergency fuel tank T-72 are shown as outside the scope of license renewal on drawing LR-M-219, sheet 1 at location C-5. This is inconsistent with the 24-inch manway, SAX 7913A, 4-inch vent lines and LS 3933A for DG storage tank T-175A shown on drawing LR-M-219, sheet 2 which shows similar equipment on T-175A as in-scope. A degraded DG emergency fuel tank T-72 could adversely impact the emergency fuel supply and the safety-related function of the diesel generators. In RAI 2.3.3.8-5, dated November 16, 2004, the staff requested the applicant to support its determination that the 20-inch manway, SAX 7907, 3-inch vent lines, and LS 3942 on the emergency fuel tank are outside the scope of license renewal.

In its response, dated December 22, 2004, the applicant stated that the failure to identify the 20-inch manway, SAX 7907, 3-inch vent lines, and LS 3942 on the emergency fuel tank as within the scope of license renewal on sheet 1 of drawing LR-M-219 was a highlighting error. The applicant stated that the manway, SAX (sample point) 7907, and the 3-inch vent lines are in-scope and subject to aging management. These components are represented by the "Tank" and "Piping and Fittings" component types in LRA Table 3.3.2-7. The applicant further stated that level switch LS 3942 is also within the scope of license renewal; however, it is an active component; therefore, it would not be subject to aging management. The applicant further stated that the drawing LR-M-219, sheet 1 was revised, and the error is being tracked in its corrective action program.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.8-5 acceptable. The applicant confirmed that the 20-inch manway, SAX 7907, 3-inch vent lines, and LS 3942 on the emergency fuel tank are within the scope of license renewal. Therefore, the staff's concerns described in RAI 2.3.3.8-5 are resolved.

2.3.3.8.3 Conclusion

The staff reviewed the LRA, accompanying scoping boundary drawings, and the RAI responses described above 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 of the 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 emergency power 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 emergency power system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.9 Containment Ventilation System

2.3.3.9.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.9, the applicant described the containment ventilation system. The containment ventilation system provides for emergency heat removal from the containment atmosphere, containment pressure control, and containment isolation.

The containment ventilation system is made up of the following heating and ventilation subsystems:

- containment cooling (VNCC)
- containment purge supply and exhaust (VNPSE)
- control rod drive (CRDM) cooling (VNCRD)
- reactor cavity cooling (VNRC)
- refueling cavity ventilation (VNRF)
- containment cleanup (VNCF)

Of these subsystems, only VNCC and VNPSE are within the scope of license renewal. The portions of the containment ventilation system containing components subject to an AMR include the equipment necessary to provide (1) emergency heat removal from the containment atmosphere, (2) containment pressure control, and (3) containment isolation, including heat exchangers, ductwork, damper housings, piping, and valves.

Functions associated with the containment ventilation system include the following:

- provides a primary containment boundary to prevent the release of radioactivity into the environment
- provides emergency heat removal from the containment, following a LOCA or main steam line break (MSLB) to limit the containment's pressure and temperature within the limits of design

In addition, the containment ventilation system performs functions that support environmental qualification.

Intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered
- provides for mechanical closure integrity on bolted joints
- provides for heat transfer

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

- accumulators and cylinders
- CS components
- damper housings
- ductwork
- fan/blower housing
- fasteners and bolting
- filters and strainers
- heat exchanger
- heaters and coolers
- piping and fittings
- thermowells
- valve body

2.3.3.9.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.9 and FSAR Sections 5.2, 5.3, and 6.3. The staff's review, using the evaluation methodology described in SER Section 2.3, was conducted in accordance with the guidance described in NUREG-1800, Section 2.3.

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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 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 2.3.3.9 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.

RAI 2.3.3.9. In RAI 2.3.3.9, dated November 17, 2004, the staff requested the applicant to clarify whether all the system components such as, but not limited to, cooling coil housings and roughing filter housings including 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, dated December 17, 2004, the applicant stated the following:

- The roughing filter housings are in-scope and subject to AMR, and are included in the "Filters/Strainers" component type in LRA Table 2.3.3-9, "Containment Ventilation System" and LRA Table 3.3.2-8, "Auxiliary Systems-Containment Ventilation System-Summary of Aging Management Evaluation."
- The 1/2HX-15A/B/C/D cooling coils are in-scope and subject to aging management, and are included in the "Heat Exchanger" component type line item in LRA Table 2.3.3-9, "Containment Ventilation System" and LRA Table 3.3.2-8, "Auxiliary Systems-Containment Ventilation System-Summary of Aging Management Evaluation."

The screens for intake and exhaust and expanded metal screen to hold the roughing filters in place were not included within the scope of license renewal, as they provide no 10 CFR 54.4(a)(1), 10 CFR 54.4(a)(2), or 10 CFR 54.4(a)(3) functions for license renewal (and,

therefore, are not included in the LRA tables). Also, screens or louvers on the exhaust ductwork are not mentioned in the CLB, and, therefore, no credit was taken for them being in place.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.9 acceptable. The applicant clarified that all applicable system components consisting of cooling coil housings and roughing filter housings are within the scope of license renewal in accordance with 10 CFR 54.4(a), and that they are subject to an AMR in accordance with 10 CFR 54.21(a)(1).

2.3.3.9.3 Conclusion

The staff reviewed the LRA and the RAI response described above 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 of the 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 ventilation 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 ventilation system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.10 Essential Ventilation System

2.3.3.10.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.10, the applicant described the essential ventilation system. The essential ventilation system is made up of the following subsystems that provide heating, ventilation, and air conditioning (including chilled water) for their respective areas and the associated equipment contained within those areas:

- control room ventilation (VNCR)
- computer room ventilation (VNCOMP)
- cable spreading room ventilation (VNCSR)
- primary auxiliary building (PAB) battery and inverter room ventilation (VNBI)
- diesel generator building ventilation (VNDG)
- PAB ventilation (VNPAB)
- circulation water pump house ventilation (VNPH)
- radwaste ventilation (VNRAD)
- drumming area ventilation (VNDRM)
- battery room ventilation (VNBR)
- auxiliary feedwater area ventilation (VNAFW)
- gas turbine building ventilation (VNGT)

Of these subsystems, only VNCR, VNCOMP, VNCSR, VNBI, VNGT, VNPAB, and VNDG are within the scope of license renewal. The portions of the essential ventilation system containing components subject to an AMR include: filters, fans, damper housings, valves, heat

exchangers, air conditioning/chiller packages, ductwork, and the associated piping and valves to support the system's intended functions.

Functions associated with the essential ventilation system include the following:

- provides climate control to areas containing safety Class 1, 2, and 3 components, namely to the inverter, diesel generator, and station battery rooms for the VNBI subsystem
- maintains the control room envelope to limit unfiltered leakage for the VNCOMP, VNCR, and VNCSR subsystems

The system can filter and remove particulates and iodine from the outside air during emergency operations to support the control room's occupants. In addition, the essential ventilation system performs functions that support fire protection and station blackout.

Intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered
- provides for mechanical closure integrity on bolted joints
- provides for filtration
- provides for heat transfer

In LRA Table 2.3.3-10, the applicant identified the following essential ventilation system component types that are within the scope of license renewal and subject to an AMR:

- damper housings
- ductwork
- fan/blower housing
- fasteners and bolting
- filters and strainers
- flow elements
- heat exchanger
- heaters and coolers
- humidifier
- instrument valve assemblies
- instrumentation
- piping and fittings
- pump casing
- tanks
- thermowells
- valve bodies

2.3.3.10.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.10 and FSAR Sections 8.7, 8.8, 9.5, and 9.8. The staff's review, using the evaluation methodology described in SER Section 2.3, was conducted in accordance with the guidance described in NUREG-1800, Section 2.3.

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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 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. The applicant responded to the staff's RAI as discussed below.

RAI 2.3.3.10. In RAI 2.3.3.10, dated November 17, 2004, the staff requested the applicant to clarify whether all the system components such as, but not limited to, cooling coil housing, valve bodies for service water system control valves, heating coil housings, direct expansion coils, filter housings, screens for intake and exhaust structures including duct sealants, wall sealants, and pressure boundary sealants, etc., are within the scope of license renewal in accordance with 10 CFR 54.4(a), and subject to AMR in accordance with 10 CFR 54.21(a)(1).

In its response, dated December 17, 2004, the applicant stated the following:

- Cooling coil/heating coil housings are in-scope, subject to aging management, and are already included within the existing "Heaters/Coolers" component type in LRA Table 3.3.2-9, "Auxiliary Systems - Service Water System - Summary of Aging Management Evaluation," (and LRA Table 2.3.3-10, "Essential Ventilation System").
- The valve bodies for the service water control valves are in-scope, subject to aging management, and are already included in LRA Table 3.3.2-5, "Auxiliary Systems - Service Water System - Summary of Aging Management Evaluation".
- Filter housings are in-scope, subject to aging management, and are already included within the existing "Filters/Strainers" component type in LRA Table 3.3.2-9, "Auxiliary Systems - Service Water System - Summary of Aging Management Evaluation," (and LRA Table 2.3.3-10, "Essential Ventilation System").
- Intake and exhaust screens/louvers have no license renewal intended functions and, therefore, require no aging management. The outside air intake screen, however, will be included within the scope of license renewal, subject to aging management, with potential aging effects of loss of material and fouling, both of which will be managed by the System Monitoring Program.
- Duct sealants, wall sealants, and pressure boundary sealants are in-scope, subject to aging management, and are already included in commodity fashion, in the Civil/Structural portion of the LRA Tables 2.4.2 / 3.5.2-2, for "Elastomers/Indoor-All" and LRA Tables 2.4.11 / 3.5.2.11, for "Silicone Based Material/Indoor."

The applicant further stated that heat exchangers HX-190 A/B and HX-191A/B were inadvertently shown to be in-scope on drawing LR-M-144, sheet 2. These heat exchangers are part of the supplementary cooling for the computer room, which were installed specifically for the plant process computer (which is nonsafety-related). The heat exchanger cooling units are not safety-related, and they do not affect the control room envelope. The loss of these cooling units will have no effect on any safety-related equipment, and, therefore, these units are considered to be outside the scope of license renewal, as they provide no 10 CFR 54.4(a)(1), 10 CFR 54.4(a)(2), or 10 CFR 54.4(a)(3) functions for license renewal and, therefore, are not included in the LRA tables.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.10 acceptable. The applicant clarified that all applicable system components consisting of cooling coil housing, valve bodies for service water system control valves, heating coil housings, filter

housings, outside air intake screen including duct sealants, wall sealants, and pressure boundary sealants 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) for the essential ventilation system. These are identified as "Component Types" in LRA Tables 2.3.3-10, 3.3.2-9 and other associated LRA Tables 2.4.2, 2.4.11, 3.3.2-5, 3.5.2-2, and 3.5.2.11. Therefore, the staff's concern described in RAI 2.3.3.10 is resolved.

RAI 2.3.3.10-1. In RAI 2.3.3.10-1, dated December 17, 2004, the staff requested the applicant to clarify whether the chiller and associated components shown on drawing LR-M-214, sheet 4 at location C-9 for the control room chilled water system and any other applicable components of the system are within the scope of license renewal in accordance with 10 CFR 54.4(a), and subject to AMR in accordance with 10 CFR 54.21(a)(1).

In an e-mail dated, January 6, 2005, the applicant stated the following:

- As part of license renewal review, the applicant did not create a specific "Chiller" component type, but rather left them as "Heat Exchanger" subcomponents. Therefore, a "Chiller" component type does not show up in Tables 2.3.3-10 or 3.3.2-9.
- All of the "Chiller" subcomponents are in-scope and require aging management, and they are represented by the "Heat Exchanger" component type. The "Heat Exchanger" line items in Table 3.3.2-9 that have treated water environment, represent those subcomponents that are on the chilled water side of the unit. The "Heat Exchanger" line items with an air/gas environment, represent the subcomponents that are on the refrigerant side of the unit. The "Heat Exchanger" line items with "Raw Water" environment represent the subcomponents that are on the service water side of the unit.

Based on the above discussion, the staff found the applicant's proposed response to RAI 2.3.3.10-1 acceptable. The applicant clarified that all applicable system components consisting of chillers and its subcomponents 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) for the essential ventilation system and are identified as "Component Types" in LRA Tables 2.3.3-10 and 3.3.2-9. In its response, dated January 17, 2005, the applicant confirmed the statement previously provided via e-mail. Therefore, the staff's concerns described in RAI 2.3.3.10-1 are resolved.

2.3.3.10.3 Conclusion

The staff reviewed the LRA, the accompanying scoping boundary drawings, and the RAI responses described above 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 of the 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 essential ventilation 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 essential ventilation system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.11 Treated Water System

2.3.3.11.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.11, the applicant described the treated water system. The treated water system is comprised of the water treatment (WT), demineralized water (DI), potable water (PW), hydrazine addition (HA), sewage treatment plant (STP), and non-radioactive liquid waste disposal (floor drains, secondary sample effluents, etc.) secondary plant subsystems. These subsystems treat and demineralize water, store and supply demineralized and potable water for various uses in the plant, transfer and hold sanitary waste, clean site sump discharges, and introduce hydrazine and morpholine to the steam generators and condensate subsystem. The treated water system is a non-seismic piping system whose primary function is to support other plant process systems. The principal components of the treated water system are pumps, tanks, hot water heaters, hoses, valves, and associated piping.

The portions of the treated water system containing components subject to an AMR include:

- shear gate valves in the G01/G02 room's oily sump
- eyewash/safety shower in the auxiliary feedwater pump (AFP) area
- equipment drains from the heating, ventilation and air conditioning (HVAC) room above the main control room
- sump pump discharge piping and STP piping in the safety injection (SI) / component cooling (CC) pump area
- DI piping in close proximity to the containment spray and spent fuel pool (SFP) pumps, and the Unit 2 charging pump cubicles

The failure of nonsafety-related SSCs in the system could prevent the satisfactory accomplishment of a safety-related function.

Intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered
- provides for mechanical closure integrity on bolted joints

In LRA Table 2.3.3-11, as modified by letter dated April 29, 2005, the applicant identified the following treated water system component types that are within the scope of license renewal and subject to an AMR:

- CS components
- fasteners and bolting
- piping and fittings
- valve bodies
- filters and strainers
- heat exchangers

2.3.3.11.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.11 and the FSAR. The staff's review, using the evaluation methodology described in SER Section 2.3, was conducted in accordance with the guidance described in NUREG-1800, Section 2.3.

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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). As a result of the implementation of the scoping methodology changes, by letter dated April 29, 2005, the applicant identified additional component types within the scope of license renewal. 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 2.3.3.11 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.

RAI 2.3.3.11-1. LRA Section 2.3.3.11 states that the shear gate valves in the G01 and G02 rooms' oily sumps are within the scope of license renewal. In addition, the LRA states these are nonsafety-related SSCs whose failure has an effect on the function of safety-related equipment. Drawing LR-M-223, sheet 3, location F-2, indicates STP 14 and 15 are in the G02 room and are within the scope of license renewal. The shear gate valves for Room G01 could not be located on the LRA drawings. In RAI 2.3.3.11-1, dated November 10, 2004, the staff requested the applicant to clarify the location of the shear gate valves associated with Room G01 that are called out as within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.21(a)(1).

In its response, dated December 14, 2004, the applicant stated that drawing LR-M-223, sheet 3, location F-2, showing both STP-14 and STP-15 in the room for G02 is a drawing error. In reality, STP-14 is located in the room for G01, whereas STP-15 is in G02. The applicant further stated that the plant drawing was updated to correct this error, and confirmed that both gate valves associated with the above STPs are within the scope of license renewal.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.11-1 acceptable; therefore, the staff's concern described in RAI 2.3.3.11-1 is resolved.

RAI 2.3.3.11-2. The LRA states that all nonsafety-related SSCs whose failure could prevent satisfactory accomplishment of any of the functions identified within 10 CFR 54.4(a)(1)(i), (ii), or (iii) shall be considered within the scope of license renewal. Inconsistencies within the treated water system LRA drawings were identified as follows: piping segments identified on drawing LR-PBM-231, sheet 2, locations B-3, D-4, and B-9; drawing LR-M-223, sheet 3 at locations E-8 and H-8; and drawing LR-PBM-231, sheet 1 at location B-3 are designated to be within the scope of license renewal; however, the basis for these determinations is not explained. These piping segments can adversely impact the function of safety-related SSCs. In RAI 2.3.3.11-2, dated November 10, 2004, the staff requested the applicant to provide additional information and drawing LR-PBM-231, sheet 2, to permit verification that they have

been properly identified to be within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.21(a)(1).

In its response, dated December 14, 2004, the applicant stated that the LRA process included performing plant walkdowns to identify nonsafety-related components that could affect safety-related components, pursuant to 10 CFR 54.4(a)(2). This is discussed in LRA Section 2.1.2.1.2. LRA Table 2.1.2.1-1 displays the results of these walkdowns and provides a brief description of the nonsafety-related SSCs that were added to the scope of license renewal. The applicant further stated:

> Although difficult to show on a drawing, the in-scope portions of these non-SR [safety-related] piping sections were determined during plant walkdowns and transitions are shown at the points where the piping exited the room. Therefore, the scoping boundary may appear in the middle of a piping run and not at an isolation valve.

