

Safety Evaluation Report Related to the License Renewal of North Anna Power Station, Units 1 and 2, and Surry Power Station, Units 1 and 2

Docket Nos. 50-338, 50-339, 50-280, and 50-281

Virginia Electric and Power Company

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



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	(NUREG-0750).

Safety Evaluation Report

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Abstract

This safety evaluation report documents the Nuclear Regulatory Commission's (NRC's) review of Virginia Electric and Power Company's (Dominion's) applications to renew the operating licenses for North Anna Power Station, Units 1 and 2, and Surry Power Station, Units 1 and 2. The NRC's Office of Nuclear Reactor Regulation reviewed the North Anna and Surry power stations license renewal applications for compliance with the requirements of Title 10 of the Code of Federal Regulations, Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants," and prepared this report to document the findings of the review.

On May 29, 2001, Dominion submitted applications for renewal of Operating License Nos. NPF-4 and NPF-7, issued pursuant to Section 103 of the Atomic Energy Act of 1954, as amended, for a period of 20 years beyond the current operating terms. The current operating licenses for North Anna power station, Units 1 and 2, expire on April 1, 2018, and August 21, 2020, respectively. North Anna power station is in Louisa County in northern Virginia on the shore of Lake Anna. North Anna power station units 1 and 2 are three-loop Westinghouse pressurized-water reactors nuclear steam supply systems designed to generate 2893 MW thermal, or approximately 942 MW electric.

In its submittal of May 29, 2001, Dominion also submitted an application for renewal of Operating License Nos. DPR-32 and DPR-37, issued pursuant to Section 104b of the Atomic Energy Act of 1954, as amended, for a period of 20 years beyond the current operating terms. The current operating licenses for Surry power station, Units 1 and 2, expire on May 25, 2012, and January 29, 2013, respectively. Surry power station is in Surry County in southern Virginia on the bank of the James River. Surry power station units 1 and 2 are three-loop Westinghouse pressurized-water reactors nuclear steam supply systems designed to generate 2546 MW thermal, or approximately 829 MW electric.

The NRC's project manager for the North Anna and Surry license renewal is Omid Tabatabai. Mr. Tabatabai may be reached at (301) 415-3738. Until April 10, 2002, the license renewal project manager for the North Anna and Surry was Mr. Robert Prato. Mr. Prato may be reached at (301) 415-1147. Correspondence to them should be addressed to License Renewal and Environmental Impacts Program, U.S. Nuclear Regulatory Commission, Mail Stop O-12D3, Washington, D.C. 20555-0001.

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Abbreviations

Abbreviation

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Definition

AC	alternating current
AAC	alternate alternating current
ACI	American Concrete Institute
ADAMS	Agency-wide Documents Access and Management System
AFC	Atomic Energy Commission
AMA	aging management activity
AMP	aging management program
AMR	aging management review
AMSAC	ATWS mitigation system actuation circuit
ANSI	American National Standards Institute
	American Petroleum Institute
AS	auxiliary steam
ASCO	Automatic Switch Company
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
	anticipated transient without scram
	auxiliary service water nump house
BACC	boric acid corrosion control
BC	bearing cooling
BCW	diesel cooling water
BD	blowdown
BEO	diesel fuel oil
BIW	Boston insulated wire
BLO	diesel lubricating oil
BR	horon recovery
BSA	diesel starting air
BSR	AAC Diesel Service Air
BTP	branch technical position
	compressed air
CASS	cast austenitic stainless steel
CC	component cooling
CD	chilled water
CD-ROM	compact disk—read only memory
CER	Code of Federal Regulations
CH	chemical volume and control
	current licensing basis
CN	condensate
CRDM	control rod drive mechanism
CS	containment sprav
CSA	conductor seal assembly
CSPE	chlorosulfonated polyethylene
CUE	cumulative usage factor
	containment vacuum
	charny unner shelf energy
UVUJE	charpy upper onen chergy

CW	circulating water
DA	Drains-Aerated
DB	Drains-building services
DBE	design basis event
DC	direct current
DG	Drains-Gaseous
ngss	diesel generator support systems
DLPS	drains and liquid processing systems
DR	deviation report
ECSA	electrical conductor seal assembly
EDG	emergency diesel generator
EDS	equipment data system
EPDM	ethylene propylene diene monomer
EDR	ethylene propylene rubber
	Electric Power Research Institute
	environmental qualification
	equipment qualification master list
	engineered safety features
	emergency switchgear room
ESGR	eddy current test
	flow-accelerated corrosion
	fuel nit cooling
	flame- and moisture resistant
	fire protection
	fire nump house
	fire protection and supporting systems
	final safety analysis report
	final safety evaluation report
FOEN EW/	feedwater
CDC	general design criterion
	General Electric
GL	generic letter
	primary and secondary plant das supply
GN	generic safety issue
GOI	generic technical report
	decome waste
GW	post-accident hydrogen control
	high-energy line break
	high-bead safety injection
	high molecular weight polyethylene
HMWPE	high radiation sampling system
HRSS	heating and vontilation
	high voltage termination
HVI	heating ventilation and air-conditioning
HVAC	instrumentation and controls
I&C	instrumentation and controls
IA	institutien anti-
IASCC	
IC	incore instrumentation

r

ICCS	inadequate core cooling system
	inner diameter
	inspection and enforcement
	intergranular stress corrosion cracking
	information notice
	Idobo National Engineering Laboratories
INEL	Institute of Nuclear Power Operations
INPO	interreted plant approximate
IPA	Integrated plant assessment
ISCH	Intake structure control house
ISFSI	independent spent fuel storage installation
ISI	inservice inspection
ISRS	inside recirculation spray
ITG	issues task group
LBB	leak-before-break
LHSI	low-head safety injection
LM	leakage monitoring
LOCA	loss-of-coolant accident
LR	license renewal
LRA	license renewal application
LTOPS	low temperature overpressure protection system
IW	liquid and solid waste
MCR	main control room
MIC	microbiologically induced corrosion
MOV	motor operated valve
MS	main steam
MT	magnetic particle test
	megawatt-electric
NAVA/+	megawatt-thermal
	North Anna Power Station
	North Anna Power Station Units 1 and 2
	nondestructive examination
	Nuclear Energy Institute
	National Fire Protection Association
	nuclear instrumentation
NI	
NPS	Nuclear Pagulaton Commission
NRC	nucleal Regulatory Commission
NSR	non-salely-related
NS	NOD with enabled cank cooling
NSQ	NSR with special quality/regulatory requirements
NSR>SR	non-safety-related affecting safety-related
NSSS	nuclear steam supply system
NST	neutron snield tank
OSRS	outside recirculation spray
PG	primary grade
PL	plumbing or power lead
PM	preventative maintenance
PORV	power-operated relief valve
PT	liquid penetrant test

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PTS	pressurized thermal shock
P-T	pressure-temperature
PWR	pressurized water reactor
PWSCC	primary-water stress corrosion cracking
QDR	qualification document review
QS	quench spray
RAI	request for additional information
RC	reactor coolant
RCP	reactor coolant pump
RCS	reactor coolant system
RG	regulatory guide
RH	residual heat removal
RI-ISI	risk-informed inservice inspection
RI	reactor cavity purification
RM	radiation monitoring
PD	refueling purification
RS	recirculation sprav
Deet	reserve station service transformer
	radiographic test
	resistance temperature detector
DT	reference temperature for pressurized thermal shock
	reference nil ductility transition temperature
	irradiation-induced shift in the RT
	reactor vessel
	reactor vessel internals
	reactor vessel level instrumentation system
	radwaste
RW	refueling water storage tank
RVVSI	
	service all
SBU	station blackout
SCBA	self-contained breathing apparatus
SCC	stress corrosion cracking
SCs	structures and components
SD	steam drains
SDBD	system design basis document
SEC	security
SER	safety evaluation report
SG	steam generator
SG-RT	steam generator recirculation and transfer
SI	safety injection
SIS	single insulated strand
SPCS	steam and power conversion systems
SPS	Surry power station
SPS 1/2	Surry power station, Units 1 and 2
SR	safety-related
SRP	standard review plan
SS	sampling system
SSCs	systems, structures, and components

.

secondary vents
service water
service water reservoir
transient cycle counting program
total integrated dose
transgranular stress corrosion cracking
time-limited aging analyses
technical specification
updated final safety analysis report
upper shelf energy
ultrasonic testing
vents-aerated
vents-gaseous
vents and gaseous processing systems
vessel head penetration
vacuum priming
ventilation
visual test
Westinghouse Owners Group
steam generator water treatment
cross-linked polyethylene

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1.0 Introduction and General Discussion

1.1 Introduction

This safety evaluation report documents the Nuclear Regulatory Commission's (NRC's) review of Virginia Electric and Power Company's (Dominion's) applications to renew the operating licenses for North Anna power station, Units 1 and 2 (NAS 1/2), and Surry power station, Units 1 and 2 (SPS 1/2) for an additional 20 years. The NRC's Office of Nuclear Reactor Regulation reviewed the NAS 1/2 and SPS 1/2 license renewal applications (LRAs) for compliance with the requirements of Title 10 of the Code of Federal Regulations, Part 54 (10 CFR Part 54), "Requirements for Renewal of Operating Licenses for Nuclear Power Plants."

The current operating licenses for NAS 1/2 expire on April 1, 2018, and August 21, 2020, respectively. NAS 1/2 is in Louisa County in northern Virginia on the shore of Lake Anna. NAS 1/2 are three-loop Westinghouse pressurized-water reactors nuclear steam supply systems designed to generate 2893 MW thermal, or approximately 942 MW electric.

The current operating licenses for SPS 1/2 expire on May 25, 2012, and January 29, 2013, respectively. SPS 1/2 is in Surry County in southern Virginia on the bank of the James River. SPS 1/2 are three-loop Westinghouse pressurized-water reactors nuclear steam supply systems designed to generate 2546 MW thermal, or approximately 829 MW electric.

The license renewal process requires a technical review of safety issues and an environmental review. The requirements for these reviews are stated in NRC regulations in 10 CFR Part 54 and Part 51, respectively. The safety review is based on the NAS 1/2 and SPS 1/2 LRAs, the North Anna and Surry updated final safety analysis reports (UFSARs), and the applicant's responses to NRC staff requests for additional information (RAIs). The applicant's responses to the RAIs are documented and docketed in letters to the NRC, and are supplemented by meeting minutes and other docketed correspondence. The public can review both LRAs and other pertinent information and material, at the NRC Public Document Room, 11555 Rockville Pike, Rockville, MD. In addition, the North Anna and Surry LRAs and other significant information and material relating to the license renewal review are available on the NRC Web site at www.nrc.gov.

This safety evaluation report (SER) summarizes the findings of the staff's safety review of the North Anna and Surry LRAs, and describes the technical details that the staff considered in its safety evaluation of the proposed operation of NAS 1/2 and SPS 1/2 for an additional 20 years beyond the terms of the current operating licenses. The staff reviewed both LRAs in accordance with NRC regulations and the guidance in the NRC draft "Standard Review Plan (SRP) for the Review of License Renewal Applications for Nuclear Power Plants," dated August 2000. The final SRP-LR was issued as NUREG-1800 in July 2001.

Chapters 2 through 4 of this SER provide the staff's evaluation of the license renewal issues that were considered during the review of each LRA. Chapter 5 is the report from the Advisory Committee on Reactor Safeguards (ACRS). The conclusions of this report are in Chapter 6.

Appendix A is a chronology of the NRC's and the applicant's principal correspondence related to the review of the applications. Appendix B is a bibliography of the documents used during

this review. Appendix C is a list of the NRC staff's principal reviewers and its contractors for this project. Appendix D is a list of the applicant's commitments to be completed prior to the expiration of the current operating license terms.

In accordance with 10 CFR Part 51, the staff prepared two draft plant-specific supplements to the generic environmental impact statement (GEIS). These supplements discuss the environmental considerations related to renewing the licenses for SPS 1/2 and NAS 1/2. The draft plant-specific supplements to the GEIS were issued separately. The NRC staff issued the draft Supplement 6 to NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants Regarding the Surry Power Station, Units 1 and 2," on April 03, 2002, and draft Supplement 7 to NUREG-1437 "Generic Environmental Impact Statement for License Renewal of Nuclear Plants Regarding the North Anna Power Station, Units 1 and 2," on April 23, 2002.

The NRC's project manager for the North Anna and Surry license renewal applications is Omid Tabatabai. Mr. Tabatabai may be reached at (301) 415-3738. Until April 10, 2002, the license renewal project manager for the North Anna and Surry applications was Mr. Robert Prato. Mr. Prato may be reached at (301) 415-1147. Correspondence to them should be addressed to License Renewal and Environmental Impacts Program, U.S. Nuclear Regulatory Commission, Mail Stop O-12D3, Washington, D.C. 20555-0001.

1.2 License Renewal Background

Pursuant to the Atomic Energy Act of 1954, as amended, and NRC regulations, licenses for the operation of 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 technical limitations. However, some plant equipment may have been designed on the basis of an expected 40-year service life.

In 1982, the NRC anticipated interest in license renewal and held a workshop on the aging of nuclear power plants. This workshop led the NRC to establish a comprehensive program for nuclear plant aging research (NPAR). As a result of this research, a technical review group concluded that many aging phenomena are readily manageable and do not involve technical issues that would preclude extending the life of nuclear power plants.

In 1986, the NRC published a request for comments regarding a policy statement on major policy, technical, and procedural issues related to life extension for nuclear power plants.

In 1991, the NRC published a license renewal rule in 10 CFR Part 54. The NRC participated in an industry-sponsored demonstration program to apply the rule to pilot plants and develop experience to establish implementation guidance. To establish a scope of review for license renewal, the license renewal 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 the initial license. In addition, the NRC found that the scope of the review did not allow sufficient credit for existing aging management programs, particularly programs implemented in accordance with the maintenance rule, 10 CFR 50.65.

As a result, the NRC amended 10 CFR Part 54 in 1995. The amended license renewal rule established a regulatory process that was simpler, more stable, and more predictable than the previous license renewal rule. In particular, 10 CFR Part 54 was revised to focus on managing the adverse effects of aging rather than on identifying all aging mechanisms. The changes to the license renewal rule were intended to ensure that systems, structures, and components (SSCs) within the scope of the rule continue to perform their intended functions during the period of extended operation. In addition, the integrated plant assessment (IPA) process was revised and simplified to be consistent with the focus on passive, long-lived structures and components (SCs).

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

1.2.1 Safety Reviews

License renewal requirements for power reactors are based on two 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 and a few other safety issues.
- 2. The plant-specific licensing basis must be maintained during the renewal term in the same manner, and to the same extent, as during the original licensing term.

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

Pursuant to 10 CFR 54.21(a), the applicant must review all SSCs that are within the scope of the rule to identify the structures and components (SCs) that are subject to an aging management review (AMR). SCs that are subject to an AMR are those that perform an intended function without moving parts or without a change in configuration or properties, and that are not subject to replacement based on a qualified life or a specified time period. As required by 10 CFR 54.21(a)(3), the applicant must demonstrate that the effects of aging will be managed in such a way that the intended functions of the SCs within the scope of license renewal will be maintained consistent with the current licensing basis (CLB) for the period of extended operation.

Active equipment is considered to be adequately monitored and maintained by existing programs. In other words, the detrimental effects of aging on active equipment are more readily detectable and will be identified and corrected through routine surveillance, performance indicators, and maintenance. The surveillance and maintenance programs and activities for

active equipment and other programs and activities for maintaining plant design and licensing bases, are required to continue throughout the period of extended operation.

Pursuant to 10 CFR 54.21(d), each application also is required to include a supplement to the plant's final safety analysis report (FSAR). This FSAR supplement must contain summary descriptions of the programs and activities for managing the effects of aging.

Another requirement for license renewal is the identification and updating of time-limited aging analyses (TLAAs). During the design phase for a plant, certain assumptions are made about the initial operating term of the plant, and these assumptions are incorporated into design calculations for some of the plant's SSCs. In accordance with 10 CFR 54.21(c)(1), these calculations must be shown to be valid for the period of extended operation or projected to the end of the period of extended operation, or the applicant must demonstrate that the effects of aging of these SSCs will be adequately managed for the period of extended operation.

In July 2001, the NRC issued Regulatory Guide (RG) 1.188, "Standard Format and Content for Applications to Renew Nuclear Power Plant Operating Licenses"; NUREG-1800, "Standard Review Plan for the Review of License Renewal Application for Nuclear Plants" (SRP-LR); and NUREG-1801, "Generic Aging Lessons Learned (GALL) Report." These documents describe methods acceptable to the NRC staff for implementing the license renewal rule and methods used by the NRC staff to evaluate applications for license renewal. The draft versions of these documents were issued for public comment on August 31, 2000 (64 FR 53047). The staff assessment of public comments was issued in July 2001 as NUREG-1739, "Analysis of Public Comments on the Improved License Renewal Guidance Documents." The Regulatory Guide endorses a Nuclear Energy Institute (NEI) guideline as an acceptable method of implementing the license renewal rule. The NEI guideline, NEI 95-10, "Industry Guideline for Implementing the Requirements of 10 CFR Part 54—The License Renewal Rule", Rev. 3, was issued in March 2001. However, the NRC staff used the draft regulatory guide along with the draft SRP-LR to review the North Anna and Surry LRAs. As experience is gained, the NRC will improve the SRP-LR and clarify the regulatory guidance.

1.2.2 Environmental Reviews

In December 1996, the staff revised the environmental protection regulations in 10 CFR Part 51 to facilitate environmental reviews for license renewal. The staff prepared a "Generic Environmental Impact Statement (GEIS) for License Renewal of Nuclear Plants" (NUREG-1437) to examine the possible environmental impacts of renewing licenses of nuclear power plants. For certain types of environmental impacts, the GEIS establishes generic findings that are applicable to all nuclear power plants. These generic findings are identified as Category 1 issues in 10 CFR Part 51, Subpart A, Appendix B. Pursuant to 10 CFR 51.53(c)(3)(i), an applicant for license renewal may incorporate these generic findings in its environmental report. Environmental impacts that must be analyzed on a plant-specific basis for license renewal are identified as Category 2 issues in 10 CFR Part 51, Subpart A, Appendix B. Such analyses must be included in an environmental report in accordance with 10 CFR 51.53(c)(3)(i).

In accordance with the NEPA and the requirements of 10 CFR Part 51, the NRC performs a plant-specific review of the environmental impacts of license renewal, including whether there is

new and significant information that was not considered in the GEIS. Four public meetings were held, two near SPS 1/2 on September 19, 2001, and two near NAS 1/2 on October 18, 2001, as part of the NRC's scoping process to identify environmental issues specific to the plant. The results of the environmental reviews and preliminary recommendations on the license renewal actions were documented in the NRC draft plant-specific Supplements 6 and 7 to the GEIS, which were issued on April 3, 2002, and April 23, 2002, for SPS 1/2 and NAS 1/2, respectively.

During the 75-day comment period for the draft plant-specific Supplements 6 and 7 to the GEIS, four additional public meetings were held, two near SPS 1/2 on May 29, 2002, and two near NAS 1/2 on June 25, 2002. At these meetings, the staff described the environmental reviews and answered questions from members of the public to help them formulate their comments on the reviews. Final Supplements 6 and 7 to the GEIS were issued in November 2002.

Supplements 6 and 7 to the GEIS present the NRC staff's analysis of the environmental impacts of renewing the SPS 1/2 and NAS 1/2 operating licenses for an additional 20 years. The staff's analysis considers and weighs the environmental effects of the proposed actions, and alternatives that are available to avoid adverse environmental effects. On the basis of the analyses and findings in the "Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants" (NUREG-1437), the environmental reports submitted by the applicant, consultation with other Federal, State, and local agencies, the NRC staff's own independent review, and the staff's consideration of public comments, the staff recommended in Supplements 6 and 7 to NUREG-1437 that the Commission determine that the adverse environmental impacts of license renewal for SPS 1/2 and NAS 1/2 are not so great that preserving the option of license renewal for energy planning decisionmaking would be unreasonable.

1.3 Summary of Principal Review Matters

The requirements for renewing operating licenses for nuclear power plants are described in 10 CFR Part 54. The staff performed its technical review of the North Anna and Surry LRAs in accordance with Commission guidance and the requirements of 10 CFR 54.4, 54.19, 54.21, 54.22, 54.23, and 54.25. The standards for renewing a license are set forth in 10 CFR 54.29.

In 10 CFR 54.4, the Commission provides the scoping requirements of the license renewal rule. The applicant submitted this information in Chapter 2 of its May 29, 2001, applications. The staff reviewed this information and found that the applicant submitted the information required by 10 CFR 54.4.

In 10 CFR 54.19(a), the Commission requires applicants for license renewal to submit general information. The applicant submitted this general information in Enclosure 1 to its letter of May 29, 2001, forwarding its applications for renewed operating licenses for NAS 1/2 and SPS 1/2. The staff reviewed Enclosure 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 each LRA include "conforming changes to the standard indemnity agreement, 10 CFR 140.92, Appendix B, to account for the expiration

term of the proposed renewed license." Regarding the standard indemnity agreement, the applicant states the following in each LRA:

The current Standard Indemnity Agreements for NAS 1/2 and SPS 1/2 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 Standard Indemnity Agreements. Item 3 of the attachment to the Standard Indemnity Agreements. Item 3 of the attachment to the Standard Indemnity Agreements. The applicant requested that conforming changes be made to Article VII of the Standard Indemnity Agreements, and/or Item 3 of the attachment to the Standard Indemnity Agreements, specifying the extension of the Standard Indemnity Agreements until the expiration dates of the renewed NAS 1/2 and SPS 1/2 operating licenses. Should the license numbers be changed upon issuance of the renewed license, the applicant requests that conforming changes be made to Item 3 of the attachment and any other section of Standard Indemnity Agreements, as appropriate.

The staff will use the original license numbers for the renewed licenses. Therefore, there is no need to make conforming changes to the indemnity agreement, and the requirements of 10 CFR 54.19(b) have been met.

In 10 CFR 54.21, the Commission requires that each application for a renewed license for a nuclear facility contain the following information: (a) an IPA, (b) current licensing basis changes made during the NRC review of the application, (c) evaluations of time-limited aging analyses (TLAAs), and (d) a final safety analysis report (FSAR) supplement. On May 29, 2001, the applicant submitted the information required by 10 CFR 54.21(a) and (c) in NAS LRA Exhibit A, "Application for Renewed Operating Licenses, North Anna, Units 1 and 2" and SPS LRA Exhibit A, "Application for Renewed Operating Licenses, Surry, Units 1 and 2." The applicant submitted the information to address the license renewal requirements of 10 CFR 54.21(d) in the FSAR supplements in Appendix A to Exhibit B of each LRA.

In 10 CFR 54.22, the Commission states the requirements regarding technical specifications. The applicant addressed the requirements of 10 CFR 54.22 in Appendix D to Exhibit B of each LRA.

The staff evaluated the technical information required by 10 CFR 54.4, 54.21, and 54.22 in accordance with the NRC's regulations and the guidance in the draft SRP. The staff's evaluation of this information is documented in Chapters 2, 3, and 4 of this SER.

The staff's evaluation of the environmental information required by 10 CFR 54.23 is documented in the final plant-specific supplements to the GEIS (NUREG-1437, Supplements 6 and 7), dated November 2002.

1.3.1 Westinghouse Topical Reports

In accordance with 10 CFR 54.17(e), the applicant referenced the following Westinghouse Owners Group topical reports in each LRA. The applicant used the topical reports to generically demonstrate that applicable aging effects for reactor coolant system components will be adequately managed for the period of extended operation.

- WCAP-14422, Rev. 2-A, "License Renewal Evaluation: Aging Management for Reactor Coolant System Supports," Westinghouse Electric Corporation, February 1997.
- WCAP-14535A, "Topical Report on Reactor Coolant Pump Flywheel Inspection Elimination," Westinghouse Electric Corporation, November 1996.
- WCAP-14574-A, "Aging Management Evaluation for Pressurizers," Westinghouse Electric Corporation, July 1996.
- WCAP-14575-A, "Aging Management Evaluation for Class I Piping and Associated Pressure Boundary Components," Westinghouse Energy Systems, August 1996.
- WCAP-14577, Rev. 1-A, "Aging Management Evaluation for Reactor Internals," Westinghouse Energy Systems, September 1997.

The staff issued the safety evaluations for these topical reports on the following dates: WCAP-14422 on November 17, 2000; WCAP-14535A on September 12, 1996; WCAP-14574A on October 26, 2000; WCAP-14575A on November 8, 2000; and WCAP-14577 on February 10, 2001. In accordance with the procedures described in NUREG-0390, "Topical Report Review Status," the staff requested that the Westinghouse Owners Group publish the accepted versions of the reports incorporating the transmittal letter and the staff safety evaluation between the title page and the abstract. The accepted versions have an *A* (for "accepted") after the report identification number.

The safety evaluations of the topical reports are intended to be stand-alone documents. An applicant that incorporates the topical reports by reference into an LRA must ensure that the conditions of approval stated in the safety evaluations are met. The staff's evaluation of the applicant's incorporation of the topical reports into the application is documented in Chapter 3 of this SER.

1.4 Summary of Open Items and Confirmatory Actions

As a result of its review, the NRC staff issued an SER with open items on June 6, 2002, and identified and documented 8 open items and 15 confirmatory actions. An issue was open if the applicant had not presented a sufficient basis for resolution. The applicant responded to each of the open items in two letters to NRC dated July 25, 2002, and October 1, 2002. The applicant's responses to open items and its confirmatory actions are described below.

<u>Open Item 2.5-1.</u> In the SER with open items, the staff asked the applicant to include the plant system portion of the offsite power system within the scope of license renewal. This open item was in accordance with the requirements of 10 CFR 54.4(a)(3) and 10 CFR 50.63(a)(1).

In response to this open item, in its letter dated July 25, 2002, the applicant stated that the plant portions of the offsite power systems for Surry and North Anna have been included in the license renewal scope for a station blackout event in accordance with 10 CFR 54.4(a)(3). Separate correspondence on this subject (Serial No. 02-297 dated July 11, 2002) provides a revised response to RAI 2.5-1. The revised response summarizes the aging management reviews for components and/or materials not addressed by the original LRAs, and lists added

in-scope equipment. The staff's evaluation of aging management reviews with respect to the SSCs added to the scope in response to this open item is set forth in section 3.9 of this SER.

Based on the information in the July 11 and 25, 2002 letters, the staff found the applicant's response acceptable and considers open item 2.5-1 closed.

<u>Open Item 3.9.2-1.</u> In the SER with open items, the staff asked the applicant to address the potential for moisture in the area of the degradation for the corrective actions attribute of the North Anna and Surry Non-EQ Cable Monitoring Activity.

In response to this open item, in its letter dated July 25, 2002, the applicant stated that it had provided (in the letter Serial No. 01-647 dated November 30, 2001) an evaluation of the North Anna and Surry Non-EQ Cable Monitoring Aging Management Activities in terms of the aging management program attributes. Furthermore, the description of the engineering evaluation process has been enhanced to ensure that if a degraded cable is identified, the cable environment, including the potential for moisture in the area of degradation, shall be considered in the engineering evaluation and appropriate corrective actions initiated through the corrective action system. A supplemental response to RAI 3.6.2-1 on this subject (Serial No. 02-297 dated July 11, 2002) incorporated the changes discussed above. Section 18.1.4 of the UFSAR supplement has also been revised to include consideration of the cable environment in the evaluation of degraded cable.

Based on the information in the November 30, 2001, and July 11 and 25, 2002 letters, the staff found the applicant's response acceptable and considers open item 3.9.2-1 closed.

<u>Open Item 3.9.2-2.</u> In the SER with open items, the staff asked the applicant to provide a technical justification to demonstrate that visual inspections will be effective in detecting damage in the high-voltage neutron monitoring instrumentation cables (and radiation monitor cables) before current-leakage can affect instrument loop accuracy. Since the radiation monitoring cables have been found to be particularly sensitive to thermal effects, the staff believed that the calibration approach is a more effective approach for neutron monitoring cables than visual inspections.

In response to this open item, in its letter dated July 25, 2002, the applicant stated that it had reviewed the SPS 1/2 and NAS 1/2 neutron monitoring instrumentation cables (and radiation monitoring cables) which operate between 1 kV and 5kV and generate signals supporting a license renewal intended-function. The review showed that the source, intermediate, and power range neutron detector cables are the only cables meeting the above criteria and are not included in the environmental qualification program (i.e., they are non-EQ cables). The routine calibration tests performed as part of the plant surveillance test program will be used to identify the potential existence of this aging degradation. The applicant in its supplemental response to RAI 3.6.2-1 (Serial No. 02-297, July 11, 2002) credited the normal calibration frequency specified in the plant technical specifications to provide reasonable assurance that severe aging degradation will be detected prior to loss of the cable's intended function. Section 18.1.4 of the UFSAR supplements also have been revised to include the use of calibration data in the aging management of these cables.

Based on the information in the July 11 and 25, 2002 letters, the staff found the applicant's response acceptable and considers open item 3.9.2-2 closed.

<u>Open Item 3.9.2-3.</u> Because cables (in open item 3.9.2-2) might be exposed to significant voltage and moisture simultaneously, the staff asked the applicant to periodically test the cables, or provide a technical basis for why not.

In response to this concern, in its letter dated July 25, 2002, the applicant stated that the LRAs identified a medium-voltage cable in the service water system at North Anna as potentially exposed to moisture but did not associate the cable with water treeing because the cable was maintained in dry condition. Water treeing is a degradation and long-term failure phenomenon that has been documented for medium-voltage electrical cable with certain extruded polyethylene and electric power research institute (EPRI) insulations. As stated in the applicant's revised response to RAI 2.5-1 (Serial No. 02-297, July 11, 2002), the cable environment for these high-voltage power cables will also be kept dry at SPS 1/2 and NAS 1/2. The applicant's approach to managing the aging mechanism of water treeing is consistent with the staff-proposed approach outlined in Section XI.E.3 of NUREG-1801. The nonenvironmentally-gualified (Non-EQ) cable monitoring program for SPS 1/2 and NAS 1/2 will be revised to specifically credit the programs necessary to control water in manholes and underground ducts associated with energized power cables. Additionally, the corrective action attribute of the non-EQ cable monitoring program will be revised to provide for performing appropriate tests of cables determined to have been wetted for a significant period of time. A supplemental response to RAI 3.6.2-1 on this subject (Serial No. 02-297 dated July 11, 2002) incorporated the requirement for testing of cables subjected to significant wetting.

Based on the information in the July 11 and 25, 2002 letters, the staff found the applicant's response acceptable and considers open item 3.9.2-3 closed.

<u>Open Item 4.3-1.</u> In the SER with open items, the staff asked the applicant to provide an assessment of charging and safety injection nozzles that is directly applicable to NAS 1/2 and SPS 1/2. The applicant had originally used the results presented in NUREG/CR-6260 (for an older vintage Westinghouse plant) to estimate the impact of the environment on fatigue usage for the NAS 1/2 and SPS 1/2 charging and safety injection nozzles.

In its October 1, 2002 response, the applicant committed to manage the environmentally assisted fatigue of the charging and safety injection nozzles for NAS 1/2 and SPS 1/2 using one or more of the following options prior to the period of extended operation:

- 1. further refinement of the fatigue analyses to lower the cumulative usage factors (CUFs) to below 1.0
- 2. repair of the affected locations
- 3. replacement of the affected locations
- 4. manage the effects of fatigue by an inspection program that has been reviewed and approved by the NRC (e.g., periodic nondestructive examination of the affected locations at inspection intervals to be determined by a method accepted by the NRC)

The applicant indicated that, if the fourth option is selected, the inspection details, including scope, qualification, method, and frequency, will be provided to the NRC for review and approval prior to the period of extended operation. An aging management program under this option would be a departure from the design basis CUF evaluation, described in the UFSAR supplements and, therefore, would require a license amendment pursuant to 10 CFR 50.59. In

view of the above, the staff finds the applicant's proposed program to be an acceptable plantspecific approach to address environmentally assisted fatigue during the period of extended operation in accordance with 10 CFR 54.21(c)(1). On the basis of the above discussion, the staff considers open item 4.3-1 closed.

<u>Open Item 4.3-2.</u> In the SER with open items, the staff asked the applicant to update the FSAR supplement to provide a more detailed discussion of its proposed program to address environmental fatigue effects. Furthermore, if the applicant selects the inspection option to manage environmentally assisted fatigue, the inspection details must be submitted to the staff prior to the period of extended operation and the method must be accepted by the staff. In addition, the staff asked the applicant to include a reference to the WCAP-15338 evaluation in the UFSAR description to provide the technical basis for the TLAA evaluation.

In its October 1, 2002 letter, the applicant provided a discussion of environmentally assisted fatigue in Section 18.3.2.4 of the revised UFSAR supplements. The applicant's revised UFSAR supplements included a discussion of the proposed approach to manage environmentally assisted fatigue for the surge line hot-leg pipe connection and the safety injection and charging nozzles. The applicant provided a further discussion of its proposed augmented inspection plan for the pressurizer surge line hot-leg nozzle in Section 18.2.1 of the revised UFSAR supplements. The applicant indicated that the inspection details regarding scope, frequency, qualifications, methods, etc., will be submitted to the NRC. Also, the applicant's July 25, 2002 response provided a revised UFSAR supplement for NAS 1/2 and SPS 1/2 which referenced WCAP-15338.

On the basis of the applicant's revised UFSAR supplements, as clarified above, the staff considers open item 4.3-2 closed.

<u>Open Item 4.6-1.</u> In the SER with open items, the staff asked the applicant to resolve the discrepancy between information provided in Table 3.8-7 of the NAS UFSAR and the NAS LRA. Specifically, Table 3.8-7 indicates that the NAS containment liner is designed to 100 cycles of operating pressure variations, 400 cycles of operating temperature variations, and 20 design basis earthquake cycles. However, the NAS LRA states that the liner plate is designed for 1,000 cycles of operating pressure variations, 4,000 cycles of temperature variation, and 20 cycles of design basis earthquakes, all simultaneously applied.

In its response to this open item, in its July 25, 2002 letter, the applicant explained that it had evaluated the NAS 1/2 and SPS 1/2 containment liner plates using a conservative estimate of the number of expected pressure and temperature cycles for the period of extended operation. This estimate includes 1500 cycles of operating-pressure variations, 6000 cycles of operating-temperature variations, and 20 design basis earthquake cycles. The staff agrees that the applicant has performed a conservative evaluation of the number of design cycles for the period of extended operation. In accordance with the requirements of 10 CFR 54.21(c)(1), the staff found the applicant's TLAA for the containment liner plate acceptable.

On the basis of the applicant's response, as clarified above, the staff considers open item 4.6-1 closed.

<u>Open Item 4.6-2.</u> In the SER with open items, the staff asked the applicant to revise the FSAR supplements to describe the TLAA evaluation of the containment liner plate, including the number of design cycles used for the evaluation of each facility.

In response to this open item, in its letter dated July 25, 2002, the applicant stated that the UFSAR supplements Section 18.3.4, "Containment Liner Plate," has been revised to include a discussion of the extrapolation of cycles to 60 years of operation and clearly established the design limits for operating pressure and temperature variations as 1500 and 6000, respectively. The anticipated operating cycle values were extrapolated to 150 (pressure) and 600 (temperature). The extrapolation increased the current 40-year values by a factor of 1.5 to account for the period of extended operation. The applicant also provided a discussion of the difference between the number of anticipated cycles and the design limits for cycles for both pressure and temperature operating variations for both stations. These extrapolated, anticipated, and design-limit values for the pressure and temperature variations are included in the proposed UFSAR changes to Table 3.8-7 for North Anna and Section 15.5.1.8 for Surry.

The staff found the applicant's revisions to FSAR supplements acceptable and considers open item 4.6-2 closed.

<u>Confirmatory Action 2.3.1.2-1.</u> In the SER with open items, the staff asked the applicant to correct the license renewal drawings referenced in the applications (11448-LRM-086A, sh. 1 and 11548-LRM-086A, sh. 1, for SPS 1/2 and 11715-LRM-093A, sh. 1 and 12050-LRM-093A, sh. 1, for NAS 1/2). These drawings had incorrectly indicated that certain leak detection components were within the scope of license renewal.

In response to this concern, in its letter dated July 25, 2002, the applicant stated that the listed drawings have been revised to remove the reactor vessel flange leak detection system from the scope of license renewal. Since the applicant has completed this action, the staff considers confirmatory action 2.3.1.2-1 closed.

<u>Confirmatory Action 3.3.1.1-1.</u> In the SER with open items, the staff asked the applicant to describe the followup actions in the appropriate aging management activity (AMA) summaries provided in UFSAR supplements of the applications. In its response to RAI B2.2.9-3, the applicant stated that it would incorporate the followup actions from Table B4.0-1 of each LRA into the UFSAR supplements for the Surry and North Anna Power Stations.

In response to this confirmatory action, in its letter dated July 25, 2002, the applicant stated that all items originally in Table B4.0-1 of the LRAs have been incorporated into the text of the respective AMA summaries in the UFSAR Supplements. The staff finds these proposed modifications to Section A2.2.1 of the UFSAR Supplements to be acceptable.

Because the applicant has completed this action, the staff considers confirmatory action 3.3.1.1-1 closed.

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<u>Confirmatory Action 3.3.1.6-1.</u> In the SER with open items, the staff asked the applicant to revise Section A2.2.6 of the UFSAR supplements to add cracking and loss of material as aging effects for concrete structures. The applicant, in response to RAI 3.5-7, had committed to credit the civil engineering structural inspection activity to manage change in material properties and the previously cited aging effects cracking and loss of material for concrete structures.

In response to this confirmatory action, in its letter dated July 25, 2002, the applicant stated that UFSAR supplement Section 18.2.6, "Civil Engineering Structural Inspections," has been modified to include change in material properties as an aging effect for both concrete and elastomer sealant and/or gasket materials.

Because the applicant has completed this action, the staff considers confirmatory action 3.3.1.6-1 closed.

<u>Confirmatory Action 3.3.1.7-1.</u> In the SER with open items, the staff asked the applicant to incorporate the followup actions from Table B4.0-1 of each LRA into the UFSAR supplements. In response to RAI B2.2.9-3, the applicant committed to describe the followup actions, including the fire protection program, in the appropriate AMA summaries in Appendix A of the applications.

In response to this concern, in its letter dated July 25, 2002, the applicant stated that all items originally in Table B4.0-1, including the fire protection program in UFSAR Supplement Section 18.2.7, of the LRAs have been incorporated into the text of the respective AMA summaries in the UFSAR supplements.

Because the applicant has completed this action, the staff considers confirmatory action 3.3.1.7-1 closed.

<u>Confirmatory Action 3.3.1.7-2.</u> In the SER with open items, the staff asked the applicant to supplement the NFPA pressure and flowrate testing (credited in each LRA as part of the fire protection program) with the work control process activity in order to manage aging effects for the fire protection system piping, and incorporate this commitment into Section A2.2.7 of the UFSAR supplements.

In response to this concern, in its letter dated July 25, 2002, the applicant stated that the UFSAR Supplement Section 18.2.7, "Fire Protection Program," has been modified to credit the work control process.

Because the applicant has completed this action, the staff considers confirmatory action 3.3.1.7-2 closed.

<u>Confirmatory Action 3.3.1.9-1</u>. In the SER with open items, the staff asked the applicant to describe the followup actions in the appropriate AMA summaries in Appendix A of the applications. In its response to RAI B2.2.9-3, in a letter dated November 30, 2001, the applicant stated that it would incorporate the licensee followup actions in Table B4.0-1 of each LRA into the UFSAR supplements.

In response to this confirmatory action, in its letter dated July 25, 2002, the applicant stated that all items originally in Table B4.0-1 of the LRAs have been incorporated into the text of the respective AMA summaries in the UFSAR supplements. This includes General Condition Monitoring in UFSAR Supplement Section 18.2.9.

Because the applicant has completed this action, the staff considers confirmatory action 3.3.1.9-1 closed.

<u>Confirmatory Action 3.3.1.10-1.</u> In the SER with open items, the staff asked the applicant to implement a one-time internal inspection of a representative sample of the box girders for the polar cranes, between year 30 and the end of the current operating license term.

In response to this confirmatory action, in its letter dated July 25, 2002, the applicant stated that UFSAR supplements Section 18.2.10, "Inspection Activities - Load Handling Cranes and Devices," has been modified to include the one-time box girder inspection.

Because the applicant has completed this action, the staff considers confirmatory action 3.3.1.10-1 closed.

<u>Confirmatory Action 3.3.1.11-1.</u> In the SER with open items, the staff asked the applicant to follow industry activities related to failure mechanisms for small-bore piping and evaluate changes to inspection activities based on industry experience.

In response to this confirmatory action, in its letter dated July 25, 2002, the applicant stated that UFSAR supplements Section 18.2.11, "ISI Program – Component and Component Support Inspection," has been modified to include the use of industry activities and guidance related to small-bore piping issues and inspections.

Because the applicant has completed this action, the staff considers confirmatory action 3.3.1.11-1 closed.

<u>Confirmatory Action 3.3.1.12-1.</u> In the SER with open items, the staff asked the applicant to add the ASME Section XI, Subsection IWL, Examination Category L-A, to the in-service inspection (ISI) program for containment inspection aging management activity to manage the potential aging effects for concrete structural members of the containment.

In response to this confirmatory action, in its letter dated July 25, 2002, the applicant stated that UFSAR supplements Section 18.2.12, "ISI Program – Containment Inspection," has been revised to incorporate ASME Section XI, Subsection IWL.

Because the applicant has completed this action, the staff considers confirmatory action 3.3.1.12-1 closed.

<u>Confirmatory Action 3.3.1.19-1.</u> In the SER with open items, the staff asked the applicant to revise the UFSAR supplements accordingly to include the following six items:

1. In Section B2.2.19 of each LRA the applicant states: "... as a licensee follow-up action, changes will be implemented into the maintenance procedures to provide reasonable assurance that consistent internal inspections will be completed during the process of performing maintenance tasks. These changes will be implemented prior to the end of the current operating license term." This item is included in each LRA Table B4.0-1 but is not discussed in Section A2.2.19 of the UFSAR Supplement. The staff asked the applicant to add this item into UFSAR supplements.

In response to this item, in its letter dated July 25, 2002, the applicant stated that the licensee follow-up action for changes to maintenance procedures has been added to Section 18.2.19 of the UFSAR supplements. The applicant has completed this action.
2. In response to RAIs 2.1-3, B2.2.7-2, and B2.2.19-3, a number of additional systems and components were added to the scope of the work control process. The staff asked the applicant to list these systems in the scope of the work control process in the UFSAR supplements for the Surry and North Anna Power Stations.

In response to this item, in its letter dated July 25, 2002, the applicant stated that the commitment has been incorporated into the UFSAR supplements (Item #3 below). The applicant's response to RAI B2.2.19-3 also credited the work control process for the fire protection system. This commitment has also been incorporated into the UFSAR supplements. (Refer to Confirmatory Action 3.3.1.7-2.) Therefore, no additional revision to the UFSAR supplement is necessary to address this item.

3. In response to RAIs 2.1-3, B2.2.7-2, and B2.2.19-3, the applicant committed to audit the work control process at years 40 and 50 and to perform supplemental inspections, as necessary, within 5 years of the audit. The staff asked the applicant to revise the UFSAR supplements for the work control process AMA to include this commitment.

In response to this item, in its letter dated July 25, 2002, the applicant stated that this commitment has been incorporated into Section 18.2.19 of the UFSAR supplements. The audit will ensure that all systems and components for which the work control process was credited, including all systems identified in RAI responses, will be represented in the program. The applicant has completed this action.

4. In response to RAIs 2.1-3, B2.2.7-2, and B2.2.19-3, the applicant committed to inspect similar material/environment components, both within the system and outside the system, if aging identified in a location within a system cannot be explained by environmental/operational conditions at that specific location. The staff asked the applicant to revise the UFSAR supplements for the work control process AMA to include this commitment.

In response to this item, in its letter dated July 25, 2002, the applicant stated that this commitment has been incorporated into Section 18.2.19 of the UFSAR supplements. The applicant has completed this action.

5. In response to RAIs 2.1-3, B2.2.7-2, and B2.2.19-3, the applicant committed to remove references to EPRI TR-107514 from the work control process description. The staff requested the applicant to revise the UFSAR supplements accordingly.

In response to this item, in its letter dated July 25, 2002, the applicant stated that the RAI responses withdrew the use and reference to EPRI report TR-107514. No reference to this report was made in the proposed UFSAR supplement which accompanied the LRAs. Therefore, no revision to the UFSAR Supplement is necessary. No additional action is required.

6. In Section A2.2.19 of each LRA, the applicant included two items related to "water treeing." Water treeing is a degradation and long-term failure phenomenon that has been documented for medium-voltage electrical cable with certain extruded polyethylene and EPRI insulations. Similar information was not included in Section B2.2.19 of the

LRA. In the SER with open items issued in June 2002, the staff asked the applicant to revise the UFSAR supplements to incorporate requested information.

In response to this item, in its letter dated July 25, 2002, the applicant stated that the USFAR supplement has been revised to remove the "boxed areas" (North Anna specific info) for "water treeing" from the Work Control Process AMP in Section 18.2.19. The applicant, however, indicated that water treeing is addressed in Section18.1.4 of the UFSAR Supplement, "Non- EQ Cable Monitoring program." The applicant has completed this action.

Since the applicant has completed these actions, the staff considers confirmatory action 3.3.1.19-1 closed.

<u>Confirmatory Action 3.3.3.2-1.</u> In the SER with open items, the staff noted that the acceptance of the applicant's transient cycle counting program (TCCP), in its discussion of the fatigue TLAA, was pending resolution of open items 4.3-1 and 4.3-2 of this SER.

Because the applicant has resolved open items 4.3-1 and 4.3-2, the staff considers confirmatory action 3.3.3.2-1 closed.

<u>Confirmatory Action 3.3.4.2-1.</u> In the SER with open items, the staff asked the applicant to include management of two additional aging effects (cracking and change in material properties) in the infrequently accessed area inspection activities.

In response to this concern, in its letter dated July 25, 2002, the applicant stated that UFSAR supplements Section 18.1.2, "Infrequently Accessed Area Inspection Activities," has been modified to include cracking and change in material properties as aging effects requiring management for concrete.

Because the applicant has completed this action, the staff considers confirmatory action 3.3.4.2-1 closed.

<u>Confirmatory Action 3.8.1-1.</u> In the SER with open items, the staff asked the applicant to monitor groundwater chemistry to ensure that the groundwater remains nonaggressive during the period of extended operation.

In response to this confirmatory action, in its letter dated July 25, 2002, the applicant stated that UFSAR supplements Section 18.2.6, "Civil Engineering Structural Inspections," has been modified to include annual monitoring of groundwater chemistry. Section 18.2.6 also requires that groundwater chemistry be considered in engineering evaluations of inspection results. In addition, the applicant has committed to monitor the groundwater chemistry at a different time each year so that any seasonal variations in the groundwater chemistry may be detected.

Because the applicant has completed this action, the staff considers confirmatory action 3.8.1-1 closed.

<u>Confirmatory Action 3.8.1-2.</u> In the SER with open items, the staff asked the applicant to provide justification for not including an aging management review of the dewatering system for control of hydrostatic pressure to the containment liner plate.

In response to this concern, in its letter dated July 25, 2002, the applicant stated that the subsurface drainage systems around the containments have been included within the scope of license renewal for SPS 1/2 and NAS 1/2. The UFSAR supplements Section 18.1.2, "Infrequent Accessed Area Inspection Activities," has been modified to include the structures associated with these systems. UFSAR supplements Section 18.2.19, "Work Control Process," encompasses the mechanical portions of the system.

Because the applicant has completed this action, the staff considers confirmatory action 3.8.1-2 closed.

<u>Confirmatory Action 3.8.2-1.</u> In the SER with open items, the staff asked the applicant to do a one-time inspection of the North Anna SWR to determine the level of sludge buildup.

In response to this concern, in its letter dated July 25, 2002, the applicant stated that UFSAR supplements Section 18.2.17, "Service Water System Inspections," has been modified to include the sludge buildup measurement commitment.

Because the applicant has completed this action, the staff considers confirmatory action 3.8.2-1 closed.

2.0 Scoping and Screening Methodology for Identifying Structures and Components Subject to Aging Management Review, and Implementation Results

The staff reviewed North Anna and Surry LRAs Section 2.0, "Scoping and Screening Methodology for Identifying Structures and Components Subject to Aging management review, and Implementation Results," as part of its scoping and screening review. In addition, the staff used the NAS and SPS UFSARs as its primary means of verification. Pursuant to 10 CFR 50.34(b)(2), the UFSAR contains "[a] description and analysis of the SSCs of the facility, with emphasis upon performance requirements, the bases, with technical justification therefore, upon which such requirements have been established, and the evaluations required to show that safety functions will be accomplished." The UFSAR is required to be updated periodically pursuant to 10 CFR 50.71(e). Thus, the UFSAR contains updated plant-specific licensing-basis information regarding the systems, SSCs, and their functions. The staff also used the license renewal drawings provided with each LRA, and the applicant's responses to requests for additional information (documented in letters from the applicant), telecommunications (documented in letters to the applicant), and other documented sources, as applicable. All applicable documents and letters used in the staff's evaluation are docketed.

In Section 2.1, "Scoping and Screening Methodology," of each LRA, the applicant described its methodology for identifying the SCs that are within the scope of license renewal and subject to an AMR. In the scoping of SSCs, the applicant performed a plant review to identify those SSCs that perform those functions that are the basis for including an SSC within the scope of license renewal as specified in 10 CFR 54.4(a). The applicant documents its scoping results in Section 2.2, "Plant Level Scoping Results," of each LRA. Of the SSCs that are within the scope of license renewal the applicant identified and listed those SCs that perform an intended function as described in 10 CFR 54.4(b) without moving parts, or without a change in configuration or properties, and that are not replaced based on qualified life or specified time period. The applicant documents its screening results in Sections 2.3 through 2.5 of the NAS and SPS LRAs. The staff reviewed the scoping and screening methodology, and provided its evaluation in Section 2.1 of this SER. The staff reviewed the scoping and screening results. The review is documented in Section 2.2, "Plant Level Scoping Results," and Section 2.3, "Screening Results: Mechanical Systems," Section 2.4, "Screening Results: Structures," and Section 2.5, "Screening Results: Electrical and Instrument and Control Components," of this SER.

2.1 Scoping and Screening Methodology

2.1.1 Introduction

Pursuant to 10 CFR Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants," Section 54.21, "Contents of Application—Technical Information," each application for license renewal must contain an Integrated Plant Assessment (IPA). Furthermore, the IPA must list and identify those SCs that are subject to an AMR from among the SSCs that are within the scope of license renewal in accordance with 10 CFR 54.4.