Based on the above statements, the applicant stated the following:

- For LRA drawing LR-PBM-231, sheet 2, the three instances identified in the RAI are all represented in Table 2.1.2.1-1, p. 2-28, in the third line item from the bottom. The safety-related equipment that could be potentially affected includes the containment spray pumps, the spent fuel pool pumps, and other safety-related equipment near pipeways #2 and #3, and near the charging pump cubicles.
- For LRA drawing LR-PBM-233, sheet 3, the two instances identified in the RAI are both represented in Table 2.1.2.1-1, p. 2-27, in the first line item. The safety-related equipment that could be potentially affected includes the safety injection pumps and the component cooling water pumps.
- For LRA drawing LR-PBM-231, sheet 1, the one instance identified in the RAI is represented in Table 2.1.2.1-1, p. 2-27, in the third line item from the top. The safety-related equipment that could be potentially affected includes the safety injection pumps, the containment spray pumps, the component cooling water pumps, and other safety-related equipment near the charging pump cubicles.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.11-2 acceptable; therefore, the staff's concern described in RAI 2.3.3.11-2 is resolved.

2.3.3.11.3 Conclusion

The staff reviewed the LRA, accompanying scoping boundary drawings, the April 29, 2005, letter, and the RAI responses described above 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 of the 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 treated water 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 treated water system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.12 Circulating Water System

2.3.3.12.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.12, the applicant described the circulating water (CW) system. The CW system provides a reliable supply of water from Lake Michigan to condense the steam exhausted from the low-pressure turbines. The system is a non-seismic piping system whose primary function is to remove heat from the steam cycle via the main condensers. The principal components of the CW system are the circulating water pumps, traveling screens and screen wash pumps, chlorine addition subsystem, and the associated piping and valves.

The portions of the CW system containing components subject to an AMR include: pump casings, valves, expansion joints and associated piping, screen wash and chlorination piping, valves, and associated components.

The failure of nonsafety-related SSCs in the system could prevent the satisfactory accomplishment of a safety-related function.

Intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered
- provides for mechanical closure integrity on bolted joints

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

- expansion joints
- fasteners and bolting
- piping and fittings
- pump casing
- valve bodies

2.3.3.12.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.12 and FSAR Section 10.1. The staff's review, using the evaluation methodology described in SER Section 2.3, was conducted in accordance with the guidance described in NUREG-1800, Section 2.3.

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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 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. The applicant responded to the staff's RAIs as discussed below.

RAI 2.3.3.12-1. LRA Section 2.3.3.12 states that portions of the CW system are considered to be within the scope of license renewal pursuant to 10 CFR 54.4(a)(2) due to the potential for flooding or spray to affect the function of the safety-related SW pumps. The 10 CFR 54.4(a)(2) scoping results for portions of the CW system that are within the scope of license renewal are identified on drawing LR-PBM-232 at location D5. This drawing indicates that the chlorination piping to the suction of CW pumps 2P-30A and 30B is in-scope; however, the same line to CW pumps 1P-30A and 30B is shown as not in-scope. In RAI 2.3.3.12-1, dated November 10, 2004, the staff requested the applicant to provide its basis for not considering chlorination piping between isolation valves CD-46 and 47 to the suction of CW pumps 1P-30A and 30B within the scope of license renewal.

In its response, dated December 14, 2004, the applicant stated that based on its 10 CFR 54.4(a)(2) walkdown, the physical location of the system with relation to the CW pumps is such that the Unit 1 chlorination piping does not cross the safety-related SW pump room as the Unit 2 chlorination lines do. Therefore, failure of the Unit 2 chlorination lines has the potential to affect the safety-related SW pumps via leakage or spray, and these lines are identified as within the scope of license renewal. Unit 1 lines do not have the potential to affect any safety-related equipment; therefore, they are not within the scope of license renewal.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.12-1 acceptable. Therefore, the staff's concerns described in RAI 2.3.3.12-1 are resolved.

RAI 2.3.3.12-2. LRA Section 2.3.3.12 states that portions of the CW system are considered to be within the scope of license renewal pursuant to 10 CFR 54.4(a)(2) due to the potential for flooding or spray to affect the function of the safety-related SW pumps. LRA drawings LR-M-212, sheet 1 and LR-M-2212 show the portions of the CW system that are within the scope of license renewal. The scoping review in the LRA states that the pumps, discharge valves, expansion joints, and associated piping within the CW pump house structure are in-scope; however, pressure taps (1PI3503 and 3504, and 1PI3503 and 3504) on the discharge of CW pumps 1-P30A and 30B and 2-P30A and 30B are not included within the scope of license renewal. In RAI 2.3.3.12-2, dated November 10, 2004, the staff requested the applicant to provide its technical justification for omitting the pressure taps (1PI3503 and 3504, and 1PI3503 and 3504) on the discharge of CW pumps 1-P30A and 30B and 2-P30A and 30B from the scope of license renewal.

In its response, dated December 14, 2004, the applicant stated that the CW system pumps, piping, valves, and expansion joints are in-scope, because of the flooding potential due to the large volume of water they carry/transport. In the event of a failure of any of these components, the water accumulation in the CW pump housing structure could exceed its draining capacity, which could thereby affect the safety-related pumps within that structure. Whereas, according to the applicant, a failure of any the small bore pressure taps will not cause water accumulation that could exceed the draining capacity of the housing structure and, therefore, will not affect the safety-related SW pumps in the structure. Therefore, the applicant concluded that the pressure taps that are identified in the RAI are not within the scope of license renewal, because they do not meet the scoping criteria for license renewal.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.12-2 acceptable. 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, accompanying scoping boundary drawings, and the RAI responses described above 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 of the 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).

2.3.3.13 Fuel Handling System

2.3.3.13.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.13, the applicant described the fuel handling system. The fuel handling system provides a safe and effective means of transporting and handling fuel, from the time it reaches the plant in a non-irradiated condition until it leaves the plant as spent fuel. The system is designed to minimize the possibility of mishandling or misoperation that could cause fuel damage and potential fission product release.

The fuel handling system ensures adequate cooling in the SFP.

2.3.3.13.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.13 and FSAR Section 9.4. The staff's review, using the evaluation methodology described in SER Section 2.3, was conducted in accordance with the guidance described in NUREG-1800, Section 2.3.

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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 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).

2.3.3.13.3 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 of the 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 handling 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 handling system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.14 Plant Sampling System

2.3.3.14.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.14, the applicant described the plant sampling system. The plant sampling system includes both the primary and secondary sampling subsystems. The primary sampling subsystem is able to take samples for laboratory analysis in order to evaluate reactor coolant and other auxiliary systems' chemistry during normal operation. In addition, this subsystem contains isolation valves for maintaining the containment pressure boundary. The secondary sampling subsystem provides a mean to obtain samples for various secondary plant location laboratory analysis.

Functions associated with the plant sampling system include the following:

- maintains the integrity of the reactor coolant pressure boundary
- provides automatic isolation of sample lines penetrating containment to prevent release of radioactivity to the environment
- provides heat removal from and/or pressure boundary of safety-related heat exchangers

In addition, the plant sampling system performs functions that support fire protection and environmental qualification.

The portions of the plant sampling system that constitute a part of the containment boundary and reactor coolant pressure boundary are within the ASME Class 1 boundary and are addressed in the Class 1 piping/components system. For convenience, a few additional components within the scope of license renewal are addressed in the following parent systems: residual heat removal system, chemical and volume control system, and component cooling water system.

As a result of the implementation of the scoping methodology changes, by letter dated April 29, 2005, the applicant identified more components within the scope of license renewal. The items originally addressed in other interface systems were left in those systems. The newly identified components include the tubing runs and valves from containment isolation valves or various sample locations to the primary sample room. The following, previously excluded, intended function and component types were identified.

Intended function within the scope of license renewal is to provide a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered.

In LRA Table 2.3.3-14, as modified by letter dated April 29, 2005, the applicant identified the following plant sampling system component types that are within the scope of license renewal and subject to an AMR:

- filters and strainers
- level gauges
- piping and fittings
- restricting orifices
- tanks
- valve bodies

2.3.3.14.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.14 and FSAR Sections 5.2 and 9.11. The staff's review, using the evaluation methodology described in SER Section 2.3, was conducted in accordance with the guidance described in NUREG-1800, Section 2.3.

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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). As a result of the implementation of the scoping methodology changes, by letter dated April 29, 2005, the applicant identified additional component types within the scope of license renewal. 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).

2.3.3.14.3 Conclusion

The staff reviewed the LRA and the April 29, 2005, letter 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 of the 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 plant 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 plant sampling system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.15 Plant Air System

2.3.3.15.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.15, the applicant described the plant air system. The plant air system includes the instrument air (IA), service air (SA), and emergency breathing air (EBA) subsystems. The IA and SA subsystems supply compressed air throughout the plant. The IA subsystem supplies dry, oil-free air to various components for the normal operation of both Units 1 and 2. The SA subsystem supplies non-dried, oil-free air to those plant services not requiring dry air. The EBA subsystem provides EBA to control room personnel based on fire protection criteria.

The portions of the plant air system containing components subject to an AMR include:

- IA components that support the charging pump vari-drives
- pressurizer power-operated relief valves (PORVs)
- IA and SA containment isolation valves
- SA boundary valves to the EBA subsystem
- EBA components from the air receivers to the connections in the control room

The plant air system provides a primary containment boundary to prevent the release of radioactivity into the environment. In addition, the plant air system performs functions that support fire protection, environmental qualification, and station blackout.

Intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered
- provides for mechanical closure integrity on bolted joints
- provides for filtration

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

- accumulators and cylinders
- compressor casing
- CS components
- fasteners and bolting
- filters and strainers
- flow indicators
- piping and fittings
- tanks
- valve bodies

2.3.3.15.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.15 and FSAR Sections 9.7 and 5.2. The staff's review, using the evaluation methodology described in SER Section 2.3, was conducted in accordance with the guidance described in NUREG-1800, Section 2.3.

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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 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. The applicant responded to the staff's RAIs, as discussed below.

RAI 2.3.3.15-1. FSAR Section 9.7.1 states that the instrument air (IA) system shall automatically isolate the purge supply and exhaust valve accumulators, including the supplemental nitrogen bottle system for 2VNPSE-3212 and 2VNPSE-3244, from the IA system during a loss of instrument air to maintain containment integrity and prevent release of radioactivity to the outside environment.

Drawing LR-PBM-2332 shows two valve actuators (listed below) as outside the scope of license renewal. However, LRA Section 2.3.3.15 states that the valve bodies are in-scope as a pressure boundary. The two valve actuators are not shown on plant drawings in a manner that is consistent with similar valves in the IA system. If portions of these valves have pressure

boundary functions that are not within the scope of license renewal, their failure could adversely impact the IA system pressure boundary function. In RAI 2.3.3.15-1, dated November 16, 2004, the staff requested the applicant to justify why the following valve actuators are not shown as within the scope of license renewal and subject to an AMR.

- actuator for 2VNPSE-3212, drawing LR-PBM-2332, location E-2.
- actuator for 2VNPSE-3244, drawing LR-PBM-2332, location E-6.

In its response, dated December 22, 2004, the applicant stated that failure to identify 2VNPSE-3212 and 2VNPSE-3244 actuators as within the scope of license renewal on drawing LR-PBM-2332 was a highlighting error. According to the applicant, these solenoid actuators are in-scope; however, they are not subject to aging management since they are active portions of the valves. Also, the bodies of the solenoid valves are in-scope as depicted on the drawing, and they have a pressure boundary intended function. Therefore, these valves would be subject to aging management. The applicant further stated that these valves are represented by the "Valve Bodies" component type in LRA Table 3.3.2-11. The above drawing was revised and the error is being tracked in its corrective action program.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.15-1 acceptable. Therefore, the staff's concerns described in RAI 2.3.3.15-1 are resolved.

RAI 2.3.3.15-2. FSAR Section 9.7.1 states that the IA system shall automatically isolate the instrument air lines penetrating containment whenever a containment isolation signal exists to maintain containment integrity and prevent release of radioactivity to the outside environment.

Drawing LR-M-209, sheet 7 shows IA piping through penetrations P-33A and P-33B in four locations as within the scope of license renewal. This agrees with LRA Section 2.3.3.15 that states the in-scope portion of the IA subsystem includes those IA components that support the charging pump variable drives, pressurizer PORVs, and the IA containment isolation valve. However, the IA air piping continuation for these containment penetrations on drawing LR-M-209, sheet 11 (at four locations B-1, C-1, C-6, and D-6) shows the IA piping as out-of-scope for license renewal. The transition location from in-scope (containment isolation) to out-of-scope (inside containment) is not clearly marked. If portions of these piping sections are out-of-scope for license renewal, their failure may affect the integrity of containment. In RAI 2.3.3.15-2, dated November 16, 2004, the staff requested the applicant to clarify the exact locations of these four transitions, and to clearly show which sections are within, and which are outside, the scope of license renewal.

In its response, dated December 22, 2004, the applicant stated that this was a highlighting error on drawing LR-M-209, sheet 11. The containment isolation function for the IA system is performed by two valves outside containment for each line, as shown on sheet 7 of the above drawing. According to the applicant, these valves and piping up to and including the containment penetration are in-scope and subject to aging management. The piping adjacent to the penetrations inside containment is out-of-scope. The applicant further stated that the drawing LR-M-209, sheet 11, was revised and the error is being tracked in its corrective action program.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.15-2 acceptable. The applicant confirmed that the in-scope transitions occur inside containment at the penetration. Therefore, the staff's concerns described in RAI 2.3.3.15-2 are resolved.

RAI 2.3.3.15-3. FSAR Section 9.7.1 states that the IA system shall automatically isolate the instrument air lines penetrating containment whenever a containment isolation signal exists to maintain containment integrity and prevent release of radioactivity to the outside environment.

Drawing LR-M-209, sheet 7 shows four tanks and associated piping as out-of-scope for license renewal. LRA Section 2.3.3.15 states that the in-scope portion of the IA subsystem includes those IA components that support the charging pump variable drives, pressurizer PORVs, and the IA containment isolation valves. Failure of these sections of piping depicted as not in-scope could affect the integrity of containment. In RAI 2.3.3.15-3, dated November 16, 2004, the staff requested the applicant to justify its determination of the following tanks and associated piping as outside the scope of license renewal and subject to an AMR:

- 1T -196, drawing LR-M-209, sheet 7, location B-3
- 1T -197, drawing LR-M-209, sheet 7, location A-3
- T -196, drawing LR-M-209, sheet 7 location E-2
- T -197, drawing LR-M-209, sheet 7 location F-2

In its response, dated December 22, 2004, the applicant stated that the four tanks referenced in this question are small air accumulators on the air line to the actuators. These tanks and their associated piping are correctly shown to be outside the scope of license renewal, because they perform no license renewal intended function and cannot affect the containment isolation function of the containment isolation valves. The applicant further stated that the failure of these tanks or piping would cause air to bleed off the actuator, thereby causing the associated containment isolation valve to close in its fail-safe position.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.3.15-3 acceptable. The pressure boundary failure of air accumulators (1T196, 1T197, T196, and T197) and the associated vent piping will not prevent the containment isolation valves from fulfilling their intended safety function. The staff agreed that these air accumulators and the adjacent vent piping for containment isolation valves 1CV3047, 1CV3048, 2CV3047, and 2CV3048 can be considered outside the scope of license renewal. Therefore, the staff's concerns described in RAI 2.3.3.15-3 are resolved.

2.3.3.15.3 Conclusion

The staff reviewed the LRA, accompanying scoping boundary drawings, and the RAI responses described above 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 of the 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 plant air 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 plant air system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.3.16 Containment Hydrogen Detectors and Recombiner System

2.3.3.16.1 Summary of Technical Information in the Application

In LRA Section 2.3.3.16, the applicant described the containment hydrogen detectors and recombiner system. The containment hydrogen detectors and recombiner system (generally referred to as the post-accident containment ventilation system (PACV)) provides a long-term method of controlling hydrogen accumulation within the containment following a LOCA. The system includes independent sample, exhaust and supply piping connections, and the associated piping and valves that support the system's intended functions. Each piping connection is equipped with redundant containment isolation valves that are located to minimize personnel's exposure to radiation, if valve operation is required. Exhaust piping discharges to either the PAB exhaust ventilation subsystem or to a hydrogen recombiner that is stored offsite. The portions of the containment hydrogen detectors and recombiner system containing components subject to an AMR extend from the piping inside containment to the containment isolation valves, including the associated piping and valves.

Functions associated with the containment hydrogen detectors and recombiner system include the following:

- provides a primary containment boundary to prevent the release of radioactivity into the environment
- provides a long-term method of controlling hydrogen accumulation and thereby containment pressure control following a LOCA

In addition, the containment hydrogen detectors and recombiner system performs functions that support environmental qualification.

Intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered
- provides for mechanical closure integrity on bolted joints

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

- CS components
- fasteners and bolting
- instrument valve assemblies
- piping and fittings
- valve bodies

2.3.3.16.2 Staff Evaluation

The staff reviewed LRA Section 2.3.3.16 and FSAR Sections 5.2 and 5.3.2.4. The staff's review, using the evaluation methodology described in SER Section 2.3, was conducted in accordance with the guidance described in NUREG-1800, Section 2.3.

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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 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).

2.3.3.16.3 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 of the 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 hydrogen detectors and recombiner 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 hydrogen detectors and recombiner system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.4 Steam and Power Conversion System

In LRA Section 2.3.4, the applicant identified the structures and components (SCs) of the steam and power conversion system that are subject to an AMR for license renewal.

The applicant described the supporting SCs of the steam and power conversion system in the following LRA sections:

- 2.3.4.1 main and auxiliary steam system
- 2.3.4.2 feedwater and condensate system
- 2.3.4.3 auxiliary feedwater system

The corresponding subsections of this SER (2.3.4.1 – 2.3.4.3) present the staff's review findings with respect to the steam and power conversion systems for both Units 1 and 2.