In Section 2.1, "Scoping and Screening Methodology," of each LRA, the applicant described the scoping and screening methodology used to identify SSCs at North Anna and Surry that are within the scope of license renewal and SCs that are subject to an AMR. The staff reviewed the applicant's scoping and screening methodology to determine whether it meets the scoping

requirements stated in 10 CFR 54.4(a) and the screening requirements stated in 10 CFR 54.21.

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

2.1.2 Summary of Technical Information in the Application

In Sections 2.0 and 3.0 of each LRA, the applicant provides the technical information required by 10 CFR 54.21(a). In Section 2.1, "Scoping and Screening Methodology," of each LRA, the applicant describes the process used to identify the SSCs that meet the license renewal scoping criteria under 10 CFR 54.4(a) and the process used to identify the SCs that are subject to an AMR as required by 10 CFR 54.21(a)(1).

Additionally, Section 2.2, "Plant Level Scoping Results"; Section 2.3, "Scoping and Screening Results, Mechanical Systems"; Section 2.4, "Scoping and Screening Results, Structures"; and Section 2.5, "Screening Results: Electrical and Instrumentation and Control Systems," of each LRA amplify the process that the applicant uses to identify the SCs that are subject to an AMR. Chapter 3 of each LRA, "Aging Management Review Results," contains the following information: Section 3.1, "Aging Management of 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 Structures and Component Supports"; Section 3.6, "Aging Management of Electrical and Instrument and Controls." Chapter 4 of each LRA, "Time-Limited Aging Analysis," contains the applicant's evaluation of time-limited aging analyses.

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

In Section 2.1.2, "Application of the Scoping Criteria in 10 CFR 54.4(a)," of each LRA, the applicant discussed the scoping methodology as it related to the safety-related criteria in accordance with 10 CFR 54.4(a)(1), non-safety-related criteria in accordance with 10 CFR 54.4(a)(2), and other scoping criteria in accordance with 10 CFR 54.4(a)(3) for regulated events.

In accordance with 10 CFR 54.4(a), with respect to the safety-related criteria, the applicant stated that the SSCs within the scope of license renewal include safety-related SSCs, which are those relied upon to remain functional during and following design basis events as defined in 10 CFR 50.49(b)(1), to ensure the following intended functions: (i) the integrity of the reactor coolant pressure boundary; (ii) the capability to shut down the reactor and maintain it in a safe shutdown condition; or (iii) the capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposure comparable to the guidelines in 10 CFR 50.34(a)(1), 10 CFR 50.67(b)(2), or 10 CFR 100.11, as applicable.

The applicant initially relied on the plant Equipment Data System (EDS) and supplemental quality lists of safety-related and non-safety-related components (Q-list) to identify safety-

related components and structures credited with remaining functional during and following design basis events defined in the current licensing basis. Additional scoping activities were then performed to identify systems within the scope of renewal and to determine structures within the scope of renewal.

With respect to the non-safety-related criteria, the applicant stated, in part, that a review of the UFSAR and other CLB documents has been performed to identify the non-safety-related and non-safety-related-quality SSCs whose failure could prevent satisfactory accomplishment of the safety-related intended functions identified in 10 CFR 54.4(a)(1). The review encompassed the design basis events considered within these documents. The results of the review are incorporated into a Criterion 2 report, which has been used as input to scoping and screening. The report identified the following four categories of non-safety-related and non-safety-related quality SSCs for inclusion within the scope of Criterion 2:

- SSCs relied on to mitigate or prevent flooding events
- piping relied on to maintain its integrity in order to prevent a high-energy line break outside Containment
- piping that is attached to safety-related piping and that is seismically designed and supported up to the first equivalent anchor point beyond the safety-related/non-safety-related or safety-related/non-safety-related quality boundary
- SSCs that are in close proximity to safety-related SSCs and whose failure during a seismic event could adversely interact with safety-related SSCs (Seismic II/I)
- Equipment relied on to maintain its pressure-retaining capability in order to maintain adequate intake canal level for design basis events (Surry only)

For all scoping criteria related to 10 CFR 54.4(a)(3), the applicant reviewed all SSCs relied on in safety analyses or plant evaluations to perform an intended function that demonstrates compliance with the Commission's regulations for fire protection [FP] (10 CFR 50.48), environmental qualification [EQ] (10 CFR 50.49), pressurized thermal shock [PTS] (10 CFR 50.61), anticipated transients without scram [ATWS] (10 CFR 50.62), and station blackout [SBO] (10 CFR 50.63) to ensure they were adequately accounted for in the scoping methodology. To support this review, the applicant developed a set of Criterion 3 reports which presented detailed design information for each regulated event. The Criterion 3 report described the regulatory requirements, the system descriptions, and specific equipment relied on to comply with the requirements, including components and structures. The purpose of those reports was to (1) identify the systems and structures that are relied on for each of those events, and to (2) either identify specific components or point to the documentation to be used as input for screening. In summary, the SSCs relied on in safety analyses or plant evaluations to perform an intended function that demonstrates compliance with NRC regulations for fire protection, environmental qualification, pressurized thermal shock, anticipated transients without scram, and station blackout have been included in the scope of license renewal in accordance with the criteria of 10 CFR 54.4(a)(3). 3 - .'

2.1.2.2 Documentation Sources Used for Scoping and Screening

Section 2.1.3 of each LRA contains a description of the relevant technical information sources used to identify the safety-related and non-safety-related intended functions for which the plant has been designed. These sources were also used to develop the list of SSCs subject to an aging management review.

- Maintenance Rule Scoping and Performance Criteria Matrix The maintenance rule scoping and performance criteria matrix was used as a source of system intended functions for both scoping and screening. This matrix includes safety-related intended functions and those intended functions associated with fire protection, equipment qualification, anticipated transients without scram, and station blackout. The maintenance rule matrix also identifies intended functions that may fall into the category of non-safety-related affecting safety-related (non-safety-related/safety-related). The non-safety-related/safety-related criterion for license renewal (10 CFR 54.4(a)(2)) and the maintenance rule (10 CFR 50.65(b)(2)(ii)) are similar.
- Civil Engineering Structural Monitoring Program The civil engineering structural monitoring program lists all plant structures and identifies the structures that have been included within the scope of the maintenance rule. This program has been used as a starting point for identifying the structures that should be included within the scope of license renewal under 10 CFR 54.4(a)(1) and 10 CFR 54.4(a)(2).
- System Design Basis Documents A set of system design basis documents (SDBDs) were developed to provide a source of design basis information about selected plant systems. The SDBDs include the following information of importance to scoping and screening: (1) system descriptions, (2) references to applicable design basis documents (such as design changes and calculations) associated with the system, (3) a list of safety-related system intended functions, intended functions potentially meeting the non-safety-related/safety-related criterion, and intended functions associated with fire protection, equipment qualification, anticipated transients without scram, and station blackout. The system intended functions listed in the SDBDs were used to supplement the maintenance rule functions for both scoping and screening.
- Equipment Data System The equipment data system (EDS) is a company database that contains (1) information for each mark-numbered structure and component, (2) the Q-List, and (3) the Environmental Qualification Master List. For each component and structure, EDS includes some or all of the following information of importance to the scoping and screening processes: (1) the quality classification (safety-related [SR], non-safety-related [NS], or non-safety-related with special quality requirements [NSQ]), (2) the intended functions of the component (provides system pressure boundary, restricts flow, provides structural integrity, etc.), and (3) the applicable classification rules (or basis) for each intended function. The classification rules that could apply include those for fire protection, station blackout, anticipated transients without scram, and several non-safety-related quality intended functions with potential applicability to Criterion 2 (non-safety-related/safety-related).
- The list of safety-related/non-safety-related quality structures and components within EDS (and the associated intended functions) is commonly referred to as the Q-List. The

Q-List was used to support the identification of safety-related components within the scope of license renewal for Criterion 1. That list was directly used in the scoping and screening processes. The EDS was also used to identify the non-safety-related/non-safety-related quality structures and components that support the identification of SSCs associated with the regulated events.

- Criterion 2 Report A review of the UFSAR and other CLB documents was performed to identify the non-safety-related, and non-safety-related-quality SSCs whose failure could prevent satisfactory accomplishment of the safety-related intended functions identified in 10 CFR 54.4(a)(1). The review has encompassed the design basis events and other failures considered within these documents. The following SSCs were identified:
 - 1. SSCs relied on to mitigate or prevent flooding events
 - 2. piping relied on to maintain its integrity in order to prevent a high-energy line break outside containment
 - 3. piping that is attached to safety-related piping and that is seismically designed and supported up to the first equivalent anchor point beyond the safety-related/non-safety-related or safety-related/non-safety-related quality boundary
 - 4. SSCs that are in close proximity to safety-related SSCs and whose failure during a seismic event could adversely interact with safety-related SSCs (Seismic II/I)
 - 5. Equipment relied on to maintain its pressure retaining capability in order to maintain adequate intake canal level for design basis events (Surry only)
- Regulated Event Reports A report was prepared for each of the five regulated events covered in 10 CFR 54.4(a)(3) to provide input to the scoping and screening processes. For each event a review of the UFSAR and other CLB documents was performed to identify any SSCs that were credited in response to these events. In addition to the Criterion 3 reports, the applicant used design drawings and other technical documentation, such as the plant technical specifications, to facilitate the identification of SSCs which met the requirements of 10 CFR 54.4.

2.1.2.3 Scoping Methodology

Scoping was performed to identify the plant systems and structures within the scope of license renewal rule. The scoping for systems and structures was performed as two separate efforts by the applicant. A discussion of each effort is presented below.

2.1.2.3.1 System Scoping Methodology

A system was initially identified as being within the scope if one or more of the following criteria were met:

1. The system performs an intended function as documented in the maintenance rule Scoping and Performance Matrix and the applicable System Design Basis Document,

- 2. The component data in EDS indicates that the system has one or more components that perform a safety-related, EQ, FP, SBO, ATWS or non-safety-related/safety-related intended function, or
- 3. The system was identified in the Criterion 2 report or in one of the five regulated event reports as being within the scope of the rule.

The preliminary scoping results were used as input to the screening process. Following the completion of system screening, the mechanical scoping results were updated to reflect any additional systems that were identified as containing or supporting in-scope components.

2.1.2.3.2 Structure Scoping Methodology

A structure was initially identified as being within the scope of license renewal if one or both of the following criteria were met:

- 1. The structure is included in the scope of the maintenance rule because it is safetyrelated or non-safety-related affecting safety-related, as indicated in the Civil Engineering Structural Monitoring Program.
- 2. The structure is identified in the Criterion 2 report or in one of the five Criterion 3 regulated event reports as being within the scope of the rule.

The structural scoping results were used as input to the structural screening process. Following the completion of system screening, the structural scoping results were updated to reflect any additional structures that were identified as containing or supporting in-scope components.

2.1.2.4 Screening Methodology

Following the identification of SSCs within the scope of license renewal, the applicant implemented a process for determining which SCs of the SSCs within the scope of renewal were subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1). The screening process identifies those SCs that perform an intended function without moving parts or without a change in configuration or properties (i.e., passive). SCs that were screened for further evaluation based on the passive criteria are subject to an AMR. During the AMR process, the SCs are evaluated to determine whether they are subject to replacement on the basis of a qualified life or specified time period (i.e., long-lived). In Section 2.1.5, "Screening Methodology," of each LRA, the applicant discussed these screening activities as they related to the SSCs that are within the scope of license renewal. The specific screening activities for the various engineering disciplines are further described in Section 2.1.5.1 for mechanical components, Section 2.1.5.2 for civil/structural, and Section 2.1.5.3 for electrical, instrumentation and controls (I&C) of each LRA.

2.1.2.4.1 Mechanical Screening

The applicant stated that the mechanical screening process was implemented on each of the systems that were identified during the scoping review phase to identify the passive mechanical components that support one or more of the system's intended functions. The system's intended functions, in conjunction with component information in EDS, the Criterion 2 report, the

Criterion 3 regulated event reports, and the applicable system drawings were used to identify the passive components within the scope of license renewal. The electrical/I&C components (such as heaters) that are in-scope only because they perform a system pressure boundary function, were treated as mechanical components and also have been identified during system screening. Specific screening criteria for this effort included identifying passive components in accordance with 10 CFR 54.21(a)(1)(i), the guidance in NEI 95-10 and other industry guidance as appropriate, addressing the cascading issue by identifying support systems down to a level necessary to provide for the satisfactory accomplishment of the safety-related intended functions identified in 10 CFR 54.4(a)(1), and addressing the attendant passive components (cooling water piping, instrument lines, and valves, etc.) of complex assemblies (such as the emergency diesel generators and air-conditioning units) by screening them separately from the complex assembly. Therefore, the attendant passive components that support a system's intended function were identified for inclusion within the scope of license renewal.

Following the completion of the screening review for a system, the annotated drawings were used to generate license renewal drawings. The passive mechanical components within the scope of license renewal are identified on those drawings. This includes the short-lived passive components as determined later during the AMR process.

2.1.2.4.2 Civil/Structural Screening

After identifying the SSCs within the scope of license renewal, the applicant performed the following screening review to determine which structures and structural components were subject to an AMR in accordance with 10 CFR 54.21(a)(1).

Screening was performed for each structure identified as being within the scope of license renewal. In addition, screening was performed for the following categories of structural equipment:

- 1. nuclear steam supply system supports
- 2. load-handling cranes and devices
- 3. plant commodities (general structural supports and other miscellaneous structural commodities)

The purpose of civil/structural screening was to identify the types of passive structural members (walls, beams, floors, grating, block walls, missile shields, pads, liners, etc.) that support the intended functions of the structure and, therefore, require an AMR. The types of structural members that require an AMR were identified based upon a review of the structural detail drawings. For mark-numbered structural members, the data in EDS were also reviewed. The screening process for NSSS supports was similar. The structural members that require an AMR were identified based upon a review of detailed structural members that require an AMR were identified based upon a review of detailed structural members and devices were evaluated based upon a review of the UFSAR. For mark-numbered cranes and devices, the data in EDS were also reviewed. Cranes and devices that are seismically designed were included within the scope of license renewal for Seismic II/I considerations. In addition, certain cranes and devices of importance to plant operations were specifically identified for inclusion within the scope of license renewal. General structural supports and other miscellaneous

structural items such as cable tray covers, fire/EQ barrier doors, fire penetration materials, cabinets, panels, and bench boards were evaluated as plant commodities.

2.1.2.4.3 Electrical Components Review

After identifying the SSCs within the scope of license renewal, the applicant also performed the following screening review to determine which electrical components were subject to an AMR. As part of this effort, the applicant relied on the requirements stated in 10 CFR 54.21(a)(1)(i) as supplemented by industry guidance in NEI 95-10 to develop a commodity evaluation approach on the basis of a plant-level evaluation of electrical equipment. The majority of electrical/I&C component groups (such as transmitters, switches, breakers, relays, actuators, radiation monitors, recorders, isolators, signal conditioners, meters, batteries, analyzers, chargers, motors, regulators, transformers, and fuses) are considered active, in accordance with 10 CFR 54.21(a)(1)(i) and the supplemental guidelines in NEI 95-10, and therefore, do not require an AMR. The electrical/I&C components (such as immersion heaters) that are in scope only because they perform a passive pressure boundary function are shown on system drawings. Those components were treated as mechanical components and identified during the system (mechanical) screening process. The following electrical/I&C component groups were identified as performing an electrical passive function in support of system intended functions:

- 1. cable and connectors
- 2. electrical penetrations
- 3. bus duct

The electrical screening results are presented in the application, which has each of the electrical/I&C component groups identified above and identifies the parts of the electrical/I&C component group that are subject to an AMR and the passive functions of the component group.

2.1.2.4.4 Screening of Stored Equipment

The applicant performed a review to identify equipment that (1) is maintained in storage, (2) is reserved for installation in the plant in response to a design basis event, and (3) requires an AMR. In addition to passive components, the review also has considered stored active components that are not routinely inspected, tested, and maintained. The Appendix R stored equipment is used to restore power to pre-selected plant components and to provide cooling to certain areas after a fire in order to attain cold shutdown. The stored equipment identified as requiring an AMR includes: cable and connectors, flexible ductwork, ventilation and vacuum systems hoses, and air and gas systems valve bodies. The applicant determined that air and gas system tools and supplies used to place the reserved equipment in service are not required for the installed equipment to remain operable (once placed in service) and are outside the scope of license renewal.

2.1.2.4.5 Screening of Thermal Insulation

Consistent with previous NRC correspondence addressed to prior license renewal applicants, the applicant performed a screening review of thermal insulation. The review considered the

impact of thermal insulation with respect to (1) the effectiveness of heat tracing, (2) room cooling, (3) Seismic II/I, and (4) halogens on pipe. The applicant developed a position paper, LR-1907/2907, "Screening for Thermal Insulation," to document its evaluation of the issue. The position paper described the NRC staff questions raised during previous LRA programs, prior applicant responses to those questions, and a discussion of the applicability of the issues to the North Anna and Surry plants. The applicant evaluated thermal insulation with respect to the criteria defined in 10 CFR 54.4(a) and determined that the insulation did not perform any safety-related function or perform a function with respect to the 10 CFR 54.4(a)(3) regulated events. The applicant evaluated the potential for the failure of the insulation to affect a safety-related intended function and concluded that thermal insulation did not meet the scoping requirements and, therefore, is not included within the scope of license renewal.

2.1.3 Staff Evaluation

As part of the review of the applicant's LRAs, the NRC staff evaluated the scoping and screening activities described in the following Sections of the applications:

- Section 2.1, "Scoping and Screening Methodology," to ensure that the applicant describes a process for identifying SSCs that are within the scope of license renewal in accordance with the requirements of 10 CFR 54.4(a)(1), (a)(2), and (a)(3)
- Section 2.2, "Plant Level Scoping Results"; Section 2.3 "Scoping and Screening Results: Mechanical Systems"; Section 2.4 "Scoping and Screening Results: Structures"; Section 2.5 "Screening Results: Electrical and Instrumentation and Controls Systems"

In addition, the staff conducted a scoping and screening methodology audit at the Dominion Engineering offices from September 10-14, 2001. The audit team reviewed implementation procedures and engineering reports on the scoping and screening methodology implemented by the applicant. The focus of the audit was to ensure that the applicant had developed and implemented adequate guidance to conduct the scoping and screening of SSCs in accordance with the methodologies described in the application and the requirements of the Rule.

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

The audit team reviewed implementation procedures and engineering reports on the scoping and screening methodology implemented by the applicant. These procedures included (1) LR-1000/LR-2000, "System and Structure Scoping," Revision 2, (2) LRPG-201, "System and Structure Screening," Revision 2, (3) LR-1001-2001, "System/Structure Screening Methodology," Revision 2, (4) LR-1007/2007, "Criterion 2 Report: Non-Safety-Related Affecting Safety-Related Surry and North Anna Power Stations," Revision 2, (4) LR-1002/2002, "10 CFR 54 Regulated Programs Environmental Qualification," Revision 0, (5) LR-1003/2003, "10 CFR 54 Regulated Programs Anticipated Transient Without Scram," Revision 2, (6) LR-1006/2006, "10 CFR 54 Regulated Programs Loss of All Alternating Current Power (SBO)," Revision 1, (7) LR-1004/2004, "10 CFR 54 Regulated Programs Pressurized Thermal Shock," Revision 0, (8) LR-1005/2005, "Fire Protection: 10 CFR 50.48 and Appendix R," Revision 1, and (9) LR-1655, "Aging Management Review Cables and Connectors," Revision 2. The team found that the scoping and screening methodology reports and procedures were consistent with Section 2.1 of each LRA and were sufficiently detailed to provide the applicant's staff with concise guidance on the scoping and screening implementation process to be followed during the LRA activities. In addition to the implementing procedures, the audit team reviewed supplemental design information, including SDBDs, maintenance rule Matrix results, and the Criterion 2 and Criterion 3 reports, which were relied upon by the applicant during the scoping and screening phases of the review. The team found these design documentation sources to be useful for ensuring that the initial scope of SSCs identified by the applicant was consistent with the CLB of the North Anna and Surry plants.

During the audit, the applicant further described the process used to incorporate plant design information into the LRA development process. The applicant referenced LR-1000/LR-2000, "System and Structure Scoping," Revision 2, LRPG-201, "System and Structure Screening," Revision 2, and LR-1001-2001, "System/Structure Screening Methodology," Revision 2, to describe the detailed process for developing each LRA, and specifically the incorporation of the SDBDs, maintenance rule Matrix information, Q-list information, and the Criterion 2 and Criterion 3 reports into the process. These reports outlined the specific use of the SDBDs, maintenance rule Matrix information, Q-list and other sources of information, such as emergency operating procedures, within the scoping methodology and presented formal guidance for use during the implementation phase. The applicant's engineering staff were cognizant of the requirements for and use of these information sources during the scoping development phase of each LRA.

The applicant presented the audit team with a detailed description of the SDBD program and described how it was incorporated into the scoping and screening process. The SDBDs were developed by the applicant during the design configuration documentation project. The audit team reviewed a sample of the SDBD reports for both safety-related and non-safety-related systems to better understand the approach the applicant implemented to determine which SSCs were initially placed in scope for license renewal. The team found the SDBD documents to provide a concise, well-documented discussion of the system, including safety-related, nonsafety-related, and NRC-required intended functions (i.e., intended functions which had been assigned as a result of commitments to the NRC, including those for the Commission regulations identified under 10 CFR 54.4 (a)(3)). Additionally, each SDBD identifies any intended function of the system relied upon for the five regulated events. Included in each SDBD was a detailed list of the sources of information, which included both North Anna or Surry-specific sources such as the UFSAR, technical specifications, calculations and analyses and non-plant-specific sources such as industry codes and standards, NUREGs, regulatory guides, inspection and enforcement bulletins, notices, generic letters, and Commission orders. The audit team reviewed the governing procedures and administrative controls and determined that they presented adequate guidance for the preparation, control, and maintenance of the SDBDs.

With respect to the Q-list information, the applicant's program for the development of the Q-list is described in the applicant's design document, VPAP-0310, "Equipment Data System Database Control." The procedure describes the electronic component database which identifies each individual mark-numbered component and provides information specific to the components safety classifications and intended functions. During the review of the Q-list information, the audit team reviewed a sample of the database screening result tables developed by the applicant to support the LRA program. The applicant designed a series of filters which enabled the LRA review engineers to sort through the equipment data system records and provide concise tables of component records on the basis of safety classification

or specific intended functions of interest, such as environmental qualification and fire protection. The audit team determined that the filter process was a useful tool for the applicant in developing the initial scope of SSCs for the program.

The applicant also presented the audit team with a detailed discussion on the development and implementation of the Criterion 2 and Criterion 3 reports. These reports were developed by the applicant's engineering staff to help ensure that all SSCs in the CLB that address the requirements of 10 CFR 54.4(a)(2) and 10 CFR 54.4(a)(3) were identified and considered for inclusion in the scope of each LRA. The Criterion 2 report provides detailed guidance for evaluating potential non-safety-related SSCs affecting safety-related SSCs, including the interpretation of guidelines during the application of the Criterion 2 requirements, interactions and events, mitigative and support functions, and a summary of potential interactions of interest as a result of certain operational occurrences such as flooding and high-energy line breaks. The Criterion 3 reports provide a detailed description of each of the regulated events of interest in accordance with 10 CFR 54.4(a)(3), including a description of the events, the regulations governing the events, and the SSCs relied upon to mitigate each event. The audit team reviewed these reports and verified that the applicant had adequately incorporated the results of these efforts into the scoping methodology effort.

On the basis of the staff's review of these procedures and from discussions with the applicant, the audit team identified certain discrepancies between the scoping and screening process described in the procedures and the actual process that was described by the applicant during the audit activities. Specifically, the Criterion 2 report did not provide a clear description and account of all essential activities in the scoping and screening process related to the determination of Criterion 2 SSCs. The report described a process by which only certain non-safety-related SSCs are brought into scope if failure of those non-safety-related SSCs is postulated in the CLB and their failure would result in the loss of a safety-related intended function. In fact, during the methodology audit, the audit team clearly established that the Rule required that all non-safety-related SSCs whose failure could result in the loss of a safety-related SSC from performing its intended function were included in scope.

On October 22, 2001, the staff issued a request for additional information to the applicant to more fully describe the actual process which was implemented for the LRA scoping and screening of Criterion 2 SSCs. By letter dated February 1, 2002, the applicant responded to the staff's request for additional information. In that response, the applicant stated that there is a statement in its Criterion 2 report that excludes certain non-safety-related equipment from license renewal scope even though its failure could result in the loss of a safety-related component. The exclusionary statement was intended to be applied whenever the CLB evaluations demonstrate acceptable consequences because the safety-related functions have not been compromised. For example, high-energy line failures outside of containment were evaluated as part of the CLB. As stated in North Anna UFSAR Section 3C.2.1, "If such an accident resulted merely in the loss of one or more components, while 100% redundancy of its function exists elsewhere, the design of the system was considered adequate." On the basis of this statement, the high-energy lines that are not subject to augmented inspections were excluded from further consideration under Criterion 2. The Surry high-energy lines outside of containment were treated in the same manner based upon a similar statement presented in Surry UFSAR Section 14B.2.1. These high-energy lines and other exclusions are addressed and were verified to be bounded by the revised methodology presented in the responses to the staff's RAIs. The applicant has revised the Criterion 2 report to delete reference to this

exclusionary statement and has supplemented the guidance with the methodology outlined in the responses to staff's request for additional information. The staff reviewed the applicant's response and found it to be acceptable on the basis of the revision of the Criterion 2 report to remove the exclusionary statement, and the applicant's re-verification of non-safety-related SSCs which meet the 10 CFR 54.4(a)(2) criterion using the revised methodology.

Two additional issues regarding the application of the requirements of 10 CFR 54.4(a)(2) were identified by the audit team regarding the treatment of non-safety-related SSC's whose failure could prevent safety-related SSCs from performing their intended functions. Specifically, item b of Section 2.1.3.6. "Criterion 2 Report," of each LRA states, in part, that non-safety-related piping that is attached to safety-related piping and that is required to be seismically designed and supported up to the first equivalent anchor point beyond the safety-related/nonsafety-related or safety-related/non-safety-related quality boundary, was not identified during screening. The second issue pertained to Item c of Section 2.1.3.6 of the application, which states, in part: "It should be noted that non-safety-related and non-safety-related quality mechanical components (e.g., piping, tanks, ducting) have not been included within the scope of license renewal for Seismic II/I because the failure of this equipment during a seismic event was not postulated in the CLB." The audit team discussed these issues with the applicant's staff and requested specific clarification regarding the applicant's approach to scoping and screening non-safety-related SSCs in accordance with the requirements of 10 CFR 54.4(a)(2). The audit team determined that the applicant did, in fact, bring into scope those safetyrelated/non-safety-related and safety-related/non-safety-related quality piping segments up through the first equivalent anchor point beyond the safety-related/non-safety-related or safetyrelated/non-safety-related quality boundary as part of its scoping and screening methodology implementation process but did not uniquely identify those segments on the applicable plant drawings, only the safety-related piping to which they were attached.

On October 22, 2001, the staff issued a request for additional information to the applicant to clarify that the safety-related/non-safety-related and safety-related/non-safety-related quality piping segments up through the first equivalent anchor point beyond the safety-related/nonsafety-related or safety-related/non-safety-related quality boundary were in fact included within the scoping results. By letter dated February 1, 2002, the applicant responded to the staff's request for additional information. In that response, the applicant stated that safety-related/non-safety-related quality piping that is attached to safety-related piping and that is seismically designed and supported up to the first equivalent anchor point beyond the safetyrelated/non-safety-related or safety-related/non-safety-related quality boundary is included within the scope of license renewal. Although these non-safety-related/non-safety-related quality piping segments were not uniquely identified during the screening process or highlighted on each LRA drawings, applicable aging effects on these piping segments are managed along with the adjoining safety-related piping. The supports for the non-safety-related/nonsafety-related quality piping segments are also included within the scope of license renewal as stated in Section 2.1.3.6 of each LRA. The staff has reviewed the applicant's response and finds it acceptable on the basis of the confirmation that these non-safety-related piping segments and supports were included in the scope.

With regard to the second issue, the audit team supplied the applicant with additional information on the treatment of such SSCs and requested that the applicant provide a response to a request for additional information on the issue. The staff stated that an applicant for license renewal should consider two configurations of non-safety-related piping systems that

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

On October 22, 2001, the staff issued a request for additional information which further described the staff's position on the 10 CFR 54.4(a)(2) requirements. By letter dated February 1, 2002, the applicant responded to the staff's request for additional information. In that response, the applicant stated that the methodology implemented for scoping of systems, structures, and component did not include non-safety-related mechanical components, such as piping, tanks, valves, etc., that are considered Seismic II/I since the failure of these components during a seismic event is not postulated in the current licensing basis. On the basis of discussions with the NRC staff, the scope under 10 CFR 54.4(a)(2) is not limited to Seismic II/I supports. Therefore, the applicant has modified the scope of license renewal for Surry and North Anna to include non-safety-related SSCs that have a spatial relationship with SSCs within the scope of license renewal on the basis of 10 CFR 54.4(a)(1) and whose failure could impact the performance of an intended safety function.

The applicant used the preventative option to determine which non-safety-related components were included within the scope of license renewal. Components considered for inclusion within the scope of license renewal in response to this RAI include piping, valves, tanks, pumps, and other mechanical system equipment.

The applicant's process to determine the non-safety-related SSCs to be added to the scope of license renewal first required identifying the plant structures and spaces that contain both safety-related and non-safety-related SSCs. After the structures and spaces were identified, the equipment database was reviewed to determine the mechanical systems containing non-safety-related components within these structures and spaces. From this list of systems, a determination was made whether an assumed failure of the non-safety-related components within these systems could impact the performance of an intended function for any SSC in-scope for 10 CFR 54.4(a)(1). Failure modes considered in the evaluation were pipe whip and jet impingement for high-energy systems and fluid leakage, fluid spray, and component displacement (such as by physical contact) for all systems. The component-level intended functions of limited structural integrity and pressure boundary were identified for these non-safety-related components. The limited structural integrity function is defined as the capability of a component to maintain sufficient integrity to prevent physical interaction with spatially oriented safety-related components. The pressure boundary function prevents leakage and spray that could affect safety-related components.

Industry and site operating experience reviews were conducted by the applicant to identify potential concerns with aging of non-fluid-containing components. No failures due to aging were identified in these reviews. This operating experience is consistent with the results of aging management reviews performed for in-scope components of the same material exposed to the same environments. On the basis of this operating experience review, it was concluded that there are no credible aging effects that would result in loss of the limited structural integrity function for non-fluid-containing components. Additionally, non-fluid-containing components cannot affect safety-related SSC due to leakage or spray. Therefore, since these non-fluid-containing components of safety-related SSCs, they were not included within the scope of license renewal for this review.

An aging management evaluation was performed for the non-safety-related mechanical components that were determined to be within the scope of license renewal. This review consisted of an evaluation of the effects of aging and identification of activities credited for managing the applicable aging effects on the basis of the results of aging management reviews performed for components of the same material and exposed to the same internal and external environments. This evaluation concluded that the aging effects of loss of material and/or cracking require management and that there are no additional material and environment combinations beyond those currently considered in the application.

The aging management activities credited with managing these aging effects are currently described in the application in the indicated section. A summary of the results of the aging management evaluation for the systems within the scope of license renewal as a result of the expansion of scope for Criterion 2 was also presented.

In a followup telecommunication on March 5, 2002, the staff requested some additional clarification regarding the operating experience information reviewed by the applicant concerning non-fluid-filled systems and the methodology implemented to exclude certain non-

safety systems determined not to impact the performance of an intended function for any SSC in-scope for 10 CFR 54.4(a)(1). In a letter dated May 22, 2002 (Serial No. 02-163), the applicant supplied additional clarification to the staff. Specifically, the applicant identified the sources of operating experience information regarding age-related degradation and structural degradation, including INPO SERs, site-specific deviation reports from each individual plant corrective action system, NRC generic communications and additional NRC correspondence from the NRC Web site and ADAMS. The applicant's operating experience review has identified no age-related degradation of non-fluid-containing components that would result in their loss of the limited structural integrity function. This conclusion was supported by the applicant's walkdowns and inspections in response to Generic Letter 87-02 using the Generic Implementation Procedure for Seismic Verification of Nuclear Plant Equipment.

With respect to the exclusion of certain non-safety-related component groups, the applicant supplied justification for every component group exclusion and documented those justifications in Technical Report LR-1921/2921, "Aging Management of Criterion 2 (nonsafety-related/safety-related) Component Groups not Addressed in AMR Reports," Rev. 0. In all cases, non-safety-related component groups excluded from the scope were determined not to be spatially oriented near safety-related components and, therefore, did not pose a credible concern. In addition, the applicant readdressed the evaluation described in the LR-1907/2907 position paper regarding thermal insulation and verified that the evaluation results remained valid, and that no new issues regarding thermal insulation were identified as a result of the expanded scope of the 10 CFR 54.4(a)(2) evaluation. In a followup telecommunication on April 3, 2002, the staff discussed the evaluation performed by the applicant and documented in the position paper with respect to thermal insulation. The staff reviewed the evaluation described in LR1907/2907 and verified that the applicant had readdressed the documented position paper with respect to the expanded scope. The results of this expanded evaluation of the 10 CFR 54.4(a)(2) were also reviewed by the NRC regional inspection team during an inspection on February 4-8, 2002. The inspection team determined that the applicant's scoping and screening activities, including the additional effort to resolve the 10 CFR 54.4(a)(2) issue, were performed in accordance with the prescribed methodology and were adequate.

As a result of this supplemental review, the applicant brought additional non-safety-related systems and associated mechanical components into the scope of license renewal, supplied the results of the associated AMRs, and presented a summary of the programs and activities that will be used to manage aging in these systems. Section 2.3.5 of this SER describes the staff's evaluation of the expanded scoping and the resultant structures and components subject to an aging management review. Sections 3.3.1 and 3.3.4 of this SER describe the aging management programs credited for these additional structures and components.

On the basis of the additional information supplied by the applicant, including expansion of the systems within the scope of license renewal and addition of new systems within scope as a result of the revised methodology, determination of the credible failures which could impact the ability of safety-related SSCs to perform their intended functions, evaluation of relevant operating experience, and incorporation of identified non-safety-related SSCs into the applicant's AMPs, the staff concludes that the applicant has supplied sufficient information to demonstrate that all SSCs that meet the 54.4(a)(2) scoping criterion have been identified as being within the scope of license renewal.

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

The audit team reviewed the methodology used by the applicant to identify mechanical, structural, and electrical components within the scope of license renewal that were subject to further aging management evaluation. The applicant presented the staff with a detailed discussion of the processes used for each discipline and supplied technical reports that described the screening methodology and a sample of the screening results reports for a selected group of safety-related and non-safety-related systems. The applicant referenced technical reports LR-1001/2001, Rev. 2, "System Structure Screening Methodology," and LRPG-201, "System and Structure Screening," during the review of the screening process. The applicant's process followed the guidance presented in NEI 95-10 and consisted of the following three activities:

- 1. review of system and structure intended functions
- 2. identification of the equipment that supports the intended functions
- 3. listing of the in-scope equipment that is passive and therefore requires an AMR

The applicant's process did not specifically attempt to determine long-lived verses short-lived components at this point in the screening methodology. That determination was performed at the AMR process implementation.

Mechanical Components

During the audit of the applicant's license renewal scoping and screening process conducted by the NRC staff, the audit team reviewed the methodology used by the applicant to identify and list the mechanical components subject to an AMR and the applicant's technical justification for this methodology. The team also examined the applicant's results from the implementation of this methodology by reviewing an overview of the mechanical systems identified as being within the scope, a sample of evaluation boundaries drawn within those systems, the resulting components determined to be within the scope of the rule, the corresponding component-level intended functions, and the resulting list of mechanical components subject to an AMR.

The methodology for identifying mechanical components within the scope of the rule included both mark-numbered (i.e., components identified in the applicant's electronic component database) and non-mark-numbered components. For the mark-numbered components, the individual components were identified and reviewed. For the non-mark-numbered components, the components were categorized by component groups such as tubing and hoses. These component groups were then evaluated as part of the system screening table development. The audit team did not identify any discrepancies between the methodology documented and the implementation results.

Structures

During the audit of the applicant's renewal scoping and screening process, the staff also examined the applicant's results from the implementation of this methodology by reviewing the •

structural components identified as being within the scope, the corresponding structural-level intended functions, and the resulting list of structural components subject to an AMR.

The applicant performed a review of all mechanical components that were determined to be within the scope of license renewal and subject to an AMR, and identified each structure that contains any of these components as being within the scope of license renewal and subject to an AMR.

The applicant explained that because most structural members (e.g., walls, beams, grating, foundations, duct banks, sumps, etc.) do not have individual mark numbers, the structural screening was initiated by first identifying structural members which support the intended functions that the structure performs. The structural members were identified by reviewing detailed structural drawings for the in-scope structures. After the structural members were identified, they were further evaluated in the structural AMR. Structural members that support equipment, piping, and ductwork were evaluated in a specific equipment support AMR.

The audit team reviewed a sample of the structural drawing packages assembled by the applicant and discussed the process and results with the cognizant engineers who performed the review. The audit team did not identify any discrepancies between the methodology documented and the implementation results.

Electrical Components

During the audit of the applicant's renewal scoping and screening process, the staff also evaluated the implementation of this methodology by reviewing the list of electrical components subject to an AMR. The electrical/I&C components that are in scope because they perform a pressure boundary function are shown on system drawings. The applicant has treated these electrical/I&C components as mechanical components and has identified them during system screening. For the non-mark-numbered components, the applicant combined the components into electrical component groups on the basis of the electrical equipment categories described in the NEI 95-10, Appendix B guidance. Those component groupings were then reviewed to determine which component groups performed an intended function without moving parts or without a change in configuration or properties in accordance with 10 CFR 54.21(a)(1)(i). Based on this approach, the applicant established the set of electrical/I&C component groups which performed a passive function in support of system intended functions. The results were reviewed by the audit team with the cognizant engineers responsible for the review. The audit team did not identify any discrepancies between the methodology documented and the implementation results.

System Screening

The applicant implemented a system-level screening process to identify mechanical, structural, and electrical components subject to an AMR. The system screening process included both the mark-numbered and non-mark-numbered components as stated above for each discipline. The system screening process consisted of the following major activities:

- 1. identify and update system intended functions
- 2. generate system screening tables
- 3. identify passive components requiring an AMR

- 4. validate system intended functions and evaluation boundaries
- 5. prepare system screening technical reports
- 6. generate license renewal drawings
- 7. assemble system screening packages
- 8. update the Structure/System Scoping Report

These major activities provided a mechanism to verify that system intended functions were captured adequately by detailed system design documentation and that the components selected for further review supported those intended functions. In preparing the system screening tables, the applicant developed a series of filters which identified components from the applicant's electronic components database that were in scope and passive. The screening tables were further used in the system screening reports to document the individual system components and commodity groups for which AMRs were performed and those components for which no AMR is needed. For each component the screening table identified the license renewal scoping criteria (safety-related, non-safety-related affecting safety-related, and the five regulated events) which were used to bring the component into scope.

The audit team reviewed the screening implementation procedures and a selected sample of the system screening reports to ensure consistent application of the applicant's screening methodology. The team identified that the sample reviewed was developed in accordance with the administrative controls governing the process and was consistent in level of detail and presentation. The audit team further reviewed a sample of the license renewal drawing and system screening table results to ensure the individual components identified in the system screening tables were reflected appropriately on the drawings. For those components identified in the system adetailed explanation for the component exclusion from an AMR. The audit team reviewed a sample of these explanations and found that they were consistent with the guidance and presented adequate justification for the determination made. The team did not observe any discrepancies between the sample tables and drawings evaluated.

On the basis of the evaluation described above, the audit team determined that the methodology, as described in each LRA and implemented by the applicant, is consistent with the requirements of the Rule, and that the screening methodology will identify SCs that meet the screening criteria of 10 CFR 54.21(a)(1).

2.1.4 Conclusions

The staff's review of the information presented in Section 2.1 of each LRA, the supporting information in UFSARs, the information presented during the scoping and screening audit and inspection, and the applicant's responses to the staff's RAIs, as discussed above, formed the basis of the staff's safety determination. The staff verified that the applicant's scoping and screening methodology, including its supplemental 10 CFR 54.4(a)(2) review which brought additional non-safety-related piping segments and associated components into the scope of license renewal was consistent with the requirements of the Rule and the staff's position on the treatment of non-safety-related SSCs. The staff concludes that there is reasonable assurance that the scoping and screening methodology used by the applicant to identify SSCs within the scope of the Rule and SCs that are subject to an AMR, is consistent with the requirements of 10 CFR 54.4 and 10 CFR 54.21.

2.1.5 References for Section 2.1

- 1. NUREG-1800, "Standard Review Plan for Review of License renewal Applications for Nuclear Power Plants", July 2001
- 2. NEI 95-10, "Industry Guideline for Implementing the Requirements of 10 CFR Part 54 -The License renewal rule", Revision 2, August 2000
- 3. North Anna and Surry Updated Final Safety Analysis Reports
- 4. NRC Generic Aging Lessons Learned Report (GALL), August 2000.
- 5. Position Paper LR-1907/2907, "Screening for Thermal Insulation", Rev. 1, 6/26/01
- 6. Regulated Events Report LR-1005, License Renewal Position Paper, "Fire Protection: 10 CFR 50.48 and Appendix R Surry Power Station, Units 1 & 2", Rev. 1, 3/2/2001
- Regulated Events Report LR-1005, License Renewal Position Paper,"Fire Protection: 10 CFR 50.48 and Appendix R North Anna Power Station, Units 1 & 2", Rev. 1, 3/2/2001
- 8. Regulated Events Report LR-1006, 10 CFR 54 Regulated Programs Loss of All Alternating Current Power (SBO) Surry Power Station, Rev. 1, 2/28/2001
- 9. Regulated Events Report LR-2006, "10 CFR 54 Regulated Programs Loss of All Alternating Current Power (SBO) North Anna Power Station", Rev. 1, 2/28/2001
- 10. Regulatory Guide 1.188, "Standard Format and Content for Applications to Renew Nuclear Power Plant Operating Licenses", July 2001
- 11. STD-GN-0003, "Standard for Determining the Safety Classification of Structures, Systems, and Components," Rev.14, 6/22/01
- 12. SDBD-SPS-SI, "System Design Basis Document, Safety Injection System, Surry Power Station", Rev.3, 7/31/00
- 13. SDBD-NAS-SI, "System Design Basis Document, Safety Injection System, North Anna Power Station," Rev.3, 5/31/01
- 14. SDBD-NAS-AFW, "System Design Basis Document, Auxiliary Feedwater System, North Anna Power Station," Rev.3, 6/15/00
- 15. SDBD-SPS-AFW, "System Design Basis Document, Auxiliary Feedwater System, Surry Power Station", Rev.3, 1/31/01
- 16. SDBD-SPS-FW, "System Design Basis Document, Feedwater System, Surry Power Station", Rev.1, 1/31/00
- 17. Technical Report LR-1007/LR-2007, "Criterion 2 report: Non-safety-related Affecting Safety-related Surry and North Anna Power Stations", Rev 2., 4/12/2001
- 18. Technical Report LR-1000/LR-2000, "License renewal System/Structure Scoping North Anna Power Station Surry Power Station", Rev 2., 7/12/2001
- 19. Technical Report LR-1001/LR-2001, "System/Structure Screening Methodology Surry and North Anna Power Stations", Rev 2., 1/31/2001
- 20. Technical Report LRPG-201, "License renewal Project Guideline System and Structure Screening Surry and North Anna Power Stations", Rev 2., 3/09/2001
- 21. Technical Report TR CE-0087, "Guideline For Monitoring Structures, Surry Power Station", Rev. 2, 8/24/98
- 22. Technical Report TR CE-0089, "Guideline For Monitoring Structures, North Anna Power Station", Rev. 4, 12/15/99
- 23. Technical Report LR-1002/LR-2002, "10 CFR 54 Regulated Programs Environmental Qualification", Rev. 0, 5/26/1999
- 24. Technical Report LR-1003/LR-2003, "10 CFR 54 Regulated Programs Anticipated Transient Without Scram", Rev. 2, 9/23/1999
- 25. Technical Report LR-2135, "License Renewal Screening Report, Safety Injection System, North Anna Power Station", Rev. 1, 5/25/01

- 26. Technical Report LR-2107, "License Renewal Screen Report, Feedwater System, North Anna Power Station", Rev. 1, 5/25/01
- 27. Technical Report LR-1655, "License Renewal Project Aging Management Review, Cables and Connectors, Surry Power Station", Rev. 2, 5/21/2001
- 28. Technical Report LR-1921/2921, "Aging Management of Criterion 2 (Nonsafety-related/Safety-related) Component Groups not Addressed in AMR Reports", Rev. 0
- 29. VPAP-0815, "Maintenance Rule Program", Rev.11, 6/28/00
- 30. VPAP-0310, "Equipment Data System (EDS) Database Control"

2.2 Plant Level Scoping Results

The statements of consideration (SOC) for the license renewal rule (60 FR 22478) indicates that an applicant has the flexibility to determine the set of SCs for which an AMR is performed, provided that this set encompasses the SCs for which the Commission has determined an AMR is required. Accordingly, the staff focused its review on verifying that the implementation of the applicant's scoping and screening methodology evaluated in Section 2.1 of this SER did not result in the omission of any structure and component (SC) that is required by 10 CFR 54.21(a)(1) to be subject to an AMR. The staff performed this review using the following two-step evaluation:

- The first step was to determine whether the applicant had properly identified the SSCs that are within the scope of license renewal in accordance with 10 CFR 54.4. As described in more detail below, the staff reviewed selected SSCs that the applicant did not identify as being within the scope of license renewal to verify that they do not meet any of the scoping criteria in 10 CFR 54.4(a)
- The second step was to determine whether the applicant had properly identified the SCs that are subject to an AMR in accordance with 10 CFR 54.21(a)(1). As described in more detail below, the staff reviewed the evaluation boundaries of the systems and structures included within the scope of license renewal to verify that the applicant considered all the SCs within the scope of license renewal in accordance with 10 CFR 54.21(a)(1). From the SCs that were within the evaluation boundaries, the staff reviewed the screening results to verify that no SC that performs its intended function without moving parts or without a change in configuration or properties (passive) or that is not subject to replacement based on qualified life or specified time period (long-lived) was excluded from an AMR. The staff did not review the SCs that the applicant had identified as subject to an AMR because it is an applicant's option to perform an AMR on more SCs than those required by 10 CFR 54.21(a)(1)

The staff's review and evaluation of the scoping results is documented below. The staff's review of the applicant's screening results will be documented in subsequent sections as referenced below. The staff performed the described scoping and screening reviews for both the North Anna and Surry LRAs to determine whether there was reasonable assurance that the applicant had identified and listed those SCs that are within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4 and 10 CFR 54.21(a)(1), respectively.

2.2.1 Technical Information in the Application

The staff reviewed Section 2.2 of the North Anna and Surry LRAs, "Plant Level Scoping Results," as part of its scoping and screening review. The staff used the NAS and SPS UFSARs as its primary means of verification. The staff also used the license renewal drawings provided with each LRA, the applicant's responses to requests for additional information as documented in letters from the applicant, telephone responses to requests for additional information as documented in letters from the applicant, telecommunications as documented in letters to the applicant, and other documented sources, as applicable. All applicable documents and letters used in the staff's evaluation are docketed.

In each LRA Section 2.1, "Scoping and Screening Methodology," the applicant describes its methodology for identifying the SCs that are within the scope of license renewal and subject to an AMR. In the scoping of SSCs, the applicant performed a plant review to identify those SSCs that perform those functions that are the basis for including an SCC within the scope of license renewal as specified in 10 CFR 54.4(a). The applicant documents its scoping results in Section 2.2, "Plant Level Scoping Results," of the North Anna and Surry LRAs. In Tables 2.2-1 and 2.2-3 of each LRA, the applicant listed the systems and structures, respectively, that are within the scope of license renewal. These tables also identify the sections of each LRA that contain the screening results for each system and structure identified by the applicant as being within the scope of license renewal. In addition, in Tables 2.2-2 and 2.2-4 of each LRA, the applicant listed the systems and structures, respectively, that are not in the scope of license renewal and the UFSAR section that contains the information used by the applicant to justify not including those systems and structures as being within the scope of license renewal. From those SSCs that are within the scope of license renewal the applicant identified and lists those SCs that perform their intended functions without moving parts or without a change in configuration or properties and that are not replaced based on qualified life or specified time period. The applicant documents its screening results in Sections 2.3 through 2.5 of each LRA. The staff reviewed the applicant's scoping and screening methodology, and documented its evaluation in Section 2.1 of this SER. The staff's review and evaluation of the applicant's scoping for both North Anna and Surry is documented in the following paragraphs. The staff review and evaluation of the applicants screening results are documented in Sections 2.3 through 2.5 of this SER.

2.2.2 Staff Review

To ensure that the scoping methodology, as described in Section 2.1 of the North Anna and Surry LRAs, identified the SSCs that are within the scope of license renewal, the staff performed the following review of the scoping results as documented in Section 2.2 of each LRA. The staff sampled the content of the NAS and SPS UFSARs based on the listing of systems and structures in Tables 2.2-1 through 2.2-4 of each LRA to identify those systems or structures that may perform a function that meets the scoping requirements of 10 CFR 54.4 that the applicant does not include within the scope of license renewal. The staff selected several systems and structures from Tables 2.2-2 and 2.2-4, such as (but not limited to) the alternate AC (AAC) diesel service air (BSR), boron recovery tank building, and condensate storage tank foundation for further evaluation.

The staff reviewed the North Anna and Surry UFSARs and found no reference to the AAC diesel service air (BSR) systems, indicating that these systems have no functions important to safety. In addition, on October 3, 2001, in a telecommunication that is documented in a letter to the applicant dated October 11, 2001, the staff requested that the applicant describe the function of the North Anna and Surry BSR systems, and why these support systems of the AAC diesel generator systems (the AAC diesel generator systems are within the scope of license renewal) were not included within the scope of license renewal. The applicant explained that the function of the BSR system is to provide pressurized service air for pneumatic maintenance equipment and it is not used in the operation of the AAC diesel during a station blackout or any of the functions that are the bases for identifying an SCC as being within the scope of license renewal in accordance with 10 CFR 54.4(a). The staff found other AAC diesel generator support systems such as AAC diesel starting air, fuel oil, lube oil, and cooling water

systems that do affect the operability of the AAC diesel generators that were included within the scope of license renewal consistent with the requirements of 10 CFR 54.4(a). On the basis of the information provided above, the staff found the applicant's exclusion of the North Anna and Surry BSR systems from the scope of license renewal to be acceptable.

In addition to this sample review, the staff did an independent and more thorough review to verify that the boron recovery tank (refer to Section 2.3.3.25 of the SER) and condensate storage tank (refer to Sections 2.3.4.3 and 2.3.4.4 of the SER) do not perform any of the functions that are the bases for identifying an SCC as being within the scope of license renewal in accordance with 10 CFR 54.4(a). Because the staff verified that the boron recovery and condensate storage tanks are not within the scope of license renewal the staff did not identify any function for the boron recovery tank building and condensate storage tank foundation that would require including these structures within the scope of license renewal in accordance with 10 CFR 54.4 and, therefore, finds the applicant's decision not to include them within the scope of license renewal to be acceptable.

As part of the scoping review, however, the staff identified a concern with the legends in the license renewal drawings submitted with the North Anna and Surry LRAs. The legend for each drawing explains the highlighted portions of the system and is intended to represent the SCs that are within the scope of license renewal. However, the license renewal drawing legends for both North Anna and Surry contain a statement that the highlighted portions of the systems represent the "components subject to aging management review." The staff reviewed a number of the drawings to verify that the highlighted portions of the drawings represent the passive components that are within the scope of license renewal. In addition, in a conference call with the applicant on September 17, 2001, as documented in a letter to the applicant dated October 11, 2001, the applicant confirmed that the highlighted portions of the drawings represent the passive SCs that are within the scope of license renewal and that some of the highlighted SCs may be screened out if they are replaced based on qualified life or specified time period. Active components within the evaluation boundaries (indicated by the highlighted portions of the drawings correctly in its review.

In the North Anna and Surry LRAs, Sections 2.3 through 2.5, the applicant identified and lists the SCs that are subject to an AMR in accordance with 54.21(a)(1). The applicant identified the mechanical system components and the structural components that are subject to an AMR in Section 2.3, "Scoping and Screening Results: Mechanical Systems," and Section 2.4, "Scoping and Screening Results: Structures," of each LRA, respectively. The staff documents the findings from its review and evaluation of the applicant's mechanical systems and plant structural components screening results in Sections 2.3 and 2.4 of this SER, respectively.

The applicant categorizes the equipment and structural supports that are within the scope of license renewal as bulk commodities, and presents the scoping and screening results for these bulk commodities in Sections 2.4.9, "NSSS Equipment Supports," and 2.4.10, "General Structural Supports," of each LRA. The staff documents the findings from its review and evaluation of the applicant's structure support scoping and screening results in Sections 2.4.9 and 2.4.10 of this SER. In addition, the applicant categorizes electrical, and instrumentation and control (EIC) components that support the operation of the systems presented throughout Sections 2.3 of the LRAs into commodity groups and presents the screening results for these commodities in Section 2.5, "Screening Results: Electrical and Instrumentation and Control

Systems," of each LRA. The staff documents the findings from its review and evaluation of the applicant's EIC component groupings in Section 2.5 of this SER.

2.2.3 Conclusion

On the basis of the review described above, the staff finds that there is reasonable assurance that the applicant has identified the SSCs for NAS 1/2 and SPS 1/2 that are within the scope of license renewal in accordance with 10 CFR 54.4.

2.3 Scoping and Screening Results: Mechanical Systems

In both the North Anna and Surry LRAs, Section 2.3, "Scoping and Screening Results: Mechanical Systems," the applicant documents its scoping and screening results for the mechanical components for NAS 1/2 and SPS 1/2 for the purpose of license renewal. This review was performed for the mechanical systems of the reactor coolant systems, the engineered safety feature systems, the auxiliary systems, and the steam and power conversion systems. The following is the staff's evaluation of the information provided in each LRA Section 2.3, the license renewal drawings provided with each LRA, information contained in the North Anna and Surry UFSARs, and the applicant's response to the staff's request for additional information.

2.3.1 Reactor Coolant System

In both the North Anna and Surry LRAs, Section 2.3.1, "Reactor Coolant System," the applicant describes the components of the reactor cooling system (RCS) that are within the scope of license renewal and subject to an AMR. The following staff evaluation applies to the RCSs of all four units (NAS 1/2 and SPS 1/2) for the purpose of license renewal. Any differences in any of the four RCSs or unique information that applies to a specific unit or site will be clearly identified as to which unit or site the information applies. Other than what is specifically stated, the following evaluation is applicable to the RCSs for NAS 1/2 and SPS 1/2.

2.3.1.1 Reactor Coolant

In the North Anna and Surry LRAs, Section 2.3.1.1, "Reactor Coolant," the applicant describes the piping and components of the RCSs that are within the scope of license renewal and subject to an AMR for NAS 1/2 and SPS 1/2. The RCSs are similar for both facilities with some minor differences in system design. Any notable differences are specifically identified and discussed in the staff's evaluation. Unless otherwise specified, the information provided below is applicable to the NAS 1/2 and SPS 1/2 RCSs. The RCS structural components that are subject to AMR are presented separately by the applicant in Section 2.4.9 of each LRA, "NSSS Equipment Supports," as commodity groups and, therefore, are evaluated separately by the staff in Section 2.4.9 of this SER. The reactor coolant (RC) piping and mechanical components are further described in Chapter 5 of the North Anna UFSAR and Chapter 4 of the Surry UFSAR.

2.3.1.1.1 Technical Information in the Application

The RCS piping and components for NAS 1/2 and SPS 1/2 are used to transfer the heat produced in the reactor cores to the steam generators, where steam is generated to drive the

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turbine generator. The RC circulates through each reactor core at a flow rate and temperature consistent with achieving the desired reactor core thermal-hydraulic performance. The reactor coolant for each of the four units also serves as a neutron moderator, a reflector, and a solvent for the neutron absorber.

The NAS 1/2 and SPS 1/2 RC piping and components within the scope of this review are similar and contain the following features. The RC piping and components provide a pressure boundary for containing the reactor coolant to limit the uncontrolled release of radiation to its secondary system and other parts of the plant.

For each unit, the RC piping and components consist of a reactor vessel and three loops (A, B, and C) that interconnect at the reactor vessel. Each loop consists of one reactor coolant pump, one steam generator, valves, and interconnecting piping. Each RCS also has a pressurizer that is connected to the Loop C hot-leg, and provides a means for controlling RCS pressure. The following major RC components are presented separately in each LRA and will be evaluated separately by the staff in the following sections of this SER:

•	Reactor Vessel	•		SER, Section 2.3.1.2
•	Reactor Vessel Internals		r	SER, Section 2.3.1.3
•	Pressurizer		-	SER, Section 2.3.1.4
•	Steam Generator			SER, Section 2.3.1.5

The remaining RC piping and components included within the scope of license renewal and subject to an AMR include the piping and valves of the three-loops for each of the four units, the RC piping and components that allow venting of the reactor vessel and pressurizer, and the RC piping and components that connect the RCS to the safety injection system. The safety injection systems deliver cooling water to the RCSs to provide for emergency cooling of the reactor core and reactor shutdown during a loss-of-coolant accident (LOCA).

The RC piping and components include a neutron shield tank for each unit that is located inside the primary shield wall around the reactor vessel. These tanks provide support for the reactor vessel and limit the heat transferred to the primary shield wall concrete. The neutron shield tanks are described further in Section 2.4.9 of the LRA, "NSSS Equipment Supports." Cooling for the tank is described in Section 2.3.3.9 of the LRA, "Neutron Shield Tank Cooling." The neutron shield tanks and neutron shield tank cooling (NS) system are further evaluated in Section 2.4.9 and Section 2.3.3.11 of this SER, respectively.

For NAS 1/2, the reactor coolant pump (RCP) motor oil collection systems are considered part of the RCSs and are included within the scope of this staff evaluation. Although these components are also included within the scope of license renewal and subject to an AMR for SPS 1/2, they are considered to be part of the fire protection (FP) system for Surry, and the parts of these systems that are within the scope of license renewal and the SCs that are subject to an AMR are evaluated by the staff with the FP system in Section 2.3.3.37 of this SER. The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of each LRA. As described in the scoping methodology, the applicant identified the RC piping and components (the portions of the RCSs) that are within the scope of license renewal on the license renewal drawings listed in Section 2.3.1.1 of each LRA. Consistent with the method described in each LRA, Section 2.1.5, "Screening Methodology," the applicant listed the RC mechanical component commodity groups that are within the license renewal evaluation boundaries and that are subject to an AMR in Table 2.3.1-1 of each LRA. The tables also list the intended functions and the LRA section containing the AMR for each commodity group.

The RC piping and components that are subject to AMR include the following component commodity groups: bellows (reactor vessel level instrumentation system), bolting, flow elements, flexible connections/hoses, bottom-mounted instrumentation flux thimble tubes, instrument valve assemblies, neutron shield tanks, piping, pump casings, RCP motor lower bearing oil coolers, RCP motor stator coolers, RCP motor upper bearing oil coolers, reactor cavity seals, restricting orifices, thermowells, tubing, and valve bodies. The applicant identified maintaining pressure boundary integrity, flow restriction, and structural and/or functional support as the intended functions for the RC piping and components that are subject to an AMR for the NAS and SPS.

2.3.1.1.2 Staff Evaluation

The staff reviewed the North Anna and Surry LRAs, Section 2.3.1.1, to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the RCSs that are within the scope of license renewal in accordance with 10 CFR 54.4(a), and that the applicant appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in Section 2.3.1.1 of each LRA, the applicable license renewal drawings, and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the portions of the RCSs that are within the scope of license renewal. The staff verified that those portions of the RCSs that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Section 2.3.1.1 of each LRA. To verify that the applicant did include the applicable portions of the NAS 1/2 and SPS 1/2 RCSs as being within the scope of license renewal, the staff focused its review on those portions of the RCS that were not identified as being within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the North Anna and Surry UFSARs to identify any additional system functions that were not identified in each LRA and verified that these additional functions did not meet the scoping requirements of 10 CFR Part 54.4. The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the RC piping and components that are subject to AMR from among those portions of the RCSs that were identified as being within the scope of license renewal. The applicant used the screening methodology described in Section 2.1 of each LRA to identify and list the SCs subject to AMR. The staff evaluation of the scoping and screening methodology is documented in Section 2.1 of this SER.

In the NAS LRA, the applicant identified the portions of the RCSs that are within the scope of license renewal on the license renewal drawing listed on page 2-37, and lists the mechanical component commodity groups that are subject to AMR in Table 2.3.1-1 of the LRA. This table provides the intended functions and a reference to the AMR results section for each component group.

In the SPS LRA, the applicant identified the portions of the RCSs that are within the scope of license renewal on the license renewal drawing listed on page 2-36, and lists the mechanical component commodity groups that are subject to AMR in Table 2.3.1-1 of the LRA. The table provides the intended functions and a reference to the AMR results section for each component group.

The license renewal drawings were highlighted by the applicant to identify those portions of the RCSs that meet at least one of the scoping requirements of 10 CFR 54.4. The staff compared the LRA drawings to the system drawings and the descriptions in the UFSAR to ensure they were representative of the RCSs. The staff performed its review by sampling the SCs that the applicant determined as being within the scope of license renewal but not subject to AMR to verify that no RC pipe or component that performs its intended function without moving parts or without a change in configuration or properties or is not subject to replacement based on qualified life or specified time period was excluded from an AMR. The staff did not identify any omissions.

2.3.1.1.3 Conclusion

On the basis of the staff's review of the information presented in Section 2.3.1.1 of each LRA, the supporting information in the North Anna and Surry UFSARs, and LRA drawings, as described above, the staff did not identify any omissions in the scoping and screening of the NAS 1/2 and SPS 1/2 RC piping and components by the applicant. Therefore, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the North Anna and Surry RCSs that are within the scope of license renewal and the RC piping and components that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.1.2 Reactor Vessel

In the North Anna and Surry LRAs, Section 2.3.1.2, "Reactor Vessel," the applicant describes the reactor vessels (RV) and RV subcomponents that are within the scope of license renewal and subject to an AMR for NAS 1/2 and SPS 1/2. The RVs are similar for both facilities with some minor differences in vessel design. Any notable differences are specifically identified and discussed in the staff's evaluation. Unless otherwise specified, the information provided below is applicable to the NAS 1/2 and SPS 1/2 RVs. The RV structural components that are subject to AMR are evaluated separately in Section 2.4.9 of each LRA, "NSSS Equipment Supports," as commodity groups and, therefore, are evaluated separately by the staff in Section 2.4.9 of this SER. The RVs and RV subcomponents are further described in Chapter 5 of the North Anna UFSAR and Chapter 4 of the Surry UFSAR.

2.3.1.2.1 Technical Information in the Application

The RVs for NAS 1/2 and SPS 1/2 are categorized as standard Westinghouse 157-inch innerdiameter three-loop RVs. Each RV is a cylindrical shell with a welded, hemispherical lower head and a flanged hemispherical upper head. Each RV provides structural support for its reactor core and serves as a pressure boundary to contain the RC and prevent the uncontrolled release of radioactive material. For NAS 1/2, the reactor vessel shell is constructed of forged rings (upper, intermediate, and lower) welded together circumferentially. At SPS 1/2, the reactor vessel shell is constructed of plate segments welded together both circumferentially and longitudinally.

All four RVs are vertically mounted on welded support pads attached to the bottom of the primary nozzles, which are spaced circumferentially around the vessel just below the vessel flange. For each RV, the three reactor coolant loop hot and cold legs are welded to the primary nozzles. The internal surfaces of the RVs are clad with a stainless steel overlay, which provides corrosion resistance for the surfaces of the RVs that are in contact with borated reactor coolant. The RV lower heads have penetrations (instrumentation tubes), for movable in-core nuclear flux thimble tubes, which extend into the reactor vessel interiors and mate with the lower internal assemblies. The core support ledge, located inside each of the four RVs just below the vessel flanges, supports the weight of the RV internals and the fuel. The lower internal assemblies hang from the core support ledges and are supported laterally by core support lugs.

Each of the four RVs has a vessel flange that mates with its closure head flange. The flanges are bolted together by 58 6-inch closure studs, nuts, and spherical washers. Each RV has two concentric, hollow, metallic O-rings between the vessel flange and closure head flange that form an inner and outer seal. This dual O-ring arrangement forms a dynamic seal when the closure head is bolted in place and internal pressure is applied. Each of the RV closure head domes are penetrated by the CRDM housing tubes and a vent pipe.

Nozzle support pads located below each of the primary nozzles provide a point of interface, and support for each of the RVs. The weight of the RVs is transmitted through the nozzle support pads to the neutron shield tank that surrounds each vessel.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of each LRA. As described in the scoping methodology, the applicant identified the RVs as being within the scope of license renewal. Consistent with the method described in the LRA, Section 2.1.5, "Screening Methodology," the applicant listed the RV subcomponents that are subject to an AMR in Table 2.3.1-2 of each LRA. The tables also list the intended functions, and the LRA sections containing the AMR for each subcomponent.

The RV subcomponents that are subject to AMR include the following items: bottom-mounted instrumentation flux thimble tubes, bottom-mounted instrumentation guide tubes, bottom head domes and torus (and cladding), closure head domes and flange (and cladding), closure studs, nuts and washers, core support lugs, CRDM housing flanges, CRDM housing tubes, CRDM latch housings, CRDM rod travel housings, seal table fittings, instrumentation port assemblies, instrumentation tubes, instrumentation tube safe ends, lifting lugs, primary nozzles and support pads (and cladding), primary nozzle safe end, refueling seal ledge, seal table, vent pipe, ventilation shroud support ring, vessel flange and core support ledge and cladding, and vessel shell (upper, intermediate and lower) and cladding. The applicant identified maintaining pressure boundary integrity and structural and/or functional support as the intended functions for the RV subcomponents that are subject to an AMR for the NAS and SPS.

2.3.1.2.2 Staff Evaluation

The staff reviewed the North Anna and Surry LRAs, Section 2.3.1.2, to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the RVs that are within the scope of license renewal in accordance with 10 CFR 54.4(a), and that the applicant appropriately identified the NAS 1/2 and SPS 1/2 RVs subcomponents that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in Section 2.3.1.2 of each LRA, the applicable license renewal drawings, and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the portions of the RVs that are within the scope of license renewal. The staff verified that those portions of the NAS 1/2 and SPS 1/2 RVs that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Section 2.3.1.2 of each LRA. To verify that the applicant did include the applicable portions of the RVs within the scope of license renewal, the staff focused its review on those portions of the RVs that were not identified as being within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the UFSARs for each facility to identify any additional system functions that were not identified in each LRA and verified that these additional functions did not meet the scoping requirements of 10 CFR 54.4.

As a result of this review, the staff identified the following potential omissions. The staff confirmed that the two concentric, hollow, metallic O-rings between the closure head flange and the reactor vessel flange form an inner and outer seal. Furthermore, it was stated in the UFSARs that leakage through the reactor vessel head flange will leak between the double O-ring seal to the leakoff path provided. Leakage into this leakoff path will cause high temperature in this line, which will actuate an alarm in the control room. On the basis of the staff's experience with license renewal the staff has generally concluded that the inner O-ring, the leakoff lines, and the outer O-ring all support the reactor vessel closure head flange pressure boundary. Although in select cases the staff has accepted a site-specific technical justification, in general, the leakoff lines are subject to an AMR. Therefore, the staff issued an RAI to the applicant to provide a site-specific technical justification for both NAS and SPS as to why aging management is not required or perform an aging management review for these components.

In a letter to the NRC dated January 4, 2002, the applicant informed the staff that the leakage detection system for NAS 1/2 and SPS 1/2 RVs begins with a 1/4" hole in the RV flanges. This 1/4" hole drains into a 1" tubing a short distance from the RV flanges; however, leakage flow past the inner O-ring is limited to the flow rate allowed by the 1/4" diameter hole in each of the RV flanges. The potential flowrate (through the 1/4" diameter hole) for each of the four RVs is well within the normal makeup capability of the charging system and, therefore, does not meet any of the scoping criteria in 10 CFR 54.4(a). In the same January 4, 2002 letter, the applicant also informed the staff that the license renewal drawings referenced in the applications (11448-LRM-086A, sh. 1, and 11548-LRM-086A, sh. 1, for Surry and 11715-LRM-093A, sh. 1, and 12050-LRM-093A, sh. 1 for North Anna) incorrectly indicate the leak detection components within the scope of license renewal, and the applicant committed to revise the affected license renewal drawings consistent with this justification. In its letter dated July 25, 2002, the applicant stated that the listed drawings have been revised to remove the reactor vessel flange leak

detection system from the scope of license renewal. Since the applicant has completed this action, the staff considers confirmatory action 2.3.1.2-1 closed.

The staff reviewed this information and the affected drawings, and concluded that the components of the leak detection system need not be included within the scope of license renewal because they do not meet the requirements of 10 CFR 54.4(a). The staff did not identify any additional potential omissions.

2.3.1.2.3 Conclusion

On the basis of the staff's review of the information presented in Section 2.3.1.2 of each LRA and the supporting information in the Surry and North Anna UFSARs and LRA drawings, as described above, the staff did not identify any omissions in the scoping of the RV and screening of the RV subcomponents for the NAS 1/2 and SPS 1/2 by the applicant. Therefore, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the NAS 1/2 and SPS 1/2 RVs that are within the scope of license renewal and the RV subcomponents that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.1.3 Reactor Vessel Internals

In the North Anna and Surry LRAs, Section 2.3.1.3, "Reactor Vessel Internals," the applicant describes the internal components of the NAS 1/2 and SPS 1/2 RVs that are within the scope of license renewal and subject to an AMR. The reactor vessel internals (RVI) are similar for both facilities with some minor differences in system design. Any notable differences are specifically identified and discussed in the staff's evaluation. Unless otherwise specified, the information provided below is applicable to the NAS 1/2 and SPS 1/2 RVIs. The RVI components are further described in Section 4.2.2 of the North Anna UFSAR and Section 3.5.1 of the Surry UFSAR.

2.3.1.3.1 Technical Information in the Application

In Section 2.3.1.3 of each LRA, the applicant states that the NAS 1/2 and SPS 1/2 RVI components are designed to direct coolant flow, to support the reactor core, and to guide the control rod assemblies in the withdrawn position. The RVIs consist of two basic assemblies: an upper internals assembly that is removed during each refueling operation to obtain access to the reactor core, and a lower internals assembly, which includes the core barrel and baffle/former assembly and can be removed, if desired, following a complete core unload. In addition, both Surry units' lower internal assemblies have a diffuser plate that is used to enhance flow uniformity entering the lower core plate. The North Anna RVIs do not have diffuser plates.

The unique Westinghouse RV design that allows the removal of the RVIs provides the capability to perform periodic inspections to determine the condition of the internals and to repair if needed. This unique capability provides a more direct means (than other designs) to determine the functionality of the RVIs during the extended period of operation.

The lower internal assembly is installed and supported in the RV by clamping the assembly to a ledge below the vessel-head mating surface, which is closely guided into place at the bottom by

radial support/clevis assemblies. This core support ledge supports the entire weight of the reactor vessel internals and the fuel. The lower internal assembly hangs from the ledge.

The upper internal assembly sits on a circumferential spring that rests on top of the lower internal flange, which also rests on the core support ledge. The bottom of the upper internals assembly is closely guided into place by the core plate alignment pins. The spring is compressed when the vessel head is lowered and tightened down, holding the lower internal assembly against the core support ledge and the upper internal assembly against the vessel head. This minimizes flow-induced vibrations and prevents upward motion of the lower internal assembly.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of each LRA. As described in the scoping methodology, the applicant identified the internal portions of the RVs that are within the scope of license renewal on the license renewal drawings listed in Section 2.3.1.3 of each LRA. Consistent with the method described in the LRA, Section 2.1.5, "Screening Methodology," the applicant listed the RVI subcomponents that are within the license renewal evaluation boundaries and that are subject to an AMR in Table 2.3.1-3 of each LRA. The tables also list the intended functions and the LRA section containing the AMR for each commodity group.

The NAS 1/2 and SPS 1/2 RVIs that are subject to AMR include the following subcomponents: baffle and former assembly, bolting (baffle/former and barrel/former), control rod guide tube split pins, control rod guide tubes, core barrel, core barrel holddown spring, diffuser plate (SPS 1/2 only), head and vessel alignment pins, head cooling spray nozzles, instrument guide tubes, lower core plate, lower support plate and columns, radial support clevis inserts, radial support keys, secondary support assembly, thermal shield, upper core plate, upper core plate alignment pins, upper instrument columns, upper support column, and upper support plate. The applicant identified providing for flow distribution and structural and/or functional support as the intended functions for the RVIs that are subject to an AMR for the NAS and SPS.

2.3.1.3.2 Staff Evaluation

The staff reviewed the North Anna and Surry LRAs, Section 2.3.1.3, to determine whether there is reasonable assurance that the applicant appropriately identified the internal portions of the NAS 1/2 and SPS 1/2 RVs that are within the scope of license renewal in accordance with 10 CFR 54.4(a), and that the applicant appropriately identified the RVI subcomponents that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in Section 2.3.1.3 of each LRA and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the internal portions of the RVs that are within the scope of license renewal. The staff verified that the NAS 1/2 and SPS 1/2 RVIs that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Section 2.3.1.3 of each LRA. To verify that the applicant did include the appropriate RVIs within the scope of license renewal, the staff focused its review on those RVIs that were not identified within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the UFSARs for each facility to identify any additional system

functions that were not identified in each LRA and verified that these additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the RVI subcomponents that were subject to AMR from among those internal portions of the RVs that were identified as being within the scope of license renewal. The applicant used the screening methodology described in Section 2.1 of each LRA to identify and list the RVIs subject to AMR. The staff's evaluation of the scoping and screening methodology is documented in Section 2.1 of this SER.

In the NAS LRA, the applicant refers to the NAS UFSAR, Figures 4.2-13, 14, and 15, for details on the North Anna RVIs, and lists the RVI subcomponents that are subject to AMR in Table 2.3.1-3 of the LRA. The table provides the intended functions and a reference to the AMR results section for each component group.

In the SPS LRA, the applicant refers to the SPS UFSAR, Figures 3.5-2, 6, and 7, for details on the Surry RVIs, and lists the RVI subcomponents that are subject to AMR in Table 2.3.1-3 of the LRA. The table provides the intended functions and a reference to the AMR results section for each component group.

The staff compared the description of the NAS 1/2 and SPS 1/2 RVIs provided in the North Anna and Surry LRAs and UFSARs. The staff continued its review by sampling the RVI subcomponents that the applicant identified as being within the scope of license renewal but not subject to AMR to verify that no subcomponent that performs its intended function without moving parts or without a change in configuration or properties, or is not subject to replacement based on qualified life or specified time period was excluded from an AMR. The staff did not identify any omissions.

2.3.1.3.3 Conclusion

On the basis of the staff's review of the information presented in Section 2.3.1.3 of each LRA and the supporting information in the North Anna and Surry UFSARs, as described above, the staff did not identify any omissions in the scoping and screening of the NAS 1/2 and SPS 1/2 RVIs by the applicant. Therefore, the staff concludes that there is reasonable assurance that the applicant has identified those internal portions of the NAS 1/2 and SPS 1/2 RVs that are within the scope of license renewal and the RVI subcomponents that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.1.4 Pressurizers

In the North Anna and Surry LRAs, Section 2.3.1.4, "Pressurizer," the applicant describes the NAS 1/2 and SPS 1/2 pressurizer and pressurizer subcomponents that are within the scope of license renewal and subject to an AMR. The pressurizers are identical for both facilities with no notable differences for the purpose of license renewal. Therefore, the information provided below is applicable to the NAS 1/2 and SPS 1/2 pressurizers. The pressurizer structural components that are subject to AMR are evaluated separately in Section 2.4.9 of each LRA, "NSSS Equipment Supports," as commodity groups and, therefore, are evaluated separately by the staff in Section 2.4.9 of this SER. The pressurizer and pressurizer subcomponents are further described in Section 5.5.5 of the North Anna UFSAR and Section 4.2.2.2 of the Surry UFSAR.

2.3.1.4.1 Technical Information in the Application

The pressurizers for NAS 1/2 and SPS 1/2 are ASME Section III Code vessels that are connected to each of the RCSs through a surge line welded to the C loop hot-leg piping and a spray line welded to the cold leg piping. The spray line and surge line nozzles are provided with thermal sleeves which provide thermal shielding. The internal surfaces of the pressurizer that are in contact with borated reactor coolant are clad with a stainless steel overlay for corrosion resistance. Access to the inside of the pressurizers is provided by a manway opening near the top of each of the pressurizers.

During normal operation, a pressurized water reactor pressurizer contains a combination of borated reactor coolant and steam that is maintained in the desired temperature and pressure range by electric heaters and the pressurizer spray system to provide pressure control for the RCS. The chemical and volume control system maintains the desired water level in the pressurizer during steady-state operation.

Pressurizers are designed to accommodate in-surges and out-surges caused by load transients. During an in-surge, the spray system is used to condense steam in the pressurizer to maintain pressurizer and overall RCS pressure within nominal limits, and to prevent the pressurizer pressure from reaching the operating point of the power-operated relief valve. A continuous spray flow is also provided to maintain reactor coolant chemistry and boron concentration in the pressurizer and associated piping consistent with the reactor coolant system. Additionally, the continuous spray flow prevents thermal stratification of the spray and surge line piping. During an out-surge, the pressure drops, causing water to flash to steam and automatic initiation of heaters to generate more steam to keep pressurizer pressure above the minimum allowable limit.

The applicant describes its process for identifying the systems and structures that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of North Anna and Surry LRAs. As described in the scoping methodology, the applicant identified the pressurizers within the scope of license renewal. Consistent with the method described in each LRA Section 2.1.5, "Screening Methodology," the applicant listed the NAS 1/2 and SPS 1/2 pressurizer subcomponents that are subject to an AMR in Table 2.3.1-4 of each LRA. The tables also list the intended functions, and each LRA sections containing the AMR for each subcomponent.

The NAS 1/2 and SPS 1/2 pressurizer subcomponents that are subject to AMR include the following items: heater well and heater sheath, instrument nozzles, lower head (and cladding), manway (including pad and cladding), manway cover bolts, manway cover with insert, relief nozzle (and cladding), relief nozzle safe end, safety nozzle (and cladding), safety nozzle safe end, sample line nozzle, seismic support lugs, shell (and cladding), spray nozzle (and cladding), spray nozzle (and cladding), spray nozzle safe end, surge nozzle thermal sleeve, support skirt and flange, surge nozzle (and cladding), the applicant identified maintaining pressure boundary integrity as the intended function for the pressurizer subcomponents that are subject to an AMR for the NAS and SPS. In addition, certain pressurizer subcomponents. The pressurizer structural support to maintain the integrity of pressure boundary components. The pressurizer structural support components that are subject to AMR are evaluated separately in Section 2.4.9 of each LRA, "NSSS Equipment Supports," as commodity groups and, therefore, are evaluated separately by the staff in Section 2.4.9 of this SER.
2.3.1.4.2 Staff Evaluation

The staff reviewed the North Anna and Surry LRAs, Section 2.3.1.4, to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the NAS 1/2 and SPS 1/2 pressurizers that are within the scope of license renewal in accordance with 10 CFR 54.4(a), and that the applicant appropriately identified the pressurizer subcomponents that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in Section 2.3.1.4 of each LRA and the North Anna and Surry UFSARs to determine whether the applicant adequately identified portions of the pressurizers that are within the scope of license renewal. The staff verified that those portions of the NAS 1/2 and SPS 1/2 pressurizers that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Section 2.3.1.4 of each LRA. To verify that the applicant did include the applicable portions of the pressurizers within the scope of license renewal, the staff focused its review on those portions that were not identified within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the UFSARs for each facility to identify any additional system functions that were not identified in each LRA and verified that these additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the NAS 1/2 and SPS 1/2 pressurizer subcomponents that are subject to AMR from among those portions of the pressurizers that were identified as being within the scope of license renewal for North Anna and Surry. The applicant used the screening methodology described in Section 2.1 of each LRA to identify and list the pressurizer subcomponents that are subject to AMR for each of the four units. The staff evaluation of the scoping and screening methodology is documented in Section 2.1 of this SER.

In the North Anna LRA, the applicant refers to the NAS UFSAR, Figure 5.5-5, for details on the North Anna pressurizers, and lists the pressurizer subcomponents that are subject to AMR in Section 2.3.1.4 of the LRA. The table provides the intended functions and a reference to the AMR results section for each component group.

In the Surry LRA, the applicant refers to the SPS UFSAR, Figure 4.2-3, for details of the Surry pressurizers, and lists the pressurizer subcomponents that are subject to AMR in Table 2.3.1-4 of the LRA. The table provides the intended functions and a reference to the AMR results section for each component group.

The staff compared the description of the NAS 1/2 and SPS 1/2 pressurizers provided in the North Anna and Surry LRAs and UFSARs. The staff continued its review by sampling the pressurizer subcomponents that the applicant identified as being within the scope of license renewal but not subject to AMR to verify that no subcomponent that performs its intended function without moving parts or without a change in configuration or properties, or is not subject to replacement based on qualified life or specified time period was excluded from an AMR. The staff did not identify any omissions.

2.3.1.4.3 Conclusions

On the basis of the staff's review of the information presented in Section 2.3.1.4 of each LRA and the supporting information in the North Anna and Surry UFSARs, as described above, the staff did not identify any omissions in the scoping and screening of the NAS 1/2 and SPS 1/2 pressurizers by the applicant. Therefore, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the NAS 1/2 and SPS 1/2 pressurizers that are within the scope of license renewal and the pressurizer subcomponents that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.1.5 Steam Generator

In the North Anna and Surry LRAs, Section 2.3.1.5, "Steam Generator," the applicant describes the NAS 1/2 and SPS 1/2 steam generators (SG) and SG subcomponents that are within the scope of license renewal and subject to an AMR. The SGs are identical for both facilities with no notable differences in design for the purpose of license renewal. Therefore, the information provided below is applicable to the NAS 1/2 and SPS 1/2 SGs. The SG structural components that are subject to AMR are evaluated separately in Section 2.4.9 of each LRA, "NSSS Equipment Supports," as commodity groups and, therefore, are evaluated separately by the staff in Section 2.4.9 of this SER. The SGs and SG subcomponents are further described in Sections 5.5.2.1 and 10.3.2 of the North Anna UFSAR and Sections 4.2.2.3 and 10.3.1.2 of the Surry UFSAR.

2.3.1.5.1 Technical Information in the Application

The NAS 1/2 and SPS 1/2 each contain three SGs, one SG is installed in each of the three reactor coolant loops on each of the four units. The SGs are vertical, shell and U-tube heat exchangers with integral moisture-separating equipment. The SGs are used to transfer heat from the single-phase, high-pressure, high-temperature borated reactor coolant on the primary side of the tubes to the two-phase steam-water mixture on the secondary side of the tubes. The internal surfaces of the SG in contact with borated reactor coolant are clad with nickel-based alloys, stainless steel weld overlay, which provides corrosion resistance. The tubesheets are clad with Inconel.

The original recirculating SGs have experienced significant tube degradation and have undergone an extensive repair program. The SG repair program consisted of replacement of the lower assembly (including the channel head, U-tubes, tubesheet, and lower shell section) and refurbishment of the upper assembly.

Each SG is a recirculating design and consists of a primary (tube) side and a secondary (shell) side. Reactor coolant flows through the primary side through inverted U-tubes, entering and leaving through the primary nozzles located in the hemispherical bottom chambers (channel head). The channel heads are welded to plates (tubesheets) from which the tube bundles extend. The channel heads are divided into inlet and outlet chambers by vertical divider plates extending from the channel heads to the tubesheets. Manways are provided for access to both sides of the divided channel head of each SG. Pressure boundary integrity is maintained by manway covers that are bolted to the manways.

On the secondary side of each SG, tube support plates, stay rods, stay rod spacer pipes, and antivibration bars are provided for structural support of the U-tubes. The tube support plates closest to the tubesheets are identified as flow distribution baffles.

Each SG tube bundle is contained inside a cylindrical wrapper. The space between the wrapper and the inside of the SG shell forms an annular region called the downcomer. Feedwater enters the SGs through the feedwater inlet nozzle located in the upper shell and is distributed around the periphery of the SG by an internal feedwater distribution ring (feedring). Feedwater exits from the top of each of the feedring through J-nozzles, where it mixes with recirculated water from the moisture separators and flows down the downcomers. The mixture of subcooled feedwater and saturated recirculated water exits from the downcomers' annular regions at the tube sheet, where it flows under the wrappers and is distributed across the tube sheets. The mixture is heated to boiling by RC heat that transfers through the U-tubes. The saturated steam/water mixture enters the moisture separator section of each SG, where liquid is removed from the mixture and returned to the evaporator section of each SG. Essentially dry steam exiting the moisture separator section of each SG passes through steam outlet nozzles that are fitted with a flow-limiting device designed to limit steam flow in the event of a main steam pipe rupture. Secondary side penetrations (handholes, access ports, blowdown nozzles, instrument taps, and manways) are provided for instrumentation and for maintenance and inspection activities. In addition, a nozzle in the upper shell of each SG facilitates the maintenance of wet layup chemistry conditions in the SG during shutdown periods via the SG recirculation and transfer system.

In each LRA Table 2.3.1-5, the applicant identified the following NAS 1/2 and SPS 1/2 SG subcomponents that are subject to AMR: antivibration bars, channel head (and cladding), channel head divider plate, feedwater inlet nozzle, primary inlet and outlet nozzles (and cladding), primary inlet and outlet nozzle safe ends, primary manway (including pad and cladding), primary manway cover bolting, primary manway cover and insert, secondary manway (including pad), secondary closure cover bolting, secondary closure covers, secondary side shell penetrations, secondary side shell (head, upper shell, lower shell, transition cone, girth weld, stay rod, steam flow limiter, steam outlet nozzle, support pads, tube bundle wrapper, tube plugs, tube support plates, tubesheet (and cladding), and U-tubes. The applicant also identifies maintaining pressure boundary integrity, structural and/or functional support, and flow distribution as the intended functions for the SG subcomponents that are subject to an AMR. In addition, certain SG structural supports that provide overall support for the SGs that are subject to AMR are evaluated separately in Section 2.4.9 of each LRA, "NSSS Equipment Supports," as commodity groups and, therefore, are evaluated separately by the staff in Section 2.4.9 of this SER.

2.3.1.5.2 Staff Evaluation

The staff reviewed North Anna and Surry LRAs, Section 2.3.1. 5, to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the NAS 1/2 and SPS 1/2 SGs that are within the scope of license renewal in accordance with 10 CFR 54.4(a), and that the applicant appropriately identified the SG subcomponents that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in each LRA and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the portions of the SGs that

are within the scope of license renewal. The staff verified that those portions of the NAS 1/2 and SPS 1/2 SGs that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal, and were identified as such by the applicant in Section 2.3.1.5 of each LRA. To verify that the applicant did include the appropriate portions of the SGs within the scope of license renewal, the staff focused its review on those portions that were not identified within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the North Anna and Surry UFSARs to identify any additional system functions that were not identified in each LRA and to verify that these additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the NAS 1/2 and SPS 1/2 SG subcomponents that are subject to AMR from among those portions of the SGs that were identified as being within the scope of license renewal. The applicant used the screening methodology described in Section 2.1 of each LRA to identify and list the SG subcomponents that are subject to AMR. The staff evaluation of the scoping and screening methodology is documented in Section 2.1 of this SER.

In the NAS LRA, the applicant refers to the NAS UFSAR, Figure 5.5-3, for details on the North Anna SGs, and lists the SG subcomponents that are subject to AMR in Table 2.3.1-5 of the LRA. The table also provides the intended functions and a reference to the AMR results section for each component group.

In the SPS LRA, the applicant refers to the SPS UFSAR, Figures 10.3-2 and 10.3-3, for details of the Surry SGs, and lists the SG subcomponents that are subject to AMR in Table 2.3.1-5 of the LRA. The table also provides the intended functions and a reference to the AMR results section for each component group.

The staff compared the UFSAR figures with the description of the SGs provided in each LRA and UFSARs. The staff continued its review by sampling the NAS 1/2 and SPS 1/2 SG subcomponents that the applicant identified as being within the scope of license renewal but not subject to AMR to verify that no subcomponent that performs its intended function without moving parts or without a change in configuration or properties, or is not subject to replacement based on qualified life or specified time period was excluded from an AMR. The staff did not identify any omissions.

2.3.1.5.3 Conclusions

On the basis of the staff's review of the information presented in Section 2.3.1.5 of each LRA and the supporting information in the North Anna and Surry UFSARs, as described above, the staff did not identify any omissions in the scoping and screening of the NAS 1/2 and SPS 1/2 SGs by the applicant. Therefore, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the NAS 1/2 and SPS 1/2 SGs that are within the scope of license renewal and the SG subcomponents that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.2 Engineered Safety Features Systems

In both the North Anna and Surry LRAs, Section 2.3.2, "Engineered Safety Features Systems," the applicant describes the SSCs of the engineered safety features (ESF) systems that are within the scope of license renewal and subject to an AMR. The following staff evaluation applies to the ESF systems of all four units (NAS 1/2 and SPS 1/2) for the purpose of license renewal. Any differences in any of the SSCs that make up the ESF systems for each of the four units or unique information that applies to a specific unit or site will be clearly identified as to which unit or site the information applies. Other than what is specifically stated, the following evaluation is applicable to the ESF systems for NAS 1/2 and SPS 1/2.

2.3.2.1 North Anna Quench Spray/Surry Containment Spray

The Quench Spray system (QS) at NAS and the Containment Spray system (CS) at SPS are functionally equivalent. In Sections 2.3.2.1 of the NAS LRA, "Quench Spray," and the SPS LRA, "Containment Spray," the applicant describes the components of the NAS quench spray and SPS containment spray (QS/CS) system that is within the scope of license renewal and subject to an AMR. This system is further described in Section 6 of the North Anna and Surry UFSARs.

2.3.2.1.1 Technical Information in the Application

The QS/CS systems are designed to pump cool and borated water from the refueling water storage tank (RWST), mixed with a sodium hydroxide solution from the chemical addition tank (CAT), through spray ring headers and nozzles into the containment. The spray solution absorbs heat from the containment atmosphere to reduce pressure and prevent challenging the structural integrity of the containment. In addition, the spray reduces the airborne iodine concentration in the post-LOCA containment atmosphere to maintain accident-dose within limits. The RWST also provides the source of water to the safety injection (SI) system (Section 2.3.2.5) for the injection phase of design basis accident mitigation.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of the LRA. As described in the scoping methodology, the applicant identified the portions of the QS/CS system that are within the scope of license renewal on the piping and instrument drawings listed in Section 2.3.2.1 of each LRA. Consistent with the method described in the LRA, Section 2.1.5, "Screening Methodology," the applicant listed the QS/CS system mechanical component commodity groups that are within the license renewal evaluation boundaries and are subject to an AMR in Table 2.3.2-1 of each LRA. The tables also list the intended functions and the LRA section containing the AMR for each commodity group.

The portion of the QS/CS system that is subject to aging management review includes the major flowpaths of the system. In each LRA, Table 2.3.2-1, the applicant listed the following twelve component commodity groups as subject to an AMR: boltings, filters/strainers, flow elements, instrument valve assemblies, nozzles, pipes, pump casings, restricting orifices, tanks, thermowells, tubings, and valve bodies. The applicant states that the intended functions for the SCs that are subject to an AMR are maintaining the pressure boundary integrity, providing filtration, restricting flow, and providing spray pattern.

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The staff reviewed Section 2.3.2.1 of each LRA to determine whether there is reasonable assurance that the applicant appropriately identified portions of the QS/CS system that are within the scope of license renewal in accordance with 10 CFR 54.4 and that the applicant appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

In addition to the information provided in Section 2.3.2.1 of each LRA, the staff reviewed the applicable piping and instrument drawings, and the North Anna and Surry UFSARs to determine if the applicant adequately identified the portions of the QS/CS system that are within the scope of license renewal. The staff verified that those portions of the QS/CS system that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal, and were identified as such by the applicant in Section 2.3.2.1 of each LRA. To verify that the applicant did include the applicable portions of the QS/CS system as being within the scope of license renewal, the staff focused its review on those portions of the QS/CS system that were not identified as being within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the UFSARs for each facility to identify any additional system functions that was not identified in each LRA, and verified that these additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the QS/CS systems that were identified as being within the scope of license renewal. The applicant used the screening methodology described in Section 2.1 of each LRA to identify and list the SCs subject to AMR. The staff evaluation of the scoping and screening methodology is documented in Section 2.1 of this SER.

In the NAS LRA, the applicant identified the portions of the QS system that are within the scope of license renewal in the drawings listed below. The applicant also listed the mechanical component commodity groups that are subject to AMR and its intended functions in Table 2.3.2-1 of the LRA.

<u>Unit 1</u>	<u>Unit 2</u>
11715-LRM-091A, Sh. 1	12050-LRM-091A, Sh. 1
11715-LRM-091A, Sh. 2	12050-LRM-091A, Sh. 2
11715-LRM-091A, Sh. 3	12050-LRM-091A, Sh. 3

In the SPS LRA, the applicant identified the portions of the CS system that are within the scope \cdot of license renewal in the drawings listed below. In addition, the applicant listed the mechanical component commodity groups that are subject to AMR and its intended functions in Table 2.3.2-1 of the LRA.

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<u>Unit 2</u>

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11448-LRM-084A, Sn. 1	11548-LAM-084A, SA. 1
11448-LRM-084A, Sh. 2	11548-LRM-084A, Sh. 2
11448-LRM-084A, Sh. 3	11548-LRM-084A, Sh. 3

The piping and instrumentation drawings were highlighted by the applicant to identify those portions of the QS/CS system that perform at least one of the scoping requirements of 10 CFR 54.4. The staff compared the LRA drawings to the system drawings and the descriptions in the UFSAR to ensure they were representative of the QS/CS system. The staff performed its review by sampling the SCs that the applicant determined are within the scope of license renewal, but not subject to AMR, to verify that no structure or component that performs its intended functions without moving parts or without a change in configuration or properties, or are not subject to replacement based on qualified life or specified time period, was excluded from an AMR. The staff did not identify any omissions.

2.3.2.1.3 Conclusions

On the basis of its review of the information contained in Section 2.3.2.1 of each LRA, the supporting information in the UFSARs, and LRA drawings, as described above, the staff did not identify any omissions in the scoping of the QS/CS system by the applicant. The staff concludes that there is reasonable assurance that the applicant has identified those portions of the QS/CS systems that are within the scope of license renewal, and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.2.2 Fuel Pit Cooling

In the North Anna and Surry LRAs, Section 2.3.2.2, "Fuel Pit Cooling," the applicant describes the components of the fuel pit cooling (FC) systems that are within the scope of license renewal and subject to an AMR for both NAS and SPS. The NAS 1/2 and SPS 1/2 each has an FC system. These systems are similar for both facilities with some minor differences in system design. Any notable differences are specifically identified and discussed in the staff's evaluation. Unless otherwise specified, the information provided below is applicable to both the North Anna and Surry FC systems. The FC structural components that are subject to AMR are presented separately by the applicant in Section 2.4.10 of each LRA, "General Structural Supports," as commodity groups and, therefore, are evaluated separately by the staff in Section 2.4.10 of this SER. These systems are further described in Section 9 of the North Anna or Surry UFSARs.

2.3.2.2.1 Technical Information in the Application

At both North Anna and Surry, the FC systems transfer heat from the spent fuel pools to the component cooling (CC) systems. The NAS and SPS FC systems also provide a means for water chemistry control for the spent fuel pools. The FC systems are used to circulate borated water from the spent fuel pools through the FC heat exchangers and back to the pools. The FC systems pump suctions connect to the spent fuel pools at an elevation that would prevent the pools from draining below the limiting water level in the event of a leak in the FC systems. A

bypass purification loop associated with each FC system provides the capability to filter and demineralize the spent fuel pool water.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of each LRA. As described in the scoping methodology, the applicant identified the portions of the FC systems that are within the scope of license renewal on the license renewal drawings listed in Section 2.3.3.2 of each LRA. Consistent with the method described in each LRA, Section 2.1.5, "Screening Methodology," the applicant listed the NAS 1/2 and SPS 1/2 FC system mechanical component commodity groups that are within the license renewal evaluation boundaries and that are subject to an AMR in Table 2.3.2-2 of both LRA. These tables also list the intended functions and the LRA sections that contain the AMR for each commodity group.

The portion of each FC system that is subject to an AMR for NAS and SPS includes the components used to remove heat from the spent fuel pools. In Table 2.3.2-2 of each LRA, the applicant listed the following eight component commodity groups subject to an AMR: bolting, instrument valve assemblies, pipe, pump casings, spent fuel pit coolers, thermowells, tubing, and valve bodies. In addition, the NAS LRA, Table 2.3.2-2, also lists expansion joints, and the SPS LRA, Table 2.3.2-2, also lists strainers as component commodity groups that are subject to an AMR for the applicable facility. The applicant identified maintaining pressure boundary integrity as the only intended function for the SCs that is subject to an AMR for the NAS and SPS FC systems.

2.3.2.2.2 Staff Evaluation

The staff reviewed each LRA Section 2.3.3.2, to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the North Anna and Surry FC systems that are within the scope of license renewal in accordance with 10 CFR 54.4, and that the applicant appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in Section 2.3.3.2 of each LRA, the applicable license renewal drawings, and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the portions of the FC systems that are within the scope of license renewal. The staff verified that those portions of the FC systems that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Section 2.3.3.2 of each LRA. To verify that the applicant did include the applicable portions of the FC systems within the scope of license renewal, the staff focused its review on those portions of the FC system that were not identified within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the UFSARs for each facility to identify any additional system functions that were not identified in each LRA and verified that the additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the FC systems that were identified as being within the scope of license renewal. The applicant used the screening methodology described in Section 2.1 of each LRA to identify and list the SCs subject to AMR. The staff evaluation of the scoping and screening methodology is documented in Section 2.1 of this SER.

In the NAS LRA, the applicant identified the portions of the FC systems that are within the scope of license renewal in Unit 1 drawing 11715-LRM-088A, Sheet 4, the fuel pit cooling and refueling purification system, and lists the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.2-2 of the LRA. The staff also verified that the portions of the NAS FC system that are within the scope of license renewal did not contain any strainers, similar to the SPS FC system.

In the SPS LRA, the applicant identified the portions of the FC systems that are within the scope of license renewal in Unit 1 drawing 11448-LRM-081A, Sh. 1, the fuel pit system, and lists the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.2-2 of the LRA. The staff also verified that the portions of the SPS FC system that are within the scope of license renewal did not contain any expansion joints, similar to the NAS FC system.

The license renewal drawings were highlighted by the applicant to identify those portions of the FC systems that meet at least one of the scoping requirements of 10 CFR 54.4. The staff compared the license renewal drawings to the system drawings and the written descriptions in the North Anna and Surry UFSARs to ensure they were representative of the FC systems. The staff performed its review by sampling the SCs that the applicant identified as being within the scope of license renewal but not subject to AMR to verify that no structure or component that performs its intended function without moving parts or without a change in configuration or properties, or are not subject to replacement based on qualified life or specified time period was excluded from an AMR. The staff did not identify any omissions.

2.3.2.2.3 Conclusions

On the basis of its review of the information contained in Section 2.3.2.2 of each LRA the supporting information in the UFSARs, and the license renewal drawings, as described above, the staff did not identify any omissions in the scoping and screening of the SCs of the North Anna and Surry FC systems by the applicant. Therefore, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the North Anna and Surry FC systems that are within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a), and 10 CFR 54.21(a)(1), respectively.

2.3.2.3 Recirculation Spray

In Section 2.3.2.3, "Recirculation Spray," of each LRA, the applicant describes the components of the recirculation spray (RS) system that are within the scope of license renewal and subject to an AMR. This system is further described in Section 6 of the North Anna and Surry UFSARs.

2.3.2.3.1 Technical Information in the Application

The recirculation spray (RS) system is designed to provide long-term heat removal from the containment atmosphere and to provide core cooling water following a design basis loss-of-coolant accident (LOCA). The RS system transfers heat from the reactor core via coolant spilled from the break and from the containment atmosphere to the service water (SW) system through the RS heat exchangers. The water collected in the containment sump is pumped back into the containment atmosphere through the heat exchangers and spray ring headers and nozzles.

The RS system is designed to return the post-LOCA-containment to subatmospheric pressure, and to maintain subatmospheric conditions for the duration of the accident recovery. Thus, it prevents the outleakage of fission products. The cooled water in the containment sump is pumped back through the reactor core by the safety injection system (Section 2.3.2.5).

In addition, at NAS, casing cooling components of the RS system provide a source of cool, borated water to the suction of the outside containment RS pumps to provide adequate net positive suction head (NPSH).