2.3.4.1 Main and Auxiliary 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 and auxiliary steam system. The main and auxiliary steam system transports the steam produced in the steam generator (SG) to the main turbine for the production of electricity. The system also provides heat removal from the RCS during normal, accident, and post-accident conditions. In addition, the main and auxiliary steam system provides steam for the turbine-driven auxiliary feedwater pumps (AFPs), which can be accessed from either of the main steam lines that are located upstream of the main steam isolation valves. The main and auxiliary steam system is in continuous operation during normal plant operation.

The portions of the main and auxiliary steam system containing components subject to an AMR include the main steam line components extending from the SGs to downstream of the non-return valves, the auxiliary steam lines to the turbine-driven AFPs (including exhaust piping), the radwaste steam lines until they exit the PAB, and the SG blowdown and sample piping components that extend from the SGs to the containment isolation valves.

Functions associated with the main and auxiliary steam system include the following:

- contains instrumentation that functions by detecting, initiating, and actuating automatic safety functions
- provides steam to the turbine-driven AFP
- provides primary containment boundary
- provides emergency heat removal from the RCS using secondary heat removal capability

Some nonsafety-related portions of piping in the system have failure modes that could prevent the satisfactory accomplishment of safety-related functions due to high-energy line breaks. In addition, the main and auxiliary steam system performs functions that support fire protection, environmental qualification, and station blackout.

Intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered
- provides for mechanical closure integrity on bolted joints
- provides for flow control or distribution, as through a spray nozzle

In LRA Table 2.3.4-1, as modified by letter dated April 29, 2005, the applicant identified the following main and auxiliary steam system component types that are within the scope of license renewal and subject to an AMR:

- CS components
- drain trap
- fasteners and bolting
- flow elements
- instrument valve assemblies
- piping and fittings
- restricting orifices
- steam traps
- valve bodies
- filters and strainers
- heat exchangers
- level gauges
- pump casing
- tanks

2.3.4.1.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.1 and FSAR Sections 10.1 and 10.2. The staff's review, using the evaluation methodology described in SER Section 2.3, was conducted in accordance with the guidance described in NUREG-1800, Section 2.3.

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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). As a result of the implementation of the scoping methodology changes, by letter dated April 29, 2005, the applicant identified additional component types within the scope of license renewal. 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 and the April 29, 2005, letter 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 of the 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 and auxiliary 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 main and auxiliary steam system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.4.2 Feedwater and Condensate System

2.3.4.2.1 Summary of Technical Information in the Application

In LRA Section 2.3.4.2, the applicant described the feedwater and condensate system. The feedwater and condensate system condenses and collects the steam exhausted from the low-pressure turbines and then returns it to the SGs for reuse. Components within the system are used to provide emergency heat removal from the RCS by utilizing secondary heat removal capability. The engineered safety features actuation system (ESFAS) provides actuation signals for feedwater isolation. The feedwater and condensate system is normally in continuous operation during normal plant operation.

The portions of the feedwater and condensate system containing components subject to an AMR extend from the feedwater regulating valves to the SGs.

Functions associated with the feedwater and condensate system include the following:

- detects, initiates, and actuates automatic safety functions
- provides emergency heat removal from the RCS by using secondary heat removal capability
- provides a primary containment boundary to prevent the release of radioactivity into the environment

Portions of the feedwater and condensate system have failure modes that could prevent the satisfactory accomplishment of safety-related functions due to high-energy line breaks. In addition, the feedwater and condensate system performs functions that support environmental qualification, station blackout, anticipated transient without scram, and fire protection.

Intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered
- provides for mechanical closure integrity on bolted joints
- provides for flow control or distribution, as through a spray nozzle

In LRA Table 2.3.4-2, as modified by letters dated April 29 and July 19, 2005, the applicant identified the following feedwater and condensate system component types that are within the scope of license renewal and subject to an AMR:

- CS components
- fasteners and bolting
- flow elements
- instrument valve assemblies
- piping and fittings
- valve bodies
- level gauges
- pump casing
- steam traps
- tanks

2.3.4.2.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.2 and FSAR Sections 5.2, 7.2, 7.4, and 10.1. The staff's review, using the evaluation methodology described in SER Section 2.3, was conducted in accordance with the guidance described in NUREG-1800, Section 2.3.

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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). As a result of the implementation of the scoping methodology changes, by letters dated April 29 and July 19, 2005, the applicant identified additional component types within the scope of license renewal. 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 2.3.4.2 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.

RAIs 2.3.4.2-1 and 2.3.4.2-4. As described in FSAR Section 10.1, the primary function of the feedwater system is to provide feedwater to the steam generators. Further, according to the LRA, portions of the feedwater system also provide pressure boundary and flow paths to support AFW makeup to the steam generators. The LRA drawings for the feedwater and condensate systems show the following listed piping/valves/fittings off of the feedwater pressure boundary as not within the scope of license renewal. Whereas, LRA Section 2.3.4.2 states that the feedwater and condensate piping and fittings are within the scope of license renewal as a pressure boundary. Failure of these sections of piping could affect the pressure

boundary function of the feedwater system. In RAI 2.3.4.2-1, dated November 16, 2004, the staff requested the applicant to justify as to why the piping areas listed below are not within the scope of license renewal and subject to an AMR.

Dwg. LR-M-202, SH-2, F-8 and C-8.....two sets of clean-out flanges
Dwg. LR-M-202, SH-2, F-8 and C-8.....two capped 3/8" ME with two in line valves
Dwg. LR-M-202, SH-2, F-9 and B-9.....two inlet lines from the Chem. Injection system
Dwg. LR-M-202, SH-2, F-7 and H-10.....valve145A and an outlet line to Dwg. 222
Dwg. LR-M-202, SH-2, B-7.....an outlet line with valve 151A
Dwg. LR-M-202, SH-2, C-9.....an outlet line to 1TE 2105
Dwg. LR-M-202, SH-2, C-9.....an outlet line to 1PT 2289
Dwg. LR-M-202, SH-2, C-8.....an outlet line to 1TX 2102
Dwg. LR-M-202, SH-2, F-9.....an outlet line to 1TE 2104
Dwg. LR-M-202, SH-2, F-9.....an outlet line to 1PT 2290
Dwg. LR-M-202, SH-2, F-8.....an outlet line to 1TX 2101
Dwg. LR-M-202, SH-1, D-10.....an outline to 216 with valve 87
Dwg. LR-M-2202, SH-2, F-3 and C-3.....a clean-out flange
Dwg. LR-M-2202, SH-2, F-3 and B-3.....two capped 3/8" ME with two in line valves
Dwg. LR-M-2202, SH-2, F-3 and B-3.....two inlet lines with valves 180 and 167
Dwg. LR-M-2202, SH-2, G-6 and F-4.....an outlet line to 2222 with valve 145B
Dwg. LR-M-2202, SH-2, B-4.....an outlet line with valve 151A
Dwg. LR-M-2202, SH-2, C-2.....an outlet line to 2TE 2105
Dwg. LR-M-2202, SH-2, C-3.....an outlet line to 2PT 2289
Dwg. LR-M-2202, SH-2, C-3.....an outlet line to 2TX 2102
Dwg. LR-M-2202, SH-2, F-2.....an outlet line to 2TE 2104
Dwg. LR-M-2202, SH-2, F-3.....an outlet line to 2PT 2290
Dwg. LR-M-2202, SH-2, F-3.....an outlet line to 2TX 2101
Dwg. LR-M-202, SH-1, D-1.....an outline to 216 with valve 87

In its response, dated December 22, 2004, the applicant stated that the primary safety functions of the feedwater and condensate system are to provide containment isolation and to maintain capability for heat removal via the steam generators. Both of these functions are accomplished by the two check valves in the main feed lines, just upstream of the steam generators (AFW makeup is downstream of these check valves). For these reasons, the applicant stated that the 16-inch main feed headers between these check valves and the feedwater regulating valves are nonsafety-related. These nonsafety-related headers were included within the scope of license renewal in order to comply with the 10 CFR 54.4(a)(2) criterion, due to potential high energy line break (HELB) interactions with nearby safety-related equipment (LRA Table 2.1.2.1-1, p. 2-25, first line item). The applicant further stated that:

> . . . Branches off of the main feedwater headers that are 1-inch and under were not included in-scope as they are not considered in HELB evaluations (per NRC guidance for HELB evaluations - per FSAR Appendix A.2 Reference 1: "General Information Required for Consideration of the Effects of a Piping System Break Outside Containment," (AEC, December 19, 1972).

Additionally, according to the applicant, since these connections of 1-inch and under, would not be likely to provide sufficient energy to create a harsh environment (as defined by the PBNP Equipment Qualification Program), only the header itself was included within the scope of

license renewal for potential HELB concerns. Therefore, the applicant stated that branch connections 1-inch and under, on the in-scope, nonsafety-related portions of the main feedwater headers, are considered to be outside the scope of license renewal.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.4.2-1 acceptable, except for the 10 CFR 54.21(a)(2) spatial effects of the branch lines, 1-inch and under, off the main feedwater headers. The applicant should further evaluate these branch lines to ensure that failure would not adversely impact the intended functions of safety-related SSCs in the room where these branches are located.

The staff review of the applicant's response to RAI 2.3.4.2-1 identified two follow-up questions. In RAI 2.3.4.2-4, dated January 10, 2005, the staff requested the applicant to:

(1) Confirm that a break in the branch piping (one-inch or less) would not impact any safety-related equipment in the immediate vicinity of the possible break location.

(2) Discuss flooding associated with a failure in the branch piping and its impact on safety-related equipment.

In its response, dated January 26, 2005, the applicant stated the following:

(1) The section of main feedwater piping in question was included in-scope to protect the safety-related (SR) (but non-environmentally qualified) feedwater transmitters (1/2FT-466, -467, -476, -477). Walkdowns were performed to verify that no high energy branch piping (including branch piping one-inch and less) was in proximity to the SR transmitters where pipe whip or jet impingement could be a hazard. Additionally, the transmitters are in large open areas where the energy input from a failure of a small bore line off of this header would not create a sufficiently harsh environment to affect the functions of these transmitters.

(2) The SR feedwater flow transmitters in question are location on the 26' elevation for Unit 2 and 39' elevation for Unit 1, and mounted about four feet off of the floor. Any leakage from the main feedwater header branch connections at these elevations would cascade to lower elevation, and not affect the function of these transmitters nor any other safety-related equipment due to flooding.

During a meeting on February 15, 2005, the staff indicated and the applicant agreed, that this response required further clarification with respect to flooding associated with branch piping failure. In its response, a clarification letter dated March 15, 2005, the applicant stated that any leakage from these main feedwater header branch connections would not cause flooding that would affect the function of the safety-related equipment, such as flow transmitters located in the room. Additionally, the applicant stated "the scoping methodology will change to a 'spaces' approach, and as such, the nonsafety-related components (including these 1-inch lines) in the same space with the safety-related transmitters will be included in-scope."

Aging effects specified in 10 CFR 54.4 were not considered in the previous HELB evaluation. Originally, the additional justification that "these 1-inch lines would not likely provide sufficient energy to create a harsh environment" was not adequate. The distances between these 1-inch lines and safety-related SSCs were not specified, and the staff was not able to evaluate the validity of the statement to ensure that the failure of these branch lines would not adversely

impact the intended functions of safety-related SSCs in the room where these branches are located. By including all nonsafety-related components in the same space with the safety-related transmitters, as stated in the clarification letter, the staff concluded that the applicant provided an acceptable response. The staff's concerns described in RAIs 2.3.4.2-1 and 2.3.4.2-4 are resolved.

RAI 2.3.4.2-2. FSAR Section 10.1 describes the primary function of the feedwater system as providing feedwater to the SGs. As described in the LRA, portions of the feedwater system also provide pressure boundary and flow paths to support AFW makeup to the SGs. The condenser manual fill line shown on drawing LR-M-202 sheet 1, at location D-10 is indicated to be within the scope of license renewal. However, a similar condenser manual fill line shown on drawing LR-M-2002, sheet 1, location D-1 is not within the scope of license renewal. Failure of this section of piping could affect the pressure boundary function of the feedwater system. In RAI 2.3.4.2-2, dated November 16, 2004, the staff requested the applicant to justify its determination to exclude this section of piping from the scope of license renewal for the Unit 2 feedwater system.

In its response, dated December 22, 2004, the applicant stated that this was a highlighting error on drawing LR-M-2002, sheet 1. The applicant also stated that the condenser manual fill line up to and including valves 2CS-86 and -87 is within the scope of license renewal and subject to aging management. These components are represented by the "Piping and Fittings" and "Valve Bodies" component types in LRA Table 3.4.2-2. According to the applicant, the drawing LR-M-2002, sheet 1 was revised, and the error is being tracked in its corrective action program.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.4.2-2 acceptable. Therefore, the staff's concern described in RAI 2.3.4.2-2 is resolved.

RAI 2.3.4.2-3. FSAR Section 10.1 describes the primary design system function of the feedwater system including provisions for blowdown from the SGs. Portions of the ESFAS also provide actuation signals for feedwater system isolation including the SG blowdown lines. Drawing LR-M-201 sheet 3, at location F-10 indicates that the blowdown lines from the steam generators A and B are within the scope of license renewal. However, drawing LR-M-2201, sheet-3, at location F-1 indicates that these sections of SG blowdown pressure boundary piping are not within the scope of license renewal for Unit 2. Also, drawing LR-M-201, sheet 1, at location E-8 indicates that this section of piping is not within the scope of license renewal for Unit 1, contrary to drawing LR-M-201, sheet 3. If the blowdown lines from the SGs are relied upon for a pressure boundary function and isolation on an ESFAS signal, then their failure could adversely impact their intended functions. In RAI 2.3.4.2-3, dated November 16, 2004, the staff requested the applicant to clarify which sections of the steam generator blowdown lines have pressure boundary functions and should be within the scope of license renewal and subject to an AMR. The applicant was further asked to justify its determination of those portions of the blowdown piping that are outside the scope of license renewal.

In its response, dated December 22, 2004, the applicant stated that this was a highlighting error on drawing LR-M-2201, sheet 3. The applicant further stated that the upstream piping is within the scope of license renewal as indicated on sheet 1 of this drawing, but the transition arrow was missed on sheet 3 of the drawing. The applicant also stated that, in both units, the blowdown piping between the SGs up to and including valves 1/2MS-2042 and 1/2MS-2045 is within the scope of license renewal and subject to aging management. According to the

applicant, drawing LR-M-2201, sheet 3 was revised, and the error is being tracked in its corrective action program.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.4.2-3 acceptable. The applicant confirmed that the blowdown lines questioned by the staff are within the scope of license renewal. Therefore, the staff's concerns described in RAI 2.3.4.2-3 are resolved.

2.3.4.2.3 Conclusion

The staff reviewed the LRA, the accompanying scoping boundary drawings, the April 29 and July 19, 2005, letters, and the RAI responses described above 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 of the 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 feedwater and 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 feedwater and condensate system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.3.4.3 Auxiliary Feedwater System

2.3.4.3.1 Summary of Technical Information in the Application

In LRA Section 2.3.4.3, the applicant described the auxiliary feedwater (AFW) system. The AFW system is designed to supply high-pressure feedwater to the SGs in order to maintain a water inventory for the removal of heat energy from the RCS. This can be achieved through secondary side steam release in the event of inoperability or unavailability of the main feedwater subsystem. One turbine-driven AFW pump (per unit) and two electric-driven AFW pumps (shared by the two units) are provided to ensure that adequate feedwater is supplied to the SGs to remove heat under all circumstances, including loss of power and loss of normal heat sink. Auxiliary feedwater flow can be maintained until power is restored or reactor decay heat removal can be accomplished by other systems.

The portions of the AFW system subject to an AMR extend from the condensate storage tanks (CSTs) to the SGs, including the associated pumps, piping, valves, and portions of the air subsystem that are required to function after loss of normal plant air supply.

Functions associated with the AFW system include the following:

- provides emergency heat removal from the reactor coolant system using secondary heat removal capability
- removes heat from the turbine bearing coolers
- provides a primary containment boundary to prevent the release of radioactivity into the environment

The failure of nonsafety-related SSCs in the system could prevent the satisfactory accomplishment of a safety-related function. In addition, the AFW system performs functions that support environmental qualification, fire protection, anticipated transient without scram, and station blackout.

Intended functions within the scope of license renewal include the following:

- provides a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered
- provides for mechanical closure integrity on bolted joints
- provides for heat transfer
- provides for flow restriction

In LRA Table 2.3.4-3, the applicant identified the following AFW system component types that are within the scope of license renewal and subject to an AMR:

- accumulators and cylinders
- CS components
- fasteners and bolting
- flow elements
- heat exchanger
- instrument valve assemblies
- piping and fittings
- pump casing
- restricting orifices
- tanks
- turbine casing
- valve bodies
- valve operator

2.3.4.3.2 Staff Evaluation

The staff reviewed LRA Section 2.3.4.3 and FSAR Sections 5.2, 7.4, 10.0, and 10.2. The staff's review, using the evaluation methodology described in SER Section 2.3, was conducted in accordance with the guidance described in NUREG-1800, Section 2.3.

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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 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 2.3.4.3 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.

RAI 2.3.4.3-1. FSAR Section 10.2 states that the AFW system has several safety-related functions, including supplying high-pressure feedwater to the SGs in order to maintain a water inventory for removal of heat energy from the reactor under specific accident conditions. Drawing LR-M-217, sheet 2, quadrant B-2, identifies a portion of the SW return piping from AFW pump 1P-29 as outside the scope of license renewal. This is inconsistent with the drawing LR-M-207, sheet 1A, quadrant B-9, that shows the return SW piping from AFW pump

1P-29 as within the scope of license renewal. Failure of the out-of-scope return line may affect the pressure boundary integrity of the AFW system. In RAI 2.3.4.3-1, dated November 16, 2004, the staff requested the applicant to clarify whether this portion of SW piping is within the scope of license renewal; if it is not, the staff requested the applicant to provide justification for not considering this piping within the scope of license renewal.