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of the LRA. As described in the scoping methodology, the applicant identified the portions of the RS systems that are within the scope of license renewal on the piping and instrument drawings listed in Section 2.3.2.3 of each LRA. Consistent with the method described in the LRA, Section 2.1.5, "Screening Methodology," the applicant listed the RS system mechanical component commodity groups that are within the license renewal evaluation boundaries and that are subject to an AMR in Table 2.3.2-3 of each LRA. The tables also list the intended functions, and the LRA section containing the AMR, for each commodity group.

The portion of the RS system that is subject to aging management review includes the major flowpaths of the system. In Table 2.3.2-3 of each LRA, the applicant listed the following fifteen component commodity groups as subject to an AMR: boltings, expansion joints, flow elements, instrument valve assemblies, nozzles, pipe, pump casings, pump seal coolers, recirculation spray coolers, restricting orifices, sump screens, tanks, thermowells, tubings, and valve bodies. In addition, Table 2.3.2-3 of the NAS LRA, also lists filter/strainers as component commodity groups that are subject to an AMR for NAS. The applicant states that the intended functions of the SCs that are subject to an AMR are maintaining pressure boundary integrity, providing filtration, restricting flow, and providing spray patterns.

2.3.2.3.2 Staff Evaluation

The staff reviewed Section 2.3.2.3 of each LRA to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the RS system that are within the scope of license renewal in accordance with 10 CFR 54.4, and that the applicant appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

In addition to the information provided in Section 2.3.2.3 of each LRA, the staff reviewed applicable piping and instrument drawings, and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the portions of the recirculation spray system that are within the scope of license renewal. The staff verified that those portions of the recirculation spray system that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified by the applicant in Section 2.3.2.3 of each LRA. To verify that the applicant did include the applicable portions of the RS system as being within the scope of license renewal, the staff focused its review on those portions of the RS system that were not identified as being within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the UFSARs for each facility to identify any additional system functions that was not identified in

each LRA, and verified that these additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the RS system that were identified as being within the scope of license renewal. The applicant used the screening methodology described in Section 2.1 of each LRA to identify and list the SCs subject to AMR. The staff evaluation of the scoping and screening methodology is documented in Section 2.1 of this SER.

In the NAS LRA, the applicant identified the portions of the RS system that are within the scope of license renewal in the drawings listed below. The applicant also listed the mechanical component commodity groups that are subject to AMR and its intended functions in Table 2.3.2-3 of the LRA.

<u>0111 2</u>
12050-LRM-091A, Sh. 3
12050-LRM-091A, Sh. 4
12050-LRM-091B, Sh. 1

In the SPS LRA, the applicant identified the portions of the RS system that are within the scope of license renewal in the drawings listed below. In addition, the applicant listed the mechanical component commodity groups that are subject to AMR and its intended functions in Table 2.3.2-3 of the LRA.

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Unit 2

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11448-LRM-084A, Sh. 2 11448-LRM-084B, Sh. 1 11448-LRM-084B, Sh. 2 11548-LRM-084B, Sh. 1 11548-LRM-084B, Sh. 2

The piping and instrumentation drawings were highlighted by the applicant to identify those portions of the RS system that perform at least one of the scoping requirements of 10 CFR 54.4. The staff compared the LRA drawings to the system drawings and the descriptions in the UFSAR to ensure they were representative of the RS system. The staff performed its review by sampling the SCs that the applicant determined as being within the scope of license renewal, but not subject to AMR, to verify that no structure or component that performs its intended functions without moving parts or without a change in configuration or properties, or are not subject to replacement based on qualified life or specified time period, was excluded from an AMR. The staff did not identify any omissions.

2.3.2.3.3 Conclusions

On the basis of its review of the information contained in Section 2.3.2.3 of each LRA and supporting information in the UFSARs and LRA drawings, the staff did not identify any omissions in the scoping of the RS system by the applicant. The staff concludes that there is reasonable assurance that the applicant has identified those portions of the RS system that are

within the scope of license renewal, and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.2.4 Residual Heat Removal

In the North Anna and Surry LRAs, Section 2.3.2.4, "Residual Heat Removal," the applicant describes the piping and mechanical components of the residual heat removal (RHR) systems that are within the scope of license renewal and subject to an AMR for NAS 1/2 and SPS 1/2. NAS 1/2 and SPS 1/2 each has a RHR system. These systems are identical for both facilities with no notable differences in system design for the purpose of license renewal. Therefore, the information provided below is applicable to the NAS 1/2 and SPS 1/2 RHR systems. The RHR structural components that are subject to AMR are presented separately by the applicant in Section 2.4.10 of each LRA, "General Structural Supports," as commodity groups and, therefore, are evaluated separately by the staff in Section 2.4.10 of this SER. The RHR piping and mechanical components are further described by the applicant in Chapter 5.5.4 of the North Anna UFSAR and Chapter 9.3 of the Surry UFSAR.

2.3.2.4.1 Technical Information in the Application

The RHR systems for NAS 1/2 and SPS 1/2 is used to transfer heat from the RCS to the component cooling (CC) system during reactor shutdown conditions. Water is drawn from the RCS, pumped through the RHR heat exchangers, and returned to the RCS to control primary system temperature. The RHR systems are in service only when RCS temperature and pressure are reduced to 350 °F and 450 psig, respectively.

In addition to its primary function of transferring heat during reactor shutdown conditions, the NAS 1/2 and SPS 1/2 RHR systems have a number of other system functions that need to be considered for license renewal. The RHR systems provide the capability to pump the reactor cavity water back to the refueling water storage tank following refueling operations. In accordance with 10 CFR Part 50, Appendix R, "Fire Protection," the applicant's relies on the RHR systems to remove heat from the RCS to reach cold shutdown conditions. In addition, portions of RHR system piping and components are within the NAS 1/2 and SPS 1/2 ASME Class 1 RCS pressure boundary. Therefore, the major flowpaths of the RHR systems are within the scope of license renewal and subject to an AMR.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of the North Anna and Surry LRAs. As described in the scoping methodology, the applicant identified the portions of the RHR system that are within the scope of license renewal on the license renewal drawings listed in Section 2.3.2.4 of each LRA. Consistent with the method described in each LRA, Section 2.1.5, "Screening Methodology," the applicant listed the NAS 1/2 and SPS 1/2 RHR mechanical component commodity groups that are subject to an AMR in Table 2.3.2-4 of each LRA. These tables also list the intended functions and the LRA sections that contain the AMR for each commodity group.

The portions of each RHR system that are subject to an AMR for NAS 1/2 and SPS 1/2 include the components that make up the major flowpaths for each system. In each LRA Table 2.3.2-4, the applicant listed the following 11 component commodity groups subject to an AMR: bolting, filters/strainers, flow element, instrument valve assemblies, pipe, pump casings, pump seal

coolers, residual heat removal heat exchangers, thermowells, tubing, and valve bodies. The applicant identified maintaining pressure boundary integrity and restricting flow as the intended functions of the SCs that are subject to an AMR for the NAS 1/2 and SPS 1/2 RHR systems.

2.3.2.4.2 Staff Evaluation

The staff reviewed Section 2.3.2.4 of the North Anna and Surry LRAs to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the NAS 1/2 and SPS 1/2 RHR systems that are within the scope of license renewal in accordance with 10 CFR 54.4, and that the applicant appropriately identified the SCs of the RHR systems that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in Section 2.3.2.4 of each LRA, the applicable license renewal drawings, and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the portions of the NAS 1/2 and SPS 1/2 RHR systems that are within the scope of license renewal. The staff verified that those portions of the RHR systems that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Section 2.3.2.4 of each LRA. To verify that the applicant did include the applicable portions of the RHR systems within the scope of license renewal, the staff focused its review on those portions of the NAS 1/2 and SPS 1/2 RHR systems that were not identified within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the UFSARs for each facility to identify any additional system functions that were not identified in each LRA and verified that these additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the SCs of the NAS 1/2 and SPS 1/2 RHR systems that are subject to AMR from among those portions of the RHR systems that are identified as being within the scope of license renewal. The applicant identified and lists the SCs subject to AMR for the RHR systems in Table 2.3.2-4 of each LRA using the screening methodology described in Section 2.1 of each LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER.

In the North Anna LRA, the applicant identified the portions of the RHR systems that are within the scope of license renewal in the drawings listed below. The applicant also listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.2-4 of the North Anna LRA.

<u>Unit 1</u>

11715-LRM-091A, Sh. 1 11715-LRM-093A, Sh. 1 11715-LRM-094A, Sh. 1 11715-LRM-094A, Sh. 2 11715-LRM-095C, Sh. 1 11715-LRM-096B, Sh. 2 11715-LRM-096B, Sh. 3 <u>Unit 2</u>

12050-LRM-091A, Sh. 1 12050-LRM-093A, Sh. 1 12050-LRM-094A, Sh. 1 12050-LRM-094A, Sh. 2 12050-LRM-095C, Sh. 1 12050-LRM-096B, Sh. 2 12050-LRM-096B, Sh. 3

2-46

In the Surry LRA, the applicant identified the portions of the RHR systems that are within the scope of license renewal in the drawings listed below. In addition, the applicant listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.2-4 of the Surry LRA.

<u>Unit 1</u>

<u>Unit 2</u>

11448-LRM-086A, Sh. 1 11448-LRM-087A, Sh. 1 11448-LRM-087A, Sh. 2 11448-LRM-089B, Sh. 2	11548-LRM-086A, Sh. 1 11548-LRM-087A, Sh. 1 11548-LRM-087A, Sh. 2 11548-LRM-089B, Sh. 2 11548-LRM-089B, Sh. 3
11448-LRM-089B, Sh. 3	11548-LRM-089B, Sh. 3

The license renewal drawings were highlighted by the applicant to identify those portions of the RHR systems that meet at least one of the scoping requirements of 10 CFR 54.4. The staff compared the LRA drawings to the system drawings and the descriptions in the North Anna and Surry UFSARs to ensure they were representative of the RHR systems. The staff performed its review by sampling the SCs that the applicant identified as being within the scope of license renewal but not subject to AMR to verify that no structure or component that performs its intended function without moving parts or without a change in configuration or properties and that are not subject to replacement based on qualified life or specified time period was excluded from an AMR.

As a result of this review, the staff identified that the applicant had modified the NAS 1/2 and SPS 1/2 containment sumps by installing vortex suppressing devices so that the containment sumps will be free of any harmful vortices for any postulated operating conditions. The modifications involved the installation of two layers of floor grating in the sump and the installation of perforated vortex breakers inside the cylindrical screens (Sections 3A.79 and 6.2.2.4.3 of the North Anna UFSAR). These components are not discussed in each LRA and do not appear to be included within the scope of license renewal. The staff requested that the applicant address this concern.

In a letter to the NRC dated January 4, 2002, the applicant explained that the perforated vortex breakers are considered an integral part of the cylindrical sump screens since they are constructed of the same material and exposed to the same environment as the sump screens. The applicable aging effects for the cylindrical sump screens (including the perforated vortex breakers) are managed by the infrequently accessed area inspection activity as identified in Table 3.2-3 of the license renewal application. In addition, the two layers of floor grating installed in the sump function as vortex suppressors were added to the scope of license renewal and are subject to an AMR. The floor grating/vortex suppressors are subject to loss of material, and this aging effect will be managed by the infrequently accessed area inspection activity. The staff has no concern with grouping the perforated vortex breakers with the cylindrical sump screens, and agrees with the applicant's decision to include the vortex suppressors within the scope of license renewal and subject to an AMR. The staff did not identify any additional omissions.

2.3.2.4.3 Conclusion

On the basis of its review of the information contained in Section 2.3.2.4 of each LRA, the supporting information in the North Anna and Surry UFSARs, and the license renewal drawings, as described above, the staff did identify that the applicant did not include the floor grating/vortex suppressors within the scope of license renewal and subject to an AMR for the NAS 1/2 and SPS 1/2 RHR systems. However, the applicant did add the floor grating/vortex suppressors to the scope of components subject to an AMR. No additional omissions were identified. Therefore, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the NAS 1/2 and SPS 1/2 RHR systems that are within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.2.5 Safety Injection

In the North Anna and Surry LRAs, Section 2.3.2.5, "Safety Injection," the applicant describes the piping and mechanical components of the safety injection (SI) systems that are within the scope of license renewal and subject to an AMR for NAS 1/2 and SPS 1/2. Each unit of NAS and SPS has an SI system. These systems are identical with no notable differences in system design for the purpose of license renewal. Therefore, the information provided below is applicable to the NAS 1/2 and SPS 1/2 SI systems. The SI structural components that are subject to AMR are presented separately by the applicant in Section 2.4.10 of each LRA, "General Structural Supports," as commodity groups and, therefore, are evaluated separately by the staff in Section 2.4.10 of this SER. The SI piping and mechanical components are further described by the applicant in Chapter 6.3 of the North Anna UFSAR and Chapter 6.2 of the Surry UFSAR.

2.3.2.5.1 Technical Information in the Application

The SI systems for NAS 1/2 and SPS 1/2 are designed to provide emergency cooling to the reactor core and to provide adequate shutdown margin in the event of a loss-of-coolant accident (LOCA). The SI systems use high-head injection pumps, low-head injection pumps, and hydro-pneumatic accumulator tanks to inject borated water into the RCS during emergency/accident conditions. In addition, the SI systems provide the capability to remove decay heat from the reactor cores for extended periods following an accident. This is accomplished by recirculating coolant, which is cooled by the recirculation spray system, from the containment sump through the core.

The SI system high-head pumps are also used as charging pumps by the chemical and volume control (CH) system. The AMR for the high-head pumps is included in the AMR for the CH system. In addition, portions of SI system piping and components are within the NAS 1/2 and SPS 1/2 ASME Class 1 RCS pressure boundary. Therefore, the major flowpaths of the SI systems are within the scope of license renewal and subject to an AMR.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of the North Anna and Surry LRAs. As described in the scoping methodology, the applicant identified the portions of the SI systems that are within the scope of license renewal on the license renewal drawings listed in Section 2.3.2.5 of each LRA. Consistent with the method described in each LRA, Section 2.1.5, "Screening Methodology," the applicant listed the NAS 1/2 and SPS 1/2 SI mechanical component commodity groups that are subject to an AMR in Table 2.3.2-5 of each LRA. These tables also list the intended functions and the LRA sections that contain the AMR for each commodity group.

The portions of each SI system that are subject to an AMR for NAS 1/2 and SPS 1/2 include the components that make up the major flowpaths for each system. In each LRA Table 2.3.2-5, the applicant listed the following 12 component commodity groups subject to an AMR: accumulators (and cladding), bolting, flow element, flow orifices, instrument valve assemblies, pipe, pump casings, pump seal coolers, sump screens, tanks, tubing, and valve bodies. The applicant identified maintaining pressure boundary integrity, providing filtration, and restricting flow as the intended functions of the SCs that are subject to an AMR for the NAS 1/2 and SPS 1/2 SI systems.

2.3.2.5.2 Staff Evaluation

The staff reviewed Section 2.3.2.5 of the North Anna and Surry LRAs to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the NAS 1/2 and SPS 1/2 SI systems that are within the scope of license renewal in accordance with 10 CFR 54.4, and that the applicant appropriately identified the SCs of the SI systems that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in Section 2.3.2.5 of each LRA, the applicable license renewal drawings, and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the portions of the NAS 1/2 and SPS 1/2 SI systems that are within the scope of license renewal. The staff verified that those portions of the SI systems that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Section 2.3.2.5 of each LRA. To verify that the applicant did include the applicable portions of the SI systems within the scope of license renewal, the staff focused its review on those portions of the NAS 1/2 and SPS 1/2 SI systems that were not identified as being within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the UFSARs for each facility to identify any additional system functions that were not identified in each LRA and verified that these additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the SCs of the NAS 1/2 and SPS 1/2 SI systems that are subject to AMR from among those portions of the SI systems that were identified within the scope of license renewal. The applicant identified and lists the SCs subject to AMR for the SI systems in Table 2.3.2-5 of each LRA using the screening methodology described in Section 2.1. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER.

In the North Anna LRA, the applicant identified the portions of the SI systems that are within the scope of license renewal in the drawings listed below. The applicant also listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.2-5 of the North Anna LRA.

<u>Unit 1</u>	<u>Unit 2</u>
11715-LRM-091A, Sh. 1	12050-LRM-091A, Sh. 1
11715-LRM-095B, Sh. 2	12050-LRM-095B, Sh. 2
11715-LRM-095C, Sh. 1	12050-LRM-095C, Sh. 1
11715-LRM-096A, Sh. 1	12050-LRM-096A, Sh. 1
11715-LRM-096A, Sh. 2	12050-LRM-096A, Sh. 2
11715-LRM-096A, Sh. 3	12050-LRM-096A, Sh. 3
11715-LRM-096B, Sh. 1	12050-LRM-096B, Sh. 1
11715-LRM-096B, Sh. 2	12050-LRM-096B, Sh. 2
11715-LRM-096B, Sh. 3	12050-LRM-096B, Sh. 3
11715-LRM-096B, Sh. 4	12050-LRM-096B, Sh. 4

In the Surry LRA, the applicant identified the portions of the SI systems that are within the scope of license renewal in the drawings listed below. In addition, the applicant listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.2-5 of the Surry LRA.

<u>Unit 1</u>	<u>Unit 2</u>
11448-LRM-084A, Sh. 1	11548-LRM-084A, Sh. 1
11448-LRM-088B, Sh. 1	11548-LRM-088B, Sh. 1
11448-LRM-088C, Sh. 1	11548-LRM-088C, Sh. 1
11448-LRM-089A, Sh. 1	11548-LRM-089A, Sh. 1
11448-LRM-089A, Sh. 2	11548-LRM-089A, Sh. 2
11448-LRM-089A, Sh. 3	11548-LRM-089A, Sh. 3
11448-LRM-089B, Sh. 1	11548-LRM-089B, Sh. 1
11448-LRM-089B, Sh. 2	11548-LRM-089B, Sh. 2
11448-LRM-089B, Sh. 3	11548-LRM-089B, Sh. 3
11448-LRM-089B, Sh. 4	11548-LRM-089B, Sh. 4

The license renewal drawings were highlighted by the applicant to identify those portions of the SI systems that meet at least one of the scoping requirements of 10 CFR 54.4. The staff compared the LRA drawings to the system drawings and the descriptions in the North Anna and Surry UFSARs to ensure they were representative of the SI systems. The staff performed its review by sampling the SCs that the applicant identified as being within the scope of license renewal but not subject to AMR to verify that no structure or component, that performs its intended function without moving parts or without a change in configuration or properties and that is not subject to replacement based on qualified life or specified time period was excluded from an AMR. The staff did not identify any omissions.

2.3.2.5.3 Conclusion

On the basis of its review of the information contained in Section 2.3.2.5 of each LRA, the supporting information in the North Anna and Surry UFSARs, and the license renewal drawings, as described above, the staff did not identify any omissions in the scoping and screening of the

SCs of the NAS 1/2 and SPS 1/2 SI systems by the applicant. Therefore, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the NAS 1/2 and SPS 1/2 SI systems that are within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3 Auxiliary Systems

In both the North Anna and Surry LRAs, Section 2.3.3, "Auxiliary Systems," the applicant describes the SSCs of the auxiliary systems that are within the scope of license renewal and subject to an AMR. The following staff evaluation applies to the auxiliary systems of NAS 1/2 and SPS 1/2 for the purpose of license renewal. Any differences in any of the SSCs that make up the auxiliary systems for each of the four units or unique information that applies to a specific unit or site will be clearly identified as to which unit or site the information applies. Other than what is specifically stated, the following evaluation is applicable to the auxiliary systems for NAS 1/2.

2.3.3.1 Chemical and Volume Control

In the North Anna and Surry LRAs, Section 2.3.3.1, "Chemical and Volume Control," the applicant describes the piping and mechanical components of the chemical and volume control (CH) systems that are within the scope of license renewal and subject to an AMR for NAS 1/2 and SPS 1/2. Each unit of NAS and SPS has a CH system. These systems are identical with • no notable differences in system design for the purpose of license renewal. Therefore, the information provided below is applicable to the NAS 1/2 and SPS 1/2 CH systems. The CH structural components that are subject to AMR are presented separately by the applicant in Section 2.4.10 of each LRA, "General Structural Supports," as commodity groups and, therefore, are evaluated separately by the staff in Section 2.4.10 of this SER. The CH piping and mechanical components are further described by the applicant in Chapter 9.3.4 of the North Anna UFSAR and Chapter 9.1 of the Surry UFSAR.

2.3.3.1.1 Technical Information in the Application

The CH systems for NAS 1/2 and SPS 1/2 provide RCS letdown and makeup for chemistry control and purification of RCS fluid and control of chemical shim concentration for reactivity control. The CH systems also provide RC pump seal injection flow, processing of RC pump seal leakoff flow, and RCS pressurizer level control. In addition, portions of CH system piping and components are within the NAS 1/2 and SPS 1/2 ASME Class 1 RCS pressure boundary. Other CH systems functions that need to be considered for license renewal includes chemical addition, boric acid batching, and borated water storage capability. Therefore, the major flowpaths of the CH systems are within the scope of license renewal and are subject to AMR.

The CH system charging pumps serve a second function as the high-head safety injection pumps during emergency conditions as described in Section 2.3.2.5, "Safety Injection" of each LRA. The NAS 1/2 and SPS 1/2 charging pumps are evaluated as part of the CH system by the staff in this section of the SER.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of the North Anna and Surry LRAs. As described in the scoping methodology, the applicant identified the portions of

the CH systems that are within the scope of license renewal on the license renewal drawings listed in Section 2.3.3.1 of each LRA. Consistent with the method described in each LRA, Section 2.1.5, "Screening Methodology," the applicant listed the NAS 1/2 and SPS 1/2 CH mechanical component commodity groups that are subject to an AMR in Table 2.3.3-1 of each LRA. These tables also list the intended functions and the LRA sections that contain the AMR for each commodity group.

The portions of each CH system that are subject to an AMR for NAS 1/2 and SPS 1/2 include the components that make up the major flowpaths for each system. In each LRA Table 2.3.3-1, the applicant listed the following 21 component commodity groups subject to an AMR: bellows, bolting, filters/strainers, flow elements, flow indicators, heaters, instrument valve assemblies, level indicators, nonregenerative and excess letdown heat exchangers, pipe, pump casings, pump lube oil coolers, pump seal coolers, RCP seal water heat exchangers, regenerative heat exchangers, restricting orifices, tanks, temperature sensors, thermowells, tubing, and valve bodies. The applicant identified maintaining pressure boundary integrity, providing heat transfer, providing filtration, and restricting flow as the intended functions of the SCs that are subject to an AMR for the NAS 1/2 and SPS 1/2 CH systems.

2.3.3.1.2 Staff Evaluation

The staff reviewed Section 2.3.3.1 of the North Anna and Surry LRAs to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the NAS 1/2 and SPS 1/2 CH systems that are within the scope of license renewal in accordance with 10 CFR 54.4, and that the applicant appropriately identified the SCs of the CH systems that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in Section 2.3.3.1 of each LRA, the applicable license renewal drawings, and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the portions of the NAS 1/2 and SPS 1/2 CH systems that are within the scope of license renewal. The staff verified that those portions of the CH systems that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Section 2.3.3.1 of each LRA. To verify that the applicant did include the applicable portions of the CH systems within the scope of license renewal, the staff focused its review on those portions of the NAS 1/2 and SPS 1/2 CH systems that were not identified within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the UFSARs for each facility to identify any additional system functions that were not identified in each LRA and verified that these additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the SCs of the NAS 1/2 and SPS 1/2 CH systems that are subject to AMR from among those portions of the CH systems that are identified as being within the scope of license renewal. The applicant identified and lists the SCs subject to AMR for the CH systems in Table 2.3.3-1 of each LRA using the screening methodology described in Section 2.1 of each LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER.

In the North Anna LRA, the applicant identified the portions of the CH systems that are within the scope of license renewal in the drawings listed below. The applicant also listed the

mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-1 of the North Anna LRA.

<u>Unit 1</u>

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<u>Unit 2</u>

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11715-LRM-088A, Sh. 1	120
11715-LRM-091A, Sh. 1	120
11715-LRM-093A, Sh. 1	120
11715-LRM-093A, Sh. 2	120
11715-LRM-093A, Sh. 3	120
11715-LRM-093B, Sh. 1	. 120
11715-LRM-095A, Sh. 1	120
11715-LRM-095A, Sh. 2	120
11715-LRM-095A, Sh. 3	120
11715-LRM-095A, Sh. 4	120
11715-LRM-095B, Sh. 1	120
11715-LRM-095B, Sh. 2	120
11715-LRM-095C, Sh. 1	120
11715-LRM-095C, Sh. 2	120
11715-LRM-95D, Sh. 1	
11715-LRM-95D, Sh. 2	
11715-LRM-096A, Sh. 2	
11715-LRM-096A, Sh. 3	

12050-LRM-091A, Sh. 1 12050-LRM-093A, Sh. 1 12050-LRM-093A, Sh. 2 12050-LRM-093A, Sh. 3 12050-LRM-093B, Sh. 1 12050-LRM-095A, Sh. 1 12050-LRM-095A, Sh. 2 12050-LRM-095B, Sh. 2 12050-LRM-095C, Sh. 1 12050-LRM-095C, Sh. 2 12050-LRM-95D, Sh. 2 12050-LRM-95D, Sh. 2 12050-LRM-95D, Sh. 3

In the Surry LRA, the applicant identified the portions of the CH systems that are within the scope of license renewal in the drawings listed below. In addition, the applicant listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-1 of the Surry LRA.

<u>Unit 1</u>

11448-LRM-088A, Sh. 4 11448-LRM-088B, Sh. 1 11448-LRM-088B, Sh. 2 11448-LRM-088B, Sh. 3 11448-LRM-088C, Sh. 1 11448-LRM-088C, Sh. 2 11448-LRM-089A, Sh. 2

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11448-LRM-071B, Sh. 2
11448-LRM-079D, Sh. 1
11448-LRM-082A, Sh. 1
11448-LRM-084A, Sh. 1
11448-LRM-086A, Sh. 1
11448-LRM-086A, Sh. 2
11448-LRM-086A, Sh. 3
11448-LRM-086B, Sh. 1
11448-LRM-087A, Sh. 2
11448-LRM-088A, Sh. 1
11448-LRM-088A, Sh. 2
11448-LRM-088A, Sh. 3

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11548-LRM-071B, Sh. 2
11548-LRM-084A, Sh. 1
11548-LRM-086A, Sh. 1
11548-LRM-086A, Sh. 2
11548-LRM-086A, Sh. 3
11548-LRM-086B, Sh. 1
11548-LRM-087A, Sh. 2
11548-LRM-088A, Sh. 1
11548-LRM-088A, Sh. 2
11548-LRM-088B, Sh. 1
11548-LRM-088B, Sh. 2
11548-LRM-088B, Sh. 3
11548-LRM-088C, Sh. 1
11548-LRM-088C, Sh. 2
11548-LRM-089A, Sh. 2

The license renewal drawings were highlighted by the applicant to identify those portions of the CH systems that meet at least one of the scoping requirements of 10 CFR 54.4. The staff compared the license renewal drawings to the system drawings and the descriptions in the North Anna and Surry UFSARs to ensure they were representative of the CH systems. The staff performed its review by sampling the SCs that the applicant identified as being within the scope of license renewal but not subject to AMR to verify that no structure or component, that performs its intended function without moving parts or without a change in configuration or properties and that is not subject to replacement based on qualified life or specified time period was excluded from an AMR. The staff did not identify any omissions.

2.3.3.1.3 Conclusion

On the basis of its review of the information contained in Section 2.3.3.1 of each LRA the supporting information in the North Anna and Surry UFSARs, and the license renewal drawings, as described above, the staff did not identify any omissions in the scoping and screening of the NAS 1/2 and SPS 1/2 CH systems by the applicant. Therefore, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the NAS 1/2 and SPS 1/2 CH systems that are within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.2 High-Radiation Sampling System (HRSS)

In general, the North Anna and Surry high-radiation sampling systems (HRSSs) do not meet the scoping criteria set forth by 10 CFR 54.4. However, at North Anna, the applicant groups the components of the component-cooling system (CC) that supply the HRSS sample coolers in the North Anna HRSS, and subsequently identifies these components using HRSS component

identification numbers. Therefore, the applicant includes the North Anna HRSS within the scope of license renewal. In the North Anna LRA, Section 2.3.3.2, "High-Radiation Sampling System," the applicant describes the piping and mechanical components of the HRSS that are within the scope of license renewal and subject to an AMR.

The components of the Surry CC system that supply the HRSS sample coolers have component cooling identification numbers, and do not need to be included within the scope of license renewal because they do not meet the scoping criteria set forth by 10 CFR 54.4. Therefore, the following evaluation only applies to the North Anna LRA.

2.3.3.2.1 Technical Information in the Application

The North Anna and Surry HRSSs provide the capability to obtain grab samples from various systems and plant areas that can be used as indications of post-accident plant conditions. In addition, the North Anna and Surry HRSSs are normally isolated from other plant systems. However, the North Anna component cooling isolation valves to the HRSS sample cooler have HRSS component identification numbers and, therefore, are considered part of the HRSS even though these valves are a functional part of the component cooling systems. On the basis of system function and operating configuration, with the exception of the component cooling isolation valves to the North Anna HRSS sample cooler, the applicant determined that North Anna and Surry HRSSs are not safety-related and do not support safety-related functions and, therefore, are not within the scope of license renewal.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of the North Anna LRA. As described in the scoping methodology, the applicant identified the portion of the North Anna HRSS that are within the scope of license renewal on license renewal drawings listed in Section 2.3.3.2 of the North Anna LRA. Consistent with the method described in each LRA, Section 2.1.5, "Screening Methodology," the applicant listed the HRSS mechanical component commodity groups that are subject to an AMR in Table 2.3.3-2 of the North Anna LRA. This table lists piping and valve bodies as the component commodity groups that are subject to an AMR. The table also identifies the intended function and the LRA section that contains the AMR for the commodity groups.

2.3.3.2.2 Staff Evaluation

The staff reviewed the HRSS scoping and screening results to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the North Anna and Surry HRSSs that are within the scope of license renewal in accordance with 10 CFR 54.4, and that the applicant appropriately identified the SCs of the HRSSs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information in Section 2.3.3.2 of the North Anna LRA, the applicable license renewal drawings, and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the portions of the North Anna HRSS that are within the scope of license renewal and to determine whether any portions of the Surry HRSS should be included within the scope of license renewal. The staff verified that the portion of the North Anna HRSS that meet the scope of license renewal. The staff verified that the portion of the North Anna HRSS that meet the scope of license renewal and were identified as such by the applicant in Section 2.3.3.2 of the North Anna LRA.

To verify that the applicant did include the applicable portion of the North Anna HRSS within the scope of license renewal, the staff focused its review on those portions of the HRSS that were not identified within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the North Anna UFSAR to identify any additional system functions that were not identified in the LRA and verified that these additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions. The staff also reviewed the Surry UFSAR and verified that the Surry HRSS need not be included within the scope of license renewal.

The staff then determined whether the applicant had properly identified the SCs of the North Anna HRSS that are subject to AMR from the portion of the HRSSs that is identified as being within the scope of license renewal. The applicant identified and lists the SCs subject to AMR for the HRSS in Table 2.3.3-2 of the North Anna LRA using the screening methodology described in Section 2.1 of the LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER.

In the North Anna LRA, the applicant identified the portion of the HRSS that is within the scope of license renewal in the drawings listed below. The applicant also listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-2 of the North Anna LRA.

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Unit 2

11715-LRM-079C, Sh. 4 11715-LRM-108A, Sh. 1 Common

The license renewal drawings were highlighted by the applicant to identify the SCs of the North Anna HRSS that meet at least one of the scoping requirements of 10 CFR 54.4. The staff compared the license renewal drawings to the system drawings and the descriptions in the North Anna UFSARs to ensure that they were representative of the HRSS. The staff performed its review by sampling the SCs that the applicant identified as being within the scope of license renewal but not subject to AMR to verify that no structure or component, that performs its intended function without moving parts or without a change in configuration or properties and, that is not subject to replacement based on qualified life or specified time period, was excluded from an AMR. The staff did not identify any omissions.

2.3.3.2.3 Conclusion

On the basis of its review of the information contained in Section 2.3.3.2 of the North Anna LRA, the supporting information in the North Anna and Surry UFSARs, and the license renewal drawings, as described above, the staff did not identify any omissions in the scoping and screening of the HRSS by the applicant. Therefore, the staff concludes that there is reasonable assurance that the applicant has identified the portion of the North Anna HRSS that is within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.3 Incore Instrumentation

In the North Anna LRA, Section 2.3.3.3, and the Surry LRA, Section 2.3.3.2, both entitled "Incore Instrumentation," the applicant describes the piping and mechanical components of the incore instrumentation (IC) systems that are within the scope of license renewal and subject to an AMR for NAS 1/2 and SPS 1/2. Each unit of NAS and SPS has an IC system. These systems are identical with no notable differences in system design for the purpose of license renewal. Therefore, the information provided below is applicable to the NAS 1/2 and SPS 1/2 IC systems. The IC structural components that are subject to AMR are presented separately by the applicant in Section 2.4.10 of each LRA, "General Structural Supports," as commodity groups and, therefore, are evaluated separately by the staff in Section 2.4.10 of this SER. The IC piping and mechanical components are further described by the applicant in Chapter 7.7.1.9 of the North Anna UFSAR and Chapter 7.6.1 of the Surry UFSAR.

2.3.3.3.1 Technical Information in the Application

The IC systems for NAS 1/2 and SPS 1/2 provide reactor core performance information in the form of neutron flux distribution data. The IC system consists of moveable incore neutron detectors, bottom-mounted instrumentation guide tubes, a seal table with seal assemblies/fittings, and isolation valves. The guide tubes, seal table, and seal table fittings form a pressure boundary for the reactor coolant system. The isolation valves normally do not provide a reactor coolant system pressure boundary, but are designed to be closed in the event of a leak in the IC system pressure boundary. The portions of the IC systems that are subject to AMR consist of the components that provide, or could be required to provide, a reactor coolant system pressure boundary.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of the North Anna and Surry LRAs. As described in the scoping methodology, the applicant identified the portions of the IC systems that are within the scope of license renewal on the license renewal drawings listed in the North Anna LRA, Section 2.3.3.3, and the Surry LRA, Section 2.3.3.2. Consistent with the method described in each LRA, Section 2.1.5, "Screening Methodology," the applicant listed the NAS 1/2 and SPS 1/2 mechanical component commodity groups that are subject to an AMR in Tables 2.3.3-3 and 2.3.3-2, respectively, of each LRA. These tables also list the intended functions and the LRA sections that contain the AMR for each commodity group.

The portions of each IC systems that are subject to an AMR for NAS 1/2 and SPS 1/2 include the following four component commodity groups: seal table, seal table fittings, bottom-mounted instrumentation guide tubes, and valve bodies. The applicant identified maintaining pressure boundary integrity as the intended function of the SCs that are subject to an AMR for the NAS 1/2 and SPS 1/2 IC systems.

2.3.3.3.2 Staff Evaluation

The staff reviewed Section 2.3.3.3 of the North Anna LRA and Section 2.3.3.2 of the Surry LRA to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the NAS 1/2 and SPS 1/2 IC systems that are within the scope of license renewal in accordance with 10 CFR 54.4, and that the applicant appropriately identified the SCs

of the IC systems that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in each LRA, the applicable license renewal drawings, and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the portions of the NAS 1/2 and SPS 1/2 IC systems that are within the scope of license renewal. The staff verified that those portions of the IC systems that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Sections 2.3.3.3 and 2.3.3.2 of the North Anna and Surry LRAs, respectively. To verify that the applicant did include the applicable portions of the IC systems within the scope of license renewal, the staff focused its review on those portions of the NAS 1/2 and SPS 1/2 IC systems that were not identified within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the UFSARs for each facility to identify any additional system functions that were not identified in each LRA and verified that these additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the SCs of the NAS 1/2 and SPS 1/2 IC systems that are subject to AMR from among those portions of the IC systems that are identified as being within the scope of license renewal. The applicant identified and listed the SCs subject to AMR for the IC systems in Table 2.3.3-3 of the North Anna LRA and Table 2.3.3-2 of the Surry LRA using the screening methodology described in Section 2.1 of each LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER.

In the North Anna LRA, the applicant identified the portions of the IC systems that are within the scope of license renewal in the drawings listed below. The applicant also listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-3 of the North Anna LRA.

<u>Unit 1</u>		<u>Unit 2</u>

11715-LRM-054F, Sh. 1 12050-LRM-054F, Sh. 1

In the Surry LRA, the applicant identified the portions of the IC systems that are within the scope of license renewal in the drawings listed below. In addition, the applicant listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-2 of the Surry LRA.

Unit

Unit 2

11448-LRM-42B, Sh. 1

11548-LRM-42B, Sh. 1

The license renewal drawings were highlighted by the applicant to identify those portions of the IC systems that meet at least one of the scoping requirements of 10 CFR 54.4. The staff compared the license renewal drawings to the system drawings and the descriptions in the North Anna and Surry UFSARs to ensure they were representative of the IC systems. The staff performed its review by sampling the SCs that the applicant identified as being within the scope

of license renewal but not subject to AMR to verify that no structure or component, that performs its intended function without moving parts or without a change in configuration or properties and, that are not subject to replacement based on qualified life or specified time period, was excluded from an AMR. The staff did not identify any omissions.

2.3.3.3.3 Conclusion

On the basis of its review of the information contained in Section 2.3.3.3 of the North Anna LRA and Section 2.3.3.2 of the Surry LRA, the supporting information in the North Anna and Surry UFSARs, and the license renewal drawings, as described above, the staff did not identify any omissions in the scoping and screening of the NAS 1/2 and SPS 1/2 IC systems by the applicant. Therefore, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the NAS 1/2 and SPS 1/2 IC systems that are within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.4 North Anna Refueling Purification/Surry Reactor Cavity Purification

In the North Anna LRA, Section 2.3.3.4, "Refueling Purification," and the Surry LRA, Section 2.3.3.3, "Reactor Cavity Purification," the applicant describes the piping and mechanical components of the refueling purification (RP) and reactor cavity purification (RL) systems (from hereon referred to collectively as RP/RL systems) that are within the scope of license renewal and subject to an AMR for NAS 1/2 and SPS 1/2. The RP/RL systems are identical with no notable differences in system design for the purpose of license renewal. Therefore, the information provided below is applicable to the NAS 1/2 and SPS 1/2 RP/RL systems. The RP/RL structural components that are subject to AMR are presented separately by the applicant in Section 2.4.10 of each LRA, "General Structural Supports," as commodity groups and, therefore, are evaluated separately by the staff in Section 2.4.10 of this SER. The RP/RL piping and mechanical components are further described by the applicant in Chapter 9.1.3 of the North Anna UFSAR and Chapter 11.3.1 of the Surry UFSAR.

2.3.3.4.1 Technical Information in the Application

The RP/RL systems for NAS 1/2 and SPS 1/2 provide a means to maintain the water quality of the filled reactor cavity during refueling operations. The systems also include the capability to pump the reactor cavity water to the refueling water storage tank. The portion of the RP/RL systems that are subject to AMR consists of the components that perform a pressure boundary function as part of the RP/RL system containment penetrations, the components that provide a pressure boundary for the reactor cavity, and the components that provide a pressure boundary at interfaces with other in-scope systems.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of the North Anna and Surry LRAs. As described in the scoping methodology, the applicant identified the portions of the RP/RL systems that are within the scope of license renewal on the license renewal drawings listed in the North Anna LRA, Section 2.3.3.4, and the Surry LRA, Section 2.3.3.3. Consistent with the method described in each LRA, Section 2.1.5, "Screening Methodology," the applicant listed the NAS 1/2 and SPS 1/2 mechanical component commodity groups that are subject to an AMR in Tables 2.3.3-4 and 2.3.3-3, respectively, of each LRA.

also list the intended functions and the LRA sections that contain the AMR for each commodity group.

The portions of each RP/RL systems that are subject to an AMR for NAS 1/2 and SPS 1/2 include the following three component commodity groups: bolting, pipe, and valve bodies. The applicant identified maintaining pressure boundary integrity as the intended function of the SCs that are subject to an AMR for the NAS 1/2 and SPS 1/2 RP/RL systems.

2.3.3.4.2 Staff Evaluation

The staff reviewed Section 2.3.3.4 of the North Anna LRA and Section 2.3.3.3 of the Surry LRA to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the NAS 1/2 and SPS 1/2 RP/RL systems that are within the scope of license renewal in accordance with 10 CFR 54.4, and that the applicant appropriately identified the SCs of the RP/RL systems that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in each LRA, the applicable license renewal drawings, and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the portions of the NAS 1/2 and SPS 1/2 RP/RL systems that are within the scope of license renewal. The staff verified that those portions of the RP/RL systems that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Sections 2.3.3.4 and 2.3.3.3 of the North Anna and Surry LRAs, respectively. To verify that the applicant did include the applicable portions of the RP/RL systems within the scope of license renewal, the staff focused its review on those portions of the NAS 1/2 and SPS 1/2 RP/RL systems that were not identified within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the UFSARs for each facility to identify any additional system functions that were not identified in each LRA and verified that these additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the SCs of the NAS 1/2 and SPS 1/2 RP/RL systems that are subject to AMR from among those portions of the RP/RL systems that are identified as being within the scope of license renewal. The applicant identified and lists the SCs subject to AMR for the RP/RL systems in Table 2.3.3-4 of the North Anna LRA and Table 2.3.3-3 of the Surry LRA using the screening methodology described in Section 2.1 of each LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER.

In the North Anna LRA, the applicant identified the portions of the RP systems that are within the scope of license renewal in the drawings listed below. The applicant also listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-4 of the North Anna LRA.

<u>Unit 1</u>

Unit 2

11715-LRM-088A, Sh. 1 11715-LRM-088A, Sh. 2 11715-LRM-088A, Sh. 3 11715-LRM-088A, Sh. 4 11715-LRM-095B, Sh. 1 11715-LRM-096A, Sh. 1

11 11 4

12050-LRM-095B, Sh. 1 12050-LRM-096A, Sh. 1

11-1-1-0

In the Surry LRA, the applicant identified the portions of the RL systems that are within the scope of license renewal in the drawings listed below. In addition, the applicant listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-3 of the Surry LRA.

<u>Unit I</u>	<u>0111 2</u>
11448-LRM-088A, Sh. 4 11448-LRM-118A, Sh. 1 11448-LRM-118A, Sh. 2	11548-LRM-088A, Sh. 2 11548-LRM-118A, Sh. 1
11440 LIMP 10Λ , OIL L	

The license renewal drawings were highlighted by the applicant to identify those portions of the RP/RL systems that meet at least one of the scoping requirements of 10 CFR 54.4. The staff compared the license renewal drawings to the system drawings and the descriptions in the North Anna and Surry UFSARs to ensure they were representative of the RP/RL systems. The staff performed its review by sampling the SCs that the applicant identified as being within the scope of license renewal but not subject to AMR to verify that no structure or component, that performs its intended function without moving parts or without a change in configuration or properties and, that are not subject to replacement based on qualified life or specified time period, was excluded from an AMR. The staff did not identify any omissions.

2.3.3.4.3 Conclusion

On the basis of its review of the information contained in Section 2.3.3.4 of the North Anna LRA and Section 2.3.3.3 of the Surry LRA, the supporting information in the North Anna and Surry UFSARs, and the license renewal drawings, as described above, the staff did not identify any omissions in the scoping and screening of the NAS 1/2 and SPS 1/2 RP/RL systems by the applicant. Therefore, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the NAS 1/2 and SPS 1/2 RP/RL systems that are within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.5 Sampling Systems

In the North Anna and Surry LRAs, Section 2.3.3.5, "Sampling System," the applicant describes the components of the NAS 1/2 and SPS 1/2 sampling systems (SSs) that are within the scope of license renewal and subject to an AMR. Each unit of NAS and SPS has an SS system. These systems are identical with no notable differences in system design for the purpose of license renewal. Therefore, the information provided below is applicable to the NAS 1/2 and

SPS 1/2 SS systems. These systems are further described in Section 9 of the North Anna and Surry UFSARs.

2.3.3.5.1 Technical Information in the Application

At both North Anna and Surry, the SSs provide a means to monitor fluid quality and other system performance parameters for various plant systems. The SSs consist of sample tubing and piping, valves, sample coolers, and other components that provide a means to control sample streams. Sample cooling is provided by the component cooling systems. Some portions of the SSs are within the ASME Class 1 RCS pressure boundary.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology" of each LRA. As described in the scoping methodology, the applicant identified the portions of the NAS 1/2 and SPS 1/2 SSs that are within the scope of license renewal on the license renewal drawings listed in Section 2.3.3.4 of each LRA. Consistent with the method described in each LRA, Section 2.1.5, "Screening Methodology," the applicant listed the SSs mechanical component commodity groupings that are within the license renewal evaluation boundaries and that are subject to an AMR in Table 2.3.3-4 of each LRA. These tables also list the intended functions, and the LRA sections containing the AMR for each component commodity grouping.

The portions of the NAS 1/2 and SPS 1/2 SSs that are subject to AMR consist of the components that form the pressure boundary for other in-scope systems via sample points and sample coolers and the components that perform the containment pressure boundary function as part of the SSs containment penetration. In each LRA Table 2.3.3-4, the applicant listed the following five component commodity groups subject to an AMR: bolting, pipe, sample coolers, tubing, and valve bodies. The applicant identified maintaining pressure boundary integrity as the only intended function for the NAS 1/2 and SPS 1/2 SS SCs that are subject to an AMR.

2.3.3.5.2 Staff Evaluation

The staff reviewed Section 2.3.3.4 of the North Anna and Surry LRAs to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the NAS 1/2 and SPS 1/2 SSs that are within the scope of license renewal in accordance with 10 CFR 54.4, and that the applicant appropriately identified the SCs of the SSs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in Section 2.3.3.4 of each LRA, the applicable license renewal drawings, and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the portions of the NAS 1/2 and SPS 1/2 SSs that are within the scope of license renewal. The staff verified that those portions of the SSs that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Section 2.3.3.4 of each LRA. To verify that the applicant did include the applicable portions of the SSs that were not identified within the scope of license renewal, the staff focused its review on those portions of the SSs that were not identified within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the UFSARs for each facility to identify any additional system functions that were not identified in each LRA and verified that these additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the SSs that are identified as being within the scope of license renewal. The applicant identified and lists the SCs subject to AMR for the SSs in Table 2.3.3-4 of each LRA using the screening methodology described in Section 2.1 of each LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER.

In the NAS LRA, the applicant identified the portions of the SSs that are within the scope of license renewal in the drawings listed below. The applicant also listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-4 of the NAS LRA.

<u>Unit 1</u>

<u>Unit 2</u>

11715-LRM-079B, Sh. 1	12050-LRM-079A, Sh. 1
11715-LRM-079C, Sh. 2	12050-LRM-089A, Sh. 3
11715-LRM-079C, Sh. 5	12050-LRM-089B, Sh. 1
11715-LRM-089B, Sh. 3	12050-LRM-093A, Sh. 1
11715-LRM-089D, Sh. 1	12050-LRM-093A, Sh. 2
11715-LRM-093A, Sh. 1	12050-LRM-093A, Sh. 3
11715-LRM-093A, Sh. 2	12050-LRM-093B, Sh. 1
11715-LRM-093A, Sh. 3	12050-LRM-094A, Sh. 1
11715-LRM-093B, Sh. 1	12050-LRM-094A, Sh. 2
11715-LRM-094A, Sh. 1	-
11715-LRM-094A, Sh. 2	

In the SPS LRA, the applicant identified the portions of the SSs that are within the scope of license renewal in the drawings listed below. In addition, the applicant listed the mechanical component commodity groups that are subject to AMR and its intended functions in Table 2.3.3-4 of the SPS LRA.

<u>Unit 1</u>	<u>Unit 2</u>
11448-LRM-072C, Sh. 3	11548-LRM-072C, Sh. 1
11448-LRM-072C, Sh. 5	11548-LRM-082A, Sh. 2
11448-LRM-072E, Sh. 1	11548-LRM-082A, Sh. 3
11448-LRM-072G, Sh. 1	11548-LRM-086A, Sh. 1
11448-LRM-082A, Sh. 1	11548-LRM-086A, Sh. 2
11448-LRM-082B, Sh. 2	11548-LRM-086A, Sh. 3
11448-LRM-086A, Sh. 1	11548-LRM-086B, Sh. 1
11448-LRM-086A, Sh. 2	11548-LRM-087A, Sh. 2
11448-LRM-086A, Sh. 3	11548-LRM-088A, Sh. 2
11448-LRM-086B, Sh. 1	11548-LRM-088B, Sh. 1
11448-LRM-087A, Sh. 1	11548-LRM-088B, Sh. 2
11448-LRM-087A, Sh. 2	
11448-LRM-088A, Sh. 4	
-11448-LRM-088B, Sh. 1	•

The license renewal drawings were highlighted by the applicant to identify those portions of the SSs that meet at least one of the scoping requirements of 10 CFR 54.4. The staff compared the LRA drawings to the system drawings and the descriptions in the North Anna and Surry UFSARs to ensure they were representative of the SSs. The staff performed its review by sampling the SCs that the applicant identified as being within the scope of license renewal but not subject to AMR to verify that no structure or component, that performs its intended function without moving parts or without a change in configuration or properties and, that is not subject to replacement based on qualified life or specified time period, was excluded from an AMR. The staff did not identify any omissions.

2.3.3.5.3 Conclusions

On the basis of its review of the information contained in Section 2.3.3.4 of each LRA the supporting information in the North Anna and Surry UFSARs, and the license renewal drawings, as described above, the staff did not identify any omissions in the scoping and screening of the SCs of the NAS 1/2 and SPS 1/2 SSs by the applicant. The staff concludes that there is reasonable assurance that the applicant has identified those portions of the NAS 1/2 and SPS 1/2 SSs that are within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a), and 10 CFR 54.21(a)(1), respectively.

2.3.3.6 Circulating Water

In the Surry LRA, Section 2.3.3.5, "Circulating Water," the applicant described the piping and mechanical components of the circulating water (CW) system for the SPS 1/2 that are within the scope of license renewal and subject to an AMR. In general, the function of CW systems at both North Anna and Surry do not meet the requirements of 10 CFR 54.4, therefore, are not within the scope of license renewal. However, portions of the SPS 1/2 CW system support the service water systems at Surry and are designated as Seismic Category I components. This is not the case for NAS 1/2. The North Anna CW systems are not in the scope of license renewal and, therefore, the following evaluation only applies to Surry LRA. The Surry CW systems structural components that are subject to AMR are presented separately by the applicant in Section 2.4.10 of the LRA, "General Structural Supports," as commodity groups and, therefore, are evaluated separately by the staff in Section 2.4.10 of this SER. The SPS 1/2 CW systems piping and mechanical components are further described by the applicant in Section 10.3.4 of the Surry UFSAR.

2.3.3.6.1 Technical Information in the Application

The CW systems for SPS 1/2 provide cooling water for the main condensers and the service water systems. Circulating water pumps discharge water from the James River into the intake canal. The intake canal water level is at a higher elevation than the discharge canal, and water is gravity fed to plant systems and components. Although the intake canal water inventory is maintained during plant operation by the four CW pumps per unit, the applicant states that the CW pumps are not relied upon to maintain intake canal inventory during emergency conditions and, therefore, are not within the scope of license renewal.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of the Surry LRA. As described in the scoping methodology, the applicant identified the portions of the SPS 1/2 CW

systems that are within the scope of license renewal on the license renewal drawings listed in Section 2.3.3.5 of the Surry LRA. Consistent with the method described in the LRA, Section 2.1.5, "Screening Methodology," the applicant listed the SPS 1/2 CW mechanical component commodity groups that are subject to an AMR in Table 2.3.3-5 of the Surry LRA. This table also lists the intended functions and the LRA section that contains the AMR for each commodity group.

The portions of each CW systems that are subject to an AMR for SPS 1/2 include the components that make up the limited portions of each system that support the Surry service water systems. In each LRA Table 2.3.3-5, the applicant listed the following five component commodity groups subject to an AMR: condenser waterboxes, filters/strainers, piping, spray shields, valve bodies. The applicant identified maintaining pressure boundary integrity, and providing a flood barrier as the intended functions of the SCs that are subject to an AMR for the SPS 1/2 CW systems.

The applicant describes its methodology for identifying the components that are within the scope of license renewal in Section 2.0 of the application, "Scoping and Screening Methodology for Identifying Structures and Components Subject to Aging Management Review, and Implementation Results." Systems within the scope of license renewal were listed by the applicant in Table 2.2-1 of each LRA. Systems not within the scope of license renewal are listed in Table 2.2-2 of each LRA. Structures within the scope of license renewal are listed by the applicant in Table 2.2-3 and structures not within the scope of license renewal are listed in Table 2.2-4 of each LRA. These tables link the reader to the appropriate section in the license renewal application to view the "screening results."

Initial scoping identifies plant systems and structures that are candidates for inclusion within the scope of 10 CFR Part 54. For systems and structures that are "scoped-in," screening was then performed to identify the passive components and structural members that support an intended function of the "in-scope" system or structure. These SC's are then subject to an AMR in accordance with 10 CFR 54.21(a). The results of the screening review were used to generate license renewal drawings. These drawings show all components that are within the scope of license renewal and those subject to AMR as highlighted.

The applicant identified "component groups" for the circulating water system that require AMR. These are presented in Table 2.3.3-5 of each LRA. This table presents the component groups with their passive function identified and a link to their AMR results. The applicant has identified the following component groups for the circulating water system that are subject to AMR: condenser waterboxes, filters/strainers, pipe, spray shields, and valve bodies.

2.3.3.6.2 Staff Evaluation

The staff reviewed the Surry LRA, Section 2.3.3.5 to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the SPS 1/2 CW systems that are within the scope of license renewal in accordance with 10 CFR 54.4, and that the applicant appropriately identified the SCs of the CW systems that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in Section 2.3.3.5 of the Surry LRA, the applicable license renewal drawings, and the Surry UFSAR to determine whether the applicant adequately

identified the portions of the SPS 1/2 CW systems that are within the scope of license renewal. The staff verified that those portions of the CW systems that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Section 2.3.3.5 of the Surry LRA. To verify that the applicant did include the applicable portions of the CW systems within the scope of license renewal, the staff focused its review on those portions of the SPS 1/2 CW systems that were not identified within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the Surry UFSAR to identify any additional system functions that were not identified in the LRA, and verified that these additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

In addition, the staff reviewed the North Anna UFSAR to identify any intended functions of the NAS 1/2 CW systems that met the scoping requirements of 10 CFR 54.4. The staff did not identify any intended function that would require including NAS 1/2 CW systems within the scope of license renewal.

The staff then determined whether the applicant had properly identified the SCs of the SPS 1/2 CW systems that are subject to AMR from among those portions of the CW systems that are identified as being within the scope of license renewal. The applicant identified and lists the SCs subject to AMR for the CW systems in Table 2.3.3-5 of Surry LRA using the screening methodology described in Section 2.1 of each LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER.

In the Surry LRA, the applicant identified the portions of the CW systems that are within the scope of license renewal in the drawings listed below. In addition, the applicant listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-5 of the Surry LRA.

<u>Unit 1</u>	Unit 2		
11448-LRM-071A, Sh. 2	11548-LRM-071A, Sh. 2 11548-LRM-071C, Sh. 1		

The license renewal drawings were highlighted by the applicant to identify those portions of the CW systems that meet at least one of the scoping requirements of 10 CFR 54.4. The staff compared the license renewal drawings to the system drawings and the descriptions in the Surry UFSAR to ensure they were representative of the CW systems. The staff performed its review by sampling the SCs that the applicant identified as being within the scope of license renewal but not subject to AMR to verify that no structure or component, that performs its intended function without moving parts or without a change in configuration or properties and, that are not subject to replacement based on qualified life or specified time period, was excluded from an AMR. The staff did not identify any omissions.

2.3.3.6.3 Conclusion

On the basis of its review of the information contained in Section 2.3.3.5 of Surry LRA, the supporting information in the North Anna and Surry UFSARs, and the license renewal drawings, as described above, the staff did not identify any omissions in the scoping and screening of the

SPS 1/2 CW systems by the applicant. Therefore, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the SPS 1/2 CW systems that are within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.7 Service Water

In the North Anna and Surry LRAs, Section 2.3.3.6, "Service Water," the applicant describes the piping and mechanical components of the service water (SW) systems that are within the scope of license renewal and subject to an AMR for North Anna and Surry. These systems are similar for both facilities with some differences in system design. Any notable differences are specifically identified and discussed in the staff's evaluation. Unless otherwise specified, the information provided below is applicable to both the North Anna and Surry SW systems. The SW systems structural components that are subject to AMR are presented separately by the applicant in Section 2.4.10 of each LRA, "General Structural Supports," as commodity groups and, therefore, are evaluated separately by the staff in Section 2.4.10 of this SER. The SW systems piping and mechanical components are further described by the applicant in Chapter 9.2.1 of the North Anna UFSAR and Chapter 9.9 of the Surry UFSAR.

2.3.3.7.1 Technical Information in the Application

The North Anna and Surry service water systems are common to both units at each facility and are designed to remove heat from various SSCs resulting from the simultaneous operation of NAS 1/2 and SPS 1/2. The major system loads for the North Anna and Surry service water systems during normal operations are the NAS 1/2 and SPS 1/2 component cooling water systems. The major load for the SW systems during accident conditions are the NAS 1/2 and SPS 1/2 recirculation spray system.

For North Anna, the SW system is a forced feed-flow system supplied by four SW system pumps. The sources of cooling water for the North Anna SW system are the North Anna reservoir and the North Anna SW system reservoir. These two independent sources of water form the ultimate heat sink for NAS 1/2.

The Surry SW system is a gravity flow system. Three emergency SW pumps are available under abnormal conditions, but are not used during normal plant operation. The Surry SW system transfers heat from other station systems and components to the ultimate heat sink via the circulating water system. Cooling water flows from the intake canal to the SW system through branch lines from the circulating water system piping. The portions of the Surry circulating water systems that interact with the Surry SW system are reviewed and evaluated by the staff in Section 2.3.3.6 of this SER, and will not be discussed any further in this evaluation. The source of cooling water for the Surry SW system is the James River. Water is transferred from the James River by way of the intake canal. In addition to the component cooling system, the Surry SW system is used during normal plant operations to cool the bearing cooling water system, the charging pump service water subsystem, and other station applications such as airconditioning and chilled water.

Both the North Anna and Surry SW systems are two-loop systems. For North Anna, however, most of the SW system heat loads can be aligned to operate on either loop. During a design basis accident (DBA) the two loops are cross-connected at the recirculation spray heat

exchanger supply and return headers of the affected unit. The North Anna SW system is not a typical "two train" system. It is designed so that no single active component failure during a DBA will prevent the service water system from performing its safety-related (design) functions, even though it acts as a single system. Two operable loops are required to provide this capability. For Surry, the SW system is not typically cross-connected under normal and accident conditions. However, each loop is capable of supplying the necessary heat removal for normal and accident operations.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of the North Anna and Surry LRAs. As described in the scoping methodology, the applicant identified the portions of the SW system that are within the scope of license renewal on the license renewal drawings listed in Section 2.3.3.6 of each LRA. Consistent with the method described in each LRA, Section 2.1.5, "Screening Methodology," the applicant listed the North Anna and Surry SW systems mechanical component commodity groups that are subject to an AMR in Table 2.3.3-6 of each LRA. These tables also list the intended functions and the LRA sections that contain the AMR for each commodity group.

The portions of each SW systems that are subject to an AMR for North Anna and Surry include the components that make up the major flowpaths for each system. In each LRA Table 2.3.3-6. the applicant listed the component commodity groups subject to an AMR. For the North Anna SW system the applicant listed the following 18 component commodity groups subject to an AMR: SW instrument air receivers, corrosion rate monitor, expansion joints, filters/strainers, flexible connections, flow element, flow orifices, instrument valve assemblies, instrumentation, spray nozzles, piping, pump casings, radiation sensors, restricting orifices, temperature sensors, thermowells, tubing, and valve bodies. The applicant identified maintaining pressure boundary integrity, providing filtration, providing spray pattern, and restricting flow as the intended functions of the SCs that are subject to an AMR for the North Anna SW system. For the Surry SW system the applicant listed the following 21 component commodity groups subject to an AMR: charging pump intermediate seal coolers, emergency service water pump diesel jacket water radiators, emergency service water pump diesel oil coolers, expansion joints, emergency service water pump diesel fan/blower housing, emergency service water pump diesel filters, filters/strainers, flexible connections, flow elements, instrument valve assemblies, instrumentation, emergency service water pump diesel oil pans, piping, pump casings, radiation sensors, emergency service water pump diesel fuel oil tanks, spray shields, temperature sensors, thermowells, tubing, and valve bodies. The applicant identified maintaining pressure boundary integrity, providing heat transfer, filtration, flood barrier, and restricting flow as the intended functions of the SCs that are subject to an AMR for the Surry SW system.

2.3.3.7.2 Staff Evaluation

The staff reviewed Section 2.3.3.6 of the North Anna and Surry LRAs to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the North Anna and Surry SW systems that are within the scope of license renewal in accordance with 10 CFR 54.4, and that the applicant appropriately identified the SCs of the SW systems that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in Section 2.3.3.6 of each LRA, the applicable license renewal drawings, and the North Anna and Surry UFSARs to determine whether the

applicant adequately identified the portions of the North Anna and SPS 1/2 SW systems that are within the scope of license renewal. The staff verified that those portions of the SW systems that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Section 2.3.3.6 of each LRA. To verify that the applicant did include the applicable portions of the SW systems within the scope of license renewal, the staff focused its review on those portions of the North Anna and Surry SW systems that were not identified within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the UFSARs for each facility to identify any additional system functions that were not identified in each LRA and verified that these additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the SCs of the North Anna and Surry SW systems that are subject to AMR from among those portions of the SW systems that are identified as being within the scope of license renewal. The applicant identified and lists the SCs subject to AMR for the SW systems in Table 2.3.3-6 of each LRA using the screening methodology described in Section 2.1 of each LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER.

In the North Anna LRA, the applicant identified the portions of the SW systems that are within the scope of license renewal in the drawings listed below. The applicant also listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-6 of the North Anna LRA.

Unit 1

Unit 2

12050-LRM-074A, Sh. 3 12050-LRM-079B, Sh. 3

11715-LRM-040D, Sn. I
11715-LRM-040D, Sh. 2
11715-LRM-074A, Sh. 3
11715-LRM-078A, Sh. 1
11715-LRM-078A, Sh. 2
11715-LRM-078A, Sh. 3
11715-LRM-078A, Sh. 4
11715-LRM-078A, Sh. 5
11715-LRM-078B, Sh. 1
11715-LRM-078B. Sh. 3
11715-LRM-078C. Sh. 1
11715-LRM-078C, Sh. 2
11715-LRM-078G. Sh. 1
11715-LRM-078G. Sh. 2
11715-LRM-078H. Sh. 1
11715-LRM-078J. Sh. 1
11715-LBM-078K, Sh. 1
11715-I BM-078I Sh 1
11715-I BM-079C Sh 3
11715-I BM-079D Sh 4
11710-LINE073D, OIL 4
In the Surry LRA, the applicant identified the portions of the SW systems that are within the scope of license renewal in the drawings listed below. In addition, the applicant listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-6 of the Surry LRA.

<u>Unit_1</u>

<u>Unit 2</u>

11448-LRM-071A, Sh. 1 11448-LRM-071A, Sh. 2 11448-LRM-071A, Sh. 3 11448-LRM-071A, Sh. 4 11448-LRM-071B, Sh. 1 11448-LRM-071D, Sh. 1 11448-LRM-071E, Sh. 1 11448-LRM-077C, Sh. 1 11448-LRM-130A, Sh. 1 11548-LRM-071A, Sh. 2 11548-LRM-071A, Sh. 3 11548-LRM-071B, Sh. 1 11548-LRM-71C, Sh. 1 11548-LRM-130A, Sh. 1

The license renewal drawings were highlighted by the applicant to identify those portions of the SW systems that meet at least one of the scoping requirements of 10 CFR 54.4. The staff compared the license renewal drawings to the system drawings and the descriptions in the North Anna and Surry UFSARs to ensure they were representative of the SW systems. The staff performed its review by sampling the SCs that the applicant identified as being within the scope of license renewal but not subject to AMR to verify that no structure or component, that performs its intended function without moving parts or without a change in configuration or properties and that is not subject to replacement based on qualified life or specified time period, was excluded from an AMR. The staff 'did not identify any omissions.

As part of its review, the staff determined that the applicant occasionally uses a temporary service water (SW) flow path to perform maintenance on the single SW supply to the component cooling water heat exchangers. The Surry updated final UFSAR indicates that this temporary flow path piping is routed through the turbine building basement from the circulating water inlet piping to the supply piping of two of the component cooling heat exchangers. The UFSAR also indicates that the temporary flow path must be in accordance with an approved temporary change to the Surry technical specifications and an associated license condition, and is used only during a SPS Unit 1 outage. The staff asked the applicant if the temporary flow path piping received an AMR. The applicant responded that the temporary flow path piping is not within the scope of license renewal. The piping of concern is part of a temporary modification that is submitted to, and reviewed by, the staff as a technical specification exception to allow the applicant to operate outside of normal plant design and operating configuration to perform special maintenance activities. The staff found the applicant's response to be acceptable.

In addition, the SPS SW is supplied by the circulating water (CW) system. Intake canal water inventory is maintained during plant operation by up to four CW pumps per unit that take a suction from the James River at the low-level intake structure and discharge through large-bore pipes to the higher elevation intake canal. Antisiphoning standpipes are provided on the pump discharge pipes to prevent draining the intake canal in the event of backflow through these

lines. The Surry UFSAR indicates that this antisiphon function is provided by active (airoperated) vacuum breakers. The standpipes are also equipped with passive vacuum breakers to provide the important antisiphon function in the event of failure of the active vacuum breakers. The staff asked the applicant if the passive vacuum breakers have received an AMR. The applicant responded that the antisiphoning passive vacuum breakers are simply large holes in the piping at a specific elevation to ensure that the siphoning effect will not drain the intake canal below a certain level. The applicant stated that because the potential loss of material is the only applicable aging effect, and an increase in the size of the hole will not affect the intended function, no aging management is required. The staff found this explanation to be acceptable.

The additional discussions between the staff and the applicant regarding the Surry SW system temporary flow path and antisiphoning device are documented in a letter from the staff to the applicant dated October 11, 2001. This additional information can be found on the docket for the Surry LRA review.

2.3.3.7.3 Conclusion

On the basis of its review of the information contained in Section 2.3.3.6 of each LRA, the supporting information in the North Anna and Surry UFSARs, and the license renewal drawings, as described above, the staff did not identify any omissions in the scoping and screening of the North Anna and Surry SW systems by the applicant. Therefore, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the North Anna and Surry SW systems that are within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.8 Chilled Water

In the North Anna LRA, Section 2.3.3.7, "Chilled Water," the applicant describes the piping and mechanical components of the chilled water (CD) systems that are within the scope of license renewal and subject to an AMR for NAS 1/2. These systems are identical for the purposes of license renewal for both NAS units without any notable differences in system design. The North Anna CD structural components that are subject to AMR are presented separately by the applicant in Section 2.4.10 of NAS LRA "General Structural Supports," as commodity groups and, therefore, are evaluated separately by the staff in Section 2.4.10 of this SER. The CD piping and mechanical components are further described by the applicant in Chapter 9.2.2 and 9.4.1 of the North Anna UFSAR.

The Surry LRA does not have a section dedicated to the CD system. The intended functions of the CD systems for Surry are performed by the SPS 1/2 containment air recirculation cooler flowpaths (included in component cooling systems), the main control room and emergency switchgear room air-conditioning (included in Ventilation System and bearing cooling systems.) These systems have evaluated in Sections 2.3.3.10, 2.3.3.24, and 2.3.3.9 of this SER. Therefore, the following evaluation only applies to NAS 1/2.

2.3.3.8.1 Summary of Technical Information in the Application

The CD systems for NAS 1/2 are defined in the North Anna UFSAR as subsystems of the component cooling systems. For NAS 1/2, the CD system designation is applied to the CD

system and the main control room and emergency switchgear room (MCR/ESGR) airconditioning CD system. Each CD subsystem provides chilled water to remove heat from various plant loads including the containment air recirculation coolers. The applicant states that the CD subsystems do not remove heat from equipment that is required to maintain the plant in a safe condition. However, the applicant identified the portions of the CD systems that perform a containment pressure boundary function within the scope of license renewal and subject to an AMR. In addition, the portions of the CD system that performs an SW system pressure boundary function when the SW systems are cross-connected are also identified as being within the scope of license renewal and subject to an AMR, but are considered in the staff review of the heating and ventilation systems in Section 2.3.3.24 of this SER.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of the North Anna and LRA. As described in the scoping methodology, the applicant identified the portions of the CD systems that are within the scope of license renewal on the license renewal drawings listed in Section 2.3.3.7 of the North Anna LRA. Consistent with the method described in each LRA, Section 2.1.5, "Screening Methodology," the applicant listed the NAS 1/2 CD mechanical component commodity groups that are subject to an AMR in Table 2.3.3-7 of the North Anna LRA. This table also list the intended functions and the LRA sections that contain the AMR for each commodity group.

The portions of each CD system that are subject to an AMR for NAS 1/2 include the components that make up the containment pressure boundary. In the NAS LRA Table 2.3.3-7, the applicant listed the following four component commodity groups subject to an AMR: filters/strainers, instrument valve assemblies, pipe, and valve bodies. The applicant identified maintaining pressure boundary integrity and filtration as the intended functions of the SCs that are subject to an AMR for the NAS 1/2 CD systems.

2.3.3.8.2 Staff Evaluation

The staff reviewed Section 2.3.3.7 of the North Anna LRA to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the NAS 1/2 CD systems that are within the scope of license renewal in accordance with 10 CFR 54.4, and that the applicant appropriately identified the SCs of the CD systems that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in Section 2.3.3.7 of the North Anna LRA, the applicable license renewal drawings, and the North Anna UFSAR to determine whether the applicant adequately identified the portions of the NAS 1/2 CD systems that are within the scope of license renewal. The staff verified that those portions of the CD systems that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Section 2.3.3.7 of the North Anna LRA. To verify that the applicant did include the applicable portions of the CD systems within the scope of license renewal, the staff focused its review on those portions of the NAS 1/2 CD systems that were not identified within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the North Anna UFSAR to identify any additional system functions that were not identified in the LRA, and verified that these additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the SCs of the NAS 1/2 CD systems that are subject to AMR from among those portions of the CD systems that are identified as being within the scope of license renewal. The applicant identified and lists the SCs subject to AMR for the CD systems in Table 2.3.3-7 of the North Anna LRA using the screening methodology described in Section 2.1 of each LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER.

In the North Anna LRA, the applicant identified the portions of the CD systems that are within the scope of license renewal in the drawings listed below. The applicant also listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-7 of the North Anna LRA.

Unit 1

<u>Unit 2</u>

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12050-LRM-079B. Sh. 3

11715-LRM-040C, Sh. 1 11715-LRM-040C, Sh. 2 11715-LRM-040E, Sh. 1 11715-LRM-040E, Sh. 2 11715-LRM-079D, Sh. 4 12050-LRM-079B, Sh. 3

The license renewal drawings were highlighted by the applicant to identify those portions of the CD systems that meet at least one of the scoping requirements of 10 CFR 54.4. The staff compared the license renewal drawings to the system drawings and the descriptions in the North Anna UFSAR to ensure they were representative of the CD systems. The staff performed its review by sampling the SCs that the applicant identified as being within the scope of license renewal but not subject to AMR to verify that no structure or component, that performs its intended function without moving parts or without a change in configuration or properties and, that are not subject to replacement based on qualified life or specified time period, was excluded from an AMR. The staff did not identify any omissions.

2.3.3.8.3 Conclusion

On the basis of its review of the information contained in Section 2.3.3.7 of the NAS LRA, the supporting information in the North Anna UFSAR, and the license renewal drawings, as described above, the staff did not identify any omissions in the scoping and screening of the NAS 1/2 CD systems by the applicant. Therefore, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the NAS 1/2 CD systems that are within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.9 Bearing Cooling

In the Surry LRA, Section 2.3.3.7, "Bearing Cooling," the applicant describes the components of the bearing cooling (BC) systems for SPS 1/2 that are within the scope of license renewal and subject to an AMR for SPS 1/2. These systems are identical for the purposes of license renewal for both SPS units without any notable differences in system design. The Surry BC structural components that are subject to AMR are presented separately by the applicant in

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Section 2.4.10 of each LRA, "General Structural Supports," as commodity groups and, therefore, are evaluated separately by the staff in Section 2.4.10 of this SER. These systems are further described in Section 10.3.9 of the Surry UFSAR. The NAS 1/2 do not have bearing cooling systems; therefore, the following staff evaluation only applies to the Surry LRA.

2.3.3.9.1 Summary of Technical Information in the Application

The SPS 1/2 BC systems are intermediate cooling systems whose primary function is to transfer heat from a number of plant systems and components to the SPS service water systems. These systems also provide makeup water to the main control rooms and emergency switchgear rooms air-conditioning chilled water systems. The BC systems are closed cooling water systems utilizing a corrosion inhibitor.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of each LRA. As described in the scoping methodology, the applicant identified the portions of the BC systems that are within the scope of license renewal on the license renewal drawings listed in Section 2.3.3.7 of each LRA. Consistent with the methodology described in the LRA, Section 2.1.5, "Screening Methodology," the applicant listed the BC system mechanical component commodity groupings that are within the license renewal evaluation boundaries and that are subject to an AMR in Table 2.3.3-7 of the Surry LRA. The tables also list the intended functions, and the Surry LRA section containing the AMR for each commodity group.

The portions of the BC systems that are subject to AMR include the BC system components that form part of the chilled water system pressure boundary for the main control rooms and emergency switchgear rooms air-conditioning units. In the LRA, Table 2.3.3-7, the applicant listed the following three component commodity groups as subject to an AMR: pipes, tanks, and valve bodies. The applicant identified maintaining pressure boundary integrity as the only intended function of the SCs that is subject to an AMR.

2.3.3.9.2 Staff Evaluation

The staff reviewed Section 2.3.3.7 of the SPS LRA to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the BC systems that are within the scope of license renewal in accordance with 10 CFR 54.4, and that the applicant appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in Section 2.3.3.7 of the LRA, the applicable license renewal drawings, and the Surry UFSAR to determine whether the applicant adequately identified the portions of the BC systems that are within the scope of license renewal. The staff verified that those portions of the BC systems that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Section 2.3.3.7 of the SPS LRA. To verify that the applicant did include the applicable portions of the BC systems that were not identified within the scope of license renewal, the staff focused its review on those portions of the BC systems that were not identified within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4(a). In addition, the staff reviewed the SPS UFSAR to identify any additional system functions that were not

identified in the LRA, and verified that these additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the BC systems that are identified within the scope of license renewal. The applicant identified and lists the SCs subject to AMR for the SPS BC systems in Table 2.3.3-7 of the LRA using the screening methodology described in Section 2.1 of each LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER.

In the SPS LRA, the applicant identified the portions of the BC systems that are within the scope of license renewal in the drawings listed below. In addition, the applicant listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-7 of the LRA:

<u>Unit 1</u>	<u>Unit 2</u>
11448-LRB-041A; Sh. 2	11548-LRM-73A, Sh. 1

The license renewal drawings were highlighted by the applicant to identify those portions of the BC systems that meet at least one of the scoping requirements of 10 CFR 54.4. The staff compared the license renewal drawings to the system drawings and the description in the SPS UFSAR to ensure that they were representative of the BC systems. The staff performed its review by sampling the SCs that the applicant identified as being within the scope of license renewal but not subject to AMR to verify that no structure or component, that performs its intended function without moving parts or without a change in configuration or properties and, that are not subject to replacement based on qualified life or specified time period, was excluded from an AMR. The staff did not identify any omissions.

2.3.3.9.3 Conclusions

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On the basis of its review of the information contained in Section 2.3.3.7 of the Surry LRA and the supporting information in the Surry UFSAR and license renewal drawings, as described above, the staff did not identify any omissions in the scoping of the BC systems by the applicant. Therefore, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the SPS 1/2 BC systems that are within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.10 Component Cooling

In the North Anna and Surry LRAs, Section 2.3.3.8, "Component Cooling," the applicant describes the piping and mechanical components of the component cooling (CC) systems that are within the scope of license renewal and subject to an AMR for NAS 1/2 and SPS 1/2. NAS 1/2 and SPS 1/2 each has a CC system. These systems are similar for both facilities, but with some differences in system design and application. Any notable differences are specifically identified and discussed in the staff's evaluation. Unless otherwise specified, the information provided below is applicable to both the North Anna and Surry CC systems. The CC structural

components that are subject to AMR are presented separately by the applicant in Section 2.4.10 of each LRA, "General Structural Supports," as commodity groups and, therefore, are evaluated separately by the staff in Section 2.4.10 of this SER. The CC piping and mechanical components are further described by the applicant in Chapter 9.2.2 of the North Anna UFSAR and Chapter 9.4 of the Surry UFSAR.

2.3.3.10.1 Summary of Technical Information in the Application

The NAS 1/2 and SPS 1/2 CC systems consist of the component cooling water, chilled water, and neutron shield tank cooling water subsystems. These subsystems can be used individually or in combination with each other to provide cooling water for the removal of heat from components. The NAS 1/2 and SPS 1/2 CC systems are intermediate cooling systems that transfer heat from plant systems and components to the service water system. Each CC system supports safety-related and non-safety-related systems and components that contain potentially radioactive fluids. The NAS 1/2 and SPS 1/2 CC systems are closed cooling water systems utilizing corrosion inhibitors.

For SPS 1/2, the CC systems are made up of two additional subsystems (in addition to the three subsystems listed above): the chilled component cooling water and the charging pump cooling water systems.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of the North Anna and Surry LRAs. As described in the scoping methodology, the applicant identified the portions of the NAS 1/2 and SPS 1/2 CC systems that are within the scope of license renewal on the license renewal drawings listed in Section 2.3.3.8 of each LRA. Consistent with the method described in each LRA, Section 2.1.5, "Screening Methodology," the applicant listed the NAS 1/2 and SPS 1/2 CC mechanical component commodity groups that are subject to an AMR in Table 2.3.3-8 of each LRA. These tables also list the intended functions and the LRA sections that contain the AMR for each commodity group.

In each LRA Section 2.3.3.8, the applicant states that the portion of the CC system that is subject to AMR consists of the components that are required to support heat removal function, and the components that perform a containment pressure boundary function. In each LRA Table 2.3.3-8, the applicant listed the following 13 component commodity groups subject to an AMR for NAS 1/2 and SPS 1/2 CC systems: CC heat exchangers, expansion joints, filters/strainers flow elements, flow indicators, instrument valve assemblies, level indicators, piping, pipe penetration cooling coils, pump casings, tanks, thermowells, tubing, and valve bodies. In addition, NAS 1/2 CC systems component commodity groups also include flexible connections and radiation sensors, and SPS 1/2 CC systems component commodity groups also include flexible dentified that the intended functions of the SCs that are subject to an AMR for the NAS 1/2 and SPS 1/2 CC systems are maintaining pressure boundary integrity, providing heat transfer, providing filtration, and restricting flow.

2.3.3.10.2 Staff Evaluation

The staff reviewed the North Anna and Surry LRAs, Section 2.3.3.8, to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the NAS 1/2

and SPS 1/2 CC systems that are within the scope of license renewal in accordance with 10 CFR 54.4, and that the applicant appropriately identified the SCs of the CC systems that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in Section 2.3.3.8 of each LRA, the applicable license renewal drawings, and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the portions of the NAS 1/2 and SPS 1/2 CC systems that are within the scope of license renewal. The staff verified that those portions of the CC systems that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Section 2.3.3.8 of each LRA. To verify that the applicant did include the applicable portions of the CC systems within the scope of license renewal, the staff focused its review on those portions of the NAS 1/2 and SPS 1/2 CC systems that were not identified within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the UFSARs for each facility to identify any additional system functions that were not identified in each LRA and verified that these additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the SCs of the NAS 1/2 and SPS 1/2 CC systems that are subject to AMR from among those portions of the CC systems that are identified as being within the scope of license renewal. The applicant identified and lists the SCs subject to AMR for the CC systems in Table 2.3.3-8 of each LRA using the screening methodology described in Section 2.1 of each LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER.

In the North Anna LRA, the applicant identified the portions of the CC systems that are within the scope of license renewal in the drawings listed below. The applicant also listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-8 of the North Anna LRA.

<u>Unit 1</u>

Unit 2

11448-LRM-071B, Sh. 2	11548-LRM-071B, Sh. 2
11448-LRM-072A, Sh. 1	11548-LRM-072A, Sh. 1
11448-LRM-072A, Sh. 2	11548-LRM-072A, Sh. 2
11448-LRM-072A, Sh. 3	11548-LRM-072A, Sh. 3
11448-LRM-072A, Sh. 4	11548-LRM-072A, Sh. 4
11448-LRM-072A, Sh. 5	11548-LRM-072A, Sh. 5
11448-LRM-072A, Sh. 6	11548-LRM-072A, Sh. 6
11448-LRM-072A, Sh. 7	11548-LRM-072A, Sh. 7
11448-LRM-072B, Sh. 1	11548-LRM-072B, Sh. 1
11448-LRM-072B, Sh. 2	11548-LRM-072B, Sh. 2
11448-LRM-072B, Sh. 3	11548-LRM-072B, Sh. 3
11448-LRM-072C, Sh. 1	11548-LRM-072C, Sh. 1
11448-LRM-072C, Sh. 2	11548-LRM-072C, Sh. 2
11448-LRM-072C, Sh. 3	
11448-LRM-072C, Sh. 4	
11448-LRM-072C, Sh. 5	
11448-LRM-072D, Sh. 1	
11448-LRM-072D, Sh. 2	
11448-LRM-072D, Sh. 3	
11448-LRM-072E, Sh. 1	
11448-LRM-072E, Sh. 2	

11448-LRM-072G, Sh. 1

In the Surry LRA, the applicant identified the portions of the CC systems that are within the scope of license renewal in the drawings listed below. In addition, the applicant listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-8 of the Surry LRA.

<u>Unit 1</u>
11448-LRM-071B, Sh. 2
11448-LRM-072A, Sh. 1
11448-LRM-072A, Sh. 2
11448-LRM-072A, Sh. 3
11448-LRM-072A, Sh. 4
11448-LRM-072A, Sh. 5
11448-LRM-072A, Sh. 6
11448-LRM-072A, Sh. 7
11448-LRM-072B, Sh. 1
11448-LRM-072B, Sh. 2
11448-LRM-072B, Sh. 3
11448-LRM-072C, Sh. 1
11448-LRM-072C, Sh. 2
11448-LRM-072C, Sh. 3
11448-LRM-072C, Sh. 4
11448-LRM-072C, Sh. 5
11448-LRM-072D, Sh. 1
11448-LRM-072D, Sh. 2
11448-LRM-072D, Sh. 3
11448-LRM-072E, Sh. 1
11448-LRM-072E, Sh. 2
11448-LRM-072G, Sh. 1

U	n	it	2

11548-LRM-071B, Sh. 2
11548-LRM-072A, Sh. 1
11548-LRM-072A, Sh. 2
11548-LRM-072A, Sh. 3
11548-LRM-072A, Sh. 4
11548-LRM-072A, Sh. 5
11548-LRM-072A, Sh. 6
11548-LRM-072A, Sh. 7
11548-LRM-072B, Sh. 1
11548-LRM-072B, Sh. 2
11548-LRM-072B, Sh. 3
11548-LRM-072C, Sh. 1
11548-LRM-072C, Sh. 2

The license renewal drawings were highlighted by the applicant to identify those portions of the CC systems that meet at least one of the scoping requirements of 10 CFR 54.4. The staff compared the license renewal drawings to the system drawings and the descriptions in the North Anna and Surry UFSARs to ensure they were representative of the CC systems. The staff performed its review by sampling the SCs that the applicant identified as being within the scope of license renewal but not subject to AMR to verify that no structure or component, that performs its intended function without moving parts or without a change in configuration or properties and, that are not subject to replacement based on qualified life or specified time period, was excluded from an AMR. The staff did not identify any omissions.

2.3.3.10.3 Conclusion

On the basis of its review of the information contained in Section 2.3.3.8 of each LRA, the supporting information in the North Anna and Surry UFSARs, and the license renewal drawings, as described above, the staff did not identify any omissions in the scoping and screening of the NAS 1/2 and SPS 1/2 CC systems by the applicant. Therefore, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the NAS 1/2 and SPS 1/2 CC systems that are within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.11 Neutron Shield Tank Cooling

In the North Anna and Surry LRAs, Section 2.3.3.9, "Neutron Shield Tank Cooling," the applicant describes the components of the neutron shield tank cooling (NS) systems that are within the scope of license renewal and subject to an AMR. NAS 1/2 and SPS 1/2 each has an NS system. These systems are identical for the purposes of license renewal for both facilities without any notable differences in system design. The NS structural components that are subject to AMR are presented separately by the applicant in Section 2.4.10 of each LRA, "General Structural Supports," as commodity groups and, therefore, are evaluated separately by the staff in Section 2.4.10 of this SER. The NS systems are further described in Section 9 of the North Anna and Surry UFSARs.

2.3.3.11.1 Summary of Technical Information in the Application

The North Anna and Surry NS systems provide cooling for the neutron shield tank fluid, which is heated by the attenuation of neutron and gamma radiation in the vicinity of the reactor vessel. The neutron shield tank fluid cooling is provided by the component cooling (CC) system.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology" of each LRA. As described in the scoping methodology, the applicant identified the portions of the NAS 1/2 and SPS 1/2 NS systems that are within the scope of license renewal on the license renewal drawings listed in Section 2.3.3.9 of each LRA. Consistent with the method described in each LRA Section 2.1.5, "Screening Methodology," the applicant listed the NAS 1/2 and SPS 1/2 NS systems mechanical component commodity groupings that are within the license renewal evaluation boundaries and that are subject to an AMR in Table 2.3.3-9 of each LRA. The table also lists the intended functions, and the LRA section containing the AMR for each commodity grouping.

The portions of the NAS 1/2 and SPS 1/2 NS systems that are subject to AMR include the NS components that provide a pressure boundary function for the component cooling water systems. In each LRA Table 2.3.3-9, the applicant listed the following six component commodity groups subject to an AMR: bolting, neutron shield tank coolers, pipe, pump casings, tanks, and valve bodies. The applicant identified maintaining system pressure boundary integrity as the only intended function for the NS system SCs that are subject to an AMR.

2.3.3.11.2 Staff Evaluation

The staff reviewed Section 2.3.3.9 of each LRA to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the NAS 1/2 and SPS 1/2 NS systems that are within the scope of license renewal in accordance with 10 CFR 54.4 and that the applicant appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided by the applicant in Section 2.3.3.9 of each LRA, the applicable license renewal drawings, and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the portions of the NS systems that are within the scope of license renewal. The staff verified that those portions of the NS systems that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and

were identified as such by the applicant in Section 2.3.3.9 of each LRA. To verify that the applicant did include the applicable portions of the NAS 1/2 and SPS 1/2 NS systems within the scope of license renewal, the staff focused its review on those portions of the NS systems that were not identified within the scope of license renewal to verify that they do not meet the scoping requirements of 10 CFR 54.4(a). The staff also reviewed the UFSARs to determine whether there were any additional system functions that were not identified in each LRA and verified that those additional functions did not meet any of the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the NAS 1/2 and SPS 1/2 NS systems that are identified as being within the scope of license renewal. The applicant identified and lists the SCs subject to AMR for the NS systems in Table 2.3.3-9 of each LRA using the screening methodology described in Section 2.1 of each LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER.

In the North Anna LRA, the applicant identified the portions of the NS systems that are within the scope of license renewal in the license renewal drawings listed below. The applicant also listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-9 of the North Anna LRA.

<u>Unit 1</u>	<u>Unit 2</u>
11715-LRM-079B, Sh. 5 12050-LRM-079A, Sh. 5	11548-LRM-072A, Sh. 7 11548-LRM-072B, Sh. 1 11548-I RM-072B, Sh. 3

In Surry LRA, the applicant identified the portions of the NS system that are within the scope of license renewal in the drawings listed below. In addition, the applicant listed the mechanical component commodity groups that are subject to AMR and its intended functions in Table 2.3.3-9 of the Surry LRA.

<u>Unit 2</u>
11548-LRM-072A, Sh. 7 11548-LRM-072B, Sh. 1

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The license renewal drawings were highlighted by the applicant to identify those portions of the NS systems that meet at least one of the scoping requirements of 10 CFR 54.4. The staff compared these drawings to the system drawings and the descriptions in both UFSARs to ensure they were representative of the NS systems. The staff performed its review by sampling the SCs that the applicant identified as being within the scope of license renewal but not subject to AMR to verify that no structure or component, that performs its intended function without moving parts or without a change in configuration or properties and, that are not subject to replacement based on qualified life or specified time period, was excluded from an AMR. The staff did not identify any omissions.

2.3.3.11.3 Conclusions

On the basis of its review of the information contained in Section 2.3.3.9 of each LRA the supporting information in the North Anna and Surry UFSARs, and license renewal drawings, as described above, the staff did not identify any omissions in the scoping of the NAS 1/2 and SPS 1/2 NS systems by the applicant. Therefore, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the NAS 1/2 and SPS 1/2 NS systems that are within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.12 Primary Grade Water

In the Surry LRA, Section 2.3.3.10, "Primary Grade Water," the applicant describes the piping and mechanical components of the primary grade water (PG) system that are within the scope of license renewal and subject to an AMR for Surry. The PG structural components that are subject to AMR are presented separately by the applicant in Section 2.4.10 of the SPS LRA "General Structural Supports," as commodity groups and, therefore, are evaluated separately by the staff in Section 2.4.10 of this SER. The PG piping and mechanical components are further described by the applicant in Chapter 9.2 of the Surry UFSAR.

For North Anna, the PG system contains no mechanical components that are within the scope of license renewal. Therefore, the following evaluation only applies to Surry LRA.

2.3.3.12.1 Summary of Technical Information in the Application

The Surry PG system primary function is to provide treated-water to plant systems for makeup, flushing, cooling, and other uses. Although providing treated-water for makeup, flushing, cooling, and other uses does not meet the scoping requirements for license renewal, portions of the Surry PG system also provide a pressure boundary for the chemical and volume control system and the fuel pit cooling system. The PG system piping and components that serve these pressure boundary functions are within the scope of license renewal and are subject to AMR.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of the Surry LRA. As described in the scoping methodology, the applicant identified the portions of the Surry PG system that are within the scope of license renewal on the license renewal drawings listed in Section 2.3.3.10 of the Surry LRA. Consistent with the method described in the LRA, Section 2.1.5, "Screening Methodology," the applicant listed the Surry PG system mechanical component commodity groups that are subject to an AMR in Table 2.3.3-10 of the Surry LRA. This table also lists the intended functions and the LRA section that contains the AMR for each commodity group.

The portions of the Surry PG system that are subject to an AMR include the components that makeup the pressure boundary for the chemical and volume control system and the fuel pit cooling system. In the LRA Table 2.3.3-10, the applicant listed the following three component commodity groups subject to an AMR: bolting, pipe, and valve bodies. The applicant identified maintaining pressure boundary integrity as the intended function of the SCs that are subject to an AMR for the Surry PG system.

2.3.3.12.2 Staff Evaluation

The staff reviewed the Surry LRA, Section 2.3.3.10, to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the Surry PG system that are within the scope of license renewal in accordance with 10 CFR 54.4, and that the applicant appropriately identified the SCs of the PG systems that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in Section 2.3.3.10 of the Surry LRA, the applicable license renewal drawings, and the Surry UFSAR to determine whether the applicant adequately identified the portions of the Surry PG system that are within the scope of license renewal. The staff verified that those portions of the PG system that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Section 2.3.3.10 of the Surry LRA. To verify that the applicant did include the applicable portions of the PG system within the scope of license renewal, the staff focused its review on those portions of the Surry PG system that were not identified within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the Surry UFSAR to identify any additional system functions that were not identified in the LRA, and verified that these additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

In addition, the staff reviewed the North Anna UFSAR to identify any intended functions of the North Anna PG system that met the scoping requirements of 10 CFR 54.4. The staff did not identify any intended function that would require including the North Anna PG system within the scope of license renewal.

The staff then determined whether the applicant had properly identified the SCs of the Surry PG system that are subject to AMR from among those portions of the PG system that are identified as being within the scope of license renewal. The applicant identified and lists the SCs subject to AMR for the PG system in Table 2.3.3-10 of Surry LRA using the screening methodology described in Section 2.1 of each LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER.

In the Surry LRA, the applicant identified the portions of the PG system that are within the scope of license renewal in the drawings listed below. In addition, the applicant listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-10 of the Surry LRA.

<u>Unit 1</u>

Unit 2

Common

11448-LRM-079C, Sh. 1 11448-LRM-079D, Sh. 1 11448-LRM-081A, Sh. 1

The license renewal drawings were highlighted by the applicant to identify those portions of the PG systems that meet at least one of the scoping requirements of 10 CFR 54.4. The staff compared the license renewal drawings to the system drawings and the descriptions in the Surry UFSAR to ensure they were representative of the PG system. The staff performed its

review by sampling the SCs that the applicant identified as being within the scope of license renewal but not subject to AMR to verify that no structure or component, that performs its intended function without moving parts or without a change in configuration or properties and, that are not subject to replacement based on qualified life or specified time period, was excluded from an AMR. The staff did not identify any omissions.

2.3.3.12.3 Conclusion

On the basis of its review of the information contained in Section 2.3.3.10 of the Surry LRA, the supporting information in the North Anna and Surry UFSARs, and the license renewal drawings, as described above, the staff did not identify any omissions in the scoping and screening of the North Anna and Surry PG systems by the applicant. Therefore, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the Surry PG system that are within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.13 Alternate AC (AAC) Diesel Generator Systems

In the North Anna LRA, Section 2.3.3.10, and the Surry LRA, Section 2.3.3.11, both entitled "Alternate AC (AAC) Diesel Generator Systems," the applicant describes the piping and mechanical components of the AAC systems that are within the scope of license renewal and subject to an AMR for North Anna and Surry. The AAC systems discussed in the following staff evaluation include the diesel generator and associated support systems. These systems are identical for the purpose of license renewal for both facilities with no notable differences. The AAC systems structural components that are subject to AMR are presented separately by the applicant in Section 2.4.10 of each LRA, "General Structural Supports," as commodity groups and, therefore, are evaluated separately by the staff in Section 2.4.10 of this SER. The AAC system piping and mechanical components are further described by the applicant in Section 9.5.11 of the North Anna UFSAR and Section 8.4.6 of the Surry UFSAR.

2.3.3.13.1 Summary of Technical Information in the Application

The North Anna and Surry AAC systems were installed in response to 10 CFR 50.63, "Loss of all AC power," and provide alternating current (AC) power to an emergency electrical bus during a Station Blackout (SBO) event. The AAC systems consist of the diesel generator and associated support systems. In North Anna LRA, Section 2.3.3.10, and the Surry 2.3.3.11, the applicant states that the diesel engine and electrical generator are within the scope of license renewal but are active components and, therefore, are not subject to AMR. The AAC supporting systems that are within the scope of license renewal include the portions of the AAC diesel cooling water (BCW) system, diesel fuel oil (BFO) system, diesel lubricating oil (BLO) system, and diesel starting air (BSA) system for both North Anna and Surry that are required for the operation of the AAC systems to meet SBO requirements.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of the North Anna and Surry LRAs. As described in the scoping methodology, the applicant identified the portions of the AAC systems that are within the scope of license renewal on the license renewal drawings listed in the North Anna LRA, Section 2.3.3.10, and the Surry LRA, Section 2.3.3.11. Consistent with the method described in each LRA, Section 2.1.5, "Screening Methodology,"

the applicant listed the North Anna and Surry AAC systems mechanical component commodity groups that are subject to an AMR in Table 2.3.3-10 and Table 2.3.3.11 of North Anna and Surry LRAs, respectively. These tables also list the intended functions and the LRA sections that contain the AMR for each commodity group.

The portions of the AAC systems that are subject to an AMR for North Anna and Surry include those long-lived, passive SCs that are required for the operation of the AAC systems to meet SBO requirements. In North Anna LRA, Table 2.3.3-10, and the Surry LRA, Table 2.3.3-11, the applicant listed the following 19 component commodity groups subject to an AMR: accumulators, air receivers, diesel aftercoolers, diesel fuel oil coolers, diesel jacket water radiators, diesel lube oil coolers, fan/blower housing, filters/strainers, heaters, instrument valve assemblies, level indicators, oil pans, pipe, pump casings, restricting orifices, tanks, thermowells, tubing, valve bodies. The applicant identified maintaining pressure boundary integrity and restricting flow as the intended functions of the SCs that are subject to an AMR for the North Anna and Surry AAC systems.

2.3.3.13.2 Staff Evaluation

The staff reviewed the North Anna LRA, Section 2.3.3.10, and the Surry LRA, Section 2.3.3.11, to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the North Anna and Surry AAC systems that are within the scope of license renewal in accordance with 10 CFR 54.4, and that the applicant appropriately identified the SCs of the AAC systems that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in Sections 2.3.3.10 and 2.3.3.11 of the North Anna and Surry LRAs, respectively, the applicable license renewal drawings, and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the portions of the North Anna and Surry AAC systems that are within the scope of license renewal. The staff verified that those portions of the AAC system that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant In the North Anna and Surry LRAs. To verify that the applicant did include the applicable portions of the North Anna and Surry AAC systems within the scope of license renewal, the staff focused its review on those portions of the North Anna and Surry AAC systems that were not identified within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the UFSARs for each facility to identify any additional system functions that were not identified in each LRA and verified that these additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the SCs of the North Anna and Surry AAC systems that are subject to AMR from among those portions of the AAC systems that are identified as being within the scope of license renewal. The applicant identified and lists the SCs subject to AMR for the AAC systems in the North Anna and Surry LRAs, Table 2.3.3-10 and Table 2.3.3.11, respectively, using the screening methodology described in Section 2.1 of each LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER. In the North Anna LRA, the applicant identified the portions of the AAC systems that are within the scope of license renewal in the drawings listed below. The applicant also listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-10 of the North Anna LRA.

<u>Unit 1</u>

<u>Unit 2</u>

Common

11715-LRM-113A, Sh. 1 11715-LRM-113B, Sh. 1 11715-LRM-113C, Sh. 1 11715-LRM-113D, Sh. 1 11715-LRM-113E, Sh. 1

In the Surry LRA, the applicant identified the portions of the AAC systems that are within the scope of license renewal in the drawings listed below. In addition, the applicant listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-11 of the Surry LRA.

<u>Unit 1</u>	<u>Unit 2</u>
11448-LRB-038B, Sh. 1 11448-LRB-046D, Sh. 1 11448-LRB-046D, Sh. 2 11448-LRB-046D, Sh. 3 11448-LRB-046D, Sh. 4	Common

The license renewal drawings were highlighted by the applicant to identify those portions of the CH systems that meet at least one of the scoping requirements of 10 CFR 54.4. The staff compared the license renewal drawings to the system drawings and the descriptions in the North Anna and Surry UFSARs to ensure they were representative of the AAC systems. The staff performed its review by sampling the SCs that the applicant identified as being within the scope of license renewal but not subject to AMR to verify that no structure or component, that performs its intended function without moving parts or without a change in configuration or properties and, that are not subject to replacement based on qualified life or specified time period, was excluded from an AMR. The staff did not identify any omissions.

2.3.3.13.3 Conclusion

On the basis of its review of the information contained in the North Anna LRA, Section 2.3.3.10, and the Surry LRA, Section 2.3.3.11, the supporting information in the North Anna and Surry UFSARs, and the license renewal drawings, as described above, the staff did not identify any omissions in the scoping and screening of the North Anna and Surry AAC systems by the applicant. Therefore, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the North Anna and Surry AAC systems that are within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.14 Emergency Diesel Generator Systems

In the North Anna LRA, Section 2.3.3.11, and the Surry LRA, Section 2.3.3.12, both entitled "Emergency Diesel Generator Systems," the applicant describes the piping and mechanical components of the emergency diesel generators (EDGs) that are within the scope of license renewal and subject to an AMR for NAS 1/2 and SPS 1/2. The EDG systems discussed in the following staff evaluation include the diesel generator and associated support systems. Each unit of NAS and SPS has an EDG. The EDG systems are similar for both facilities with some minor differences in system design. Any notable differences are specifically identified and discussed in the staff's evaluation. Unless otherwise specified, the information provided below is applicable to both the NAS 1/2 and SPS 1/2 EDG systems. The EDG structural components that are subject to AMR are presented separately by the applicant in Section 2.4.10 of each LRA, "General Structural Supports," as commodity groups and, therefore, are evaluated separately by the staff in Section 2.4.10 of this SER. The EDG piping and mechanical components are further described by the applicant in Sections 8.3.1, and 9.5.4 to 9.5.8 of the North Anna UFSAR and Section 8.5 of the Surry UFSAR.