In its response, dated December 22, 2004, the applicant stated that this was a highlighting error on drawing LR-M-217, sheet 2. The applicant further stated that the SW piping (supply and return for the AFW pump bearings) is within the scope of license renewal, as depicted on drawing LR-M-207, sheet 1A, and would be subject to aging management. According to the applicant, the drawing LR-M-217, sheet 2 was revised, and the error is being tracked in its corrective action program.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.4.3-1 acceptable. Therefore, the staff's concern described in RAI 2.3.4.3-1 is resolved.

RAI 2.3.4.3-2. FSAR Section 10.2 states the AFW system has several safety-related functions including supplying high-pressure feedwater to the SGs in order to maintain a water inventory for removal of heat energy from the reactor under specific accident conditions. Drawing LR-M-217, sheet 2, quadrant B-3, identifies a portion of the air supply piping to valve 1 MS 2090 as within the scope of license renewal. This is inconsistent with the drawing LR-M-207, sheet 1A, quadrant C-10, which shows the pneumatic supply line to 1 MS 2090 as outside the scope of license renewal. Failure of the out-of-scope pneumatic supply line may adversely impact the safety-related functions of the AFW system. In RAI 2.3.4.3-2, dated November 16, 2004, the staff requested the applicant to clarify whether this portion of air supply piping is within the scope of license renewal; if it is not, the staff requested the applicant to provide justification for not considering this piping within the scope of license renewal.

In its response, dated December 22, 2004, the applicant stated that this was a highlighting error on drawing LR-M-217, sheet 2. The solenoid valve associated with 1MS 2090 is within the scope of license renewal, but it is an active component and, therefore, is not subject to aging management. The applicant also stated that the air piping between the solenoid and valve is not in-scope, because it has no intended function. If this air tubing were to fail, the valve would go to its fail-safe position, and would not impact the intended function of the valve (*i.e.*, to supply SW to the bearings). According to the applicant, the drawing LR-M-217, sheet 2 was revised, and the error is being tracked in its corrective action program.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.4.3-2 acceptable. Therefore, the staff's concern described in RAI 2.3.4.3-2 is resolved.

RAI 2.3.4.3-3. FSAR Section 10.2 states the AFW system has several safety-related functions, including supplying high-pressure feedwater to the SGs in order to maintain a water inventory for removal of heat energy from the reactor under specific accident conditions. Drawing LR-M-217, sheet 2, quadrant E-8 identifies a portion of the air supply piping to valve 2 MS 2090 as within the scope of license renewal. This is inconsistent with drawing LR-M-207, sheet 1A, quadrant G-10 that shows the pneumatic supply line to 2 MS 2090 as outside the scope of license renewal. Failure of the out-of-scope pneumatic supply line may adversely impact the safety-related functions of the AFW system. In RAI 2.3.4.3-3, dated November 16, 2004, the staff requested the applicant to clarify whether this portion of air supply piping is within the

scope of license renewal; if it is not, the staff requested the applicant to provide justification for not considering this piping within the scope of license renewal.

In its response, dated December 22, 2004, the applicant stated that this was a highlighting error on drawing LR-M-217, sheet 2. The solenoid valve associated with 2 MS 2090 is within the scope of license renewal, but it is an active component and, therefore, is not subject to aging management. The applicant also stated that the air piping between the solenoid and valve is not in-scope, because it has no intended function. If this air tubing were to fail, the valve would go to its fail-safe position, and would not impact the intended function of the valve (*i.e.*, to supply SW to the bearings). According to the applicant, drawing LR-M-217, sheet 2 was revised, and the error is being tracked in its corrective action program.

Based on the above discussion, the staff found the applicant's response to RAI 2.3.4.3-3 acceptable. Therefore, the staff's concern described in RAI 2.3.4.3-3 is resolved.

2.3.4.3.3 Conclusion

The staff reviewed the LRA, the accompanying scoping boundary drawings, and the RAI responses described above 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 of the 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 AFW 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 AFW system components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4 Scoping and Screening Results - Containments, Structures, and Component Supports

This section documents the staff's review of the applicant's scoping and screening results for containments, structures, and component supports. Specifically, this section discusses the following containments, structures, and component supports:

- Units 1 and 2 containment building
- control building
- circulating water pumphouse
- diesel generator building
- Units 1 and 2 facade
- primary auxiliary building (PAB)
- Units 1 and 2 turbine building
- yard structures
- cranes, hoists, and lifting devices
- component supports commodity group
- fire barrier commodity group
- 13.8 kV switchgear building
- fuel oil pumphouse
- gas turbine building

In accordance with the requirements of 10 CFR 54.21(a)(1), the applicant must identify and list passive, long-lived containments, structures, and component supports 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 was no omissions of containments, structures, and component supports 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 containments, structures, and component supports. The objective of the review was to determine if the components and supporting structures for a specific containment, structure or containment support 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 renewal. The staff reviewed relevant licensing basis documents, including the final safety analysis report (FSAR), for each containment, structure, and component support to determine if the applicant had omitted system 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.

As documented under RAI 2.1-1 in SER Section 2.1, by letter dated April 29, 2005, the applicant changed the methodology used to determine the nonsafety-related SCs that are within the scope of license renewal in accordance with the requirements of 10 CFR 54.4(a)(2). As a result of the implementation of the scoping methodology changes, the applicant identified no new containment, structures, and supports component groups within the scope of license renewal.

Screening. After completing its scoping evaluation, the staff reviewed the applicant's screening results. For those SCs with intended functions, the staff sought to determine: (1) if the function(s) are performed with moving parts or involve a change in configuration or properties, or (2) if they are subject to replacement based on a qualified life or specific 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 containments, structures, and component supports 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.

The corresponding subsections of this SER (2.4.1 – 2.4.14) present the staff's review findings with respect to the containments, structures, and component supports for both Units 1 and 2.

2.4.1 Containment Units 1 and 2 Building Structure

2.4.1.1 Summary of Technical Information in the Application

In LRA Section 2.4.1, the applicant identified the structures and components of the Units 1 and 2 containment building structure that are subject to an AMR for license renewal. Both the Units 1 and 2 containments are essentially identical in design and construction. The structures consist of two prestressed, post-tensioned, reinforced concrete cylinders with flat base slabs and shallow domed roofs. The structures provide biological shielding for both normal and accident situations. Each containment structure is entirely housed in an unheated enclosure (facade) that provides protection from the weather. The various components of the containment structures include: the concrete wall structure, steel wall liner, reinforced concrete and steel-framed internal structures, electrical penetrations, large equipment access, personnel airlocks, and fuel access penetration. Major components include the liner plate, penetrations, airlocks and equipment hatches.

The portions of the Units 1 and 2 containment building structure containing components subject to an AMR include the walls, dome, foundations, tendons, internal structures, floors, ceilings, beams, and columns.

Functions associated with the Units 1 and 2 containment building structure include the following:

- provides a primary containment boundary by enclosing the entire reactor and coolant system to ensure that an acceptable upper limit of leakage of radioactive materials to the environment is not exceeded
- houses a substantial amount of safety-related mechanical and electrical equipment and components

The failure of nonsafety-related systems, structures and components in the structure could prevent the satisfactory accomplishment of a safety-related function. Specifically, the internal structure of the containment structure houses and supports the refueling cavity, which utilizes the reactor cavity seal ring during refueling. In addition, the Units 1 and 2 containment building structure performs functions that support fire protection.

Intended functions within the scope of license renewal include the following:

- provides a spray shield or curbs for directing flow (*e.g.*, safety injection flow to containment sump)
- provides a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered
- provides shelter or protection for safety-related components
- provides structural support for nonsafety-related components whose failure could prevent satisfactory accomplishment of any of the required safety-related functions or regulated event functions

- provides a rated fire barrier to confine or retard a fire from spreading to or from adjacent areas of the plant
- provides a barrier to protect against internal and external flooding events
- provides a heat sink during station blackout or design-basis accidents
- provides a barrier for protection against internally or externally generated missiles
- provides for pipe whip restraint
- provides shielding against radiation

In LRA Table 2.4.1-1, the applicant identified the following containment Units 1 and 2 building structure component types that are within the scope of license renewal and subject to an AMR:

- buried concrete (foundation - basemat)
- indoor concrete (cylinder walls and buttresses, dome and ring girder)
- indoor concrete (internal structure - columns, beams, slabs, and walls)
- borated water elastomer (RV cavity seal ring)
- indoor elastomer (airlock door seals, penetrations - electrical)
- indoor grout (column baseplates; miscellaneous steel structures)
- indoor structural carbon steel fasteners (dome truss, miscellaneous steel structures, cast-in-place anchor bolts)
- indoor structural carbon steel (airlocks and equipment hatches including bolting)
- indoor structural carbon steel (containment liner and keyway channels)
- indoor structural carbon steel (exposed portions of embedded steel; framing - columns, beams, bracing, baseplates, dome truss, and crane supports; platforms, grating, stairs, ladders, and checkered plates; CRDM missile shield)
- indoor structural carbon steel (penetrations - electrical)
- indoor structural carbon steel (penetrations - mechanical, including bolting)
- indoor structural carbon steel (post-tensioning tendons)
- indoor structural copper alloy (airlock bushings)
- indoor structural stainless steel fasteners (miscellaneous items)
- borated water structural stainless steel (refueling cavity liner; sandbox covers including bolting; plates, bars, strips, and rods associated with the RC; fuel transfer tube including bolting)
- indoor structural stainless steel (penetrations - electrical)
- indoor structural stainless steel (miscellaneous items, reactor cavity liner)
- buried structural steel piles (carbon steel h-piles - foundation)

2.4.1.2 Staff Evaluation

The staff reviewed LRA Section 2.4.1 using the evaluation methodology described in SER Section 2.4. The staff conducted its review in accordance with the guidance described in NUREG-1800, Section 2.4, "Scoping and Screening Results: Structures."

In conducting its review, the staff evaluated the structural or component functions described in the LRA and FSAR 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 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 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.

RAI 2.4-1. The staff's review of LRA Section 2.4.1 and Table 2.4.1-1 identified the word "ALL" at the end of each component group. In RAI 2.4-1, dated January 26, 2005, the staff requested the applicant to clarify the usage of the word "ALL" for the component groups.

In its response, dated February 25, 2005, the applicant stated that the intent of "ALL" at the end of each component group was to signify that "ALL" of the material/environment items associated with the component group were included. No further meaning or intent was implied.

Based on the above discussion, the staff found this clarification acceptable. The staff's concern described in RAI 2.4-1 is resolved.

RAI 2.4-3. The LRA Section 2.4 does not appear to contain information about thermal insulation on piping and/or structures that perform an intended function. The staff is aware that the concrete temperatures around the main steam and feedwater lines were found to be about 380 °F for an unknown period of time. Thermal insulation is usually used between the hot piping and concrete to maintain the maximum temperature of concrete below the threshold levels of 150 °F for general areas and 200 °F for local areas around hot penetrations. Thermal insulation is passive and long-lived, and serves an intended function in accordance with 10 CFR 54.4(a)(2). Therefore, in RAI 2.4-3, dated January 26, 2005, the staff requested the applicant to: (1) identify the locations of the thermal insulation that serves an intended function in accordance with 10 CFR 54.4(a)(2), (2) describe plant-specific operating experience related to the degradation of thermal insulation, and (3) describe the scoping and screening results of thermal insulation and provide the technical bases for its exclusion from the scope of license renewal.

In its response, dated February 25, 2005, the applicant stated:

> Thermal insulation for structures is discussed in Section 2.1.3.1.2, page 2-45, of the LRA.
>
> 2.1.3.1.2 Screening of Thermal Insulation
>
> In response to NRC staff requests for additional information (RAIs) on other license renewal applications, a screening review has been performed of thermal insulation. The review identified only one location where thermal insulation is within the scope of license renewal. Insulation is installed on the main steam and main feedwater containment penetrations, and is needed to maintain steady-state concrete temperatures less than 150 °F. This insulation is enclosed in the annulus and is not subject to wetting, and there are no plausible aging effects that could warrant aging management.
>
> The insulation for the containment penetrations is considered to be in-scope but having no intended functions or aging effects. The initial request for plant-specific operating experience regarding the degradation of thermal insulation on the containment penetrations was contained in RAI 3.5-3. The operating experience was provided by NMC letter dated August 26, 2004. In that letter, NMC committed to inspect the penetrations that exhibited the high temperature (*i.e.*, greater than 150 °F).

Based on the above discussion, the staff found the applicant's response to RAI 2.4-3 acceptable. The applicant has committed to inspect the penetrations that exhibited high temperature (*i.e.*, greater than 150 °F). The staff's concern described in RAI 2.4-3 is resolved.

2.4.1.3 Conclusion

The staff reviewed the LRA, its related structural or component information, and RAI responses described above 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 Units 1 and 2 containment building 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 Units 1 and 2 containment building structure components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.2 Control Building Structure

2.4.2.1 Summary of Technical Information in the Application

In LRA Section 2.4.2, the applicant identified the structures and components of the control building (CB) structure that are subject to an AMR for license renewal. The CB is a rectangular, safety-related, seismic Class 1 structure that is constructed from reinforced concrete with internal bracing that is provided by reinforced concrete walls, columns, and floors. The CB is adjacent to the primary auxiliary building (PAB) and enveloped by the Units 1 and 2 turbine

buildings (TBs). The CB is enclosed within the turbine buildings, but is considered an independent structure since it has no fixed structural attachments to either the TBs, or the PAB.

The portions of the CB structure containing components subject to an AMR include the walls, roof, foundations, floors, doors, ceilings, beams, and columns.

The CB structure provides structural support and housing for safety Class 1, 2, and 3 systems, structures, and components (SSCs). The failure of nonsafety-related SSCs in the structure could prevent the satisfactory accomplishment of a safety-related function. In addition, the CB structure performs functions that support fire protection and station blackout.

Intended functions within the scope of license renewal include the following:

- provides shelter or protection for safety-related components
- provides structural support to nonsafety-related components whose failure could prevent satisfactory accomplishment of any of the required safety-related functions or regulated event functions
- provides a rated fire barrier to confine or retard a fire from spreading to or from adjacent areas of the plant
- provides a barrier to protect against internal and external flooding events
- provides a heat sink during station blackout or design-basis accidents
- provides shielding against high energy line breaks
- provides a barrier for protection against internally or externally generated missiles
- provides shielding against radiation
- provides structural and/or functional support to safety-related equipment

In LRA Table 2.4.2-1, the applicant identified the following CB structure component types that are within the scope of license renewal and subject to an AMR:

- buried concrete (foundation - spread footings)
- indoor concrete (walls, ceilings, floors, columns; equipment pedestals; spray walls (AFWP room))
- indoor concrete (wall - east)
- indoor doors
- indoor elastomers (rubber flap - diesel generator room (DGR) louver; rubber sill, sweep - flood doors; gasket and seals - control room doors)
- indoor glass (glass windows - control room wall (north, south, and east); glass windows - computer room (east wall))
- indoor grout (miscellaneous steel structures)
- outdoor masonry block wall (DGR - east wall)

- indoor masonry block walls (battery room, non-vital switchgear room (non-VSR), control room - internal, DGR and AFW pump room tunnel)
- indoor structural carbon steel fasteners (subsoil drain cover; wall panels and plates, bracing; HELB and flood barriers; door braces; platforms, stairs)
- outdoor structural carbon steel fasteners (missile shield - DGR; corner plates - DGR (east wall))
- indoor structural carbon steel (HELB barriers - cable spreading room (CSR) north and south wall, non-VSR - south wall and braces, and east wall barriers around cable trays; SW guard pipe - battery room; condensate storage tank supply guard pipe - 1E battery room (26 EL); door braces - VSR south and west walls; wall plates - CSR north and south walls; wall panels - control room north, south and east walls; flood barrier - non-VSR (east wall); masonry wall bracing; platforms, stairs)
- outdoor structural carbon steel (missile barrier and bracing - DGR air intake)
- indoor structural cast iron (floor drain covers and flanges (DGR, vital switchgear room (VSR), AFWP room)
- outdoor wood (missile shield - integral part of diesel generator air intake)

2.4.2.2 Staff Evaluation

The staff reviewed LRA Section 2.4.2 and the FSAR. The staff's review, using the evaluation methodology described in SER Section 2.4, was conducted in accordance with the guidance described in NUREG-1800, Section 2.4.

In conducting its review, the staff evaluated the structural or component functions described in the LRA and FSAR 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 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 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.

RAI 2.4-4. LRA Table 2.4.2-1 lists outdoor wood as a component group within the scope of license renewal and missile barrier as the intended function for the control building structure. In RAI 2.4-4, dated January 26, 2005, the staff requested the applicant to explain what this outdoor wood component is and how the wood component serves as a missile barrier.

In its response, dated February 25, 2005, the applicant stated that the emergency diesel generator air-intake louvers are protected by a missile barrier. The missile of concern is from environmental sources. The missile barrier is constructed from structural steel and the outside face is made from C-channels. Treated wood timbers are bolted to the C-channels and are part of the missile barrier along with the steel C-channel.

Based on the above discussion, the staff found the applicant's response to RAI 2.4-4 acceptable, because the wood is a part of the steel missile barrier. The staff's concern described in RAI 2.4-4 is resolved.

2.4.2.3 Conclusion

The staff reviewed the LRA, its related structural or component information, and RAI response described above 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 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 control building structure components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.3 Circulating Water Pumphouse Structure

2.4.3.1 Summary of Technical Information in the Application

In LRA Section 2.4.3, the applicant identified the structures and components of the circulating water pumphouse (CWPH) structure that are subject to an AMR for license renewal. The CWPH structure consists of four interconnected facilities: forebay, CWPH building, intake crib, and discharge flumes. Only the forebay and CWPH building are within the scope of license renewal. In an emergency, there are four separate flow paths into the forebay (two intake pipes and two discharge flumes). However, only one flow path is needed. The nonsafety-related intake crib is completely submerged offshore. It connects with the forebay's surge chambers via two 14-foot-diameter pipes that are buried beneath the lakebed. The forebay channels the water to the pump bay within the CWPH building. The CWPH building contains pumps for the circulating water system, SW system, and fire protection system. Two nonsafety-related discharge flumes are attached to the east wall of the forebay's seal wells and extend into Lake Michigan. Circulating water discharge from the Units 1 and 2 condensers empties into its respective seal well via two 12-foot-diameter pipes and then flows to the discharge flumes via 14-foot-diameter valves.

The portions of the CWPH structure containing components subject to an AMR include the walls, roof, foundations, floors, doors, ceilings, beams, and columns.

The CWPH structure structurally supports and houses six safety-related SW pumps. In addition, the CWPH structure performs functions that support fire protection.

Intended functions within the scope of license renewal include the following:

- provides shelter or protection for safety-related components
- provides structural and/or functional support to safety-related equipment
- provides a rated fire barrier to confine or retard a fire from spreading to or from adjacent areas of the plant

- provides a barrier to protect against internal and external flooding events
- provides a barrier to protect against internally or externally generated missiles
- provides a source of cooling water for plant shutdown

In LRA Table 2.4.3-1, the applicant identified the following CWPH structure component types that are within the scope of license renewal and subject to an AMR:

- buried concrete (foundation - basemat)
- indoor concrete (floors; missile barrier; non-combustible wall (SW pumps))
- outdoor concrete (walls, roof)
- raw water concrete (forebay structure and pump bays)
- indoor doors (all doors throughout the building)
- indoor grout (column baseplates)
- indoor structural carbon steel fasteners (structural steel framing)
- indoor structural carbon steel (framing - columns, beams)

2.4.3.2 Staff Evaluation

The staff reviewed LRA Section 2.4.3 and the FSAR. The staff's review, using the evaluation methodology described in SER Section 2.4, was conducted in accordance with the guidance described in NUREG-1800, Section 2.4.

In conducting its review, the staff evaluated the structural or component functions described in the LRA and FSAR 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 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 2.4.3 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.

RAI 2.4-5. LRA Section 2.4.3 states that the intake crib and the discharge flumes are connected to the forebay and the CWPH structures and provide functions for water intake and discharge, respectively. However, only the forebay and the CWPH structures are within the scope of license renewal. In RAI 2.4-5, dated January 26, 2005, the staff requested the applicant to provide justification for excluding the intake crib and the discharge flumes from license renewal.

In its response, dated February 25, 2005, the applicant stated:

> The intake crib is located 1750 ft. from the shore in a water depth of 22 ft. Water flows from the intake crib to the pumphouse forebay via two 14 ft. diameter, corrugated, galvanized, structural plate pipes buried to a minimum depth of 3 ft. below the lake bed. The water flows from a common Unit 1 and Unit 2 forebay through bar grates and traveling screens (8) to the suction of the CW service water, and firewater pumps. The water exits the plant through the two discharge flumes.
>
> The Circulating Water Pumphouse is a seismic Class I structure common to Unit 1 and Unit 2. It houses the firewater and service water pumps in addition to the CW pumps. The intake crib, intake pipes, forebay bar grates, discharge flumes, and traveling screens are nonsafety-related, non-QA, seismic class III structures and components.
>
> There are four separate and independent flow paths into the forebay. Included are two 14-ft. diameter offshore intake pipes and backflow from two CW discharge flow paths. The CW discharge flow paths consist of backflow from the discharge flume into the surge chamber via the sealwell. Any one of the four independent flow paths will provide substantially more flow than the firewater and service water pump supply requirements. The service water and firewater system need to pass less than 5% of the Circulating Water Pumphouse total design capacity (*i.e.*, 712,000 gpm). No credible simultaneous failure of the four independent flow paths could occur to preclude lake water from reaching the firewater and service water pumps.
>
> AEC Safety Evaluation dated July 15, 1970, evaluated the failure of both 14-ft. diameter offshore intake pipes. In this event, it was concluded that lake water for service water pumps can be provided directly to the seal well from the CW discharge flume. AOP-13A "Circulating Water System Malfunction," provides this guidance in the event of blockage of the intake crib and dropping forebay level.
>
> In conclusion the non-safety-related, non-QA, and seismic class III intake crib, intake pipes, and discharge flumes do not affect any safety-related system structure or component (SSC) intended functions in accordance with 10 CFR 54.4(a)(2) and therefore are not within the scope of license renewal.

Based on the above discussion, the staff found the applicant's response to RAI 2.4-5 acceptable. The intake crib and the discharge flume do not affect any intended function of safety-related SSCs. The staff's concern described in RAI 2.4-5 is resolved.

RAI 2.4-6. The staff was unable to identify whether the traveling water screens, as shown in the license renewal drawing LR-M-212-SH-2, are included within the scope of license renewal. In RAI 2.4-6, dated January 26, 2005, the staff requested the applicant to indicate if they are in-scope and where in the LRA these are discussed. If the traveling screens are outside the scope of license renewal, the staff requested the applicant to justify their exclusion from the scope of license renewal.

In its response, dated February 25, 2005, the applicant stated:

> The traveling water screens are not within the scope of license renewal. The forebay bar grates and traveling screens are non-safety-related, non-QA, seismic class III structures and components. The service water and firewater pumps are the essential plant equipment that always require a water supply. The Circulating Water Pumphouse structures and components are designed/sized for a maximum CW flow rate of 712,000 gpm (both units or 178,000 gpm per CW pump) plus the flow rates of the service water and firewater pumps.
>
> Typical flow rates for the service water system in accident conditions vary, up to a maximum of 21,000 gpm (one unit in normal operation, second unit experiencing a design basis accident). The flow rates of the service water and firewater pumps represent less than 5% of the total design flow (*i.e.*, 712,000 gpm) into the forebay.
>
> Neither the non-safety-related forebay bar grates (gross filtration) or traveling screens (finer filtration) could prevent passing the less than 5% total design flow rate from reaching the suction of the firewater or service water pumps. It is not credible that a total blockage condition could develop, (i.e., a non-safety affecting safety condition). The bar grates and traveling screens are not relied on in a safety analyses or plant evaluations to perform a function that demonstrates compliance with the NRC's regulations for fire protection (FP).
>
> In conclusion, the nonsafety-related, non-QA, seismic class III traveling screens are out-of-scope of license renewal. Substantial clogging of these components will not prevent the firewater or service water pumps from obtaining minimum supply requirements.

Based on the above discussion, the staff found the applicant's response to RAI 2.4-6 acceptable. The traveling water screens do not affect any intended function of safety-related SSCs. The staff's concern described in RAI 2.4-6 is resolved.

2.4.3.3 Conclusion

The staff reviewed the LRA, its related structural or component information, and RAI responses described above 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 circulating water pumphouse 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 circulating water pumphouse structure components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.4 Diesel Generator Building Structure

2.4.4.1 Summary of Technical Information in the Application

In LRA Section 2.4.4, the applicant identified the structures and components of the diesel generator building (DGB) structure that are subject to an AMR for license renewal. The DGB is a rectangular, safety-related, seismic Class 1 structure with an attached, nonsafety-related, seismic Class 3, stairway-passageway enclosure along the building's west side. The building is an independent structure with no other buildings in its immediate vicinity. The safety-related, seismic Class 1 portion of the DGB is constructed from reinforced concrete with internal bracing provided by reinforced concrete walls and floors. The DGB houses the train 'B' emergency diesel generators (EDGs), including their support equipment and distribution switchgear, the fuel oil storage tanks, and the fuel oil transfer pumps that service all four EDGs.

The portions of the DGB structure containing components subject to an AMR include the walls, roof, foundations, floors, doors, ceilings, beams, and columns.

The DGB structure provides structural support and housing to safety-related SSCs. The failure of nonsafety-related SSCs in the structure could prevent the satisfactory accomplishment of a safety-related function. In addition, the DGB structure performs functions that support fire protection and station blackout.

Intended functions within the scope of license renewal include the following:

- provides shelter or protection for safety-related components
- provides structural support to nonsafety-related components whose failure could prevent satisfactory accomplishment of any of the required safety-related functions or regulated event functions
- provides structural and/or functional support to safety-related equipment
- provides a rated fire barrier to confine or retard a fire from spreading to or from adjacent areas of the plant
- provides a barrier for protection against internally or externally generated missiles

In LRA Table 2.4.4-1, the applicant identified the following DGB structure component types that are within the scope of license renewal and subject to an AMR:

- buried concrete (foundation - footings and basemat)
- indoor concrete (walls, floors, and ceilings)
- outdoor concrete (walls, roof)
- outdoor doors
- indoor doors
- indoor grout (platforms, stairs)
- indoor structural carbon steel fasteners (platforms, stairs; missile shields)
- indoor structural carbon steel fasteners (missile shields)
- indoor structural carbon steel (framing - crane rails supports; platforms, stairs)
- outdoor structural carbon steel (missile shields, wall plates at missile shields)

2.4.4.2 Staff Evaluation

The staff reviewed LRA Section 2.4.4 and the FSAR. The staff's review, using the evaluation methodology described in SER Section 2.4, was conducted in accordance with the guidance described in NUREG-1800, Section 2.4.

In conducting its review, the staff evaluated the structural or component functions described in the LRA and FSAR 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 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).

2.4.4.3 Conclusion

The staff reviewed the LRA and its related structural or 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 concluded that there is reasonable assurance that the applicant adequately identified the diesel generator building 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 diesel generator building structure components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.5 Facade Units 1 and 2 Structure

2.4.5.1 Summary of Technical Information in the Application

In LRA Section 2.4.5, the applicant identified the structures and components of the Units 1 and 2 facade structure that are subject to an AMR for license renewal. The Units 1 and 2 facade structures are seismic Class 3 structures consisting primarily of steel framing and metal siding. The facade's perimeter wall framing is supported vertically on reinforced concrete walls that are supported by an independent, reinforced concrete foundation. The facade structures have no intermediate floors other than a stair tower that provides access to upper elevations of the PAB and the containment. The facades surround and enclose the reinforced concrete containment structures and function primarily to provide the containments with a sheltered environment.

The portions of the Units 1 and 2 facade structure containing components subject to an AMR include the walls, roof truss, foundations, beams, and columns.

The failure of nonsafety-related SSCs in the Units 1 and 2 facade structure could prevent the satisfactory accomplishment of a safety-related function. Specifically, the structures provide no physical protection from design-basis external hazards, but do provide weather protection for equipment and personnel.

Intended function within the scope of license renewal is to provide structural support to nonsafety-related components whose failure could prevent the satisfactory accomplishment of any of the required safety-related functions or regulated event functions.

In LRA Table 2.4.5-1, the applicant identified the following Units 1 and 2 facade structure component types that are within the scope of license renewal and subject to an AMR:

- buried concrete (foundation - spread footings)
- indoor concrete (floor)
- outdoor concrete (retaining walls)
- indoor grout (column baseplates)
- indoor masonry block wall (elevators and stairs towers)
- indoor structural carbon steel fasteners (structural steel framing, steel framing for elevator and stair towers)
- indoor structural carbon steel (framing - columns, beams; roof truss)

2.4.5.2 Staff Evaluation

The staff reviewed LRA Section 2.4.5 and the FSAR. The staff's review, using the evaluation methodology described in SER Section 2.4, was conducted in accordance with the guidance described in NUREG-1800, Section 2.4.

In conducting its review, the staff evaluated the structural or component functions described in the LRA and FSAR 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 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).

2.4.5.3 Conclusion

The staff reviewed the LRA and its related structural or 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 concluded that there is reasonable assurance that the applicant adequately identified the Units 1 and 2 facade 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 Units 1 and 2 facade structure components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.6 Primary Auxiliary Building Structure

2.4.6.1 Summary of Technical Information in the Application

In LRA Section 2.4.6, the applicant identified the structures and components of the primary auxiliary building (PAB) structure that are subject to an AMR for license renewal. The PAB is a rectangular, multi-floored, reinforced concrete and steel, framed structure, consisting of a central area and two wings (north and south). The PAB internal bracing is provided by reinforced concrete walls, floors, and slabs, and structural steel framing. The reinforced concrete PAB central area and portions of the reinforced concrete north and south wings are seismic Class 1 structures. The PAB's steel superstructure is a seismic Class 3 structure. Each PAB area is founded on its own basemat.

The portions of the PAB structure containing components subject to an AMR include the new and spent fuel storage racks, walls, roof, foundations, floors, doors, ceilings, beams, and columns.

The PAB provides structural support and housing to safety-related SSCs. The failure of nonsafety-related SSCs in the structure could prevent the satisfactory accomplishment of a safety-related function. In addition, the PAB performs functions that support fire protection.

Intended functions within the scope of license renewal include the following:

- maintains the subcriticality of spent fuel
- provides shelter or protection for safety-related components
- provides structural support to nonsafety-related components whose failure could prevent satisfactory accomplishment of any of the required safety-related functions or regulated event functions
- provides structural and/or functional support to safety-related equipment
- provides a rated fire barrier to confine or retard a fire from spreading to or from adjacent areas of the plant
- provides a barrier to protect against internal and external flooding events
- provides a barrier for protection against internally or externally generated missiles
- provides shielding for protection against high-energy line breaks (HELBs)
- provides a pressure-retaining boundary so that sufficient flow at adequate pressure is delivered
- provides a spray shield or curbs for directing flow

In LRA Table 2.4.6-1, the applicant identified the following PAB structure component types that are within the scope of license renewal and subject to an AMR:

- borated water Boraflex (spent fuel storage racks)
- buried concrete (foundation - basemat)

- indoor concrete (walls, ceilings, floors; spent fuel pool)
- outdoor concrete (walls)
- indoor doors
- borated water elastomer (spent fuel pool gates)
- indoor elastomers (all rubber sill, sweep-flood doors)
- indoor grout (columns baseplates, miscellaneous steel structures)
- indoor masonry block wall (block walls (8-ft, 26-ft, 46-ft elevation))
- indoor structural carbon steel fasteners (structural steel framing)
- buried structural carbon steel piles (spent fuel pool)
- indoor structural carbon steel (crane support girders; framing - columns, beams; roof truss; platforms, stairs)
- borated water structural stainless steel (spent fuel pool (SFP), SFP canal, SFP gates, spent fuel storage racks)
- indoor structural stainless steel (new fuel storage racks)

2.4.6.2 Staff Evaluation

The staff reviewed LRA Section 2.4.6 and the FSAR. The staff's review, using the evaluation methodology described in SER Section 2.4, was conducted in accordance with the guidance described in NUREG-1800, Section 2.4.

In conducting its review, the staff evaluated the structural or component functions described in the LRA and FSAR 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 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).

2.4.6.3 Conclusion

The staff reviewed the LRA and its related structural or 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 concluded that there is reasonable assurance that the applicant adequately identified the PAB 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 PAB structure components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.7 Turbine Building Units 1 and 2 Structure

2.4.7.1 Summary of Technical Information In the Application

In LRA Section 2.4.7, the applicant identified the structures and components of the Units 1 and 2 turbine building (TB) structure that are subject to an AMR for license renewal. The Units 1 and 2 TBs are rectangular, nonsafety-related, seismic Class 3 structures that are constructed from structural steel and reinforced concrete, with internal bracing provided by structural steel columns and beams. The TBs are located adjacent to the PAB. The TBs are in a line, with the Unit 1 building situated south of Unit 2 building; the Unit 1 to Unit 2 interface is located over the control building. The TBs enclose the control building, except for the control building's east and west walls. Lateral bracing exists between the TB's structural steel framing, the adjacent, seismic Class 3, PAB's steel superstructure, and the south service building's steel framing. The TBs have no fixed structural attachments with the adjacent, seismic Class 1 structures of the control building and the lower reinforced portion of the PAB.

The portions of the Units 1 and 2 TB structure containing components subject to an AMR include the walls, roof, foundations, floors, ceilings, beams, and columns.

The structural steel frame and foundation of the nonsafety-related Units 1 and 2 TB structure provide support to SSCs with safety-related functions. In addition, the Units 1 and 2 TB structure performs functions that support fire protection.

Intended functions within the scope of license renewal include the following:

- provides a rated fire barrier to confine or retard a fire from spreading to or from adjacent areas of the plant
- provides structural support to nonsafety-related components whose failure could prevent satisfactory accomplishment of any of the required safety-related functions or regulated event functions
- provides structural and/or functional support to safety-related equipment

In LRA Table 2.4.7-1, the applicant identified the following Units 1 and 2 TB structure component types that are within the scope of license renewal and subject to an AMR:

- buried concrete (foundation - spread footings and basemat, floor)
- indoor concrete (floors and walls (north, 8-ft and 26-ft elevation), turbine generator lube oil reservoir area curbing, lube oil storage tank area walls)
- outdoor concrete (foundation walls)
- indoor grout (column baseplates)
- indoor masonry block walls (lube oil storage room walls (Unit 2 only))
- indoor structural carbon steel fasteners (structural steel framing, HELB barriers, flood louvers, rollup door braces)

- indoor structural carbon steel (flood louvers - east wall; door bracing - east wall; HELB barrier - north wall; crane rails supports; framing - columns, beams; roof truss)

2.4.7.2 Staff Evaluation

The staff reviewed LRA Section 2.4.7 and the FSAR. The staff's review, using the evaluation methodology described in SER Section 2.4, was conducted in accordance with the guidance described in NUREG-1800, Section 2.4.