2.3.3.14.1 Summary of Technical Information in the Application

For NAS 1/2 and SPS 1/2 the EDGs are a diesel engine driven electrical generator that provides a backup source of electrical power to the emergency electrical bus in the event that the normal supply is unavailable. At North Anna, the EDG systems consist of the diesel generator and the following support systems: emergency diesel generator cooling (EC) systems, emergency generator (EG) system, emergency diesel generator lubrication (EL) systems, emergency diesel generator starting air (EB) systems, fuel oil (FO) system. At Surry, the EDG systems consist of the emergency generator (EG) systems and the emergency electrical power (EE) systems. The Surry EE and EG systems are functionally equivalent to the North Anna emergency diesel generator cooling (EC) systems, emergency diesel generator lubrication (EL) systems, emergency generator (EG) systems, emergency diesel generator starting air (EB) systems, and fuel oil (FO) systems. The portion of the EDG support systems that are subject to AMR consists of the components that are required for operation of the EDGs.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of the North Anna and Surry LRAs. As described in the scoping methodology, the applicant identified the portions of the EDG systems that are within the scope of license renewal on the license renewal drawings listed in the North Anna LRA, Section 2.3.3.11, and the Surry LRA, Section 2.3.3.12. Consistent with the method described in each LRA, Section 2.1.5, "Screening Methodology," the applicant listed the NAS 1/2 and SPS 1/2 mechanical component commodity groups that are subject to an AMR in Tables 2.3.3-11 and 2.3.3-12, respectively, of each LRA. These tables also list the intended functions and the LRA sections that contain the AMR for each commodity group.

The portions of each EDG systems that are subject to an AMR for NAS 1/2 and SPS 1/2 include the following 4 component commodity groups: air receivers, diesel aftercoolers, diesel jacket water radiators, diesel lube oil coolers, fan/blower housings, filters/strainers, flow orifices, heaters, instrument valve assemblies, level indicators, oil pans, pipe, pump casings, tanks, thermowells, tubing, valve bodies. The applicant identified maintaining pressure boundary

integrity and flow restriction as the intended functions of the SCs that are subject to an AMR for the NAS 1/2 and SPS 1/2 EDG systems.

2.3.3.14.2 Staff Evaluation

The staff reviewed Section 2.3.3.11 of the North Anna LRA and Section 2.3.3.12 of the Surry LRA to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the NAS 1/2 and SPS 1/2 EDG systems that are within the scope of license renewal in accordance with 10 CFR 54.4, and that the applicant appropriately identified the SCs of the EDG systems that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in each LRA, the applicable license renewal drawings, and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the portions of the NAS 1/2 and SPS 1/2 EDG systems that are within the scope of license renewal. The staff verified that those portions of the EDG systems that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Sections 2.3.3.11 and 2.3.3.12 of the North Anna and Surry LRAs, respectively. To verify that the applicant did include the applicable portions of the EDG systems within the scope of license renewal, the staff focused its review on those portions of the NAS 1/2 and SPS 1/2 EDG systems that were not identified within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the North Anna and Surry UFSARs to identify any additional system functions that were not identified in each LRA and verified that these additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the SCs of the NAS 1/2 and SPS 1/2 EDG systems that are subject to AMR from among those portions of the EDG systems that are identified as being within the scope of license renewal. The applicant identified and lists the SCs subject to AMR for the EDG systems in Table 2.3.3-11 of the North Anna LRA and Table 2.3.3-12 of the Surry LRA using the screening methodology described in Section 2.1 of each LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER.

In the North Anna LRA, the applicant identified the portions of the EDG systems that are within the scope of license renewal in the drawings listed below. The applicant also listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-11 of the North Anna LRA.

<u>Unit 1</u>

Unit 2

11715-LRB-035A, Sh. 1	12050-LRM-107A, Sh. 1
11715-LRB-035A, Sh. 2	12050-LRM-107A, Sh. 2
11715-LRB-035C, Sh. 1	12050-LRM-107A, Sh. 3
11715-LRB-035C, Sh. 2	12050-LRM-107A, Sh. 4
11715-LRB-035C, Sh. 3	12050-LRM-107B, Sh. 1
11715-LRB-035C, Sh. 4	12050-LRM-107B, Sh. 2
11715-LRM-107A, Sh. 1	12050-LRM-107C, Sh. 1
11715-LRM-107A, Sh. 2	12050-LRM-107C, Sh. 2
11715-LRM-107A, Sh. 3	12050-LRM-107D, Sh. 1
11715-LRM-107A, Sh. 4	12050-LRM-107D, Sh. 2
11715-LRM-107B, Sh. 1	
11715-LRM-107B, Sh. 2	
11715-LRM-107C, Sh. 1	,
11715-LRM-107C, Sh. 2	
11715-LRM-107D, Sh. 1	r
11715-LRM-107D, Sh. 2	-

In the Surry LRA, the applicant identified the portions of the EDG systems that are within the scope of license renewal in the drawings listed below. In addition, the applicant listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-12 of the Surry LRA.

<u>Unit 1</u>

Unit 2

Common

11448-LRB-038B, Sh. 1 11448-LRB-046D, Sh. 1 11448-LRB-046D, Sh. 2 11448-LRB-046D, Sh. 3 11448-LRB-046D, Sh. 4

The license renewal drawings were highlighted by the applicant to identify those portions of the EDG systems that meet at least one of the scoping requirements of 10 CFR 54.4. The staff compared the license renewal drawings to the system drawings and the descriptions in the North Anna and Surry UFSARs to ensure they were representative of the EDG systems. The staff performed its review by sampling the SCs that the applicant identified as being within the scope of license renewal but not subject to AMR to verify that no structure or component, that performs its intended function without moving parts or without a change in configuration or properties and, that are not subject to replacement based on qualified life or specified time period, was excluded from an AMR. The staff did not identify any omissions.

2.3.3.14.3 Conclusion

On the basis of its review of the information contained in Section 2.3.3.11 of the North Anna LRA and Section 2.3.3.12 of the Surry LRA, the supporting information in the North Anna and Surry UFSARs and the license renewal drawings, as described above, the staff did not identify any omissions in the scoping and screening of the NAS 1/2 and SPS 1/2 EDG systems by the

applicant. Therefore, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the NAS 1/2 and SPS 1/2 EDG systems that are within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.15 Security

Both the NAS and SPS LRAs present information regarding yard lighting required to meet 10 CFR Part 50, Appendix R, Section III.J, "emergency lighting" requirements, in sections entitled "Security." The review of these components is covered in the fire protection section of this safety evaluation (Section 2.3.3.37).

2.3.3.16 Compressed Air

In the North Anna LRA, Section 2.3.3.13, "Compressed Air," the applicant describes the piping and mechanical components of the compressed air (CA) system that are within the scope of license renewal and subject to an AMR for North Anna. The CA structural components that are subject to AMR are presented separately by the applicant in Section 2.4.10 of each LRA, "General Structural Supports," as commodity groups and, therefore, are evaluated separately by the staff in Section 2.4.10 of this SER. The CA piping and mechanical components are further described by the applicant in Chapter 9.4.1 of the North Anna UFSAR. The Surry ventilation system (VS), which is functionally equivalent to the North Anna CA system, is evaluated in Section 2.3.3.24 of this SER. Therefore, the following evaluation only applies to North Anna LRA.

2.3.3.16.1 Summary of Technical Information in the Application

The North Anna CA system provides bottled compressed dry air of breathing quality to pressurize the main control room envelope for postulated accidents involving radioactive release. The pressurization ensures outward leakage in order to limit the dose to control room personnel. The bottled air is of sufficient quantity to last a minimum of 1 hour. Emergency supply ventilation systems, taking suction from the turbine building through high-efficiency particulate air (HEPA) and charcoal filters, are provided to continue the supply of breathing and pressurization air indefinitely on depletion of the bottled air supply.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of the North Anna and Surry LRAs. As described in the scoping methodology, the applicant identified the portions of the North Anna CA system that are within the scope of license renewal on license renewal drawings listed in Section 2.3.3.13 of the North Anna LRA. Consistent with the method described in the LRA, Section 2.1.5, "Screening Methodology," the applicant listed the CA system mechanical component commodity groups that are subject to an AMR in Table 2.3.3-13 of the North Anna LRA. The applicant identified the following component commodity groups for the compressed air system that are subject to AMR: instrument valve assemblies, tubing, valve bodies. The applicant also identifies maintaining pressure boundary integrity as the intended function of the SCs that are subject to an AMR for the North Anna CA system.

2.3.3.16.2 Staff Evaluation

The staff reviewed the CA system scoping and screening results to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the North Anna CA system that are within the scope of license renewal in accordance with 10 CFR 54.4, and that the applicant appropriately identified the SCs of the CA system that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information in Section 2.3.3.13 of the North Anna LRA, the applicable license renewal drawings, and the North Anna UFSAR to determine whether the applicant adequately identified the portions of the North Anna CA system that are within the scope of license renewal. The staff verified that the portion of the North Anna CA system that meets the scoping requirements of 10 CFR 54.4 was included within the scope of license renewal and were identified as such by the applicant in Section 2.3.3.13 of the North Anna LRA. To verify that the applicant did include the applicable portion of the North Anna CA system within the scope of license renewal, the staff focused its review on those portions of the CA system that were not identified within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the North Anna UFSAR to identify any additional system functions that were not identified in each LRA and verified that the surry CA function was performed by the Surry ventilation system and did not need to be included within the scope of this review.

The staff then determined whether the applicant had properly identified the SCs of the North Anna CA system that are subject to AMR from the portion of the CA system that is identified as being within the scope of license renewal. The applicant identified and lists the SCs subject to AMR for the CA system in Table 2.3.3-13 of the North Anna LRA using the screening methodology described in Section 2.1 of each LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER.

In the North Anna LRA, the applicant identified the portions of the CA system that are within the scope of license renewal in the drawings listed below. The applicant also listed the mechanical component commodity groups that are subject to AMR and its intended function in Table 2.3.3-13 of the North Anna LRA.

Unit 1

<u>Unit 2</u>

Common

11715-LRB-034F, Sh. 1 11715-LRB-034F, Sh. 2 11715-LRB-034F, Sh. 3 11715-LRB-034F, Sh. 4 11715-LRB-034F, Sh. 5

The license renewal drawings were highlighted by the applicant to identify the SCs of the North Anna CA system that meet at least one of the scoping requirements of 10 CFR 54.4. The staff compared the license renewal drawings to the system drawings and the descriptions in the North Anna UFSAR to ensure that they were representative of the CA system. The staff performed its review by sampling the SCs that the applicant identified as being within the scope of license renewal but not subject to AMR to verify that no structure or component, that performs its intended functions without moving parts or without a change in configuration or properties and that is not subject to replacement based on qualified life or specified time period, was excluded from an AMR. The staff did not identify any omissions.

2.3.3.16.3 Conclusion

On the basis of its review of the information contained in Section 2.3.3.13 of the North Anna LRA, the supporting information in the North Anna and Surry UFSARs, and the license renewal drawings, as described above, the staff did not identify any omissions in the scoping and screening of the CA system by the applicant. Therefore, the staff concludes that there is reasonable assurance that the applicant has identified the portion of the North Anna CA system that is within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.17 Instrument Air

In the North Anna and Surry LRAs, Section 2.3.3.14, "Instrument Air," the applicant describes the components of the instrument air (IA) systems that are within the scope of license renewal and subject to an AMR for both North Anna and Surry. Each unit of NAS and SPS has an IA system. These systems are similar for both facilities with some differences in system design. Any notable differences are specifically identified and discussed in the staff's evaluation. Unless otherwise specified, the information provided below is applicable to both the North Anna and Surry IA systems. The IA structural components that are subject to AMR are presented separately by the applicant in Section 2.4.10 of each LRA, "General Structural Supports," as commodity groups and, therefore, are evaluated separately by the staff in Section 2.4.10 of this SER. These systems are further described in Section 9.3.1 of North Anna UFSAR and Section 9.8 of the Surry UFSAR.

2.3.3.17.1 Summary of Technical Information in the Application

The IA system is a subsystem of the compressed air system. The compressed air system includes a service air subsystem, an IA subsystem, and a containment instrument air subsystem for each unit. System pressures are dictated by the expected uses of instrument air or service air.

For NAS 1/2, the IA subsystem is fed by the service air subsystem, and is the normal supply to the containment instrument air subsystem. The containment instrument air compressors provide backup capability to the containment instrument air subsystem. The IA compressors, air receivers, piping, valves, and supports for critical instruments and controls are designed to conform with Seismic Class I criteria. The containment instrument air compressors, receivers, and air driers are not designed to Seismic Class I criteria.

For SPS 1/2, the service air compressors are the primary source of compressed air to both the service air and IA subsystems during normal plant operation. The IA compressors provide backup capability to the IA subsystem and the containment instrument air subsystem and are connected to the emergency power system for greater availability of compressed air in the

event offsite power is lost. Portions of the IA subsystem which are critical system components and designated containment isolation features are designed to Seismic I criteria.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of each LRA. As described in the scoping methodology, the applicant identified the portions of the IA systems that are within the scope of license renewal on the license renewal drawings listed in Section 2.3.3.14 of each LRA. Consistent with the method described in each LRA, Section 2.1.5, "Screening Methodology," the applicant listed the NAS 1/2 and SPS 1/2 IA system mechanical component commodity groups that are within the license renewal evaluation boundaries and subject to an AMR in Table 2.3.3-14 of each LRA. These tables also list the intended functions and the LRA sections that contain the AMR for each commodity group.

The portions of each IA systems that are subject to an AMR for NAS 1/2 and SPS 1/2 include the portions of the IA systems that perform a containment pressure boundary function as part of the IA system containment penetration, and the backup compressed air subsystem components that provide for operation of critical components. For NAS 1/2, the IA compressor coolers perform a service water system pressure boundary function and are also subject to an AMR. For SPS 1/2, the containment IA compressor heat exchangers perform a component cooling system pressure boundary function and are also subject to an AMR. In each LRA, Table 2.3.3-14, the applicant listed the following component commodity groups subject to an AMR: bolting, instrument valve assemblies, pipe, tubing, valve bodies. In addition, the North Anna LRA identifies gas bottles, hoses, and instrument air compressor coolers, and the Surry LRA identifies containment 1A compressor heat exchanger, filters/strainers, and flexible connections as component commodity groups that are subject to an AMR for that site. The applicant identified maintaining pressure boundary integrity and providing filtration as the intended functions of the SCs that are subject to an AMR for the NAS 1/2 and SPS 1/2 IA systems.

2.3.3.17.2 Staff Evaluation

The staff reviewed each LRA Section 2.3.3.14 to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the NAS 1/2 and SPS 1/2 IA systems that are within the scope of license renewal in accordance with 10 CFR 54.4, and that the applicant appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in Section 2.3.3.14 of each LRA, the applicable license renewal drawings, and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the portions of the IA systems that are within the scope of license renewal. The staff verified that those portions of the IA systems that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Section 2.3.3.14 of each LRA. To verify that the applicant did include the applicable portions of the IA systems within the scope of license renewal, the staff focused its review on those portions of the IA systems that were not identified within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the UFSARs for each facility to identify any additional system functions that were not identified in each LRA and verified that these additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the SCs of the NAS 1/2 and SPS 1/2 IA systems that are subject to AMR from among those portions of the IA systems that are identified as being within the scope of license renewal. The applicant identified and listed the SCs subject to AMR for the IA systems in Table 2.3.3-14 of each LRA using the screening methodology described in Section 2.1 of each LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER.

In the North Anna LRA, the applicant identified the portions of the IA systems that are within the scope of license renewal in the drawings listed below. The applicant also listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-14 of the North Anna LRA.

<u>Unit 1</u>

11715-LRM-082A, Sh. 1 11715-LRM-082A, Sh. 2 11715-LRM-082C, Sh. 2 11715-LRM-082C, Sh. 2 11715-LRM-082D, Sh. 2 11715-LRM-082M, Sh. 1 11715-LRM-082N, Sh. 1 11715-LRM-082N, Sh. 2 11715-LRM-082N, Sh. 3 11715-LRM-093B, Sh. 1 <u>Unit 2</u>

12050-LRM-082A, Sh. 1 12050-LRM-082A, Sh. 2 12050-LRM-082B, Sh. 1 12050-LRM-082B, Sh. 2 12050-LRM-082B, Sh. 3 12050-LRM-082C, Sh. 1 12050-LRM-082C, Sh. 2 12050-LRM-093B, Sh. 1

In the Surry LRA, the applicant identified the portions of the IA systems that are within the scope of license renewal in the drawings listed below. In addition, the applicant listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-14 of the Surry LRA.

Unit 1	<u>Unit 2</u>
1448-LRM-072A, Sh. 1	11548-LRM-072A, Sh. 1
1448-LRM-075C, Sh. 1	11548-LRM-075B, Sh. 2
1448-LRM-075C, Sh. 3	11548-LRM-075C, Sh. 1
1448-LRM-075E, Sh. 2	11548-LRM-075C, Sh. 2
1448-LRM-075J, Sh. 1	11548-LRM-075D, Sh.1
	11548-LRM-075J, Sh. 1

The license renewal drawings were highlighted by the applicant to identify those portions of the IA systems that meet at least one of the scoping requirements of 10 CFR 54.4. The staff compared the license renewal drawings to the system drawings and the descriptions in the North Anna and Surry UFSARs to ensure they were representative of the IA systems. The staff performed its review by sampling the SCs that the applicant identified as being within the scope of license renewal but not subject to AMR to verify that no structure or component, that performs its intended function without moving parts or without a change in configuration or

properties and, that are not subject to replacement based on qualified life or specified time period, was excluded from an AMR. The staff did not identify any omissions.

2.3.3.17.3 Conclusion

On the basis of its review of the information contained in Section 2.3.3.14 of each LRA, the supporting information in the North Anna and Surry UFSARs, and the license renewal drawings, as described above, the staff did not identify any omissions in the scoping and screening of the NAS 1/2 and SPS 1/2 IA systems by the applicant. Therefore, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the NAS 1/2 and SPS 1/2 IA systems that are within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.18 Primary and Secondary Plant Gas Supply

In the North Anna and Surry LRAs, Section 2.3.3.15, "Primary and Secondary Plant Gas Supply," the applicant describes the piping and mechanical components of the primary and secondary plant gas supply (GN) systems that are within the scope of license renewal and subject to an AMR for the NAS 1/2 and SPS 1/2. The NAS 1/2 and SPS 1/2 each has a GN system. These systems are similar for both facilities with some differences in system design. Any notable differences are specifically identified and discussed in the staff's evaluation. Unless otherwise specified, the information provided below is applicable to NAS 1/2 and SPS 1/2. The GN structural components that are subject to AMR are presented separately by the applicant in Section 2.4.10 of each LRA, "General Structural Supports," as commodity groups and, therefore, are evaluated separately by the staff in Section 2.4.10 of this SER. The GN piping and mechanical components are further described by the applicant in Sections 5.5.8.2 and 9.5.10 of the North Anna UFSAR and Sections 6.2.2.2 and 10.3.1 of the Surry UFSAR.

2.3.3.18.1 Summary of Technical Information in the Application

The NAS 1/2 and SPS 1/2 GN systems provide compressed gas for various plant uses. The portions of the NAS 1/2 GN systems that are within the scope of license renewal include those portions that provide compressed gas to the hydrogen analyzer system, the hydrogen recombiner valves, and the pressurizer power-operated relief valves (PORVs). The portion of the SPS 1/2 GN systems that are within the scope of license renewal include those portions that provide compressed gas to the main steam systems and those portions that serve as the containment pressure boundary for the GN system nitrogen supply to the safety injection accumulators and main steam system.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of each LRA. As described in the scoping methodology, the applicant identified the portions of the GN systems that are within the scope of license renewal on the license renewal drawings listed in Section 2.3.3.15 of each LRA. Consistent with the method described in each LRA, Section 2.1.5, "Screening Methodology," the applicant listed the NAS 1/2 and SPS 1/2 GN system mechanical component commodity groups that are within the license renewal evaluation boundaries and that are subject to an AMR in Table 2.3.3-15 of each LRA. These tables also list the intended functions and the LRA sections that contain the AMR for each commodity group.

The portions of each GN system that is subject to an AMR for NAS 1/2 includes the system components that provide compressed gas for the operational support of the hydrogen analyzer system, that provide a backup pneumatic source for the hydrogen analyzer and hydrogen recombiner valves, and that provide a backup pneumatic source for the pressurizer power-operated relief valves (PORVs) upon a loss of instrument air. The portions of the SPS 1/2 GN systems that are subject to an AMR consist of the system components that provide the GN systems nitrogen supply to the safety injection accumulators containment penetration pressure boundary, and that provide the GN systems supply connection to the main steam lines containment pressure boundary and main steam system pressure boundary. In both LRAs, Table 2.3.3-15, the applicant listed the following component commodity groups subject to an AMR: pipe, valve bodies. In addition, the North Anna LRA identifies bolting, gas bottles, hoses, instrument valve assemblies, and tubing commodity groups. The applicant identified maintaining pressure boundary integrity as the intended function for the SCs that are subject to an AMR for the NAS 1/2 and SPS 1/2 GN systems.

2.3.3.18.2 Staff Evaluation

The staff reviewed each LRA Section 2.3.3.15, to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the NAS 1/2 and SPS 1/2 GN systems that are within the scope of license renewal in accordance with 10 CFR 54.4, and that the applicant appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in Section 2.3.3.15 of each LRA, the applicable license renewal drawings, and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the portions of the GN systems that are within the scope of license renewal. The staff verified that those portions of the GN systems that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Section 2.3.3.15 of each LRA. To verify that the applicant did include the applicable portions of the GN systems within the scope of license renewal, the staff focused its review on those portions of the GN systems that were not identified within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the UFSARs for each facility to identify any additional system functions that were not identified in each LRA and verified that these additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the SCs of the NAS 1/2 and SPS 1/2 GN systems that are subject to AMR from among those portions of the GN systems that are identified as being within the scope of license renewal. The applicant identified and lists the SCs subject to AMR for the GN systems in Table 2.3.3-15 of each LRA using the screening methodology described in Section 2.1 of each LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER.

In the North Anna LRA, the applicant identified the portions of the GN systems that are within the scope of license renewal in the drawings listed below. The applicant also listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-15 of the North Anna LRA.

<u>Unit 1</u>	<u>Unit 2</u>
11715-LRM-082A, Sh. 2 11715-LRM-082C, Sh. 1 11715-LRM-093B, Sh. 1 11715-LRM-105A, Sh. 1 11715-LRM-105C, Sh. 1 11715-LRM-106A, Sh. 1 11715-LRM-106A, Sh. 2 11715-LRM-106A, Sh. 4	12050-LRM-082A, Sh. 2 12050-LRM-093B, Sh. 1

In the Surry LRA, the applicant identified the portions of the GN systems that are within the scope of license renewal in the drawings listed below. In addition, the applicant listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-15 of the Surry LRA.

-	1 1 1
<u>Unit 1</u>	<u>Unit 2</u>
11448-LRM-064A, Sh. 1	11548-LRM-064A, Sh. 1
11448-LRM-064A, Sh. 2	11548-LRM-064A, Sh. 2
11448-LRM-064A, Sh. 3	11548-LRM-064A, Sh. 3
11448-LRM-064B, Sh. 1	11548-LRM-064B, Sh. 1
11448-LRM-089A, Sh. 3	11548-LRM-089A, Sh. 3
11448-LRM-089B, Sh. 1	11548-LRM-089B, Sh. 1
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The license renewal drawings were highlighted by the applicant to identify those portions of the GN systems that meet at least one of the scoping requirements of 10 CFR 54.4. The staff compared the license renewal drawings to the system drawings and the descriptions in the North Anna and Surry UFSARs to ensure they were representative of the GN systems. The staff performed its review by sampling the SCs that the applicant identified as being within the scope of license renewal but not subject to AMR to verify that no structure or component, that performs its intended function without moving parts or without a change in configuration or properties and, that are not subject to replacement based on qualified life or specified time period, was excluded from an AMR. The staff did not identify any omissions.

2.3.3.18.3 Conclusion

On the basis of its review of the information contained in Section 2.3.3.15 of each LRA, the supporting information in the North Anna and Surry UFSARs, and the license renewal drawings, as described above, the staff did not identify any omissions in the scoping and screening of the NAS 1/2 and SPS 1/2 GN systems by the applicant. Therefore, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the NAS 1/2 and SPS 1/2 GN systems that are within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.19 Service Air

In the North Anna and Surry LRAs, Section 2.3.3.16, "Service Air," the applicant describes the components of the service air (SA) systems that are within the scope of license renewal and subject to an AMR for both North Anna and Surry. NAS 1/2 and SPS 1/2 each has a SA system. These systems are identical for both facilities with no notable differences in system design for the purpose of license renewal. Therefore, the information provided below is applicable to both the North Anna and Surry SA systems. The SA structural components that are subject to AMR are presented separately by the applicant in Section 2.4.10 of each LRA, "General Structural Supports," as commodity groups and, therefore, are evaluated separately by the staff in Section 2.4.10 of this SER. These systems are further described in Section 9.3.1 of North Anna UFSAR and Section 9.8 of the Surry UFSAR.

2.3.3.19.1 Summary of Technical Information in the Application

The SA system provides a source of compressed air to support plant general service compressed air requirements. The SA system can be used as a source of compressed air to the instrument air system. The applicant has stated that the portion of the SA system that is subject to AMR is limited to components that perform a containment pressure boundary function as part of the SA system containment penetration.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of each LRA. As described in the scoping methodology, the applicant identified the portions of the SA systems that are within the scope of license renewal on the license renewal drawings listed in Section 2.3.3.16 of each LRA. Consistent with the method described in each LRA, Section 2.1.5, "Screening Methodology," the applicant listed the NAS 1/2 and SPS 1/2 SA system mechanical component commodity groups that are within the license renewal evaluation boundaries and that are subject to an AMR in Table 2.3.3-16 of each LRA. These tables also list the intended functions and the LRA sections that contain the AMR for each commodity group.

The portion of each SA system that is subject to an AMR for NAS 1/2 and SPS 1/2 is limited to components that perform a Containment pressure boundary function as part of the SA system Containment penetration. In both LRAs, Table 2.3.3-16, the applicant listed the following component commodity groups subject to an AMR: bolting, pipe, valve bodies. The applicant identified maintaining pressure boundary integrity as the only intended function for the SCs that is subject to an AMR for the NAS 1/2 and SPS 1/2 SA systems.

2.3.3.19.2 Staff Evaluation

The staff reviewed each LRA Section 2.3.3.16 to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the NAS 1/2 and SPS 1/2 SA systems that are within the scope of license renewal in accordance with 10 CFR 54.4, and that the applicant appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in Section 2.3.3.16 of each LRA, the applicable license renewal drawings, and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the portions of the SA systems that are within the scope of

license renewal. The staff verified that those portions of the SA systems that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Section 2.3.3.16 of each LRA. To verify that the applicant did include the applicable portions of the SA systems within the scope of license renewal, the staff focused its review on those portions of the SA systems that were not identified within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the UFSARs for each facility to identify any additional system functions that were not identified in each LRA and verified that this additional functions did not meet the scoping requirements of 10 CFR 54.4.

The staff then determined whether the applicant had properly identified the SCs of the NAS 1/2 and SPS 1/2 SA systems that are subject to AMR from among those portions of the SA systems that are identified as being within the scope of license renewal. The applicant identified and lists the SCs subject to AMR for the SA systems in Table 2.3.3-16 of each LRA using the screening methodology described in Section 2.1 of each LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER.

In the North Anna LRA, the applicant identified the portions of the SA systems that are within the scope of license renewal in the drawings listed below. The applicant also listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-16 of the North Anna LRA.

<u>Unit 1</u>

Unit 2

12050-LRM-082F. Sh. 2

11715-LRM-082F, Sh. 1

In the Surry LRA, the applicant identified the portions of the SA systems that are within the scope of license renewal in the drawings listed below. In addition, the applicant listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-16 of the Surry LRA.

Unit 1 Unit 2 11448-LRM-075G, Sh. 1 11548-LRM-075E, Sh. 1

The license renewal drawings were highlighted by the applicant to identify those portions of the SA systems that meet at least one of the scoping requirements of 10 CFR 54.4. The staff compared the license renewal drawings to the system drawings and the descriptions in the North Anna and Surry UFSARs to ensure they were representative of the SA systems. The staff performed its review by sampling the SCs that the applicant identified as being within the scope of license renewal but not subject to AMR to verify that no structure or component, that performs its intended function without moving parts or without a change in configuration or properties and, that are not subject to replacement based on qualified life or specified time period, was excluded from an AMR. The staff did not identify any omissions.

2.3.3.19.3 Conclusion

On the basis of its review of the information contained in Section 2.3.3.16 of each LRA, the supporting information in the North Anna and Surry UFSARs, and the license renewal drawings, as described above, the staff did not identify any omissions in the scoping and screening of the NAS 1/2 and SPS 1/2 SA systems by the applicant. Therefore, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the NAS 1/2 and SPS 1/2 SA systems that are within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.20 Containment Vacuum (CV)

In each LRA Section 2.3.3.17, "Containment Vacuum," the applicant describes the components of the containment vacuum system that are within the scope of license renewal and subject to an AMR. This system is further described in Section 6.2.6 of the North Anna UFSAR and Section 5.3.4 of the Surry UFSAR.

2.3.3.20.1 Summary of Technical Information in the Application

The containment vacuum (CV) system establishes and maintains the subatmospheric pressure of the containment building in support of plant operation. The CV system also provides a flowpath, via the containment penetration piping, for the containment post-accident hydrogen analyzer system.

For NAS, the CV pump seal water heat exchangers are cooled by the component cooling (CC) system. These components are subject to aging management review for a CC system pressure boundary function.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of each LRA. As described in the scoping methodology, the applicant identified the portions of the CV system that are within the scope of license renewal on the piping and instrument drawings listed in Section 2.3.3.17 of each LRA. Consistent with the method described in the LRA, Section 2.1.5, "Screening Methodology," the applicant listed the CV system mechanical component commodity groups that are within the license renewal evaluation boundaries and that are subject to an AMR in Table 2.3.3-17 of each LRA. The tables also list the intended functions and the LRA sections that contain the AMR for each commodity group.

The portion of the CV system that is subject to aging management review is limited to components that perform a containment pressure boundary function as part of the CV system containment penetrations. In each LRA, Table 2.3.3-17, the applicant listed the following two component commodity groups as subject to an AMR: pipe and valve bodies. In addition, the NAS LRA, Table 2.3.3-17, lists containment vacuum heat exchangers as a component commodity group that is subject to an AMR for NAS. The applicant identified maintaining pressure boundary integrity as the only intended function for the SCs that is subject to an AMR.

2.3.3.20.2 Staff Evaluation

The staff reviewed each LRA Section 2.3.3.17 to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the CV system that are within the scope of license renewal in accordance with 10 CFR 54.4, and that the applicant appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in Section 2.3.3.17 of each LRA, the applicable piping and instrument drawings, and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the portions of the containment vacuum systems that are within the scope of license renewal. The staff verified that those portions of the containment vacuum systems that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Section 2.3.3.17 of each LRA. To verify that the applicant did include the applicable portions of the CV system within the scope of license renewal, the staff focused its review on those portions of the CV system that were not identified within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the UFSARs for each facility to identify any additional system functions that were not identified in each LRA and verified that these additional functions did not meet the scoping requirements of 10 CFR Part 54.4. The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the CV system that were identified as being within the scope of license renewal. The applicant used the screening methodology described in Section 2.1 of each LRA to identify and list the SCs subject to AMR. The staff evaluation of the scoping and screening methodology is documented in Section 2.1 of this SER.

In the NAS LRA, the applicant identified the portions of the CV system that are within the scope of license renewal in the drawings listed below. In Table 2.3.3-17 of the LRA, the applicant listed the mechanical component commodity groups that are subject to AMR and their intended functions.

<u>Unit 1</u>	Unit 2
11715-LRM-079C, Sh. 1 11715-LRM-092A, Sh. 2	12050-LRM-092A, Sh. 2

In the SPS LRA, the applicant identified the portions of the CV system that are within the scope of license renewal in the drawings listed below. In Table 2.3.3-17 of the LRA, the applicant listed the mechanical component commodity groups that are subject to AMR and their intended functions.

- U	nit	1
		_

Unit 2

11448-LRM-085A, Sh. 1	11448-LRM-085A, Sh. 1
11448-LRM-085A, Sh. 2	11448-LRM-085A, Sh. 2

The piping and instrumentation drawings were highlighted by the applicant to identify those portions of the CV system that meet at least one of the scoping requirements of 10 CFR 54.4. The staff compared the LRA drawings to the system drawings and the descriptions in the UFSAR to ensure they were representative of the CV system. The staff performed its review by sampling the SCs that the applicant identified as being within the scope of license renewal but not subject to AMR, to verify that no structure or component that performs its intended function without moving parts or without a change in configuration or properties, or is not subject to replacement based on qualified life or specified time period, was excluded from an AMR. The staff did not identify any omissions.

2.3.3.20.3 Conclusions

On the basis of its review of the information contained in Section 2.3.3.17 of each LRA, the supporting information in the UFSARs, and the LRA drawings, as described above, the staff did not identify any omissions in the scoping of the CV system by the applicant. The staff concludes that there is reasonable assurance that the applicant has identified those portions of the CV system that are within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.21 Leakage Monitoring (LM)

In each LRA Section 2.3.3.18, "Leakage Monitoring," the applicant describes the components of the leakage monitoring system that are within the scope of license renewal and subject to an AMR. This system is further described in Sections 6.2.7 and 7.3.1.3.2 of the North Anna UFSAR and Sections 5.3.2 and 7.5.1.2 of the Surry UFSAR.

2.3.3.21.1 Summary of Technical Information in the Application

The leakage monitoring (LM) system provides containment pressure signals to the engineered safety features (ESF) actuation system. The system is also designed to provide pressure sensing during containment leakage rate testing.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of each LRA. As described in the scoping methodology, the applicant identified the portions of the LM system that are within the scope of license renewal on the piping and instrument drawings listed in Section 2.3.3.18 of each LRA. Consistent with the method described in each LRA, Section 2.1.5, "Screening Methodology," the applicant listed the LM system mechanical component commodity groups that are within the license renewal evaluation boundaries and that are subject to an AMR in Table 2.3.3-21 of each LRA. The tables also list the intended functions, and the LRA section containing the AMR, for each commodity group.

The portion of the LM system that is subject to aging management review is limited to components that perform a containment pressure boundary function as part of the LM system containment penetrations. In each LRA, Table 2.3.3-18, the applicant listed the following four component commodity groups as subject to an AMR: bolting, pipe, tubing, and valve bodies. The applicant identified maintaining pressure boundary integrity as the only intended function for the SCs that is subject to an AMR.

2.3.3.21.2 Staff Evaluation

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

The staff reviewed the information provided in Section 2.3.3.18 of each LRA the applicable piping and instrument drawings, and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the portions of the leakage monitoring system that are within the scope of license renewal. The staff verified that those portions of the leakage monitoring system that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Section 2.3.3.18 of each LRA. To verify that the applicant did include the applicable portions of the LM system within the scope of license renewal, the staff focused its review on those portions of the LM system that were not identified within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the UFSARs for each facility to identify any additional system functions that were not identified in each LRA and verified that these additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the LM system that were identified as being within the scope of license renewal. The applicant used the screening methodology described in Section 2.1 of each LRA to identify and list the SCs subject to AMR. The staff evaluation of the scoping and screening methodology is documented in Section 2.1 of this SER.

In the NAS LRA, the applicant identified the portions of the LM system that are within the scope of license renewal in the drawings listed below. The applicant also listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-18 of the LRA.

<u>Unit 1</u>

Unit 2

11715-LRM-092A, Sh. 1

12050-LRM-092A, Sh. 1

In the SPS LRA, the applicant identified the portions of the LM system that are within the scope of license renewal in the drawings listed below. In addition, the applicant listed the mechanical component commodity groups that are subject to AMR and its intended functions in Table 2.3.3-18 of the LRA.

Unit 1 Unit 2 11448-LRM-085A, Sh. 1 11548-LRM-085A, Sh. 1

The piping and instrumentation drawings were highlighted by the applicant to identify those portions of the LM system that meet at least one of the scoping requirements of 10 CFR 54.4.

The staff compared the LRA drawings to the system drawings and the descriptions in the UFSAR to ensure they were representative of the LM system. The staff performed its review by sampling the SCs that the applicant identified as being within the scope of license renewal but not subject to AMR, to verify that no structure or component that performs its intended function without moving parts or without a change in configuration or properties, or is not subject to replacement based on qualified life or specified time period, was excluded from an AMR. The staff did not identify any omissions.

2.3.3.21.3 Conclusions

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

2.3.3.22 Secondary Vents (SV)

In each LRA Section 2.3.3.19, "Secondary Vents," the applicant describes the components of the secondary vents system that are within the scope of license renewal and subject to an AMR. This system is further described in Section 10 of the NAS and SPS UFSARs.

2.3.3.22.1 Summary of Technical Information in the Application

The secondary vents (SV) system provides a vent path for noncondensable gases discharged by the main condenser air ejectors.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of each LRA. As described in the scoping methodology, the applicant identified the portions of the SV system that are within the scope of license renewal on the piping and instrument drawings listed in Section 2.3.3.19 of each LRA. Consistent with the method described in the LRA, Section 2.1.5, "Screening Methodology," the applicant listed the SV system mechanical component commodity groups that are within the license renewal evaluation boundaries and that are subject to an AMR in Table 2.3.3-19 of each LRA. The tables also list the intended functions and the LRA sections that contain the AMR for each commodity group.

The portion of the SV system that is subject to aging management review is limited to components that perform a containment pressure boundary function as part of the SV system containment penetrations. In each LRA, Table 2.3.3-19, the applicant listed valve bodies as the only component commodity group subject to an AMR, although the table notes that the piping associated with these components is included in the vacuum priming (VP) system (section 2.3.3.23 of this SER). The applicant identified maintaining pressure boundary integrity as the only intended function for the SCs that is subject to an AMR.

2.3.3.22.2 Staff Evaluation

The staff reviewed Section 2.3.3.19 of each LRA to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the SV system that are within the scope of license renewal in accordance with 10 CFR 54.4, and that the applicant appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in Section 2.3.3.19 of each LRA, the applicable piping and instrument drawings, and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the portions of the secondary vents system that are within the scope of license renewal. The staff verified that those portions of the secondary vents system that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Section 2.3.3.19 of each LRA. To verify that the applicant did include the applicable portions of the SV system within the scope of license renewal, the staff focused its review on those portions of the SV system that were not identified within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the UFSARs for each facility to identify any additional system functions that were not identified in each LRA and verified that these additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the SV system that were identified as being within the scope of license renewal. The applicant used the screening methodology described in Section 2.1 of each LRA to identify and list the SCs subject to AMR. The staff evaluation of the scoping and screening methodology is documented in Section 2.1 of this SER.

In the NAS LRA, the applicant identified the portions of the SV system that are within the scope of license renewal in the drawings listed below. The applicant also listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-19 of the LRA.

<u>Unit 1</u>

<u>Unit 2</u>

12050-LRM-072A, Sh. 2

11715-LRM-072A, Sh. 2

In the SPS LRA, the applicant identified the portions of the SV system that are within the scope of license renewal in the drawings listed below. In addition, the applicant listed the mechanical component commodity groups that are subject to AMR and its intended functions in Table 2.3.3-19 of the LRA.

<u>Unit 1</u>	۰_	<u>Unit 2</u>
11448-LRM-066A, Sh. 2	•	11548-LRM-066A, Sh. 2

The piping and instrumentation drawings were highlighted by the applicant to identify those portions of the SV system that meet at least one of the scoping requirements of 10 CFR 54.4.
The staff compared the LRA drawings to the system drawings and the descriptions in the UFSAR to ensure they were representative of the SV system. The staff performed its review by sampling the SCs that the applicant identified as being within the scope of license renewal but not subject to AMR, to verify that no structure or component that performs its intended function without moving parts or without a change in configuration or properties, or is not subject to replacement based on qualified life or specified time period, was excluded from an AMR. The staff did not identify any omissions.

2.3.3.22.3 Conclusions

On the basis of its review of the information contained in Section 2.3.3.19 of each LRA, the supporting information in the UFSARs, and LRA drawings, as described above, the staff did not identify any omissions in the scoping of the SV system by the applicant. The staff concludes that there is reasonable assurance that the applicant has identified those portions of the SV system that are within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.23 Vacuum Priming (VP)

In each LRA Section 2.3.3.20, "Vacuum Priming," the applicant describes the components of the vacuum priming system that are within the scope of license renewal and subject to an AMR. This system is further described in Section 10 of the North Anna and Surry UFSARs.

2.3.3.23.1 Summary of Technical Information in the Application

The vacuum priming (VP) system removes noncondensable gases from various plant systems. In addition, at SPS, the VP system also provides a circulating water (CW) system pressure boundary function at the VP tank drain connection to the main condenser outlet CW pipe. The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of the LRA. As described in the scoping methodology, the applicant identified the portions of the VP system that are within the scope of license renewal on the piping and instrument drawings listed in Section 2.3.3.20 of each LRA. Consistent with the method described in the LRA, Section 2.1.5, "Screening Methodology," the applicant listed the VP system mechanical component commodity groups that are within the license renewal evaluation boundaries and that are subject to an AMR in Table 2.3.3-20 of each LRA. The tables also list the intended functions, and the LRA section containing the AMR, for each commodity group.

The portion of the VP system that is subject to aging management review includes the components that perform a containment pressure boundary function as part of the VP system containment penetrations. In addition, at SPS, the additional portions of the VP system that are subject to aging management review consist of the components that form the CW system pressure boundary, and the components that provide a vent path for gases from the component cooling (CC) system heat exchangers that form a service water (SW) system pressure boundary. In each LRA, Table 2.3.3-20, the applicant listed the following two component commodity groups as subject to an AMR: pipes and valve bodies. The applicant identified maintaining pressure boundary integrity as the only intended function for the SCs that is subject to an AMR.

2.3.3.23.2 Staff Evaluation

The staff reviewed each LRA Section 2.3.3.20, to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the VP system that are within the scope of license renewal in accordance with 10 CFR 54.4, and that the applicant appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in Section 2.3.3.20 of each LRA the applicable piping and instrument drawings, and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the portions of the vacuum priming system that are within the scope of license renewal. The staff verified that those portions of the vacuum priming system that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Section 2.3.3.20 of each LRA. To verify that the applicant did include the applicable portions of the VP system within the scope of license renewal, the staff focused its review on those portions of the VP system that were not identified within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the UFSARs for each facility to identify any additional system functions that were not identified in each LRA and verified that these additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the VP system that were identified as being within the scope of license renewal. The applicant used the screening methodology described in Section 2.1 of each LRA to identify and list the SCs subject to AMR. The staff evaluation of the scoping and screening methodology is documented in Section 2.1 of this SER.

In the NAS LRA, the applicant identified the portions of the VP system that are within the scope of license renewal in the drawings listed below. The applicant also listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-20 of the LRA.

. <u>Unit 1</u>

<u>Unit 2</u>

11715-LRM-072A, Sh. 2

12050-LRM-072A, Sh. 2

In the SPS LRA, the applicant identified the portions of the VP system that are within the scope of license renewal in the drawings listed below. In addition, the applicant listed the mechanical component commodity groups that are subject to AMR and its intended functions in Table 2.3.3-20 of the LRA.

<u>Unit 1</u>

<u>Unit 2</u>

11448-LRM-066A, Sh. 2	11548-LRM-066A, Sh. 2
11448-LRM-071A, Sh. 2	11548-LRM-071A, Sh. 2
11448-LRM-074A, Sh. 1	11548-LRM-074A, Sh. 1

The piping and instrumentation drawings were highlighted by the applicant to identify those portions of the VP system that meet at least one of the scoping requirements of 10 CFR 54.4. The staff compared the LRA drawings to the system drawings and the descriptions in the UFSAR to ensure they were representative of the VP system. The staff performed its review by sampling the SCs that the applicant identified as being within the scope of license renewal but not subject to AMR, to verify that no structure or component that performs its intended function without moving parts or without a change in configuration or properties, or is not subject to replacement based on qualified life or specified time period, was excluded from an AMR. The staff did not identify any omissions.

2.3.3.23.3 Conclusions

On the basis of its review of the information contained in Section 2.3.3.20 of each LRA, the supporting information in the UFSARs, and LRA drawings, as described above, the staff did not identify any omissions in the scoping of the VP system by the applicant. The staff concludes that there is reasonable assurance that the applicant has identified those portions of the VP system that are within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.24 Heating and Ventilation

In Section 2.3.3.21 of both North Anna and Surry LRAs, the applicant describes the components of the heating and ventilation (HV) systems that are within the scope of license renewal and subject to an AMR. For North Anna, Section 2.3.3.21 is titled "Heating and Ventilation" while for Surry, this section is titled "Ventilation." However, the North Anna HV system is functionally equivalent to the Surry system. This system is further described in Sections 9.4 and 6.4.1 of the North Anna UFSAR and in Sections 5.3.1 and 9.13 of the Surry UFSAR.

2.3.3.24.1 Summary of Technical Information in the Application

The HV system comprises several ventilation subsystems with the general function of providing the space and equipment cooling. Certain subsystems also provide radiological controls (e.g., emergency ventilation subsystem takes suction from the turbine building through particulate filters and charcoal absorber to remove airborne radioactivity during accident conditions). The HV subsystems within the scope of license renewal are those that perform essential cooling and those that maintain onsite and offsite radiological doses within limits for postulated accident conditions.

The auxiliary ventilation subsystem comprises fresh air supply and exhaust ventilation for the auxiliary building, fuel building, decontamination building, safeguards building, and common filtration units. The auxiliary ventilation subsystem also includes the exhaust ventilation filters, fans, dampers, and ductwork for engineered safety features (ESF) equipment areas (emergency system).

The containment ventilation subsystem consists of containment air recirculation, control rod drive mechanism (CRDM) ventilation, and containment purge ventilation. The containment air recirculation ventilation supplies containment heat removal during normal and shutdown operations. The CRDM ventilation cools the ventilation air drawn from the CRDM area of the

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reactor vessel head in order to remove heat generated in the head region. The containment purge supplies containment atmosphere air changes to maintain radiological control and personnel habitability levels during plant shutdown conditions.

The main control room and emergency switchgear room (MCR/ESGR) ventilation subsystem comprises air-conditioning ventilation components and MCR envelope pressurization components. The air-conditioning system consists of supply and exhaust-ventilation and a recirculation system. The supply and exhaust system is secured in an emergency in order to isolate the MCR envelope. The recirculation air-conditioning system, including water chillers and associated equipment, air handling units, dampers, and ductwork, supplies cooling during normal and emergency conditions.

The pressurization of the MCR envelope is required for postulated accidents involving radioactive releases in order to limit the dose to control room personnel. Pressurization is performed by the MCR/ESGR bottled air system initially and by the MCR/ESGR emergency ventilation system for the long term. The bottled air system consists of compressed breathing air bottles, piping, and valves. The MCR/ESGR emergency ventilation system consists of fans, filters, dampers, and ductwork.

For Surry, the cable-spreading room ventilation subsystem supplies cooling to the cablespreading area in the service building. This subsystem is relied upon for certain severe fire scenarios. For North Anna, ventilation subsystem components supply cooling for critical areas of the auxiliary building and the fuel building in the event that a severe fire disables the normal ventilation system, rod drive room, and cable vault ventilation subsystem includes emergency supply ventilation fans and ductwork that supply cooling to safety-related motor control centers if normal ventilation is lost.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of each LRA. As described in the scoping methodology, the applicant identified portions of the HV system that are within the scope of license renewal on the piping and instrumentation diagrams (P&IDs) listed in Section 2.3.3.21 of each LRA. Consistent with the method described in Section 2.1.5, "Screening Methodology," of each LRA, the applicant listed the mechanical component commodity groupings that are within the license renewal evaluation boundaries and that are subject to an AMR in Table 2.3.3-21 of each LRA. The tables also list the intended functions and the LRA section containing the AMR for each commodity grouping.

The portions of the HV system subject to an AMR consists of the following: components of the auxiliary ventilation subsystem that supply required post-accident ESF equipment cooling and control of radiological conditions, including portions of the normal supply and exhaust that provide a pressure boundary for the ESF equipment areas (emergency system); cooling coils of the containment air recirculation ventilation and CRDM ventilation that provide pressure boundary for the chilled water system; components of the containment purge that provide containment pressure boundary as part of the HV system containment penetrations and that provide a pressure boundary for the ESF areas exhaust ventilation; components of the air-conditioning system that supply isolation and cooling of the MCR envelope; components of the MCR/ESGR bottled air system and MCR/ESGR emergency ventilation system that supply pressurization of the MCR envelope; for Surry, components of the cable-spreading room ventilation subsystem that supply cooling for the cable-spreading area; for North Anna,

components of ventilation subsystems that supply cooling for critical areas of the auxiliary building and the fuel building, and components of the rod drive room and cable vault ventilation subsystem that supply cooling to safety-related motor control centers.

In Table 2.3.3-21 of each LRA, the applicant listed the following component commodity groups as subject to an AMR: cooling coils, damper and fan/blower housings, expansion joints, filter/strainers, flow elements, gas bottles, valve assemblies, chiller condensers and evaporators, flexible connections, heaters, in-line instrumentation, level indicators, thermowells, valve bodies, ductwork, pipes, pump casings, restricting orifices, tanks, tubing. The applicant identified restricting flow and maintaining pressure boundary, filtration, and heat transfer as the intended functions for the HV system SCs that are subject to an AMR.

2.3.3.24.2 Staff Evaluation

The staff reviewed Section 2.3.3.21 of each LRA to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the HV system that are within the scope of license renewal in accordance with 10 CFR 54.4, and that the applicant appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in Section 2.3.3.21 of each LRA, the applicable piping and instrumentation diagrams (P&IDs), and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the portions of the HV system that are within the scope of license renewal. The staff verified that those portions of the HV system that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Section 2.3.3.21 of each LRA. To verify that the applicant did include the applicable portions of the HV system that were not identified within the scope of license renewal, the staff focused its review on those portions of the HV system that were not identified within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the UFSAR for each facility to identify any additional system functions that were not identified in each LRA and verified that these additional functions did not meet the scoping requirements of 10 CFR 54.4.

The staff then determined whether the applicant had properly identified the SCs that are subject to an AMR from among those portions of the HV system that are identified as being within the scope of license renewal. The applicant identified and lists the SCs subject to an AMR for the HV system in Table 2.3.3-21 of each LRA using the screening methodology described in Section 2.1 of each LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER. The staff performed its review by sampling the SCs that the applicant determined within the scope of license renewal but not subject to an AMR to verify that these SCs do not performed their intended functions without moving parts or without a change in configuration or properties or are subject to replacement based on qualified life or specified time period.