In conducting its review, the staff evaluated the structural or component functions described in the LRA and FSAR 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 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).

2.4.7.3 Conclusion

The staff reviewed the LRA and its related structural or 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 concluded that there is reasonable assurance that the applicant adequately identified the Units 1 and 2 TB 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 Units 1 and 2 TB structure components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.8 Yard Structures

2.4.8.1 Summary of Technical Information in the Application

In LRA Section 2.4.8, the applicant identified the structures and components of the yard structures that are subject to an AMR for license renewal. The yard structures include electrical manholes and duct banks, tank foundations, SBO equipment foundations, and earthen berm barriers. Electrical manholes and duct banks contain safety-related and nonsafety-related cables. Manholes are reinforced concrete, box-type structures with a reinforced concrete or cast iron cover. Duct banks are reinforced concrete structures that encase galvanized steel and PVC pipes which serve as conduits for the electrical cables. In-scope SBO components include electrical distribution items needed for coping and power restoration. Typical yard structures consist of the equipment foundations, pads, and support structures. The gas turbine generator (GTG) fuel oil tank foundations and surrounding earthen berms are also included. Other miscellaneous yard structures are not within the scope of license renewal.

The portions of the yard structures containing components subject to an AMR include the concrete manholes and duct banks, electrical equipment concrete foundations and steel support structures, and the earthen berms.

The yard structures house several electrical manholes and their associated duct banks, which contain safety-related cables. These SSCs are vital to plant safety and provide suitable protection against severe, external, environmental phenomena. In addition, the yard structures perform functions that support fire protection and station blackout.

Intended functions within the scope of license renewal include the following:

- provides shelter or protection for safety-related components
- provides structural support to nonsafety-related components whose failure could prevent satisfactory accomplishment of any of the required safety-related functions or regulated event functions
- provides structural and/or functional support to safety-related equipment
- provides a rated fire barrier to confine or retard a fire from spreading to or from adjacent areas of the plant

In LRA Table 2.4.8-1, the applicant identified the following yard structure component types that are within the scope of license renewal and subject to an AMR:

- buried concrete (electrical duct banks, equipment foundations and support pads, manholes)
- indoor concrete (manhole interior)
- outdoor concrete (equipment foundations and support pads, manholes and covers)
- outdoor structural carbon steel fasteners/outdoor (switchyard equipment frames)
- outdoor structural carbon steel (manhole covers, framing - 345k VAC distribution system, bus ducts - high-voltage station auxiliary transformers to circuit breaker cabinets, bus ducts - low-voltage station auxiliary transformers to 13.8k VAC switchgear cabinet)
- outdoor structural cast iron (manhole frames and covers)
- buried masonry block wall (manholes)

2.4.8.2 Staff Evaluation

The staff reviewed LRA Section 2.4.8 and the FSAR. The staff's review, using the evaluation methodology described in SER Section 2.4, was conducted in accordance with the guidance described in NUREG-1800, Section 2.4.

In conducting its review, the staff evaluated the structural or component functions described in the LRA and FSAR 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 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 2.4.8 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.

RAI 2.4-8. LRA Section 2.4.8 states that yard transformer and tower concrete foundations, and transformer fire walls are not within the scope of license renewal. In RAI 2.4-8, dated January 26, 2005, the staff requested the applicant to explain the function of each item listed above and provide justification for their exclusion.

In its response, dated February 25, 2005, the applicant stated:

> The license renewal electrical power distribution drawing depicting the in-scope systems/components are shown on LR drawing LR-Electrical-E1. The corresponding civil structures that support the power distribution are depicted on LR drawing LR-E-100, Sheet 1. An example of a yard transformer that is not in-scope would be the Unit Auxiliary Transformers (X02s). Consequently, the foundation for the X02s would not be in-scope. The High Voltage Station Auxiliary Transformers (X03s) and their corresponding foundations are an example of an in-scope transformer.
>
> Four high voltage transmission line towers provide power to the switchyard. Each tower has a concrete foundation. These towers are outside the in-scope area as defined by the portions of the switchyard that are part of the CLB for SBO in accordance with 10 CFR 50.63. As depicted on LRA drawing LR-Electrical-E1, these towers and their associated foundations are not in-scope.
>
> The transformer firewall is a structure constructed between the two Low Voltage Station Auxiliary Transformers (X04s). The firewall was installed in 1991 as a result of a weakness from a property loss stand point and reliability of offsite power as cited by Nuclear Mutual Limited Insurance (NML). This wall is not installed to comply with 10 CFR 50.48. Therefore, the firewall is not within the scope of license renewal.

Based on the above discussion, the staff found the applicant's response to RAI 2.4-8 acceptable. The applicant clarified which items are within the scope of license renewal, which are outside the scope of license renewal, and provided the basis for those that are outside-scope. The staff's concern described in RAI 2.4-8 is resolved.

RAI 2.4-2. LRA Section 2.4 does not appear to contain information about tanks and their foundations. In RAI 2.4-2, dated January 26, 2005, the staff requested the applicant to provide a list of all tanks and their foundations for each unit. Additionally, the staff requested the applicant to: (1) identify the tanks and their foundations that are within the scope of license renewal and define their intended functions, (2) identify the tanks and their foundations that are outside the scope of license renewal and the basis for their exclusion, and (3) specify where the AMR for each in-scope tank and tank foundation is located in the LRA.

In its response, dated February 25, 2005, the applicant stated:

> Tanks are associated with the system in which they reside. They are addressed and scoped in the mechanical section of the LRA, Section 2.3. The tables in LRA Section 2.3 have a component group, "Tanks." The license renewal drawings for the systems are listed and tanks that are in-scope are highlighted on the drawings. Tanks are not individually identified by component number in the LRA but the LRA basis documentation does contain individual component information which is available for review on-site.
>
> Tank foundations are scoped in LRA Section 2.4 and are typically constructed of concrete or steel. Tanks foundations and intended functions are typically presented in LRA Section 2.4.8, "Yard Structures," Section 2.4.10, "Component Supports Commodity Group," or individual section for the building. Tank and tank foundation AMR information is contained in the corresponding Sections 3.1 through 3.5 of the LRA.

Based on the above discussion, the staff found the applicant's response to RAI 2.4-2 acceptable in that tanks are addressed and scoped in the mechanical section, LRA Section 2.3. However, the staff found unacceptable the omission of tank foundations from LRA Section 2.4. The applicant should identify the tank foundations that are or should be within the scope of license renewal and define their intended functions. The applicant should also specify the appropriate AMR for each in-scope tank foundation and identify the tank foundations that are not or should not be within the scope of license renewal and the basis for their exclusion. This was identified as confirmatory item (CI) 2.4-2.

In its response to CI 2.4-2, by letter dated June 10, 2005, the applicant identified individual tanks and their foundations that are within the scope of license renewal. Subsequently, the applicant submitted a letter, dated June 29, 2005, to clarify the intended functions and AMR information of those tank foundations that are within the scope of license renewal. This letter stated that the intended function for tank foundations is either a safety-related or a nonsafety-related support and that the AMR information is contained within the corresponding LRA Section 3.5. Since tank foundations are not stated under the column of component types in buildings of LRA Section 3.5, the applicant used examples to illustrate that the tank foundations within the scope of license renewal are included in either concrete or steel component types, and further stated that every in-scope tank foundation within a building or in yard structures would be captured by those component items.

With all in-scope tanks and their foundations identified, intended functions stated, and the AMR information clarified, the staff concluded that the applicant has properly documented the necessary information related to the tanks and their foundations and considers the applicant's response to RAI 2.4-2 to be acceptable. The staff's concern is resolved and, therefore, CI 2.4-2 is closed.

2.4.8.3 Conclusion

The staff reviewed the LRA, its related structural or component information, and RAI responses described above 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 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 yard structures components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.9 Cranes, Hoists, and Lifting Devices

2.4.9.1 Summary of Technical Information in the Application

In LRA Section 2.4.9, the applicant identified the structures and components of the cranes, hoists, and lifting devices that are subject to an AMR for license renewal. The cranes, hoists, and lifting devices system consists of the fuel handling cranes and the load handling systems that comply with NUREG-0612. The fuel handling cranes include the reactor cavity manipulator cranes and the spent fuel pool (SFP) bridge crane. The applicant stated that the fuel handling cranes are not within the scope of license renewal because their intended functions do not support safety-related structures and components or have heavy load capacities. The NUREG-0612 load handling systems include the containment cranes, auxiliary building main crane, and the turbine building overhead crane. This license renewal system also includes the emergency diesel generator G03 and G04 cranes and monorails in the diesel generator building, the reactor coolant pump lifting slings, the reactor vessel head, and the internals lifting rigs. The specific components comprising this license renewal system are the bridge and trolley structural members of the heavy load cranes and lifting devices, which include the crane rails and hardware.

The portions of the cranes, hoists, and lifting devices system containing components subject to an AMR include the bridge and trolley structural beams, girders, and rails associated with the NUREG-0612 heavy load cranes and lifting devices.

Intended function within the scope of license renewal is to provide structural support to nonsafety-related components whose failure could prevent the satisfactory accomplishment of any of the required safety-related functions or regulated event functions.

In LRA Table 2.4.9-1, the applicant identified the following cranes, hoists, and lifting devices that are within the scope of license renewal and subject to an AMR:

- structural carbon steel fasteners/indoor (rail hardware)
- structural carbon steel/indoor (bridge and trolley framing; crane rails, monorails; and lifting rigs)
- structural stainless steel/borated water (reactor vessels internals lifting rig)

2.4.9.2 Staff Evaluation

The staff reviewed LRA Section 2.4.9 and the FSAR. The staff's review, using the evaluation methodology described in SER Section 2.4, was conducted in accordance with the guidance described in NUREG-1800, Section 2.4.

In conducting its review, the staff evaluated the structural or component functions described in the LRA and FSAR 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 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 2.4.9 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.

RAI 2.4-7. LRA Table 2.4.4-1 lists crane rails supports as a component group within the scope of license renewal. In RAI 2.4-7, dated January 26, 2005, the staff requested the applicant to explain whether the crane, rails, hoists, and lifting devices are also within the scope of license renewal. If they are not, the applicant was requested to provide justification for their exclusion.

In its response, dated February 25, 2005, the applicant stated:

> The boundary between the building structures and their associated cranes is at the rail support / rail interface, (*i.e.*, all components from the rail and above) are associated with the crane [sic]. The rail support system is considered part of the building structure. Table 2.4.4-1, "Diesel Generator Building Structure," contains the Component Group, "Structural Carbon Steel/Indoor-All," which includes the structural steel that supports the crane rails.
>
> Cranes are discussed in Section 2.4.9, "Cranes, Hoists, and Lifting Devices System," of the LRA. The specific components comprising this license renewal system are the passive load-bearing structural members (bridge and trolley), and/or structural beams, and girders of these cranes, hoists, and lifting devices, including the crane rails and hardware. Therefore, these passive components are considered in-scope.
>
> All other components of the crane or hoist are considered active or have no component-level intended functions. This includes, but is not limited to, control panels, lights, switches, terminal boxes, motors, cameras, brakes, gears, and cables. These components and subcomponents are considered out-of-scope.

Based on the above discussion, the staff found the applicant's response to RAI 2.4-7 acceptable. The applicant clarified that all passive load-bearing structural members of the cranes, hoists, and lifting devices are within the scope of license renewal. The staff's concern described in RAI 2.4-7 is resolved.

RAI 2.4-9. LRA Section 2.4.9 states that the reactor cavity manipulator cranes and the spent fuel pool bridge crane are not within the scope of license renewal. In RAI 2.4-9, dated January 26, 2005, the staff requested the applicant to provide evidence that the collapse of these cranes would not damage any safe shutdown equipment.

In its response, dated February 25, 2005, the applicant stated:

> At the end of refueling operations, the reactor cavity manipulator crane is stowed and shut down. By operating instruction, OI 23, "Containment Fuel Transfer Equipment," the manipulator crane is parked in its storage location and all power is removed. When properly stowed during normal operations the manipulator crane is not considered a Seismic non-safety-related affecting safety-related hazard. This crane is parked in a location such that no safety-related equipment would be affected by structural failure of the crane.
>
> The SFP bridge crane does not interface with or impact any safety-related component. In addition the bridge assembly is designed with hold down bars fitted around the rail to prevent any type of tipping. The SFP bridge hoist handles fuel. The potential radiological consequences for the postulated fuel handling accident as described in FSAR Chapter 14.2.1 are well within the dose guidelines of 10 CFR 100.

Based on the above discussion, the staff found the applicant's response to RAI 2.4-9 acceptable. The applicant clarified that the manipulator crane and the SFP bridge crane do not impact any safety-related components. The staff's concern described in RAI 2.4-9 is resolved.

2.4.9.3 Conclusion

The staff reviewed the LRA, its related structural or component information, and RAI responses described above 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 cranes, hoists, and lifting devices components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the cranes, hoists, and lifting devices components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.10 Component Supports Commodity Group

2.4.10.1 Summary of Technical Information in the Application

In LRA Section 2.4.10, the applicant identified the structures and components of the component supports commodity group (CSUP) that are subject to an AMR for license renewal. The CSUP contains component and equipment supports, pipe restraints, electrical raceways, and electrical enclosures associated with Units 1 and 2, and the common plant systems and equipment. This commodity group includes the grout under the base-plate and fasteners used to support or anchor equipment. The CSUP excludes jet impingement barriers (*e.g.*, HELB barriers) and the miscellaneous plant structures and their details (*e.g.*, stairs, platforms, crane rails). All of these items were evaluated as parts of the structures in which they are contained.

The portions of the component supports commodity group containing components subject to an AMR include the component equipment supports, pipe restraints, electrical raceways, and electrical enclosures.

The CSUP commodity group provides structural support, including fasteners and anchorages, for safety-related SSCs. The commodity group also contains electrical enclosures and raceways that can house safety-related electrical components. In addition, the failure of nonsafety-related SSCs in the structure could prevent the satisfactory accomplishment of a safety-related function.

Intended functions within the scope of license renewal include the following:

- provides structural support to nonsafety-related components whose failure could prevent satisfactory accomplishment of any of the required safety-related functions or regulated event functions
- provides structural and/or functional support to safety-related equipment
- provides for pipe whip restraint

In LRA Table 2.4.10-1, the applicant identified the following CSUP component types that are within the scope of license renewal and subject to an AMR:

- indoor elastomer (equipment mount vibration isolators)
- indoor grout (equipment and supports baseplates)
- outdoor grout (equipment and supports baseplates)
- indoor high strength structural carbon steel fasteners (high strength structural fasteners - reactor coolant system component supports)
- indoor structural carbon steel fasteners (ASME equipment, ASME pipe supports and restraints)
- indoor structural carbon steel fasteners (equipment supports - pipe restraints, mechanical equipment, HVAC ducts, panels and cabinets; raceways; miscellaneous steel structures)
- outdoor structural carbon steel fasteners (G01/02 exhaust stack, equipment supports - yard)
- indoor structural carbon steel (ASME pipe supports and restraints; ASME equipment supports; framing - structural shapes; non-ASME pipe supports and restraints; non-ASME equipment supports; HVAC duct supports; raceways - cable trays, metallic conduit, wireways; electrical enclosures - panels, boxes, cabinets, consoles)
- outdoor structural carbon steel (G01/02 exhaust stack, equipment supports - yard)
- indoor structural stainless steel fasteners (equipment/component attachments (primarily nuclear steam supply system))
- indoor structural stainless steel (structural shapes (primarily NSSS and tubing))

2.4.10.2 Staff Evaluation

The staff reviewed LRA Section 2.4.10 and the FSAR. The staff's review, using the evaluation methodology described in SER Section 2.4, was conducted in accordance with the guidance described in NUREG-1800, Section 2.4.

In conducting its review, the staff evaluated the structural or component functions described in the LRA and FSAR 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 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).

2.4.10.3 Conclusion

The staff reviewed the LRA and its related structural or 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 concluded that there is reasonable assurance that the applicant adequately identified the component supports commodity group components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the component supports commodity group components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.11 Fire Barrier Commodity Group

2.4.11.1 Summary of Technical Information in the Application

In LRA Section 2.4.11, the applicant identified the structures and components of the fire barrier commodity group that are subject to an AMR for license renewal. The fire barrier commodity group includes all of the fire stops and fire wraps used throughout the site that are credited in the FPER. Fire stops are the fire barrier penetration seals and cable tray fire stops. Fire wraps comprise an envelope system that is installed around electrical components, conduits, and cabling to maintain safe shutdown functions by suppressing any possible fire damage. In addition, structural steel member fire proofing is considered as a fire wrap.

The portions of the fire barrier commodity group containing components subject to an AMR include fire barrier penetration seals, cable tray fire stops, and fire wraps.

The fire barrier commodity group performs functions that support fire protection.

Intended function within the scope of license renewal is to provide a rated fire barrier to confine or retard a fire from spreading to or from adjacent areas of the plant.

In LRA Table 2.4.11-1, the applicant identified the following fire barrier commodity group component types that are within the scope of license renewal and subject to an AMR:

- indoor calcium silicate board (cable trays - fire stop, penetration seals)
- indoor ceramic fiber (cable trays - fire stop, penetration seals)
- indoor ceramic fiber-board (penetration seals)
- indoor ceramic fiber-mat (cable trays - fire stop)
- indoor silicone-based material (sprayed-on mastic, cable trays - fire stop, penetration seals)
- indoor stainless steel appurtenances (tape, banding, banding seals, and wire for fire wraps and penetration seals)
- indoor structural carbon steel (fire damper frames; cable tray covers)
- indoor gypsum board (walls)

2.4.11.2 Staff Evaluation

The staff reviewed LRA Section 2.4.11 and the FSAR. The staff's review, using the evaluation methodology described in SER Section 2.4, was conducted in accordance with the guidance described in NUREG-1800, Section 2.4.

In conducting its review, the staff evaluated the structural or component functions described in the LRA and FSAR 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 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 2.4.11 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.

RAI 2.4.11-1. The NRC's "Fire Protection Safety Evaluation Report" dated August 2, 1979, Section 4.9.1, states that "Cable tray penetration in existing walls, floors, and ceilings are sealed with various configurations utilizing Flamemastic 71A coating, Kaowool ceramic fiber blanket, and Marinite insulation board." No reference is made to Flamemastic 71A and Marinite insulation board in LRA Section 2.4.11 "Fire Barrier Commodity Group" or in PBNP "Fire Protection Evaluation Report," Revision 3, April 2004, Section 5.1.2. This appears to be a PBNP license condition. In RAI 2.4.11-1, dated September 10, 2004, the staff requested the applicant to identify where these coatings are addressed in the LRA scoping, screening, and AMR sections.

In its response, dated October 8, 2004, the applicant stated:

> Cable tray penetration seals were upgraded to a qualified three-hour rating in 1980 and 1981. Standard penetration details were designed and qualified by Insulation Consultants & Management Services, Inc. (ICMS). The open item on cable tray penetration seal qualification was closed by a supplemental SER dated January 22, 1981.
>
> The ablative Flamemastic coating is a water-based compound of thermoplastic resins (flame-retardant) and inorganic, incombustible fibers. Material application is generally by spraying. Marinite fireproof panels are comprised of rigid boards, initially incorporating asbestos fibers and later with inert fibers and reinforcing agents. These penetration materials were supplemented and/or superseded by the ICMS penetrations designs.
>
> The LRA, Section 2.4.11, represents these materials, Marinite and Flamemastic, respectively, with a "calcium silicate board" or "silicone based material component group" designation. The aging management reviews for these components and materials are presented in Table 3.5.2-11. The LRA, Section B2.1.10, Fire Protection Program, details the periodic visual inspections of the fire barriers and their penetrations, including all of the material discussed above.

Based on the above discussion, the staff found the applicant's response to RAI 2.4.11-1 acceptable. The applicant adequately explained that the cable tray penetration seal materials, (*i.e.*, coatings, Flamemastic 71A and Marinite insulation board) are included in the calcium silicate board or silicone-based material component group designations in LRA Table 3.5.2-11. Further, the applicant explained that the applicable AMR is described in LRA Section B2.1.10. The staff concluded that the fire protection coatings were correctly included within the scope of license renewal and subject to an AMR. Therefore, the staff's concern described in RAI 2.4.11-1 is resolved.

2.4.11.3 Conclusion

The staff reviewed the LRA, its related structural or component information, and RAI response described above 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 containments, structures, and component supports 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 components of the fire barrier commodity group that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the components of the fire barrier commodity group that are subject to an aging management review, as required by 10 CFR 54.21(a)(1).

2.4.12 13.8 kV Switchgear Building Structure

2.4.12.1 Summary of Technical Information in the Application

In LRA Section 2.4.12, the applicant identified the structures and components of the 13.8 kV switchgear building structure that are subject to an AMR for license renewal. The 13.8 kV switchgear building structure is a rectangular, nonsafety-related, seismic Class 3, concrete and masonry block structure. The building is an independent structure with no other buildings located in its immediate vicinity. The 13.8 kV switchgear building structure houses nonsafety-related electrical equipment including: 13.8k volts-alternating current (VAC) buses H01, H02, and H03, and 13.8K VAC circuit breakers H52-10, H52-20, H52-21, H52-30, and H52-31. The gas turbine generator (GTG) electrical power is supplied to the 13.8 kV VAC power system via circuit breaker H52-10 and tie bus H01. GTG (G05) is relied upon as the alternate AC power source during an SBO event and is relied upon to supply power to safely shutdown loads through the alternate shutdown equipment during a fire in 4160 VAC switchgear.

The portions of the 13.8 kV switchgear building structure containing components subject to an AMR include the foundation and equipment supports.

The 13.8 kV switchgear building structure performs functions that support fire protection and station blackout.

Intended function within the scope of license renewal is to provide structural support to nonsafety-related components whose failure could prevent the satisfactory accomplishment of any of the required safety-related functions or regulated event functions.

In LRA Table 2.4.12-1, the applicant identified the following 13.8 kV switchgear building structure component types that are within the scope of license renewal and subject to an AMR:

- buried concrete (foundation - spread footing and basemat)
- indoor concrete (floor (integral with basemat))
- outdoor concrete (foundation - spread footing and basemat)

2.4.12.2 Staff Evaluation

The staff reviewed LRA Section 2.4.12 and the FSAR. The staff's review, using the evaluation methodology described in SER Section 2.4, was conducted in accordance with the guidance described in NUREG-1800, Section 2.4.

In conducting its review, the staff evaluated the structural or component functions described in the LRA and FSAR 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 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 2.4.12 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.

RAI 2.4-10. LRA Section 2.4.12 states that the reinforced concrete foundation slab and switchgear anchors are within the scope of license renewal, but the remaining portions of the 13.8 KV switchgear building structure are not. In RAI 2.4-10, dated January 26, 2005, the staff requested the applicant to clarify if the foundation slab is supported by foundation footings. If so, the staff believes foundation footings should also be within the scope of license renewal. Since the interior walls, exterior masonry block and concrete walls, and the roof are not within the scope of license renewal, the staff also requested evidence that their collapse would not damage any safe shutdown equipment.

In its response, dated February 25, 2005, the applicant stated:

> The 13.8 KV switchgear building slab is supported by foundation footings that are considered in-scope. Specific scoping basis is applied to buildings and structures associated with equipment of the regulated events of 10 CFR 54.4(a)(3). For the civil discipline, the regulated events of concern include station blackout (SBO) and FP. Refer to the LRA Section 2.4.12, "System Function Listing" for additional information. The foundation and footings for the 13.8 KV switchgear building are listed in LRA Table 2.4.1.2-1, "13.8 KV Switchgear Building Structure" "CONCRETE/OUTDOOR -ALL: FOUNDATION - SPREAD FOOTING AND BASEMAT" Component Group.
>
> A detailed explanation of the regulated events scoping basis is presented in the NMC response to RAI 2.4-12 in this letter.
>
> Note that the superstructure of the 13.8 KV Switchgear Building is managed as part of the routine preventative maintenance practices at PBNP.
>
> In conclusion, the collapse of the superstructure of the 13.8KV building would not damage any safe shutdown equipment.

Based on the above discussion, the staff found the applicant's response to RAI 2.4-10 acceptable. The collapse of the superstructure of the 13.8KV building would not damage any safe shutdown equipment. The staff's concern described in RAI 2.4-10 is resolved.

2.4.12.3 Conclusion

The staff reviewed the LRA, its related structural or component information, and RAI response described above 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 13.8KV building 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 13.8KV building structure components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.13 Fuel Oil Pumphouse Structure

2.4.13.1 Summary of Technical Information in the Application

In LRA Section 2.4.13, the applicant identified the structures and components of the fuel oil pumphouse structure that are subject to an AMR for license renewal. The fuel oil pumphouse structure is a rectangular, safety-related, seismic Class 1, structure that is constructed from reinforced concrete and concrete masonry block. This building is an independent structure with no other structures in its immediate vicinity. The fuel oil pumphouse building houses nonsafety-related mechanical and electrical equipment, including the gas turbine (GT) fuel oil supply pump, which is required for GTG (G05) operation. The G05 generator is relied upon as the alternate AC (AAC) power source during an SBO event and is also relied upon to supply power to safely shutdown loads through the alternate shutdown equipment during a fire in 4160 VAC switchgear.

The portions of the fuel oil pumphouse structure containing components subject to an AMR include the foundations and equipment supports.

The fuel oil pumphouse structure performs functions that support fire protection and station blackout.

Intended function within the scope of license renewal is to provide structural support to nonsafety-related components whose failure could prevent the satisfactory accomplishment of any of the required safety-related functions or regulated event functions.

In LRA Table 2.4.13-1, the applicant identified the following fuel oil pumphouse structure component types that are within the scope of license renewal and subject to an AMR:

- buried concrete (foundation - basemat, walls)
- indoor concrete (ceiling (25-ft, 6-in elevation)
- outdoor concrete (foundation - basemat)

2.4.13.2 Staff Evaluation

The staff reviewed LRA Section 2.4.13 and the FSAR. The staff's review, using the evaluation methodology described in SER Section 2.4, was conducted in accordance with the guidance described in NUREG-1800, Section 2.4.

In conducting its review, the staff evaluated the structural or component functions described in the LRA and FSAR 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 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 2.4.13 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.

RAI 2.4-11. LRA Section 2.4.13 states that the above-grade block wall portions of the superstructure, including roof, of the fuel oil pumphouse structure are not within the scope of license renewal. In RAI 2.4-11, dated January 26, 2005, the staff requested the applicant to provide evidence that their collapse would not damage any safe shutdown equipment.

In its response, dated February 25, 2005, the applicant stated:

> The SSCs in the fuel oil pump house are not safety-related and do not support safe shutdown equipment.
>
> Specific scoping basis is applied to buildings and structures associated with equipment of the regulated events of 10 CFR 54.4(a)(3). For the civil discipline, the regulated events of concern include SBO and FP. Refer to the LRA Section 2.4.13, "System Function Listing" for additional information. A detailed explanation of the regulated events scoping basis is presented in the NMC response to RAI 2.4-12 in this letter.
>
> It should be noted that the superstructure of the Fuel Oil Pumphouse structure is managed as part of the routine preventative maintenance practices at PBNP.
> In conclusion, the collapse of the Fuel Oil Pump House superstructure will not damage any safe shutdown equipment.

Based on the above discussion, the staff found the applicant's response to RAI 2.4-11 acceptable. The collapse of the fuel oil pump house superstructure will not damage any safe shutdown equipment. The staff's concern described in RAI 2.4-11 is resolved.

2.4.13.3 Conclusion

The staff reviewed the LRA, its related structural or component information, and RAI response described above 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 oil pumphouse 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 fuel oil pumphouse structure components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.4.14 Gas Turbine Building Structure

2.4.14.1 Summary of Technical Information in the Application

In LRA Section 2.4.14, the applicant identified the structures and components of the GT building structure that are subject to an AMR for license renewal. The GT building structure is a rectangular, nonsafety-related, seismic Class 3 structure that is constructed from pre-fabricated

metal walls and roof panels, which are attached to a structural steel frame. The building's structural steel frame is supported by a reinforced concrete basemat and foundation. The building is an independent structure with no other buildings located in its immediate vicinity. The GT building houses the nonsafety-related GTG (G05) and its associated mechanical and electrical equipment. The G05 generator is relied upon as the AAC power source during an SBO event and is also relied upon to supply power to safely shut down loads through the alternate shutdown equipment during a fire in the 4160 VAC switchgear.

The portions of the GT building structure containing components subject to an AMR include the foundations and equipment pedestals.

The gas turbine building structure performs functions that support fire protection and station blackout.

Intended function within the scope of license renewal is to provide structural support to nonsafety-related components whose failure could prevent the satisfactory accomplishment of any of the required safety-related functions or regulated event functions.

In LRA Table 2.4.14-1, the applicant identified the following GT building structure component types that are within the scope of license renewal and subject to an AMR:

- buried concrete (foundation - basemat)
- indoor concrete (floor; equipment pedestals)
- outdoor concrete (foundation - basemat)

2.4.14.2 Staff Evaluation

The staff reviewed LRA Section 2.4.14 and the FSAR. The staff's review, using the evaluation methodology described in SER Section 2.4, was conducted in accordance with the guidance described in NUREG-1800, Section 2.4.

In conducting its review, the staff evaluated the structural or component functions described in the LRA and FSAR 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 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 2.4.14 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.

RAI 2.4-12. LRA Section 2.4.14 states that generator G05 and its associated mechanical and electrical equipment is housed in the GT building structure, and is relied upon as the AAC power source during an SBO. It is also relied upon to supply power to safe shutdown loads through the alternate shutdown equipment during a fire in the 4160 VAC switchgear. LRA Section 2.4.14 further states that only the concrete foundation slab and the turbine-generator

concrete equipment pedestals are within the scope of license renewal, and the remaining portions of the structure, which include the steel superstructure, are not within the scope of license renewal. In RAI 2.4-12, dated January 26, 2005, the staff requested the applicant to provide evidence that the functions of generator GO5 and its associated mechanical and electrical equipment will not be impaired due to the collapse of the remaining portions of the GT building structure.

In its response, dated February 25, 2005, the applicant stated:

> Presented below is the basis for scoping buildings and structures associated with equipment of the regulated events of 10 CFR 54.4(a)(3). In particular, for the civil discipline, this pertains to SBO and FP.
>
> The following are selected excerpts from the license renewal standard review plan NUREG-1800, Section 2.1.3.1.3, dealing with regulated events scoping methodology.
>
> > . . . Systems, structures, and components (SSCs) relied on in safety analyses or plant evaluations to perform functions that demonstrate compliance with the requirements of the fire protection, environmental qualification, pressurized thermal shock (PTS), anticipated transients without scram (ATWS), and station blackout (SBO) regulations are identified.
> >
> > The scoping criteria in 10 CFR 54.4(a)(3) require an applicant to consider "[a]ll SSC relied on in safety analyses or plant evaluations to perform a function that demonstrates compliance with the [specified] Commission regulations[.]" In addition, Section III.c(iii) (60 FR 22467) of the SOC states that the NRC intended to limit the potential for unnecessary expansion of the review for SSCs that meet the scoping criteria under 10 CFR 54.4(a)(3) and provides additional guidance that qualifies what is meant by "those SSCs relied on in safety analyses or plant evaluations to perform a function that demonstrates compliance with the Commission regulations" in the following statement:
> >
> > > . . . the Commission intends that this [referring to 10 CFR 54.4(a)(3)] scoping category include all systems, structures, and components whose function is relied upon to demonstrate compliance with these Commission's regulations.

Therefore, all SSCs that are relied upon in the plant's CLB (as defined in 10 CFR 54.3), plant-specific experience, industry-wide experience (as appropriate), and safety analyses or plant evaluations to perform a function that demonstrates compliance with the NRC's regulations identified under 10 CFR 54.4(a)(3) are required to be included within the scope of the rule. For example, if a non-safety-related diesel generator is required for safe shutdown under the FP plan, the diesel generator and all SSCs specifically required for that diesel to comply with and operate within the NRC's regulations based on the applicant's design specifications for that diesel shall be included within the scope of license renewal under 10 CFR 54.4(a)(3). This may include, but should not be limited to, the cooling water system or systems required for operability, the diesel support pedestal, and any applicable power supply cable specifically required for safe shutdown in the event of a fire.

In addition, the last sentence of the second paragraph in the SOC, Section III.c.(iii) provides the following guidance for limiting the scoping criteria under 10 CFR 54.4(a)(3) as it applies to the use of hypothetical failures:

> Consideration of hypothetical failures that could result from system interdependencies, that are not part of the current licensing bases and that have not been previously experienced is not required.

The SOC does not provide any additional guidance relating to the use of hypothetical failures or the need to consider second-, third-, or fourth-level support systems for scoping under 10 CFR 54.4(a)(3). Therefore, in the absence of this guidance, hypothetical failures or second-, third-, or fourth-level support systems need not be considered in determining the SSCs within the scope of the rule under 10 CFR 54.4(a)(3). For example, if a nonsafety-related diesel generator is relied upon only to remain functional to demonstrate compliance with the NRC SBO regulations, the applicant need not consider the following SSCs: (1) an alternate/backup cooling water system, (2) non-seismically-qualified building walls, or (3) an overhead segment of non-seismically qualified piping (in a Seismic II/I configuration). This guidance is not intended to exclude any support system (identified by an applicant's CLB, actual plant-specific experience, industry-wide experience, as applicable, safety analyses or plant evaluations) that is specifically required for compliance with or operation within the applicable NRC regulation.

The applicant is required to identify the systems, structures, and components whose functions are relied on to demonstrate compliance with these regulated events (that is, *whose functions were credited in the analysis or evaluation*). *Mere mention of a system*, structure, or component in the analysis or evaluation does not constitute support of an intended function as required by the regulation.

PBNP uses the nonsafety-related gas turbine generator G-05 as the Alternate AC (AAC) source in response to the SBO event. G-05 support systems and structures, all non-safety-related include but are not limited to:

- G-05 foundation and building
- G-05 fuel oil, tank and tank foundation, fuel oil piping
- G-05 cooling water, pipe, tank and foundation (a closed system)
- G-05 electrical cable, conduit, tray and duct banks
- G-05 associated electrical distribution equipment and their foundations

G-05 and its direct support systems are within the scope of license renewal. Direct support system/structures are those that are essential to the operability of the specific SSCs that are relied upon to perform the required functions for the regulated event. Those systems and structures that are not essential, nor provide direct support, are considered the second, or third-level support systems/structures.

The CLB contains no safety analyses or plant evaluations that credits the building or requires second or third level failure analysis for G-05 or its building. Based on this and the scoping methodology described above, the building superstructure is not within the scope of license renewal. The concrete pedestal/foundation that supports G-05 is within

the scope of license renewal, for it provides direct support and is essential to the operation of G-05. This same logic is applied to the fuel oil tank foundation, fuel oil transfer pump foundation, electrical distribution equipment foundations, and the duct banks. The Fuel Oil Pumphouse and 13.8 KV Switchgear buildings (but not their superstructures) are, therefore, in-scope.

In conclusion, the building foundations that support G-05 and its support equipment are in-scope. The building superstructure is out-of-scope of license renewal. Refer to LRA Section 2.4.14, "System Function Listing" for additional information.

Note that the superstructure of the Gas Turbine Building Structure is managed as part of the routine preventative maintenance practices at PBNP (*i.e.*, good building maintenance or life-cycle management).

Based on the above discussion, the staff found the applicant's response to RAI 2.4-12 acceptable. The applicant provided the basis for excluding from the scope of license renewal the superstructure of the gas turbine building structure. The staff's concern described in RAI 2.4-12 is resolved.

2.4.14.3 Conclusion

The staff reviewed the LRA, its related structural or component information, and the RAI response described above 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 gas turbine building 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 gas turbine building structure components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.5 Scoping and Screening Results: Electrical and Instrumentation and Controls

This section documents the staff's review of the applicant's scoping and screening results for electrical systems and instrumentation and controls (I&C) systems. Specifically, LRA Section 2.5 discusses the following passive, long-lived electrical components potentially subject to an AMR:

- commodity group descriptions
- 120 VAC vital instrument power system
- 125 VDC power system
- 4160 VAC power system
- 480 VAC power system
- control rod drive and indication system and nuclear process instrumentation
- miscellaneous AC power and lighting system
- offsite power system
- reactor protection system including anticipated transient without scram

- engineered safety features actuation system
- plant communications system
- 13.8k VAC power system
- radiation monitoring system

In accordance with the requirements of 10 CFR 54.21(a)(1), the applicant must identify and list passive, long-lived electrical and I&C systems and components 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 systems 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 renewal. The staff reviewed relevant licensing basis documents, including the FSAR, 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.

As documented under RAI 2.1-1 in SER Section 2.1, by letter dated April 29, 2005, the applicant changed the methodology used to determine the nonsafety-related SSCs that are within the scope of license renewal in accordance with the requirements of 10 CFR 54.4(a)(2). As a result of the implementation of the scoping methodology changes, the applicant identified no new electrical and instrumentation control component groups within the scope of license renewal.

Screening. After completing its scoping evaluation, the staff reviewed the applicant's screening results. For those SCs with intended functions, the staff sought to determine: (1) if the function(s) are performed with moving parts or involve a change in configuration or properties, or (2) if they are subject to replacement based on a qualified life or specific 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 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 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.

The corresponding subsections of this SER (2.5.1 – 2.5.1.8, respectively) present the staff's review findings with respect to the electrical and I&C systems for both Units 1 and 2.

2.5.1 Commodity Group Descriptions

In LRA Section 2.5.1, the applicant described the components and systems included in the commodity group:

- insulated cables and connections
- electrical penetration assemblies
- electrical phase bus
- switchyard bus
- transmission conductors
- high-voltage insulators
- uninsulated ground conductors
- panels and junction boxes

The commodity group is within the scope of license renewal because it meets 10 CFR 54.4(a)(1) by providing electrical power to safety Class 1, 2, and 3 components; some SSCs in the system are considered to be within the scope of license renewal because their failure could affect the capability of safety-related SSCs in accordance with 10 CFR 54.4(a)(2); others are within the scope of license renewal because they support fire protection, anticipated transient without scram, and station blackout in accordance with 10 CFR 54.4(a)(3).

Intended function within the scope of license renewal is to electrically connect specified sections of an electrical circuit to deliver voltage, current, or signal. Additional intended functions are to electrically isolate and provide structural support to transmission conductors, phase bus, and switchyard buses.

In LRA Table 2.5-1, the applicant identified the following commodity group component types that are within the scope of license renewal and subject to an AMR:

- electrical cables and connections not subject to 10 CFR 50.49 EQ requirements
- electrical cables and connections used in instrumentation circuits not subject to 10 CFR 50.49 EQ requirements that are sensitive to reduction in conductor insulation
- electrical connections not subject to 10 CFR 50.49 EQ requirements that are exposed to borated water leakage
- electrical penetration assemblies
- high-voltage insulators
- inaccessible medium-voltage cables and connections not subject to 10 CFR 50.49 EQ requirements
- phase bus

- switchyard buses and connections
- transmission conductors

2.5.1.1 Insulated Cables and Connections

2.5.1.1.1 Summary of Technical Information in the Application

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

The applicant evaluated PBNP cables and connectors as commodities across system boundaries. This is termed the spaces approach in NUREG-1800, Section 2.5.3.1. LRA Table 2.5-1 defines component types that are subject to aging management and lists their intended functions. The LRA states that these cables and connectors are within the scope of license renewal and are subject to aging management review.

2.5.1.1.2 Staff Evaluation

The staff reviewed LRA Section 2.5.1 using the evaluation methodology described in SER Section 2.5. The staff conducted its review in accordance with the guidance described in NUREG-1800, Section 2.5, "Scoping and Screening Results: Electrical and Instrumentation and Controls Systems."

In conducting its review, the staff evaluated the structural or component functions described in the LRA and FSAR 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 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 applicant evaluated the cables and connectors as commodities across system boundaries on a plant-wide basis. LRA Section 2.5.1 states that "plant-wide" generally includes all cables and connectors throughout PBNP to provide complete coverage of cables and connectors in the scope of license renewal. In the LRA, the applicant indicated that the passive function of the cables and connectors is to conduct electricity, and the cables and connectors are subject to an AMR. The staff agrees that the applicant correctly identified the cables and connectors as components that perform their function without moving parts or a change in configuration or properties (passive and long-lived) and are, therefore, subject to an AMR.

2.5.1.1.3 Conclusion

During its review of the information provided in the LRA and the FSAR, the staff did not identify any omissions or discrepancies in the applicant's scoping and screening results for insulated cables and connections. 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 the applicant adequately identified the insulated cables and connections components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the insulated cables and connections components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.5.1.2 Electrical Penetration Assemblies

2.5.1.2.1 Summary of Technical Information in the Application

LRA Section 2.5.1 describes containment electrical penetrations as passive, long-lived component assemblies that perform a containment boundary function and provide an electrical connection between two sections of the electrical/I&C circuits for conducting electrical power (voltage and current), either continuously or intermittently throughout the plant to enable them to perform their intended functions. The pigtail at each end of the penetration is connected to the field cable in various ways. Therefore, the boundary of the electrical penetrations include these pigtails. Containment electrical penetrations that are associated with 10 CFR 50.49 EQ program are addressed as short-lived and periodically replaced, or as long-lived TLAA components. The containment electrical penetrations that are classified as short-lived and periodically replaced, or TLAA components, are not included in the set of penetrations requiring aging management review.

2.5.1.2.2 Staff Evaluation

The staff reviewed LRA Section 2.5.1 using the evaluation methodology described in SER Section 2.5. The staff conducted its review in accordance with the guidance described in NUREG-1800, Section 2.5.

In conducting its review, the staff evaluated the structural or component functions described in the LRA and FSAR 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 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 electrical penetrations identified by the applicant requiring an AMR are nonsafety-related, non-EQ, and used plant-wide to conduct electrical power (voltage and current), either continuously or intermittently between two sections of the electrical/I&C circuits supplying power to various equipment in the containment. The staff reviewed these component categories against the requirements in 10 CFR 54.4(a)(1) and 10 CFR 54.4(b) and found that those categories are encompassed by the requirements. The staff reviewed the information in the

FSAR and found that the applicant identified the containment electrical penetrations that are within the scope of license renewal.

2.5.1.2.3 Conclusion

During its review of the information provided in the LRA and the FSAR, the staff did not identify any omissions or discrepancies in the applicant's scoping and screening results for electrical penetration assemblies. 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 the applicant adequately identified the electrical penetration assemblies components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the electrical penetration assemblies components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.5.1.3 Electrical Phase Bus

2.5.1.3.1 Summary of Technical Information in the Application

LRA Section 2.5.1 describes phase buses (isolated, non-segregated, segregated) and their standoffs as a component assembly conducting electrical power (voltage and current), either continuously or intermittently between various equipment and components throughout the plant, to enable them to perform their intended functions. The phase bus bars are a pre-assembled raceway design, with bus bars mounted on insulated supports (standoffs). The intended function of the standoffs is to support the electrical phase buses. In the LRA, the applicant identified non-segregated phase buses within the scope of license renewal for the 13.8k VAC, 4.16k VAC, and 480 VAC power systems.

2.5.1.3.2 Staff Evaluation

The staff reviewed LRA Section 2.5.1 using the evaluation methodology described in SER Section 2.5. The staff conducted its review in accordance with the guidance described in NUREG-1800, Section 2.5.

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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 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 phase buses identified by the applicant consist of non-segregated phase buses that are used in the 13.8k VAC, 4.16k VAC, and 480 VAC plant-wide to conduct electrical power (voltage and current), either continuously or intermittently between various equipment and components. The staff reviewed these component categories against the requirements in 10 CFR 54.4(a)(1) and 10 CFR 54.4(b) and found that those categories are encompassed by

the requirements. The staff reviewed the information in the FSAR and found that the applicant identified the phase bus within the scope of license renewal.

2.5.1.3.3 Conclusion

During its review of the information provided in the LRA and the FSAR, the staff did not identify any omissions or discrepancies in the applicant's scoping and screening results for electrical phase bus. 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 the applicant adequately identified the electrical phase bus components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the electrical phase bus components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.5.1.4 Switchyard Bus

2.5.1.4.1 Summary of Technical Information in the Application

LRA Section 2.5.1 describes switchyard bus as a passive, unenclosed, long-lived component that is used to connect two or more elements of an electrical power circuit such as switches and transmission conductors. In the LRA, the applicant stated that the switchyard bus within the scope of license renewal is the portion of the offsite power system interconnection 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.

2.5.1.4.2 Staff Evaluation

The staff reviewed LRA Section 2.5.1 using the evaluation methodology described in SER Section 2.5. The staff conducted its review in accordance with the guidance described in NUREG-1800, Section 2.5.

In conducting its review, the staff evaluated the system functions described in the LRA and FSAR 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 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).

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. The staff reviewed these component categories against the requirements in 10 CFR 54.4(a)(1) and 10 CFR 54.4(b) and found that those categories are encompassed by the requirements. The staff reviewed the information in the FSAR and found that the applicant identified the switchyard bus within the scope of license renewal.

2.5.1.4.3 Conclusion

During its review of the information provided in the LRA and the FSAR, the staff did not identify any omissions or discrepancies in the applicant's scoping and screening results for switchyard bus. 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 the applicant adequately identified the switchyard bus 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 bus components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.5.1.5 Transmission Conductors

2.5.1.5.1 Summary of Technical Information in the Application

LRA Section 2.5.1 describes transmission conductors as uninsulated, stranded electrical cables used in switchyards, switching stations, and transmission lines to connect two or more elements of electrical power breakers, transformers, and passive switchyard bus. In the LRA, the applicant stated that the transmission conductors 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.

2.5.1.5.2 Staff Evaluation

The staff reviewed LRA Section 2.5.1 using the evaluation methodology described in SER Section 2.5. The staff conducted its review in accordance with the guidance described in NUREG-1800, Section 2.5.

In conducting its review, the staff evaluated the structural or component functions described in the LRA and FSAR 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 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 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 short sections of ACSR between rigidly supported connecting equipment. The staff reviewed these component categories against the requirements in 10 CFR 54.4(a)(1) and 10 CFR 54.4(b) and found that those categories are encompassed by the requirements. The staff reviewed the information in the FSAR and found that the applicant identified the transmission conductors within the scope of license renewal.

2.5.1.5.3 Conclusion

During its review of the information provided in the LRA and the FSAR, the staff did not identify any omissions or discrepancies in the applicant's scoping and screening results for transmission conductors. 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 the applicant adequately identified the transmission conductors components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the transmission conductors components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.5.1.6 High-Voltage Insulators

2.5.1.6.1 Summary of Technical Information in the Application

LRA Section 2.5.1 describes high-voltage insulators as a component used to support and insulate high-voltage electrical components in the switchyard, transmission lines such as transmission conductors, and switchyard bus. The high-voltage insulators serve as an intermediate support between a supporting structure, such as a support pedestal or transmission tower, and the switchyard bus or transmission conductor. In the LRA, the applicant stated that the high-voltage insulators that are within the scope of license renewal are associated with the in-scope portion of the offsite power system as station post insulators providing support for the switchyard bus connecting the unit high-voltage station auxiliary transformers and the circuit switchers, and they support the circuit switchers themselves.

2.5.1.6.2 Staff Evaluation

The staff reviewed LRA Section 2.5.1 using the evaluation methodology described in SER Section 2.5. The staff conducted its review in accordance with the guidance described in NUREG-1800, Section 2.5.

In conducting its review, the staff evaluated the structural or component functions described in the LRA and FSAR 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 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).

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, and they support the circuit switchers themselves. The staff reviewed these component categories against the requirements in 10 CFR 54.4(a)(1) and 10 CFR 54.4(b) and found that those categories are encompassed by the requirements. The staff reviewed the information in the FSAR and found that there the applicant identified the high-voltage insulators within the scope of license renewal.

2.5.1.6.3 Conclusion

During its review of the information provided in the LRA and the FSAR, the staff did not identify any omissions or discrepancies in the applicant's scoping and screening results for high-voltage insulators. 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 the applicant adequately identified the high-voltage insulators components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the high-voltage insulators components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.5.1.7 Uninsulated Ground Conductors

2.5.1.7.1 Summary of Technical Information in the Application

LRA Section 2.5.1 describes the uninsulated ground conductors as electrical conductors (*e.g.*, copper cable, copper bar) that are uninsulated (bare) and are used to make ground connections for electrical equipment. Uninsulated ground conductors are connected to electrical equipment housings and electrical enclosures as well as metal structural features such as cable tray equipment and building structural steel.

In the LRA, the applicant stated that uninsulated ground conductors are always isolated or insulated from the electrical operating circuits and are not required for those circuits or equipment to perform their intended functions. Therefore, uninsulated ground conductors are not within the scope of license renewal.

2.5.1.7.2 Staff Evaluation

The staff reviewed LRA Section 2.5.1 using the evaluation methodology described in SER Section 2.5. The staff conducted its review in accordance with the guidance described in NUREG-1800, Section 2.5.

In conducting its review, the staff evaluated the structural or component functions described in the LRA and FSAR 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 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 uninsulated ground conductors identified by the applicant are electrical conductors that are uninsulated and used to make ground connections for electrical equipment. These conductors are connected by impression or fusion using various types of metals and inorganic materials that have no aging effects. Therefore, the staff concluded that uninsulated ground conductors are not within the scope of license renewal.

2.5.1.7.3 Conclusion

During its review of the information provided in the LRA and the FSAR, the staff did not identify any omissions or discrepancies in the applicant's scoping and screening results for uninsulated ground conductors. 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 the applicant adequately identified the uninsulated ground conductors components as not within the scope of license renewal.

2.5.1.8 Panels and Junction Boxes

2.5.1.8.1 Summary of Technical Information in the Application

LRA Section 2.5.1 describes panels and junction boxes as commodities that include control boards, electrical panels, switchgear, cabinets, junction boxes, and other electrical enclosures. This commodity is considered a part of the component supports commodity group and provides the aging management review of all structural support components and other equipment within the scope of license renewal.

2.5.1.8.2 Staff Evaluation

The staff reviewed LRA Section 2.5.1 using the evaluation methodology described in SER Section 2.5. The staff conducted its review in accordance with the guidance described in NUREG-1800, Section 2.5.

In conducting its review, the staff evaluated the structural or component functions described in the LRA and FSAR 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 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 2.5.1 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.

RAI 2.5.1. LRA Section 2.5 lists panels and junction boxes as a system within the scope of license renewal. In addition, panels and junction boxes are described under "commodity group" as commodities that include control boards, electrical panels, switchgear, cabinets, junction boxes, and other electrical enclosures. However, in LRA Table 2.5-1, panels and junction boxes are not listed as components subject to an AMR. In RAI 2.5.1, dated November 18, 2004, the staff requested the applicant to clarify if there are any electrical passive components such as connections, wiring, and hardware that could degrade because of aging mechanisms due to moisture and corrosion within the cabinets, junction boxes, and other electrical enclosures.

In its response, dated January 25, 2005, the applicant stated that panels and junction boxes were evaluated regarding whether they contain any active components or have only passive components within them. The applicant further stated that if they contain any active components, then the contents are exempt from an AMR, but if they contain only passive components, such as cable connections (*e.g.*, connectors or splices) or terminal strips, these components are subject to an AMR within the scope of those specific commodities. The applicant stated that penetrations into panels and junction boxes are sealed, and if appropriate, a weep hole is provided to drain moisture or boric acid.

Based on the above discussion, the staff found the applicant's response to RAI 2.5.1 acceptable. The applicant confirmed that all the panels and junction boxes were evaluated and are being managed. The staff's concern described in RAI 2.5.1 is resolved.

2.5.1.8.3 Conclusion

During its review of the information provided in the LRA, FSAR, and RAI response described above, the staff did not identify any omissions or discrepancies in the applicant's scoping and screening results for panels and junction boxes. 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 the applicant adequately identified the panels and junction box components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified the panels and junction boxes components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

2.6 Conclusion for Scoping and Screening

The staff has reviewed the information in LRA Section 2, "Scoping and Screening Methodology for Identifying Structures and Components Subject to Aging Management Review, and Implementation Results." The staff determined the applicant's scoping and screening methodology was consistent with the requirements of 10 CFR 54.21(a)(1) and the staff's position on the treatment of safety and nonsafety-related SSC's 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).

On the basis of its review, the staff concluded that the applicant adequately identified those systems and components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant adequately identified those systems and components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

With regard to these matters, the staff has concluded that there is reasonable assurance that the activities authorized by the renewed license will continue to be conducted in accordance with the CLB, and that any changes made to the CLB in order to comply with 10 CFR 54.29(a) are in accordance with the Act and the Commission's regulations.