The staff then determined whether the applicant had properly identified the SCs that are subject to an AMR from among those portions of the HV system that were identified as being within the scope of license renewal. The applicant used the screening methodology described in Section 2.1 of each LRA to identify and list the SCs subject to an AMR. The staff evaluation of the scoping and screening methodology is documented in Section 2.1 of this SER.

In a telecommunication summary dated November 21, 2001, the NRC staff requested specific information from the applicant concerning the exclusion of the following components from the scope of license renewal and/or an AMR:

- exhaust fan housings
- bird screen or wire mesh
- building sealant materials
- radiation, chlorine, and smoke detection monitors
- control room air bottles

In an electronic communication dated November 21, 2001, the applicant provided the following responses:

- The North Anna and Surry exhaust fans, fan housings, and respective dampers, identified by the NRC staff, do not perform any intended function consistent with scoping criteria under 10 CFR 54.4(a) and, therefore, are not within the scope of license renewal.
 - There is no bird wire or wire mesh used as a protective cover for the vent stack.
 - For both Surry and North Anna, sealant material is not used in the auxiliary building HVAC system. Surry and North Anna auxiliary building ventilation systems use welded and interlocking joints. Structural sealants are used in the auxiliary building and are addressed under structural scoping.
 - Sealants used in the main control room pressure boundary are within the scope of license renewal. The sealants are covered under Sections 2.4.11 and 3.5.11 of each LRA, "Miscellaneous Structural Commodities." The sealants are identified as "fire barrier penetration seals" in Tables 2.4.11-1 and 3.5.11-1.
 - Chlorine detectors are not installed at either Surry or North Anna. Smoke detectors are within the scope of license renewal for Surry and North Anna; however, the smoke detectors are local, self-contained units. The detectors themselves are active and, therefore, there are no smoke detector components that are subject to an AMR. With the exception of the containment high-range radiation monitors (CHRRM) at Surry and, North Anna, there are no radiation monitors that are within the scope of license renewal. The CHRRM are local, self-contained units. The detectors themselves are active and therefore, there are no CHRRM components subject to an AMR.
 - The Surry ventilation (VS) system contains gas bottles that are included within the scope of license renewal. The corresponding gas bottles for North Anna, however, are contained in systems other than the HV system as clarified below.

The control room air bottles for both stations are within the scope of license renewal and perform a passive pressure boundary function and as such are highlighted on the license renewal drawings. However, the bottles are periodically replaced and, therefore, do not require an AMR and are not shown on LRA screening summary tables. The control room air bottles are contained within the VS system for Surry and the compressed air (CA) system for North Anna.

The Surry VS system also contains an in-scope long-lived air bottle which performs an intended function for air-operated dampers within the VS system. This air bottle is represented by the component group "gas bottles" in Table 2.3.3-21 of the Surry LRA. The corresponding gas bottles for North Anna are also within the scope and are long-lived, but are contained within the instrument air (IA) system (Table 2.3.3-14 of the North Anna LRA).

With regard to the North Anna LRA, the NRC staff also requested that the applicant define "Future HEPA Charcoal," and briefly explain its relationship to the scope of the auxiliary building. In an electronic communication dated November 21, 2001, the applicant presented clarification that the filter unit is a three-element housing where two of three element compartments are being used as "HEPA" and "Charcoal" filtering functions. The third compartment has nothing installed and is labeled as "Future."

With regard to Table 2.3.3-21 of the North Anna LRA, the NRC staff requested that the applicant describe the components that make up the commodity group "Instrumentation," and discuss why Table 2.3.3-21 of the Surry LRA does not identify a similar commodity group. In an electronic communication dated November 21, 2001, the applicant stated that as indicated in a footnote to Table 2.3.3-21 of the LRA for North Anna, the component group "instrumentation" includes miscellaneous in-line instrumentation that performs a pressure boundary function. The Surry VS system does not have similar components that were included in a similar component group; therefore, an instrumentation component group is not included in Table 2.3.3-21 of the LRA for Surry.

For each LRA the NRC staff observed that although the evaluation boundary of the main control room and different switchgear rooms is identified, the applicant did not define the areas that constitute the main control room envelope. In a letter dated November 26, 2001, the NRC staff issued RAI 2.3.3.21-1 and requested that the applicant to (1) describe the main control room envelope in terms of systems, subsystems, and spaces, and its intended functions for both North Anna and Surry in sufficient detail that the NRC staff can perform its review consistent with the information provided in each LRA, (2) ensure that the discussion includes sufficient correlation with the scoping and AMR activities contained in each LRA to allow the NRC staff to utilize the information already provided, and (3) identify any SCs that need to be added to the already identified scope of license renewal and include all the applicable scoping and AMR information.

In a letter dated February 5, 2002, the applicant responded to RAI 2.3.3.21-1 and stated that the control room envelope for both Surry and North Anna is located within the service building, which is described in Section 2.4.5, "Miscellaneous Structures," of each LRA. For Surry, the control room envelope consists of the control room (including the control room annex area), emergency switchgear and relay rooms, battery rooms, associated stairwell, and mechanical equipment room (MER) 3. For North Anna, the control room envelope consists of the control room, emergency switchgear and relay rooms, battery rooms, and the associated stairwell. As indicated in Table 2.4.5-2, "Miscellaneous Structures - Service Building," of the North Anna LRA, the floor slabs and walls associated with the control room envelope perform a pressure boundary function for the envelope. In addition, fire barrier penetration seals and fire doors and/or EQ barrier doors associated with the control room envelope also perform a pressure boundary function in support of the envelope. Systems associated with the Surry control room envelope are described, along with the associated functions, in Section 2.3.3.21, "Ventilation,"

and consist of the air-conditioning system, the bottled air pressurization system, and the emergency ventilation system. Components that are subject to an AMR are identified in Table 2.3.3-21 of the Surry LRA. This table also identifies the section within the Surry LRA that contains the AMR results. Systems associated with the North Anna control room envelope are described, along with the associated functions, in Sections 2.3.3.21, "Heating and Ventilation," and 2.3.3.13, "Compressed Air," of the North Anna LRA, and consist of the air-conditioning system, bottled air pressurization system, and emergency ventilation system. Components that are subject to an AMR are identified in Tables 2.3.3-21 and 2.3.3-13 of the North Anna LRA. These tables also identify the section within the LRA that contains the AMR results. The SCs that comprise the control room envelope and that support the envelope functions are included within the scope of license renewal and subject to an AMR as described in each LRA. The applicant further stated that no new SCs need to be added to the scope of license renewal as a result of the response to RAI 2.3.3.21-1.

The NRC staff reviewed the applicant's responses to the staff's RAIs and determined that the applicant properly identified portions of the HV system that are within the scope of license renewal and subject to an AMR. The staff did not identify any omissions.

In the LRA for North Anna, the applicant identified the portions of the HV system that are within the scope of license renewal in the P&IDs listed below. The applicant also listed the mechanical component commodity groups that are subject to an AMR and their intended functions in Table 2.3.3-21 of the North Anna LRA.

<u>Unit 1</u>

<u>Unit 2</u>

11715-LRB-006A, Sh. 1	12050-LRM-079A, Sh. 2
11715-LRB-006A, Sh. 2	12050-LRM-079A, Sh. 3
11715-LRB-006A, Sh. 3	12050-LRM-079A, Sh. 4
11715-LRB-023A, Sh. 1	12050-LRM-079B, Sh. 3
11715-LRB-034F, Sh. 1	
11715-LRB-034F, Sh. 2	
11715-LRB-034F, Sh. 3	
11715-LRB-034F, Sh. 4	
11715-LRB-034F, Sh. 5	
11715-LRB-040C, Sh. 1	
11715-LRB-040C, Sh. 2	
11715-LRB-040D, Sh. 2	
11715-LRB-040D, Sh. 2	r
11715-LRB-040E, Sh. 1	
11715-LRB-040E, Sh. 2	
11715-LRM-079B, Sh. 2	
11715-LRM-079B, Sh. 3	
11715-LRM-079B, Sh. 4	
11715-LRM-079D, Sh. 4	
11715-LRM-106A, Sh. 4	

In the LRA for Surry, the applicant identified the portions of the HV system that are within the scope of license renewal in the P&IDs listed below. In addition, the applicant listed the

mechanical component commodity groups that are subject to an AMR and its intended functions in Table 2.3.3-21 of the Surry LRA.

<u>Unit 1</u>

11448-LRB-006A, Sh. 1
11448-LRB-006D, Sh. 1
11448-LRB-006D, Sh. 2
11448-LRB-006D, Sh. 3
11448-LRB-006D, Sh. 4
11448-LRB-024A, Sh. 1
11448-LRB-041A, Sh. 1
11448-LRB-041A, Sh. 2
11448-LRB-041A, Sh. 3
11448-LRB-041B, Sh. 1
11448-LRB-041B, Sh. 2
11448-LRB-041B, Sh. 3
11448-LRM-071D, Sh. 1
11448-LRM-071D, Sh. 2
11448-LRM-072A, Sh. 2
11448-LRM-072A, Sh. 3
11448-LRM-072A, Sh. 4
11448-LRM-072B, Sh. 2

<u>Unit 2</u>

11548-LRB-006A, Sh. 1 11548-LRM-072A, Sh. 2 11548-LRM-072A, Sh. 3 11548-LRM-072A, Sh. 4 11548-LRM-072B, Sh. 1

The P&IDs were highlighted by the applicant to identify those portions of the HV system that meet at least one of the scoping requirements of 10 CFR 54.4. The staff compared these P&IDs to the P&IDs and descriptions in the UFSARs to ensure they were representative of the HV system. The staff performed its review by sampling the SCs that the applicant determined within the scope of license renewal but not subject to an AMR to verify that no structure or component, that performs its intended function without moving parts or without a change in configuration or properties and, that are not subject to replacement based on qualified life or specified time period, was excluded from an AMR. The staff did not identify any omissions.

2.3.3.24.3 Conclusions

On the basis of the staff's review of the information contained in Section 2.3.3.21 of both North Anna and Surry LRAs, the supporting information in the UFSARs and P&IDs, and the applicant's responses to the staff's RAIs as described above, the staff did not identify any omissions in the scoping and screening of the HV system. Therefore, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the HV system that are within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a), and 10 CFR 54.21 (a)(1), respectively.

2.3.3.25 Boron Recovery

In the North Anna and Surry LRAs, Section 2.3.3.22, "Boron Recovery," the applicant describes the piping and mechanical components of the boron recovery (BR) systems that are within the scope of license renewal and subject to an AMR. North Anna and Surry both have a BR

system. These systems are identical with no notable differences in system design for the purpose of license renewal. Therefore, the information provided below is applicable to the North Anna and Surry BR systems. The BR structural components that are subject to AMR are presented separately by the applicant in Section 2.4.10 of each LRA, "General Structural Supports," as commodity groups and, therefore, are evaluated separately by the staff in Section 2.4.10 of this SER. The BR piping and mechanical components are further described by the applicant in Chapter 9.3.5 of the North Anna UFSAR and Chapter 9.2 of the Surry UFSAR.

2.3.3.25.1 Summary of Technical Information in the Application

North Anna and Surry both have a single BR system common to Unit 1 and Unit 2. The North Ann and Surry BR systems are used to degasify and store borated radioactive water letdown by the chemical and volume control systems or gaseous drain water transferred by the drains-gaseous systems. The portions of the BR systems that are subject to AMR consist of the components that provide the system pressure boundary for the BR and other interconnected systems.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of the North Anna and Surry LRAs. As described in the scoping methodology, the applicant identified the portions of the BR systems that are within the scope of license renewal on the license renewal drawings listed in the North Anna and Surry LRAs, Section 2.3.3.22. Consistent with the method described in each LRA, Section 2.1.5, "Screening Methodology," the applicant listed the NAS 1/2 and SPS 1/2 mechanical component commodity groups that are subject to an AMR in Tables 2.3.3-22 of each LRA. These tables also list the intended functions and the LRA sections that contain the AMR for each commodity group.

The portions of NAS 1/2 and SPS 1/2 BR systems that are subject to an AMR include the following 12 component commodity groups subject to an AMR: bellows, bolting, distillate coolers and stripper trim cooler, filters/strainers, heaters, overhead condensers, pipe, primary drain transfer tank vent chiller condenser, pump casings, stripper vent chillers, stripper vent condensers, and valve bodies. The applicant identified maintaining pressure-boundary integrity and providing filtration as the intended functions of the SCs that are subject to an AMR for the North Anna and Surry BR systems.

2.3.3.25.2 Staff Evaluation

The staff reviewed Sections 2.3.3.22 of both the North Anna and Surry LRAs to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the North Anna and Surry BR systems that are within the scope of license renewal in accordance with 10 CFR 54.4, and that the applicant appropriately identified the SCs of the BR systems that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in each LRA, the applicable license renewal drawings, and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the portions of the North Anna and Surry BR systems that are within the scope of license renewal. The staff verified that those portions of the BR systems that meet the

scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Sections 2.3.3.22 of both North Anna and Surry LRAs. To verify that the applicant did include the applicable portions of the BR systems within the scope of license renewal, the staff focused its review on those portions of the North Anna and Surry BR systems that were not identified within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the UFSARs for each facility to identify any additional system functions that were not identified in each LRA and verified that these additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the SCs of the North Anna and Surry BR systems that are subject to AMR from among those portions of the BR systems that are identified as being within the scope of license renewal. The applicant identified and lists the SCs subject to AMR for the BR systems in Table 2.3.3-22 of each LRA using the screening methodology described in Section 2.1 of each LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER.

In the North Anna LRA, the applicant identified the portions of the BR system that are within the scope of license renewal in the drawings listed below. The applicant also listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-22 of the North Anna LRA.

<u>Unit 1</u>

<u>Unit 2</u>

11715-LRM-079C, Sh. 1 11715-LRM-079C, Sh. 4 11715-LRM-079C, Sh. 5 11715-LRM-086B, Sh. 3 Common

In the Surry LRA, the applicant identified the portions of the BR systems that are within the scope of license renewal in the drawings listed below. In addition, the applicant listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-22 of the Surry LRA.

<u>Unit 1</u>

<u>Unit 2</u>

Common

11448-LRM-072C, Sh. 2 11448-LRM-072D, Sh. 3 11448-LRM-079A, Sh. 2 11448-LRM-079C, Sh. 1

The license renewal drawings were highlighted by the applicant to identify those portions of the BR systems that meet at least one of the scoping requirements of 10 CFR 54.4. The staff compared the license renewal drawings to the system drawings and the descriptions in the North Anna and Surry UFSARs to ensure they were representative of the BR systems. The staff performed its review by sampling the SCs that the applicant identified as being within the scope of license renewal but not subject to AMR to verify that no structure or component, that performs its intended function without moving parts or without a change in configuration or

properties and, that are not subject to replacement based on qualified life or specified time period, was excluded from an AMR. The staff did not identify any omissions.

2.3.3.25.3 Conclusion

On the basis of its review of the information contained in Sections 2.3.3.22 of each LRA the supporting information in the North Anna and Surry UFSARs, and the license renewal drawings, as described above, the staff did not identify any omissions in the scoping and screening of the North Anna and Surry BR systems by the applicant. Therefore, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the North Anna and Surry BR systems that are within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.26 Drains-Aerated

In each LRA Section 2.3.3.23, "Drains-Aerated," the applicant describes the components of the aerated drain (DA) systems that are within the scope of license renewal and subject to an AMR. NAS 1/2 and SPS 1/2 each has a DA system. These systems are identical for the purposes of license renewal for both facilities without any notable differences in system design. The DA structural components that are subject to AMR are presented separately by the applicant in Section 2.4.10 of each LRA, "General Structural Supports," as commodity groups and, therefore, are evaluated separately by the staff in Section 2.4.10 of this SER. The DA systems are further described in Section 9.3.5 of the North Anna UFSAR and Section 9.7 of the Surry UFSAR.

2.3.3.26.1 Summary of Technical Information in the Application

The DA system collects potentially radioactive fluids in building sumps and discharges the sump fluids to the waste disposal system for processing and disposal. The waste disposal function in itself is not within the scope of license renewal in accordance with 10 CFR 54.4(a). However, the containment penetration portion of the NAS 1/2 and SPS 1/2 DA system that serves as part of the containment pressure boundary is subject to AMR.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of each LRA. As described in the scoping methodology, the applicant identified portions of the DA system that are within the scope of license renewal on the license renewal drawings that are listed in Section 2.3.3.23 of each LRA. Consistent with the method described in each LRA, Section 2.1.5, "Screening Methodology," the applicant listed the DA system mechanical component commodity groups that are subject to an AMR in Table 2.3.3-23 of each LRA. These tables also list the intended functions, and the LRA section containing the AMR for each commodity group. Specifically, the applicant identified the following component commodity groups as subject to an AMR: pipe, valve bodies, and bolting. The applicant states that maintaining pressure boundary integrity is the only intended function subject to an AMR for these components.

2.3.3.26.2 Staff Evaluation

The staff reviewed Section 2.3.3.23 of the North Anna and Surry LRAs to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the NAS 1/2 and SPS 1/2 DA systems that are within the scope of license renewal in accordance with 10 CFR 54.4, and that the applicant appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in Section 2.3.3.23 of each LRA, the applicable license renewal drawings, and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the portions of the DA systems that are within the scope of license renewal. The staff verified that those portions of the NAS 1/2 and SPS 1/2 DA system that meet the scoping requirements of 10 CFR 54.4(a) were included within the scope of license renewal and were identified as such by the applicant in Section 2.3.3.23 of each LRA.

In the North Anna and Surry LRAs, Section 2.3.3.23, the applicant listed nine detailed drawings for the DA system. The detailed drawings were highlighted to identify those portions of the system that are within the scope of license renewal. The staff compared the license renewal drawings to the system drawings and descriptions in the North Anna and Surry UFSARs to ensure that they were representative of the DA systems. To verify that the applicant did include the applicable portions of the NAS 1/2 and SPS 1/2 DA systems within the scope of license renewal, the staff focused its review on those portions of the DA system that were not identified within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4(a). In addition, the staff reviewed the UFSARs for each facility to identify any additional system functions that were not identified in each LRA and verified that these additional functions did not meet the scoping requirements of 10 CFR 54.4(a). The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the NAS 1/2 and SPS 1/2 DA systems that were identified as being within the scope of license renewal. The applicant used the screening methodology described in Section 2.1 of each LRA to identify and list the SCs subject to AMR. The staff evaluation of the scoping and screening methodology is documented in Section 2.1 of this SER.

In the North Anna LRA, the applicant identified the portions of the DA system that are within the scope of license renewal and lists the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-23 of the LRA.

In the Surry LRA, the applicant identified the portions of the DA systems that are within the scope of license renewal and lists the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-23 of the LRA.

The staff then sampled the SCs that were within the scope of license renewal but not subject to an AMR to verify that the intended functions of these SCs were not performed without moving parts or without a change in configuration or properties, or were subject to replacement based on qualified life or specified time period. The staff did not identify any omissions.

2.3.3.26.3 Conclusions

On the basis of the staff's review of the information contained in Section 2.2.3.23 of each LRA and the supporting information in the license renewal drawings and the North Anna and Surry UFSARs, as described above, the staff did not identify any omissions in the scoping and screening results of the NAS 1/2 and SPS 1/2 DA systems by the applicant. Therefore, the staff finds that there is reasonable assurance that the applicant has adequately identified those portions of the NAS 1/2 and SPS 1/2 DA systems that are within the scope of license renewal and the associated SCs that are subject to an AMR, in accordance with the requirements of 10 CFR 54.4(a) and 54.21(a)(1), respectively.

2.3.3.27 North Anna Drains-Building Services System/Surry Plumbing System

In the North Anna LRA, Section 2.3.3.24 "Drains-Building Services Systems," the applicant describes the components of the drains-building services (DB) systems that are within the scope of license renewal and subject to an AMR for NAS 1/2. This system is further described in Section 9.3.3 of the North Anna UFSAR. In the Surry LRA, Section 2.3.3.25, "Plumbing," the applicant describes the components of the plumbing (PL) systems that are within the scope of license renewal and subject to an AMR for SPS 1/2. The PL is further described in the SPS UFSAR, Appendix 9C. The DB system and PL system structural components that are subject to AMR are presented separately by the applicant in Section 2.4.10 of each LRA, "General Structural Supports," as commodity groups and, therefore, are evaluated separately by the staff in Section 2.4.10 of this SER. Both the DB and PL systems are evaluated below in this section of the SER. Unless otherwise specified, the information provided below is applicable to the NAS 1/2 DB systems and to the SPS 1/2 PL systems.

2.3.3.27.1 Summary of Technical Information in the Application

The safety function of the North Anna DB systems and Surry PL systems is to prevent or mitigate plant flooding for its perspective unit. The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology" of each LRA. As described in the scoping methodology, the applicant identified the portions of the DB and PL systems that are within the scope of license renewal on the license renewal drawings listed in Section 2.3.3.24 and Section 2.3.3.25 of the respective LRA. Consistent with the methodology described in Section 2.1.5, "Screening Methodology," of each LRA the applicant listed the DB and PL systems mechanical component commodity groupings in Tables 2.3.3-24 and 2.3.3-25, respectively, that are within the license renewal evaluation boundaries and that are subject to an AMR. The portions of the DB and PL systems that are subject to AMR include the main control room and emergency switchgear room, chiller rooms, sump discharge path components that prevent flooding of the chiller rooms for NAS 1/2 turbine building sump pumps, and discharge piping for SPS 1/2. In the NAS LRA, Table 2.3.3-24, and the SPS LRA, Table 2.3.3-25, the applicant listed the following three component commodity groups as subject to an AMR: pipe, pump casings, and valve bodies. The applicant identified maintaining system pressure boundary integrity as the only intended function of the SCs subject to an AMR for the DB and PL systems.

2.3.3.27.2 Staff Evaluation

The staff reviewed the North Anna LRA, Section 2.3.3.24, and the Surry LRA, Section 2.3.3.25, to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the DB systems and PL systems that are within the scope of license renewal and the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

The staff reviewed the information provided by the applicant in each LRA, the applicable license renewal drawings, and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the SSCs of the DB and PL systems that are within the scope of license renewal. The staff verified that those portions of the DB and PL systems that meet the scoping requirements of 10 CFR 54.4(a) were included within the scope of license renewal and were identified as such by the applicant in Sections 2.3.3.24 and 2.3.3.25 of each LRA, respectively. To verify that the applicant did include the applicable portions of the DB and PL systems within the scope of license renewal, the staff focused its review on those portions of the DB and PL systems that were not identified within the scope of license renewal to verify that they do not meet the scoping requirements of 10 CFR 54.4(a). The staff also reviewed the applicable portions of the North Anna and Surry UFSARs to determine whether there were any additional system functions that were not identified in either LRA, and verified that those additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the DB and PL systems that are identified as being within the scope of license renewal. The applicant identified and lists the SCs subject to AMR for the DB and PL systems in Tables 2.3.3-24 and 2.3.3.25 (respectively) using the screening methodology described in each LRA Section 2.1. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER.

In the NAS LRA, the applicant identified the portions of the DB system that are within the scope of license renewal on the license renewal drawings listed below. "The applicant also listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-24 of the NAS LRA.

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Unit 2

11715-LRB-201A, Sh. 1 11715-LRB-201A, Sh. 2 Common

In the SPS LRA, the applicant identified the portions of the PL system that are within the scope of license renewal in the drawings listed below. The applicant also listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-25 of the SPS LRA.

<u>Unit 1</u>

11448-LRB-15B, Sh. 1

11548-LRB-15B, Sh. 1

Unit 2

The license renewal drawings were highlighted by the applicant to identify those portions of the DB and PL systems that perform at least one of the scoping requirements of 10 CFR 54.4(a). The staff compared the license renewal drawings to the system drawings and the verbal descriptions in the North Anna and Surry UFSARs to ensure they were representative of the DB and PL systems. The staff performed its review by sampling the SCs that the applicant identified as being within the scope of license renewal but not subject to AMR to verify that no structure or component, that performs its intended function without moving parts or without a change in configuration or properties and, that are not subject to replacement based on qualified life or specified time period, was excluded from an AMR. The staff did not identify any omissions.

2.3.3.27.3 Conclusions

On the basis of its review of the information contained in Section 2.3.3.24 of the NAS LRA and Section 2.3.3.25 of the SPS LRA, the supporting information from both UFSARs, and applicable license renewal drawings, as described above, the staff did not identify any omissions in the scoping and screening of the North Anna DB systems and Surry PL systems by the applicant. The staff concludes that there is reasonable assurance that the applicant has identified those portions of the NAS 1/2 DB systems and SPS 1/2 PL systems that are within the scope of license renewal and subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.28 Drains - Gaseous

In the North Anna LRA, Section 2.3.3.25, and Surry LRA, Section 2.3.3.24, both entitled "Drains - Gaseous," the applicant describes the components of the gaseous drain (DG) systems that are within the scope of license renewal and subject to an AMR. Each unit of NAS and SPS has a DG system. These systems are identical with no notable differences in system design for the purpose of license renewal. Therefore, the information provided below is applicable to the NAS 1/2 and SPS 1/2 DG systems. The DG structural components that are subject to AMR are presented separately by the applicant in Section 2.4.10 of each LRA, "General Structural Supports," as commodity groups and, therefore, are evaluated separately by the staff in Section 2.4.10 of this SER. The DG systems are further described in Section 9.3.3 of the North Anna UFSAR and Section 9.7 of the Surry UFSAR.

2.3.3.28.1 Summary of Technical Information in the Application

The DG system collects potentially radioactive fluids and discharges the fluids to the boron recovery system. DG system drainage collected from the primary systems is processed through the primary drains transfer tank and cooler. The function of collecting primary system drainage performed by the DG system is not in itself within the scope of license renewal in accordance with 10 CFR 54.4(a). However, the containment penetration portion of the DG system that serves as part of the containment pressure boundary and the portion of the DG

system (the primary drains transfer tank cooler) that serves as part of the component cooling system pressure boundary are subject to AMR.

In addition, the portions of the Surry DG system that serve as part of the safety injection (SI) system and neutron shield tank cooling (NS) system pressure boundaries are subject to an AMR. This includes the DG drain isolation valves from the safety injection (SI) system piping and the DG drain isolation valves from the NS system coolers.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of each LRA. As described in the scoping methodology, the applicant identified portions of the DG system that are within the scope of license renewal on license renewal drawings that are listed in Section 2.3.3.25 of North Anna LRA and Section 2.3.3.24 of Surry LRA. Consistent with the method described in each LRA, Section 2.1.5, "Screening Methodology," the applicant listed the DG system mechanical component commodity groups that are subject to an AMR in Table 2.3.3-25 of the North Anna LRA and Table 2.3.3-24 of the Surry LRA. These tables also list the intended functions, and the LRA section containing the AMR for each commodity group. Specifically, the applicant identified the following component commodity groups as subject to an AMR: pipe, valve bodies, bolting, and primary drain transfer tank coolers. The applicant states that maintaining pressure boundary integrity is the only intended function subject to an AMR for these components.

2.3.3.28.2 Staff Evaluation

The staff reviewed the Surry and North Anna LRAs, Sections 2.3.3.24 and 2.3.3.25, respectively, to determine whether there is reasonable assurance that the applicant has appropriately identified the DG system SCs that are within the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information provided in each LRA, the applicable license renewal drawings, and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the portions of the NAS 1/2 and SPS 1/2 DG systems that are within the scope of license renewal. The staff verified that those portions of the DG systems that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Sections 2.3.3.25 and 2.3.3.24 of the North Anna and Surry LRAs, respectively. To verify that the applicant did include the applicable portions of the DG systems within the scope of license renewal, the staff focused its review on those portions of the NAS 1/2 and SPS 1/2 DG systems that were not identified within the scope of license renewal and verified that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the UFSARs for each facility to identify any additional system functions that were not identified in each LRA and verified that these additional functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the DG systems that were identified as being within the scope of license renewal. The applicant used the screening methodology described in Section 2.1 of each LRA to identify and list the SCs subject to AMR. The staff evaluation of the scoping and screening methodology is documented in Section 2.1 of this SER.

In the North Anna LRA, the applicant identified the portions of the DG system that are within the scope of license renewal in the license renewal drawings. The applicant also listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-25 of the North Anna LRA.

In the Surry LRA, the applicant identified the portions of the DG systems that are within the scope of license renewal in the drawings listed below. In addition, the applicant listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-24 of the Surry LRA.

The license renewal drawings were highlighted by the applicant to identify those portions of the DG systems that meet at least one of the scoping requirements of 10 CFR 54.4. The staff compared the license renewal drawings to the system drawings and the descriptions in the North Anna and Surry UFSARs to ensure they were representative of the DG systems. The staff performed its review by sampling the SCs that the applicant identified as being within the scope of license renewal but not subject to AMR to verify that no structure or component, that performs its intended function without moving parts or without a change in configuration or properties and, that are not subject to replacement based on qualified life or specified time period, was excluded from an AMR. The staff did not identify any omissions.

2.3.3.28.3 Conclusions

On the basis of its review of the information contained in Section 2.3.3.25 of the North Anna LRA and Section 2.3.3.24 of the Surry LRA, the supporting information in the North Anna and Surry UFSARs, and the license renewal drawings, as described above, the staff did not identify any omissions in the scoping and screening of the NAS 1/2 and SPS 1/2 DG systems by the applicant. Therefore, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the NAS 1/2 and SPS 1/2 DG systems that are within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.3.29 Liquid and Solid Waste

In the North Anna LRA, Section 2.3.3.26, "Liquid and Solid Waste," the applicant describes the components of the liquid and solid waste (LW) systems that are within the scope of license renewal and subject to an AMR. The system is further described in Section 11.2 of the North Anna UFSAR. The following staff evaluation only applies to the North Anna LRA because the SPS does not have an LW system that is within the scope of license renewal.

2.3.3.29.1 Summary of Technical Information in the Application

The LW system processes potentially radioactive liquid and solid wastes produced by the operation of the plant. The waste processing function is not in itself within the scope of license renewal in accordance with 10 CFR 54.4(a). However, the portions of the LW system that provide the pressure boundary for the chemical and volume control (CH) and component cooling (CC) systems are subject to AMR.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of each LRA. As

described in the scoping methodology, the applicant identified portions of the LW system that are within the scope of license renewal on the license renewal drawings that are listed in Section 2.3.3.26 of the North Anna LRA. Consistent with the method described in the LRA, Section 2.1.5, "Screening Methodology," the applicant listed the LW system mechanical component commodity groups that are subject to an AMR in Table 2.3.3-26 of the North Anna LRA. These tables also list the intended functions, and the LRA section containing the AMR for each commodity group. Specifically, the applicant identified the following component commodity groups as subject to an AMR: valve bodies and the steam generator blowdown heat exchangers. The applicant noted that the piping associated with these components is included in the radwaste (RW) system (Section 2.3.3.32 of this SER). The applicant states that maintaining pressure boundary integrity is the only intended function that is subject to an AMR for these components.

2.3.3.29.2 Staff Evaluation

The staff reviewed the North Anna LRA, Section 2.3.3.26, to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the LW system that are within the scope of license renewal in accordance with 10 CFR 54.4 (a), and that the applicant appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the scoping and screening results provided in Section 2.3.3.26 of the LRA, the applicable license renewal drawings, and the North Anna UFSAR to determine whether the applicant adequately identified the portions of the LW system that are within the scope of license renewal. The staff verified that those portions of the LW system that meet the scoping requirements of 10 CFR 54.4(a) were included within the scope of license renewal and were identified as such by the applicant in Section 2.3.3.26 of the North Anna LRA.

In the North Anna LRA, Section 2.3.3.26, the applicant listed three license renewal drawings for the LW system. The detailed drawings were highlighted to identify those portions of the system that are within the scope of license renewal. The staff compared the LRA drawings to the system drawings and descriptions in the UFSARs to ensure that they were representative of the LW system. The staff sampled portions of the drawings that were not highlighted to verify that these components did not meet any of the intended functions associated with the scoping criteria of 10 CFR 54.4(a). The staff also reviewed the UFSARs to determine whether there were any additional system functions that were not identified in the LRA and verified that those additional functions did not meet the scoping requirements of 10 CFR 54.4(a). In addition, the staff specifically confirmed that the LW system does not penetrate the containment, and that there is no containment isolation function associated with this system.

Furthermore, the staff reviewed the SPS LW system to verify that it was appropriately excluded from the scope of license renewal in accordance with 10 CFR 54.4(a). The applicant determined that North Anna and Surry use different system boundary nomenclature. At NAS, the CH ion exchanger drain valves are identified as liquid waste (LW) valves. At SPS, the drain valves on the CH ion exchangers are identified as CH valves. The design of the blowdown systems at North Anna and Surry differ as well. The NAS blowdown system uses a flash tank design and discharges the blowdown to waste. The steam generator blowdown heat exchangers at North Anna cool the flash tank effluent and are within the boundary of the liquid waste system. The cooling water is from the CC system and the portion of the heat exchanger

that provides a pressure boundary for the CC system is the portion in scope and subject to AMR. The heat exchanger provides no other intended function than CC system pressure boundary. Additionally, the temperature control valve on the component cooling water outlet piping of these heat exchangers has an LW mark number and was appropriately included in the scope of license renewal per 10 CFR 54.4(a)(1). The SPS blowdown systems design has a blowdown recovery system and uses condensate as the cooling medium. The blowdown interface with condensate is at a non-safety-related portion of the condensate system and was appropriately determined not to be within the scope of license renewal consistent with the requirements of 10 CFR 54.4.

The staff did not identify any omissions in the scoping of the North Anna and the exclusion of the Surry LW systems.

The staff then determined whether the applicant had properly identified the SCs that are subject to an AMR from among those portions of the North Anna LW system that were identified within the scope of license renewal. The applicant used the screening methodology described in Section 2.1 of each LRA to identify and list the SCs subject to AMR. The staff evaluation of the scoping and screening methodology is documented in Section 2.1 of this SER. In the North Anna LRA, the applicant identified the portions of the LW system that are within the scope of license renewal and lists the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.3-26 of the LRA. The staff then sampled the SCs that were within the scope of license renewal but not subject to an AMR to verify that the intended functions of these SCs were not performed without moving parts or without a change in configuration or properties, or were subject to replacement based on qualified life or specified time period. The staff did not identify any omissions.

2.3.3.29.3 Conclusions

On the basis of the staff's review of the information contained in Section 2.2.3.26 of the North Anna LRA and the supporting information in the license renewal drawings and the North Anna UFSAR, as described above, the staff did not identify any omissions in the scoping and screening results of the LW system by the applicant. Therefore, the staff finds that there is reasonable assurance that the applicant has adequately identified those portions of the North Anna LW system that are within the scope of license renewal and the associated SCs that are subject to an AMR, in accordance with the requirements of 10 CFR 54.4(a) and 54.21(a)(1), respectively. The staff also confirmed that the Surry LW system need not be included within the scope of license renewal in accordance with 10 CFR 54.4.

2.3.3.30 Plumbing

This Section has been combined with, and discussed in Section 2.3.3.27, "North Anna Drains-Building Services System/Surry Plumbing System" of this SER.

2.3.3.31 Gaseous Waste

In the SPS LRA Section 2.3.3.26, "Gaseous Waste," the applicant describes the components of the gaseous waste (GW) system that are within the scope of license renewal and subject to an AMR. The system is further described in Section 11.2.5 of the SPS UFSAR. The in-scope portion of the GW system at Surry is functionally equivalent to the North Anna post-accident

hydrogen control (HC) system which is evaluated in Sections 2.3.3.33 of this SER. Therefore, the following staff evaluation only applies to the Surry LRA.

2.3.3.31.1 Summary of Technical Information in the Application

The GW system provides holding capability and processing for potential radioactive gases collected from various plant systems. The GW system also provides the capability to monitor and control the post-accident containment atmosphere hydrogen concentration via hydrogen analyzer and recombiner units. The portions of the GW system that are associated with containment hydrogen monitoring and control, and that perform a containment pressure boundary function as part of the GW system containment penetration, are subject to an AMR.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of the LRAs. As described in the scoping methodology, the applicant identified portions of the GW system that are within the scope of license renewal on the license renewal drawings that are listed in Section 2.3.3.26 of the Surry LRA. Consistent with the method described in the LRA, Section 2.1.5, "Screening Methodology," the applicant listed the GW system mechanical component commodity groups that are subject to an AMR in Table 2.3.3-26 of the Surry LRA. This table also lists the intended functions, and the LRA section containing the AMR for each commodity group. Specifically, the applicant identified the following component commodity groups as subject to an AMR: valve bodies, pipe, tubing, instrument valve assemblies, recombiner, and flexible connections. The applicant states that maintaining pressure boundary integrity is the only intended function that is subject to an AMR for these components.

2.3.3.31.2 Staff Evaluation

The staff reviewed the Surry LRA, Section 2.3.3.26, to determine whether there is reasonable assurance that the applicant has appropriately identified the portions of the GW system that are within the scope of license renewal in accordance with 10 CFR 54.4 (a), and that the applicant has appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the scoping and screening results provided in Section 2.3.3.26 of the SPS LRA, the applicable license renewal drawings, and the Surry UFSAR to determine if the applicant has adequately identified the portions of the GW system that are in the scope of license renewal. The staff verified that those portions of the GW system that meet the scoping requirements of 10 CFR 54.4(a) were included within the scope of license renewal, and were identified as such by the applicant in Section 2.3.3.26 of the Surry LRA.

In the SPS LRA, Section 2.3.3.26, the applicant listed three license renewal drawings for the GW system. The detailed drawings are highlighted to identify those portions of the system that are within the scope of license renewal. The staff compared the LRA drawings to the system drawings and descriptions in the UFSARs to ensure they were representative of the GW system. The staff sampled portions of the drawings that were not highlighted to verify that these components did not meet any of the intended functions associated with the scoping, criteria of 10 CFR 54.4(a). The staff also reviewed the UFSARs to determine if there were any additional system functions that were not identified in the LRA and verified that those additional functions did not meet the scoping requirements of 10 CFR 54.4(a).

In the conference call dated October 3, 2001, the staff asked the applicant to clarify its determination of certain components of the GW system being not in the scope of license renewal. Specifically, as shown in NAS UFSAR Section 3.2.2 and Table 3.2-1, the GW components, such as gas waste decay tanks, waste gas recombiner, compressors, filter, blowers, piping and valves, and supports from stripper to dilution air, and surge drum, are identified as Seismic Category I, and therefore, the staff believes that these components are safety-related in the current design basis. Similarly, SPS UFSAR Table15.2-1 identifies the components such as gas waste decay tanks, waste gas recombiner, compressors, filter, and blowers being Seismic Category I, and therefore, these components are safety-related. However, the staff could not find those GW components being included in the scope of license renewal.

The applicant clarified that those GW components, questioned by the staff, are classified as safety-related in the equipment data system (EDS). However, based on the results of the waste gas decay tank rupture accident analysis, the failure of these portions of the GW systems would result in dose consequences well below the guidelines of 10 CFR, Part 100. Therefore, these portions of the NAS and SPS GW systems have no intended functions [as defined in 10 CFR 54.4(a)(1)(iii)], and were determined to be not within the scope. During the scoping process on the other hand, the SPS GW system was determined to be within the scope of license renewal, because portions of the SPS GW system, including the components associated with the containment hydrogen analyzer system and containment atmosphere sample penetration, are within the scope of license renewal for their function of supporting the containment pressure boundary. The in-scope portion of the SPS GW system, which is also determined to be within the scope under HC system boundary in the NAS LRA. The staff did not identify any omissions in the scoping of mechanical components according to 10 CFR 54.4(a).

The staff then determined whether the applicant had properly identified the SCs that are subject to an AMR from among those portions of the Surry GW system that were identified as being within the scope of license renewal. The applicant used the screening methodology described in Section 2.1 of the LRAs to identify and list the SCs subject to an AMR. The staff evaluation of the scoping and screening methodology is documented in Section 2.1 of this SER. In the Surry LRA, the applicant listed the mechanical component commodity groups that are subject to an AMR and its intended functions in Table 2.3.3-26 of the Surry LRA. The staff then sampled the SCs that the applicant determined as being within the scope of license renewal but not subject to an AMR to verify that no structure or component, that performs its intended functions without moving parts or without a change in configuration or properties (passive) or that is not subject to replacement based on qualified life or specified time period (long-lived), was excluded from an AMR. The staff did not identify any omissions.

2.3.3.31.3 Conclusions

On the basis of the staff's review of the information contained in Section 2.3.3.26 of the Surry LRA, the supporting information in the license renewal drawings, and the Surry UFSAR, as described above, the staff did not identify any omissions in the scoping and screening results of the GW system by the applicant. Therefore, the staff finds that there is reasonable assurance that the applicant has adequately identified those portions of the GW system that are within the scope of license renewal, and the associated SCs that are subject to an AMR, in accordance with the requirements of 10 CFR 54.4(a) and 54.21(a)(1), respectively.

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2.3.3.32 Radwaste

In the NAS LRA Section 2.3.3.27, "Radwaste," the applicant describes the components of the radwaste (RW) system that are within the scope of license renewal and subject to an AMR. The system is further described in Section 11.2 of the NAS UFSAR. Because of the design differences between NAS and SPS, the following staff evaluation only applies to the North Anna LRA.

2.3.3.32.1 Summary of Technical Information in the Application

The RW system processes potentially radioactive radwaste produced by the operation of the plant. The portion of the RW system that provides the pressure boundary for the chemical and volume control (CH) system is subject to an AMR.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of the LRAs. As described in the scoping methodology, the applicant identified portions of the RW system that are within the scope of license renewal on the license renewal drawings that are listed in Section 2.3.3.27 of the NAS LRA. Consistent with the method described in the LRA, Section 2.1.5, "Screening Methodology," the applicant listed the RW system mechanical component commodity groups that are subject to an AMR in Table 2.3.3-27 of the North Anna LRA. This table also lists the intended functions, and the LRA section containing the AMR for each commodity group. Specifically, the applicant identified the following component commodity groups as subject to an AMR: pipe, and valve bodies. The applicant noted that the valves associated with these components are included in the LW system (Section 2.3.3.29 of this SER). The applicant states that maintaining pressure boundary integrity is the only intended function that is subject to an AMR for these components.

2.3.3.32.2 Staff Evaluation

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

The staff reviewed the scoping and screening results provided in Section 2.3.3.27 of the LRA, the applicable license renewal drawings, and the North Anna UFSAR to determine if the applicant has adequately identified the portions of the RW system that are in the scope of license renewal. The staff verified that those portions of the RW system that meet the scoping requirements of 10 CFR 54.4(a) were included within the scope of license renewal, and were identified as such by the applicant in Section 2.3.3.27 of the North Anna LRA.

In the North Anna LRA, Section 2.3.3.27, the applicant listed six license renewal drawings for the RW system. The detailed drawings are highlighted to identify those portions of the system that are within the scope of license renewal. The staff compared the LRA drawings to the system drawings and descriptions in the UFSARs to ensure that they were representative of the RW system. The staff sampled portions of the drawings that were not highlighted to verify that these components did not meet any of the intended functions associated with the scoping

criteria of 10 CFR 54.4(a). The staff also reviewed the UFSARs to determine if there were any additional system functions that were not identified in the LRA and verified that those additional functions did not meet the scoping requirements of 10 CFR 54.4(a). The staff did not identify any omissions in the scoping of the North Anna RW system.

The staff then determined whether the applicant had properly identified the SCs that are subject to an AMR from among those portions of the North Anna RW system that were identified as being within the scope of license renewal. The applicant used the screening methodology described in Section 2.1 of the LRAs to identify and list the SCs subject to an AMR. The staff evaluation of the scoping and screening methodology is documented in Section 2.1 of this SER. In the North Anna LRA, the applicant listed the mechanical component commodity groups that are subject to an AMR and its intended functions in Table 2.3.3-27 of the North Anna LRA. The staff then sampled the SCs that the applicant determined as being within the scope of license renewal but not subject to an AMR to verify that no structure or component, that performs its intended functions without moving parts or without a change in configuration or properties (passive) or that is not subject to replacement based on qualified life or specified time period (long-lived), was excluded from an AMR. The staff did not identify any omissions.

2.3.3.32.3 Conclusions

On the basis of the staff's review of the information contained in Section 2.3.3.27 of the North Anna LRA, the supporting information in the license renewal drawings, and the North Anna UFSAR, as described above, the staff did not identify any omissions in the scoping and screening results of the RW system by the applicant. Therefore, the staff finds that there is reasonable assurance that the applicant has adequately identified those portions of the RW system that are within the scope of license renewal, and the associated SCs that are subject to an AMR, in accordance with the requirements of 10 CFR 54.4(a) and 54.21(a)(1), respectively.

2.3.3.33 Post-Accident Hydrogen Removal

In the NAS LRA Section 2.3.3.28 "Post-Accident Hydrogen Removal," the applicant describes the components of the post-accident hydrogen removal (HC) system that are within the scope of license renewal and subject to an AMR. The system is further described in Section 6.2.5 of the NAS UFSAR. The in-scope portion of the HC system at North Anna is functionally equivalent to the Surry gaseous waste (GW) system which is evaluated in Section 2.3.3.31. Therefore, the following staff evaluation only applies to the North Anna LRA.

2.3.3.33.1 Summary of Technical Information in the Application

The HC system provides the capability to monitor and control the post-accident containment atmosphere hydrogen concentration. The HC system is comprised of hydrogen recombiner units, hydrogen analyzers, and associated components. The portion of the HC system that are associated with containment hydrogen monitoring and control, and that perform a containment pressure boundary function as part of the HC system containment penetration is subject to an AMR.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of the LRAs. As described in the scoping methodology, the applicant identified portions of the HC system that

are within the scope of license renewal on the license renewal drawings that are listed in Section 2.3.3.28 of the NAS LRA. Consistent with the method described in the LRA, Section 2.1.5, "Screening Methodology," the applicant listed the HC system mechanical component commodity groups that are subject to an AMR in Table 2.3.3-28 of the NAS LRA. This table also lists the intended functions, and the LRA section containing the AMR for each commodity group. Specifically, the applicant identified the following component commodity groups as subject to an AMR: pipe, valve bodies, tubing, instrument valve assemblies, recombiner, flexible connections, expansion joints, fan/blower housings, filters/strainers, flow element, and tanks. The applicant states that maintaining pressure boundary integrity is the only intended function that is subject to an AMR for all the above components except two. The flow element has both the flow restriction and pressure boundary functions. The filters/strainers have the filtration function.

2.3.3.33.2 Staff Evaluation

The staff reviewed the NAS LRA, Section 2.3.3.28, to determine whether there is reasonable assurance that the applicant has appropriately identified the portions of the HC system that are within the scope of license renewal in accordance with 10 CFR 54.4 (a), and that the applicant has appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the scoping and screening results provided in Section 2.3.3.28 of the NAS LRA, the applicable license renewal drawings, and the North Anna UFSAR to determine if the applicant has adequately identified the portions of the HC system that are in the scope of license renewal. The staff verified that those portions of the HC system that meet the scoping requirements of 10 CFR 54.4(a) were included within the scope of license renewal, and were identified as such by the applicant in Section 2.3.3.28 of the North Anna LRA.

In the NAS LRA, Section 2.3.3.28, the applicant listed six license renewal drawings for the HC system. The detailed drawings are highlighted to identify those portions of the system that are within the scope of license renewal. The staff compared the LRA drawings to the system drawings and descriptions in the UFSARs to ensure they were representative of the HC system. The staff sampled portions of the drawings that were not highlighted to verify that these components did not meet any of the intended functions associated with the scoping criteria of 10 CFR 54.4(a). The staff also reviewed the UFSARs to determine if there were any additional system functions that were not identified in the LRA and verified that those additional functions did not meet the scoping requirements of 10 CFR 54.4(a). The staff did not identify any omissions in the scoping of mechanical components according to 10 CFR 54.4(a).

The staff then determined whether the applicant had properly identified the SCs that are subject to an AMR from among those portions of the North Anna HC system that were identified as being within the scope of license renewal. The applicant used the screening methodology described in Section 2.1 of the LRAs to identify and list the SCs subject to an AMR. The staff evaluation of the scoping and screening methodology is documented in Section 2.1 of this SER. In the North Anna LRA, the applicant listed the mechanical component commodity groups that are subject to an AMR and its intended functions in Table 2.3.3-28 of the North Anna LRA. The staff then sampled the SCs that the applicant determined as being within the scope of license renewal but not subject to an AMR to verify that no structure or component, that performs its intended functions without moving parts or without a change in configuration or properties

(passive) or that is not subject to replacement based on qualified life or specified time period (long-lived), was excluded from an AMR. The staff did not identify any omissions.

2.3.3.33.3 Conclusions

On the basis of the staff's review of the information contained in Section 2.3.3.28 of the North Anna LRA, the supporting information in the license renewal drawings, and the North Anna UFSAR, as described above, the staff did not identify any omissions in the scoping and screening results of the HC system by the applicant. Therefore, the staff finds that there is reasonable assurance that the applicant has adequately identified those portions of the HC system that are within the scope of license renewal, and the associated SCs that are subject to an AMR, in accordance with the requirements of 10 CFR 54.4(a) and 54.21(a)(1), respectively.

2.3.3.34 Radiation Monitoring

In the NAS LRA, Section 2.3.3.29, and SPS LRA, Section 2.3.3.27, "Radiation Monitoring," the applicant describes the components of the radiation monitoring (RM) system that are within the scope of license renewal and subject to an AMR. The system is further described in Section 11.4 of the NAS UFSAR and Section 11.3 of the SPS UFSAR.

2.3.3.34.1 Summary of Technical Information in the Application

The RM system provides indication of radiation conditions in various plant areas and within potentially radioactive plant systems. The portion of the RM system that perform a containment pressure boundary function as part of the RM system containment penetration is subject to an AMR.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of the LRAs. As described in the scoping methodology, the applicant identified portions of the RM system that are within the scope of license renewal on the license renewal drawings that are listed in Section 2.3.3.29 of NAS LRA and Section 2.3.3.27 of SPS LRA. Consistent with the method described in the LRAs Section 2.1.5, "Screening Methodology," the applicant listed the RM system mechanical component commodity groups that are subject to an AMR in Table 2.3.3-29 of NAS LRA and Table 2.3.3-27 of SPS LRA. These tables also list the intended functions, and the LRA section containing the AMR for each commodity group. Specifically, the applicant identified the following component commodity groups as subject to an AMR: pipe, and valve bodies. The applicant states that maintaining pressure boundary integrity is the only intended function that is subject to an AMR for these components.

2.3.3.34.2 Staff Evaluation

The staff reviewed the NAS LRA Section 2.3.3.29, and the SPS LRA Section 2.3.3.27 to determine whether there is reasonable assurance that the applicant has appropriately identified the portions of the RM system that are within the scope of license renewal in accordance with 10 CFR 54.4(a), and that the applicant has appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the scoping and screening results provided in Section 2.3.3.29 of the NAS LRA, Section 2.3.3.27 of the SPS LRA, the applicable license renewal drawings, and the NAS and SPS UFSARs to determine if the applicant has adequately identified the portions of the RM system that are within the scope of license renewal. The staff verified those portions of the RM system that meet the scoping requirements of 10 CFR 54.4(a) were included in the scope of license renewal, and were identified as such by the applicant in Section 2.3.3.29 of the NAS LRA and Section 2.3.3.27 of the SPS LRA.

In the NAS LRA, Section 2.3.3.29, and SPS LRA Section 2.3.3.27, the applicant listed four license renewal drawings for the RM system. The detailed drawings are highlighted to identify those portions of the system that are within the scope of license renewal. The staff compared the LRA drawings to the system drawings and descriptions in the UFSARs to ensure that they were representative of the RM system. The staff sampled portions of the drawings that were not highlighted to verify that these components did not meet any of the intended functions associated with the scoping criteria of 10 CFR 54.4(a). The staff also reviewed the UFSARs to determine if there were any additional system functions that were not identified in the LRA and verified that those additional functions did not meet the scoping requirements of 10 CFR 54.4(a).

Furthermore, the staff reviewed the NAS and SPS systems to verify that the components associated with the radiation monitoring function such as post-accident radiation monitors, containment high-range radiation monitor system, containment gaseous and particulate monitors were properly excluded from the scope of license renewal in accordance with 10 CFR 54.4(a). The applicant determined that with the exception of the containment high range radiation monitors (CHRRMS) at SPS and NAS, the radiation monitoring function do not perform the intended function as specified in 10 CFR 54.4(a). The CHRRMS monitor is in the scope of license renewal, but the monitor has no passive components subject to an AMR. The portion of the RM system that is subject to an AMR consists of the components that perform a containment pressure boundary function as part of the RM system containment penetration. The staff did not identify any omissions by the applicant in scoping of mechanical components according to 10 CFR 54.4(a).

The staff then determined whether the applicant had properly identified the SCs that are subject to an AMR from among those portions of the RM system that were identified as being within the scope of license renewal. The applicant used the screening methodology described in Section 2.1 of the LRAs to identify and list the SCs subject to an AMR. The staff evaluation of the scoping and screening methodology is documented in Section 2.1 of the SER. In both the NAS and SPS LRAs, the applicant identified the portions of the RM system that are within the scope of license renewal in the license renewal drawings, and lists the mechanical component commodity groups that are subject to an AMR and its intended functions in Table 2.3.3-29 of the NAS LRA and Table 2.3.3-27 of the SPS LRA. The staff then sampled the SCs that the applicant determined as being within the scope of license renewal but not subject to an AMR to verify that no structure or component, that performs its intended functions without moving parts or without a change in configuration or properties (passive) or that is not subject to replacement based on qualified life or specified time period (long-lived), was excluded from an AMR. The staff did not identify any omissions.

2.3.3.34.3 Conclusions

On the basis of the staff's review of the information contained in Section 2.3.3.29 of the NAS LRA and Section 2.3.3.27 of the SPS LRA, the supporting information in the license renewal drawings, and the NAS and SPS UFSARs, as described above, the staff did not identify any omissions in the scoping and screening results of the RM system by the applicant. Therefore, the staff finds that there is reasonable assurance that the applicant has adequately identified those portions of the RM systems that are within the scope of license renewal, and the associated SCs that are subject to an AMR, in accordance with the requirements of 10 CFR 54.4(a) and 54.21(a)(1), respectively.

2.3.3.35 Vent - Aerated

In the SPS LRA Section 2.3.3.28 "Vent - Aerated," the applicant describes the components of the vent-aerated (VA) gaseous waste system that are within the scope of license renewal and subject to an AMR. The system is further described in Section 9.7 of the SPS UFSAR. The Surry VA system is equivalent to the function of the North Anna drains-aerated (DA) system which is evaluated in Section 2.3.3.26. The following staff evaluation applies to SPS VA system only.

2.3.3.35.1 Summary of Technical Information in the Application

The Surry VA system collects and processes gases vented from various potentially radioactive systems. The portions of the VA system that perform a containment pressure boundary function as part of the VA system containment penetration is subject to an AMR.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of the LRAs. As described in the scoping methodology, the applicant identified portions of the VA system that are within the scope of license renewal on the license renewal drawings that are listed in Section 2.3.3.28 of the Surry LRA. Consistent with the method described in the LRA, Section 2.1.5, "Screening Methodology," the applicant listed the VA system mechanical component commodity groups that are subject to an AMR in Table 2.3.3-28 of the Surry LRA. This table also lists the intended functions, and the LRA section containing the AMR for each commodity group. Specifically, the applicant identified the following component commodity groups as subject to an AMR: valve bodies, and pipe. The applicant states that maintaining pressure boundary integrity is the only intended function that is subject to an AMR for these components.

2.3.3.35.2 Staff Evaluation

The staff reviewed Surry LRA, Section 2.3.3.28 to determine whether there is reasonable assurance that the applicant has appropriately identified the portions of the VA system that are within the scope of license renewal in accordance with 10 CFR 54.4(a), and that the applicant has appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

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The staff reviewed the scoping and screening results provided in Section 2.3.3.28 of the Surry LRA, the applicable license renewal drawings, and the Surry UFSAR to determine if the applicant has adequately identified the portions of the VA system that are in the scope of

license renewal. The staff verified that those portions of the VA system that meet the scoping requirements of 10 CFR 54.4(a) were included within the scope of license renewal, and were identified as such by the applicant in Section 2.3.3.28 of the Surry LRA.

In the Surry LRA, Section 2.3.3.28, the applicant listed three license renewal drawings for the VA system. The detailed drawings are highlighted to identify those portions of the system that are within the scope of license renewal. The staff compared the LRA drawings to the system drawings and descriptions in the UFSARs to ensure that they were representative of the VA system. The staff sampled portions of the drawings that were not highlighted to verify that these components did not meet any of the intended functions associated with the scoping criteria of 10 CFR 54.4(a). The staff also reviewed the UFSAR to determine if there were any additional system functions that were not identified in the LRA and verified that those additional functions did not meet the scoping requirements of 10 CFR 54.4(a). The staff did not identify any omissions in the scoping of the Surry VA system.

The staff then determined whether the applicant had properly identified the SCs that are subject to an AMR from among those portions of the Surry VA system identified as being within the scope of license renewal. The applicant used the screening methodology described in Section 2.1 of the LRAs to identify and list the SCs subject to an AMR. The staff evaluation of the scoping and screening methodology is documented in Section 2.1 of this SER. In the Surry LRA, the applicant identified the portions of the VA system that are within the scope of license renewal in the license renewal drawings and lists the mechanical component commodity groups that are subject to an AMR and its intended functions in Table 2.3.3-28 of the Surry LRA. The staff then sampled the SCs that the applicant determined as being within the scope of license renewal but not subject to an AMR to verify that no structure or component, that performs its intended functions without moving parts or without a change in configuration or properties (passive) or that is not subject to replacement based on qualified life or specified time period (long-lived), was excluded from an AMR. The staff did not identify any omissions.

2.3.3.35.3 Conclusions

On the basis of the staff's review of the information contained in Section 2.3.3.28 of the Surry LRA, the supporting information in the license renewal drawings, and the Surry UFSAR, as described above, the staff did not identify any omissions in the scoping and screening results of the VA system by the applicant. Therefore, the staff finds that there is reasonable assurance that the applicant has adequately identified those portions of the VA system that are within the scope of license renewal, and the associated SCs that are subject to an AMR, in accordance with the requirements of 10 CFR 54.4(a) and 54.21(a)(1), respectively.

2.3.3.36 Vent - Gaseous

In the NAS LRA, Section 2.3.3.30, and SPS LRA, Section 2.3.3.29, "Vent - Gaseous," the applicant describes the components of the vent - gaseous (VG) system that are within the scope of license renewal and subject to an AMR. The system is further described in Section 9.3.3 of the NAS UFSAR and Section 9.7 of the SPS UFSAR.

2.3.3.36.1 Summary of Technical Information in the Application -

The VG system collects and processes potentially radioactive gases vented from various plant systems. The portion of the VG system that performs a containment pressure boundary function as part of the VG system containment penetration is subject to an AMR. For Surry specific, its VG system vent isolation valves from the neutron shield tank and cooling (NS) system perform a NS pressure boundary function and are also subject to an AMR.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of the LRAs. As described in the scoping methodology, the applicant identified portions of the VG system that are within the scope of license renewal on the license renewal drawings that are listed in Section 2.3.3.30 of the NAS LRA and Section 2.3.3.29 of the SPS LRA. Consistent with the method described in the LRA, Section 2.1.5, "Screening Methodology," the applicant listed the VG system mechanical component commodity groups that are subject to an AMR in Table 2.3.3-30 of the NAS LRA and Table 2.3.3-29 of the SPS LRA. These tables also list the intended functions, and the LRA section containing the AMR for each commodity group. Specifically, the applicant identified the following component commodity groups as subject to an AMR: pipe, and valve bodies. The applicant states that maintaining pressure boundary integrity is the only intended function that is subject to an AMR for these components.

2.3.3.36.2 Staff Evaluation

The staff reviewed NAS LRA, Section 2.3.3.30, and SPS LRA, Section 2.3.3.29 to determine whether there is reasonable assurance that the applicant has appropriately identified the VG system that are within the scope of license renewal in accordance with 10 CFR 54.4(a), and that the applicant has appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the scoping and screening results provided in Section 2.3.3.30 of the NAS LRA, Section 2.3.3.29 of the SPS LRA, the applicable license renewal drawings, and the North Anna and Surry UFSARs to determine if the applicant has adequately identified the portions of the VG system that are in the scope of license renewal. The staff verified that those portions of the VG system that meet the scoping requirements of 10 CFR 54.4(a) were included within the scope of license renewal, and were identified by the applicant in Section 2.3.3.30 of the NAS LRA and Section 2.3.3.29 of the SPS LRA.

In the North Anna LRA Section 2.3.3.30, and Surry LRA Section 2.3.3.29, the applicant listed eight license renewal drawings for the VG system. The detailed drawings are highlighted to identify those portions of the system that are within the scope of license renewal. The staff compared the LRA drawings to the system drawings and descriptions in the UFSARs to ensure that they were representative of the VG system. The staff sampled portions of the drawings that were not highlighted to verify that these components did not meet any of the intended functions associated with the scoping criteria of 10 CFR 54.4(a). The staff also reviewed the UFSARs to determine if there were any additional system functions that were not identified in the LRA and verified that those additional functions did not meet the scoping requirements of 10 CFR 54.4(a). The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the SCs that are subject to an AMR from among those portions of the North Anna VG system that were identified as being within the scope of license renewal. The applicant used the screening methodology described in Section 2.1 of the LRAs to identify and list the SCs subject to an AMR. The staff evaluation of the scoping and screening methodology is documented in Section 2.1 of this SER. In both LRAs, the applicant identified the portions of the VG system that are within the scope of license renewal in the license renewal drawings, and lists the mechanical component commodity groups that are subject to an AMR and its intended functions in Table 2.3.3-30 of the NAS LRA and Table 2.3.3-29 of the SPS LRA. The staff then sampled the SCs that the applicant determined as being within the scope of license renewal but not subject to an AMR to verify that no structure or component, that performs its intended functions without moving parts or without a change in configuration or properties (passive) or that is not subject to replacement based on qualified life or specified time period (long-lived), was excluded from an AMR. The staff did not identify any omissions.

2.3.3.36.3 Conclusions

On the basis of the staff's review of the information contained in Section 2.3.3.30 of the NAS LRA and Section 2.3.3.29 of the SPS LRA, the supporting information in the license renewal drawings, and the North Anna and Surry UFSARs, as described above, the staff did not identify any omissions in the scoping and screening results of the VG system by the applicant. Therefore, the staff finds that there is reasonable assurance that the applicant has adequately identified those portions of the VG systems that are within the scope of license renewal, and the associated SCs that are subject to an AMR, in accordance with the requirements of 10 CFR 54.4(a) and 54.21(a)(1), respectively.

2.3.3.37 Fire Protection

In the North Anna LRA, Section 2.3.3.31, and the Surry LRA, Section 2.3.3.30, both entitled "Fire Protection," the applicant describes the SSCs of the fire protection (FP) systems that are within the scope of license renewal and the SCs subject to an AMR. North Anna and Surry both have a variety of FP systems. For both North Anna and Surry, the applicant follows criteria set forth in Appendix A of the Branch Technical Position, APCSB 9.5-1 and Appendix R, Sections III.G, III.J, and III.O, to satisfy the requirements of 10 CFR 50.48. Therefore, these systems are similar for both facilities for the purpose of license renewal with some differences in system design. Any notable differences are specifically identified and discussed in the staff's evaluation. Unless otherwise specified, the information provided below is applicable to both the North Anna and Surry FP systems. These systems are further described throughout the North Anna or Surry UFSAR. As part of its scoping and screening process, the applicant also utilizes Regulated Event Reports as discussed below.

2.3.3.37.1 Summary of Technical Information in the Application

Consistent with 10 CFR 54.4(a)(3), the applicant prepared Fire Protection Regulated Events Reports for North Anna and Surry to identify the FP systems relied on for compliance with 10 CFR 50.48. These reports discuss the history of each facility's fire protection program (FPP) and identify analysis, documents, and correspondence which constitute the CLB. As part of the applicant's scoping and screening process, the applicant has utilized Regulated Event Reports and each facility's UFSAR. The applicant describes its process for identifying the mechanical components that are within the scope of license renewal and subject to an AMR in Section 2.1.4, "Scoping Methodology," of each LRA. As described in the scoping methodology, the applicant identified the portions of the FP systems that are within the scope of license renewal on the drawings listed in Section 2.3.3.2 of each LRA. Consistent with the method described in the North Anna and Surry, Section 2.1.5, "Screening Methodology," the applicant listed the NAS 1/2 and SPS 1/2 FP systems' mechanical component commodity groups that are within the license renewal evaluation boundaries and are subject to an AMR in Table 2.3.2-2 of each LRA. These tables also list the intended functions and the LRA sections that contain the AMR for each commodity group.

In each LRA, FP system information is located in various sections. The North Anna LRA has the reactor coolant pump (RCP) oil collection system in Section 2.3.1.1, "Reactor Coolant," emergency yard lighting in Section 2.3.3.12, "Security," fire detection and suppression in Section 2.3.3.31, "Fire Protection," and fire barrier requirements in Section 2.4.11, "Miscellaneous Structural Commodities." In Surry LRA, RCP oil collection system is included with fire detection and suppression in Section 2.3.3.30, "Fire Protection," emergency yard lighting is in Section 2.3.3.13, "Security," and fire barrier requirements are in Section 2.4.11, "Miscellaneous Structural Commodities."

Section III.O of Appendix R requires each RCP to be equipped with an oil collection system to prevent an oil fire from spreading to other components within containment. The NAS LRA, Table 2.3.1-1 and drawings 11715-LRM-093E and 12050-LRM-093E, indicate the SCs subject to an AMR. The Surry LRA, Table 2.3.3-30 and drawings 11448-LRB-047F and 11548-LRB-047F, indicate the SCs subject to an AMR. At both facilities, RCP oil collection system drip pans, drip pan enclosures, flame arrestors, flexible connections/hoses, pipe, tanks, and valve bodies are subject to an AMR.

In the North Anna LRA, Section 2.3.3.12, and Surry LRA, Section 2.3.3.13, it is noted that the backup diesel generator, cabling, and yard lighting are required to meet Appendix R emergency lighting requirements. Table 2.3.3-12 in the North Anna LRA and Table 2.3.3-13 in the Surry LRA, list the passive diesel generator components and the yard lighting poles as SCs subject to an AMR.

The North Anna LRA, Section 2.3.3.31, and the Surry LRA, Section 2.3.3.30, contain the fire detection and suppression systems scoping review. Fire detection devices are required in areas that contain safe shutdown equipment and/or safety-related equipment. In each LRA the applicant considers fire detection devices to be active SCs, not subject to an AMR.

Fixed fire suppression can be divided into water-based and gaseous type systems. Waterbased systems include sprinkler, deluge, and foam system, along with the water supply, pumps, distribution piping, valves and hose racks for those systems. At North Anna, fire suppression water is obtained from either Lake Anna or the service reservoir, each having at least 300,000 gallons. A diesel and an electric fire pump are installed and each can deliver 3,000 gpm. LRA drawing 11715-LRB-41B indicates that the fire pumps, jockey pump, valves, and piping are subject to an AMR. Table 2.3.3-31 lists piping, pump casings, diesel fire pump radiator, and valve bodies as SCs subject to an AMR. At Surry, two 300,000 gallon tanks are provided, the top 50,000 gallons for domestic water and the bottom 250,000 gallons reserved for FP. A diesel and an electric fire pump are provided, each capable of delivering 2,500 gpm. Drawing 11448-LRB-47A indicates the water tanks, fire pumps, jockey pump, valves, and piping are subject to an AMR, while the tank fill and domestic water systems are not. Table 2.3.3-30 includes the following SCs subject to an AMR: water tanks, pump casings, diesel fire pump radiator, piping, and valve bodies.

At both North Anna and Surry, 12-inch fire mains and hydrants were installed around the facility and each hydrant is provided with a hose house for fire hose and fire fighting equipment. The fire hose and equipment are routinely inspected and considered consumables not subject to an AMR. The fire main provides water to branch-lines for hose stations and sprinkler, deluge, and foam systems. North Anna drawings 11715-LRB-101A/B/E and Surry drawing 11448-LRB-047B identify branch lines to facilities with FP systems that are in scope of the license renewal. At both North Anna and Surry, the training center, AAC building, fuel oil storage tank, technical support center, security building, and warehouses were excluded from license renewal. At Surry, drawing 11448-LRB-047C identifies additional facilities excluded from license renewal: fuel oil foam house, gravel neck control building, nuclear information center, south annex, fab and paint shops, radwaste facility, and the local emergency ops facility (LEOF). Tables 2.3.3-31 in both LRAs list piping, hydrants, and valve bodies as SCs that are subject to an AMR.

Manual fire hose stations are located in areas containing safety-related equipment. North Anna drawings 11715-LRB-102A/B and 12050-LRB-104A identified the following areas the stations are within the scope of license renewal: fuel building, service water pump house, auxiliary building, service building, turbine building, and containment buildings. Surry drawings 11448-LRB-047B, Sheets 1 thru 3, identified the following areas the stations are within the scope of license renewal: turbine building, service building, auxiliary building, fuel building, cable tunnels, clean change building, condensate polishing building, auxiliary boiler room, machine shops, and containment buildings. The drawings indicate the station piping and valves are subject to an AMR.

The North Anna Regulated Event Report lists CLB sprinkler systems that protect the following: turbine building, turbine oil storage room, N-16 enclosures, auxiliary boiler room, CCW pump area, service building cable vault and tunnel, service building warehouse, AAC building, on-line chemistry monitoring computer room, service water chemistry addition system building, records building, warehouse No. 2, security building, training center, and machine shop. Drawings 11715-LRB-103A/E and 12050-LRB-105A identify the turbine building, turbine oil storage room, and auxiliary boiler room sprinkler systems as being within the scope of license renewal. The drawings show valves and piping are included in the AMR, with the exception of test and drainage piping, alarm components (pressure switch, retard chamber, and associated piping) and the N-16 enclosure sprinkler system, Table 2.3.3-31 identifies the pipe, sprinkler heads, and valve bodies as SCs subject to an AMR.

The Surry Regulated Event Report lists CLB sprinkler systems that protect the following: Turbine building, turbine oil storage room, auxiliary boiler room, service building, service building cable vault and tunnel, condensate polishing, machine shop, laundry, warehouses, construction clean change building, training center, LEOF, on-line chemistry monitoring computer room, and the ACC building. Drawings 11448-LRB-047B, sheets 1 through 5, identify the following sprinkler systems as being within the scope of license renewal: Turbine building, turbine oil storage room, auxiliary boiler room, service building, service building cable vault and tunnel, condensate polishing, machine shop, and laundry. The drawings show valves and piping are subject to an AMR, with the exception of test and drainage system. Table 2.3.3-30 lists pipe, sprinkler heads, and valve bodies as SCs subject to an AMR.

The North Anna Regulated Event Report identified CLB deluge systems that protect the following: bearing cooling towers, turbine-oil reservoir, hydrogen seal-oil unit, oil purifier unit, and main power and station service transformers. Drawings 11715-LRB-103A and 12050-LRB-105A show these deluge systems with the exception of the cooling towers as being within the scope of license renewal. Table 2.3.3-31 lists pipe, sprinkler heads, and valve bodies as SCs subject to an AMR.

The Surry Regulated Event Report identified CLB deluge systems that protect the following: service building cable vault and tunnel, lube oil reservoir coolers, hydrogen seal-oil unit, turbine lube oil conditioners, main power and station service transformers, and auxiliary building charcoal filters. The drawings 11448-LRB-047B, sheets 1, 4, and 5, identify these deluge systems within the scope of license renewal. Table 2.3.3-30 lists pipe, sprinkler heads, and valve bodies as SCs subject to an AMR.

Both UFSARs include a foam system in the CLB to protect the bulk fuel oil storage tank. Neither Regulated Event Reports mentions these systems and the Surry drawing 11448-LRB-047C excludes the system from the scope of license renewal.

The North Anna Regulated Event Report identifies the following as protected by Carbon Dioxide (CO_2) fire suppression systems: primary and service building cable vault and tunnel, normal switchgear rooms, cable tray spreading room, turbine and generator bearing and exciter enclosures, emergency diesel generator rooms, auxiliary building charcoal filters, fuel oil pump rooms, and technical support center (TSC) charcoal filters. The report notes the TSC system is not required for safe shutdown. Drawing 11715-LRB-104A/B/C identifies the systems above except for the service building cable vault and tunnel and TSC charcoal filters as being within the scope of license renewal. Table 2.3.3-31 lists the CO_2 tank cooling coils, compressor casings, nozzle, and piping as the SCs subject to an AMR.

The Surry Regulated Event Report identifies the following are protected by low-pressure CO_2 : switchgear rooms, service building and containment cable vaults, cable tray spreading rooms, auxiliary building charcoal filters, turbine and generator bearing enclosures, emergency diesel generator rooms, and motor control center rooms. The drawings 11448-LRB-047E, Sheets 1 through 5, identify the above systems within the scope of license renewal. Table 2.3.3-30 lists the CO_2 cooling coils, compressor casings, nozzle, and piping as SCs subject to an AMR.

The Surry Regulated Event Report does not identify any areas protected by high-pressure CO₂. The Surry UFSAR identified three areas in the CLB protected by high-pressure CO₂: fuel oil pump rooms, emergency service water pump house diesel tank, and the TSC charcoal filters. The UFSAR notes the TSC system is not required for safe shutdown. Drawings 11448-LRB-047G and H identifies the CO₂ systems protecting the fuel oil pump rooms and emergency service water pump house to be within the scope of license renewal. Table 2.3.3-30 lists gas bottles, piping, and nozzles as SCs subject to an AMR.

The North Anna Regulated Event Report identifies the following as protected by halon: emergency switchgear and main control room, security building control room and cable vaults,

training center simulator, and the LEOF. Drawings 11715-LRB-104D and 104E identifies the emergency switchgear and the main control room halon systems are within the scope of license renewal. Table 2.3.3-31 lists gas bottles, piping and nozzles as SCs subject to an AMR.

The Surry Regulated Event Report identifies the following as protected by halon: emergency switchgear and relay rooms, training center simulator, LEOF, and the security building control room. Drawing 11448-LRM-27K identifies the emergency switchgear and relay rooms as being within the scope of license renewal. Table 2.3.3-30 lists gas bottles, piping, and nozzles as SCs subject to an AMR.

In each LRA, Section 2.4 indicates the facility fire barriers that are within the scope of license renewal. Table 2.4.11-1 lists penetration seals, fire doors, fire stops, fire wrap, fire wrap bands, fire stop supports, cable tray covers, gypsum boards, radiant energy shields, and seismic-gap covers as SCs subject to an AMR. Table 2.3.3-21 lists fire damper housings as an SC subject to an AMR.

In each LRA Appendix C, Section C2.3, "Identification of Short Lived Components and Consumables," identifies portable fire extinguishers, fire hoses, and air packs for self-contained breathing apparatuses as consumables, not subject to an AMR.

2.3.3.37.2 Staff Evaluation

In accordance with 10 CFR 54.4(a)(3), all SSCs in safety analysis or plant evaluations that demonstrate compliance with the Commission's regulation for FP (10 CFR 50.48) are within the scope of license renewal. The FP license condition defines the CLB as the FPP as described in the applicants UFSAR and various NRC approved SERs. Therefore, the FP systems included in the FPP should be within the scope of license renewal.

The staff reviewed the UFSARs and applicable SERs to determine the FP systems that define the applicant's CLB. A comparison of the FPP with the information provided in each LRA has identified FP systems that were excluded from license renewal. For NAS, the following were excluded: cooling tower deluge system, fuel oil storage tank foam system, service building cable vault and tunnel CO_2 and sprinkler systems, training center and security building halon and sprinkler systems, and sprinkler systems protecting the following: CCW pump area, service building warehouse, on-line chemistry monitoring system computer room, N-16 enclosure, AAC building, service water chemical addition system building, records storage building, and warehouse No. 2. For Surry, the following were excluded: security building halon, training center halon and sprinkler systems, fuel oil storage tank foam system, and the following sprinkler systems for the turbine oil storage room, AAC building, station and chemical warehouses, construction clean change building. The Surry radwaste facility sprinkler system was not included in the UFSAR, but its inclusion is suggested by the guidance in Appendix A of the BTP.

As described in the UFSARs and SERs, the applicant identified the approved FPP as a mix of systems, some required to meet the CLB and others installed for industrial safety purposes. The UFSARs noted this distinction for the TSC charcoal filter CO_2 system, but not the numerous systems that were excluded in each LRA. In a request for additional information, the applicant was asked to justify excluding FP systems needed for the CLB from the scope of license renewal. In a letter to the NRC dated February 5, 2002, the applicant states that after

reviewing the appropriate documentation, it decided to clarify the CLB in the UFSAR. On January 22, 2002, the applicant revised the UFSARs to identify those FP systems that are not required for the CLB. The FP license condition for both facilities allows such changes without prior NRC approval only if those changes would not adversely affect the ability to achieve and maintain safe shutdown. The applicant justified removal of FP systems from the CLB because a fire in these locations would not adversely affect safety-related SSCs or safe shutdown.

The applicant identified the following North Anna FP systems not required for the CLB: cooling tower deluge, fuel oil storage tank foam system; training center, security building, LEOF halon and sprinkler systems, and the sprinkler systems protecting the following: nuclear information center, records storage building, service water chemical addition system building, site construction office building, and warehouses. Some FP systems were added to license renewal: service building cable vault and tunnel CO₂ and sprinkler systems, and sprinkler systems protecting the N-16 enclosures, CCW pump area, AAC building, and the on-line chemistry monitoring computer room.

The Surry UFSAR was revised to note the following FP systems are not required for the CLB: fuel oil storage tank foam system, training center halon and sprinkler systems, security building halon, and the sprinkler systems protecting the administration buildings, construction clean change building, fabrication shop, gravel neck combustion turbine facility, LEOF, paint shop, records vault, south annex, station and chemical warehouse, nuclear information center, and warehouses 1, 2, 7, and 8. The following sprinkler systems were added to the scope of the license renewal: turbine oil storage room, AAC building, on-line chemistry monitoring computer room, and radwaste facility.

After determining which FP systems were within the scope of license renewal the staff reviewed each LRA to verify that the applicant determined those SCs that should be subject to an AMR. The applicant has included most components within scope; the low-pressure CO₂ refrigeration components (compressor and associated piping) and the sprinkler system alarm components (retard chamber, orifice, pressures switch, associated piping) were excluded. The staff considered the refrigeration components active, not requiring an AMR. However, the staff requested additional information justifying the exclusion of the alarm components from license renewal. On February 5, 2002, in a letter to the NRC, the applicant added the sprinkler system alarm components to the SCs that are subject to an AMR.

2.3.3.37.3 Conclusions

On the basis of its review of the information contained in the North Anna LRA, Section 2.3.3.31, and the Surry LRA, Section 2.3.3.30, the supporting information in the Regulated Event Reports, the North Anna and Surry UFSARs, and the LRA drawings, as described above, the staff did not identify any additional omissions in the scoping and screening of the SCs of the North Anna and Surry FP systems by the applicant. Therefore, the staff concludes that there is reasonable assurance that the applicant has identified those portions of the North Anna and Surry FP systems that are within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.
2.3.3.38 Hydrogen Gas

In the SPS LRA, Section 2.3.3.31 "Hydrogen Gas," the applicant describes the components of the hydrogen gas (HG) system that are within the scope of license renewal and subject to an AMR. The system is further described in Section 10.3.3.2 of the SPS UFSAR. The HG system is specific to SPS 1/2 and staff's evaluation only applies to SPS 1/2. The NAS 1/2 does not have HG system.

2.3.3.38.1 Summary of Technical Information in the Application

The HG system provides hydrogen and carbon dioxide gas for main electrical generator service. The portion of the HG system that consists of the isolation valve located at the fire protection (FP) system low-pressure carbon dioxide tank that isolates the flowpath to the main generator is subject to an AMR.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of the LRAs. As described in the scoping methodology, the applicant identified portions of the HG system that are within the scope of license renewal on the license renewal drawings that are listed in Section 2.3.3.31 of the Surry LRA. Consistent with the method described in the LRA, Section 2.1.5, "Screening Methodology," the applicant listed the HG system mechanical component commodity groups that are subject to an AMR in Table 2.3.3-31 of the Surry LRA. This table also lists the intended functions, and the LRA section containing the AMR for each commodity groups as subject to an AMR: valve bodies, and pipe. The applicant noted that the in-scope piping associated with the component is included in the fire protection (FP) system. The applicant states that maintaining pressure boundary integrity is the only intended function that is subject to an AMR for these components.

2.3.3.38.2 Staff Evaluation

The staff reviewed Section 2.3.3.31 of the SPS LRA to determine whether there is reasonable assurance that the applicant has appropriately identified the portions of HG system that are within the scope of license renewal in accordance with 10 CFR 54.4(a), and that the applicant has appropriately identified SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the scoping and screening results provided in Section 2.3.3.31 of the SPS LRA, the applicable license renewal drawings, and the SPS UFSAR to determine if the applicant has adequately identified the portions of the HG system that are in the scope of license renewal. The staff verified that those portions of the HG system that meet the scoping requirements of 10 CFR 54.4(a) were included within the scope of license renewal, and were identified as such by the applicant in Section 2.3.3.31 of the Surry LRA.

In the Surry LRA, Section 2.3.3.31, the applicant listed one license renewal drawing for the HG system. The detailed drawing is highlighted to identify those portions of the system that are within the scope of license renewal. The staff compared the LRA drawings to the system drawings and descriptions in the UFSAR to ensure that they were representative of the HG system. The staff sampled portions of the drawings that were not highlighted to verify that

these components did not meet any of the intended functions associated with the scoping criteria of 10 CFR 54.4(a). The staff also reviewed the UFSAR to determine if there were any additional system functions that were not identified in the LRA and verified that those additional functions did not meet the scoping requirements of 10 CFR 54.4(a). The staff did not identify any omissions.

The staff then determined whether the applicant had properly identified the SCs that are subject to an AMR from among those portions of the Surry HG system that were identified as being within the scope of license renewal. The applicant used the screening methodology described in Section 2.1 of the LRAs to identify and list the SCs subject to an AMR. The staff evaluation of the scoping and screening methodology is documented in Section 2.1 of this SER. In the Surry LRA, the applicant identified the portions of the HG system that are within the scope of license renewal in the license renewal drawing and lists the mechanical component commodity groups that are subject to an AMR and its intended functions in Table 2.3.3-31 of the Surry LRA. The staff then sampled the SCs that the applicant determined as being within the scope of license renewal but not subject to an AMR to verify that no structure or component, that performs its intended functions without moving parts or without a change in configuration or properties (passive) or that is not subject to replacement based on qualified life or specified time period (long-lived), was excluded from an AMR. The staff did not identify any omissions.

2.3.3.38.3 Conclusions

On the basis of the staff's review of the information contained in Section 2.3.3.31 of the Surry LRA, the supporting information in the license renewal drawings, and the Surry UFSAR, as described above, the staff did not identify any omissions in the scoping and screening results of the HG system by the applicant. Therefore, the staff finds that there is reasonable assurance that the applicant has adequately identified those portions of the HG systems that are within the scope of license renewal, and the associated SCs that are subject to an AMR, in accordance with the requirements of 10 CFR 54.4(a) and 54.21(a)(1), respectively.

2.3.4 Steam and Power Conversion Systems

In both the North Anna and Surry LRAs, Section 2.3.4, "Steam and Power Conversion Systems," the applicant describes the SSCs of the steam and power conversion systems (SPCSs) that are within the scope of license renewal and subject to an AMR. The following staff evaluation applies to the SPCSs of NAS 1/2 and SPS 1/2 for the purpose of license renewal. Any differences in any of the SSCs that make up the SPCSs for each of the four units or unique information that applies to a specific unit or site will be clearly identified as to which unit or site the information applies. Other than what is specifically stated, the following evaluations are applicable to the SPCSs for NAS 1/2 and SPS 1/2.

2.3.4.1 Auxiliary Steam

In the North Anna and Surry LRAs, Section 2.3.4.1, "Auxiliary Steam," the applicant describes the components of the auxiliary steam (AS) system that are within the scope of license renewal and subject to an AMR. The auxiliary steam system is further described in Section 10.4.1 of the North Anna UFSAR and Section 10.3.2 of the Surry UFSAR.

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2.3.4.1.1 Summary of Technical Information in the Application

The auxiliary steam (AS) system supplies low-pressure, saturated steam to various plant systems.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of each LRA. As described in the scoping methodology, the applicant identified the portions of the AS system that are within the scope of license renewal on the piping and instrument drawings listed in Section 2.3.4.1 of each LRA. Consistent with the methodology described in Section 2.1.5, "Screening Methodology," of each LRA, the applicant listed the AS system mechanical component commodity groups that are within the license renewal evaluation boundaries and that are subject to an AMR in Table 2.3.4-1 of each LRA.

The portion of the AS system subject to aging management review includes the steam pressure regulating valve and associated bypass and isolation valves that are credited with providing a main steam system pressure boundary intended function in the event of a station blackout event or severe fire (Appendix R) event. Table 2.3.4-1 of the SPS and NAS LRAs lists valve bodies as the only component commodity group subject to an AMR. The piping associated with these components is noted to be included in the main steam (MS) systems. The tables also list the intended functions, and the LRA sections containing the AMR for the valves commodity group. The applicant identified maintaining system pressure boundary integrity as the only intended function of the SCs subject to an AMR for the AS system.

2.3.4.1.2 Staff Evaluation

The staff reviewed each LRA Section 2.3.4.1 to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the AS system that are within the scope of license renewal in accordance with 10 CFR 54.4, and that the applicant appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information presented in Section 2.3.4.1 of the LRA, the applicable piping and instrument drawings, and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the portions of the AS system that are within the scope of license renewal. The staff verified that those portions of the AS system that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Section 2.3.4.1 of each LRA. To verify that the applicant did include the applicable portions of the AS system stat were not identified within the scope of license renewal, the staff focused its review on those portions of the AS systems that were not identified within the scope of license renewal to verify that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the UFSARs to identify any additional system intended functions that were not identified in each LRA and verified that these additional intended functions did not meet the scoping requirements of 10 CFR 54.4. The staff did not identify any omissions.

The staff determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the AS system that are identified within the scope of license renewal. The applicant identified and lists the SCs subject to AMR for the AS system in Table 2.3.4-1 of the LRA using the screening methodology described in Section 2.1 of each

LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER.

In the NAS LRA, the applicant identified the portions of the AS system that are within the scope of license renewal in the drawings listed below. In addition, the applicant listed the valve mechanical component commodity group that is subject to AMR and its intended function in Table 2.3.4-1 of the LRA:

> Unit 1 12050-LRM-072A, Sh. 1 11715-LRM-072A, Sh. 1

Unit 2

In the SPS LRA, the applicant identified the portions of the AS system that are within the scope of license renewal in the drawings listed below. In addition, the applicant listed the valve mechanical component commodity group that is subject to AMR and its intended function in Table 2.3.4-1 of the LRA:

<u>Unit 1</u> <u>Unit 2</u> 11548-LRM-066A, Sh. 1 11448-LRM-066A, Sh. 1

The piping and instrumentation drawings were highlighted by the applicant to identify those portions of the AS system that meet at least one of the scoping requirements of 10 CFR 54.4. The staff compared the LRA drawings to the descriptions in the UFSARs to ensure they were representative of the AS system. The staff performed its review by sampling the SCs that the applicant identified as being within the scope of license renewal but not subject to AMR to verify that no structure or component that performs its intended function without moving parts or without a change in configuration or properties and that are not subject to replacement on the basis of qualified life or specified time period, was excluded from an AMR.

The staff did not identify any omissions, but asked why the small-bore lines leading to several steam traps were not included in the AS system scope for the pressure boundary intended function. In a telecommunication dated November 21, 2001, the applicant clarified that the intended function of the AS system is to prevent excessive reactor cooldown in the event the main steam trip valves cannot be shut due to an Appendix R fire or SBO event. Only large-bore pipe could provide the capacity to cause excessive cooldown; therefore, smaller lines such as those leading to the steam traps are not in scope for Appendix R or SBO intended functions.

2.3.4.1.3 Conclusions

On the basis of its review of the information contained in Section 2.3.4.1 of each LRA, the supporting information in the UFSARs, and LRA drawings, as described above, the staff did not identify any omissions in the scoping of the AS system by the applicant. The staff concludes that there is reasonable assurance that the applicant has identified those portions of the AS system that are within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

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2.3.4.2 Blowdown

In the North Anna and Surry LRAs, Section 2.3.4.2, "Blowdown," the applicant describes the components of the blowdown (BD) system that are within the scope of license renewal and subject to an AMR. The blowdown system is further described in Section 10.4.6 of the North Anna UFSAR and Section 10.3.1 of the Surry UFSAR.

2.3.4.2.1 Summary of Technical Information in the Application

The BD system provides a flowpath for the continuous blowdown flow from the steam generator secondary side to maintain acceptable steam generator water chemistry. The BD system isolates flow for containment isolation, maintains steam generator inventory during transients and in the event of a high-energy line break.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of each LRA. As described in the scoping methodology, the applicant identified the portions of the BD system that are within the scope of license renewal on the piping and instrument drawings listed in Section 2.3.4.2 of each LRA. Consistent with the methodology described in Section 2.1.5, "Screening Methodology," of each LRA, the applicant listed the BD system mechanical component commodity groups that are within the license renewal evaluation boundaries and that are subject to an AMR in Table 2.3.4-2 of each LRA. The tables also list the intended functions, and the LRA sections containing the AMR for the commodity groups.

The portion of the BD system subject to aging management review consists of the components from the steam generator to the first manual isolation valve downstream of the outboard containment isolation valves. For NAS only, the portion of the BD system that provides the component cooling system pressure boundary at the BD system vent condenser is also subject to aging management review. For SPS only, the portion of the BD system that provides the circulating water system pressure boundary at the connection to the circulating water outlet from the main condenser is also subject to aging management review. In the LRA, Table 2.3.4-2, the applicant listed the following five component commodity groups as subject to an AMR: flow elements, instrument valve assemblies, pipe, tubing, and valve bodies. In addition, the NAS LRA Table 2.3.4-2, also lists steam generator blowdown vent condensers as a component commodity group that is subject to an AMR. The applicant identified maintaining pressure boundary integrity and restricting flow (flow elements only) as intended functions for the SCs that are subject to an AMR for the NAS and SPS BD systems.

2.3.4.2.2 Staff Evaluation

The staff reviewed Section 2.3.4-2 of the NAS and SPS LRAs to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the BD system that are within the scope of license renewal in accordance with 10 CFR 54.4, and that the applicant appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information presented in Section 2.3.4-2 of each LRA, the applicable piping and instrument drawings, and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the portions of the BD system that are within the scope of

license renewal. The staff verified that those portions of the BD system that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Section 2.3.4-2 of each LRA. To verify that the applicant did include the applicable portions of the BD system within the scope of license renewal, the staff focused its review on those portions of the BD systems that were not identified within the scope of license renewal to verify that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the UFSARs to identify any additional system intended functions that were not identified in each LRA and verified that these additional intended functions did not meet the scoping requirements of 10 CFR 54.4.

In a telecommunication with the applicant dated November 21, 2001, the staff asked whether any of the BD piping, which should be classified as high-energy piping, was considered as class II/I, i.e., although the piping that is not safety-related and has no seismic or tornado design requirements, its failure must not cause a functional loss of any safety-related equipment. The staff asked why this interaction of Class II/I systems was not identified as an intended function of the blowdown system, with parts of the BD system within the scope of license renewal for Class II/I considerations. In its response to RAI 2.1-2, the applicant stated that this issue was being reevaluated generically. The applicant in a letter dated February 1, 2002, responded to RAIs related to the scoping of non-safety-related systems that have a spatial relationship with safety-related systems. The applicant's response to RAI 2.1-1, in that letter, specifically addressed how high-energy lines such as those in the BD system were scoped for license renewal. Table 2.1-3-4 for North Anna, and Table 2.1-3-5 for Surry, include the AMR results for the specific BD system material groups that were determined to be within the expanded scope of license renewal.

The staff did not identify any other omissions during its scoping review of the BD system. The staff determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the BD system that are identified within the scope of license renewal. The applicant identified and listed the SCs subject to AMR for the BD system in Table 2.3.4-2 of the LRAs using the screening methodology described in Section 2.1 of each LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER.

In the NAS LRA, the applicant identified the portions of the BD system that are within the scope of license renewal in the drawings listed below. The applicant also listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.4-2 of the LRA:

<u>Unit 1</u>

Unit 2

11715-LRM-079A, Sh. 3 11715-LRM-098A, Sh. 2 11715-LRM-098A, Sh. 3 11715-LRM-098A, Sh. 4 13075-LRM-102C, Sh. 1 12050-LRM-098A, Sh. 2 12050-LRM-098A, Sh. 3 12050-LRM-098A, Sh. 4 12050-LRM-102B, Sh. 1

In the SPS LRA, the applicant identified the portions of the BD system that are within the scope of license renewal in the drawings listed below. The applicant also listed the mechanical

component commodity groups that are subject to AMR and their intended functions in Table 2.3.4-2 of the LRA:

<u>Unit 1</u>	<u>Unit 2</u>
11448-LRM-071A, Sh. 2	11548-LRM-071A, Sh. 2
11448-LRM-124A, Sh. 1	11548-LRM-124A, Sh. 1
11448-LRM-124A, Sh. 2	11548-LRM-124A, Sh. 2
11448-LRM-124A, Sh. 3	11548-LRM-124A, Sh. 3
11448-LRM-124A, Sh. 4	11548-LRM-124A, Sh. 4

The piping and instrumentation drawings were highlighted by the applicant to identify those portions of the BD system that meet at least one of the scoping requirements of 10 CFR 54.4. The staff compared the LRA drawings to the descriptions in the UFSARs to ensure they were representative of the BD system. The staff performed its review by sampling the SCs that the applicant identified as being within the scope of license renewal but not subject to AMR, to verify that no structure or component that performs its intended function without moving parts or without a change in configuration or properties and that are not subject to replacement on the basis of qualified life or specified time period, was excluded from an AMR.

2.3.4.2.3 Conclusions

On the basis of its review of the information contained in Section 2.3.4.2 of each LRA, the supporting information in the UFSARs and LRA drawings, and the applicant's responses to RAIs, as described above, the staff did not identify any additional omissions in the scoping of the BD system by the applicant. The staff concludes that there is reasonable assurance that the applicant has identified those portions of the BD system that are within the scope of license renewal and the SCs that are subject to an AMR in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), respectively.

2.3.4.3 Condensate

In the North Anna and Surry LRAs, Section 2.3.4.3, "Condensate," the applicant describes the components of the condensate (CN) system that are within the scope of license renewal and subject to an AMR. The condensate system is further described in Section 9.2.4, Section 10.4.3, and Section 10.4.4 of the North Anna UFSAR and in Section 10.3.5 of the Surry UFSAR.

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2.3.4.3.1 Summary of Technical Information in the Application

The primary purpose of the condensate (CN) system is to provide chemically treated-water to the suction of the main feedwater pumps at sufficient pressure to support main feedwater pump operation. The CN system also provides the piping, valves, water storage, and makeup supply for auxiliary feedwater. An emergency condensate storage tank is provided for each unit. Each tank supplies water to the three auxiliary feedwater pumps through individual lines.

The applicant describes its process for identifying the mechanical components that are within the scope of license renewal in Section 2.1.4, "Scoping Methodology," of each LRA. As described in the scoping methodology, the applicant identified the portions of the CN system that are within the scope of license renewal on the piping and instrument drawings listed in Section 2.3.4.3 of each LRA. Consistent with the methodology described in Section 2.1.5, "Screening Methodology," of each LRA, the applicant listed the CN system mechanical component commodity groups that are within the license renewal evaluation boundaries and that are subject to an AMR in Table 2.3.4-3 of each LRA. The tables also list the intended functions, and the LRA sections containing the AMR for the commodity groups.

The portion of the CN system subject to aging management review includes the emergency condensate storage tanks and the associated components up to the suction of the pumps. For SPS only, a portion of the CN system provides the component cooling system pressure boundary at the makeup connection to the component cooling surge tank. The components that support this intended function are also subject to aging management review. In the LRA, Table 2.3.4-3, the applicant listed the following four component commodity groups as subject to an AMR: instrument valve assemblies, pipe, tanks, and tubing. In addition, the SPS LRA, Table 2.3.4-3, also lists valve bodies as a component commodity group subject to an AMR. The applicant identified maintaining pressure boundary integrity as the only intended function for the SCs that is subject to an AMR for the NAS and SPS CN systems.

2.3.4.3.2 Staff Evaluation

The staff reviewed Section 2.3.4-3 of the NAS and SPS LRAs to determine whether there is reasonable assurance that the applicant appropriately identified the portions of the CN system that are within the scope of license renewal in accordance with 10 CFR 54.4, and that the applicant appropriately identified the SCs that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

The staff reviewed the information presented in Section 2.3.4-3 of the LRA, the applicable piping and instrument drawings, and the North Anna and Surry UFSARs to determine whether the applicant adequately identified the portions of the CN system that are within the scope of license renewal. The staff verified that those portions of the CN system that meet the scoping requirements of 10 CFR 54.4 were included within the scope of license renewal and were identified as such by the applicant in Section 2.3.4-3 of each LRA. To verify that the applicant did include the applicable portions of the CN system within the scope of license renewal, the staff focused its review on those portions of the CN systems that were not identified within the scope of license renewal to verify that they did not meet the scoping criteria of 10 CFR 54.4. In addition, the staff reviewed the UFSARs to identify any additional system intended functions that were not identified in each LRA and verified that these additional intended functions did not meet the scoping requirements of 10 CFR 54.4.

As a result of this review, the NRC staff requested additional information in a letter to the applicant dated November 26, 2001. The staff asked why the 6" line up to and including the vacuum breaker on NAS condensate storage tank 1-CN-TK-1 and the similar 4" line to the vacuum breaker on NAS condensate storage tank 2-CN-TK-1 were not identified within license renewal scope due to the potential for failure of these lines and/or the vacuum breaker to cause the failure of the associated tank. In the response, dated February 5, 2002, the applicant stated that both tanks are vented to atmosphere through an open 6"-diameter vent line. Therefore,

the vacuum breakers and the associated piping do not perform a license renewal intended function and are not included in scope. In the RAI, the staff also requested the applicant to confirm that there is an open 6" vent line on condensate storage tank 2-CN-TK-1, along with a parallel nitrogen pressurization system and a vacuum breaker, and to describe the intended function for each of the components identified. The applicant's letter dated February 5, 2002, confirmed the vent line (open to atmosphere) in addition to the vacuum breaker and nitrogen line penetrating the top of 2-CN-TK-1, noting an identical configuration exists for 1-CN-TK-1. The 6" diameter vent line prevents adverse pressure conditions within the tank during filling and drawdown. The applicant stated that this line (which is not highlighted for 2-CN-TK-2 on the LRA drawing) is within the scope of license renewal. The applicant stated that the nitrogen line is no longer used and is isolated from the tank by closed manual isolation valves so its failure cannot affect tank function. Therefore, the nitrogen line is not within the scope of license renewal. The license renewal drawings for 1-CN-TK-1 do not depict the 6" vent line. Therefore, the applicant was requested to confirm that the nitrogen line to 1-CN-TK-1 is isolated from the tank similar to 2-CN-TK-2 and that the vent on tank 1-CN-TK-1 is similarly within the scope of license renewal. The applicant provided a draft RAI response via an e-mail on May 10, 2002. The applicant's e-mail response to staff's questions is docketed and available to public. In its response, the applicant stated that NAS condensate storage tanks 1-CN-TK-1 and 2-CN-TK-1 each has a 6"diameter open vent line, a 4" line with a vacuum breaker installed, and a nitrogen line penetrating the top of the tank in an identical configuration. For both tanks, the open vent line is within the scope of license renewal. The nitrogen line on each tank is not used and isolated, and the vacuum breaker for each tank is not required for the tank function, and these components are not within the scope of license renewal. The applicant further stated that the license renewal drawing configuration errors noted by the staff were being corrected. The staff did not identify any other omissions

The staff determined whether the applicant had properly identified the SCs that are subject to AMR from among those portions of the CN system that are identified within the scope of license renewal. The applicant identified and lists the SCs subject to AMR for the CN system in Table 2.3.4-3 of the LRA using the screening methodology described in Section 2.1 of each LRA. The staff evaluated the scoping and screening methodology and documented its findings in Section 2.1 of this SER.

In the NAS LRA, the applicant identified the portions of the CN system that are within the scope of license renewal in the drawings listed below. The applicant also listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.4-3 of the LRA:

<u>Unit 1</u>

Unit 2

11715-LRM-074A, Sh. 3 11715-LRM-078B, Sh. 1 11715-LRM-078B, Sh. 3 12050-LRM-074A, Sh. 3

In the SPS LRA, the applicant identified the portions of the CN system that are within the scope of license renewal in the drawings listed below. The applicant also listed the mechanical component commodity groups that are subject to AMR and their intended functions in Table 2.3.4-3 of the LRA: