Progress Energy

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July 18, 2005

SERIAL: BSEP 05-0097 10 CFR 54

U. S. Nuclear Regulatory Commission
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Washington, DC 20555-0001

Subject: Brunswick Steam Electric Plant, Unit Nos. 1 and 2
Docket Nos. 50-325 and 50-324/License Nos. DPR-71 and DPR-62
Clarification of Responses to Requests for Additional Information - License Renewal (NRC TAC Nos. MC4639 and MC4640)

Reference: Letter from Cornelius J. Gannon to the U. S. Nuclear Regulatory Commission (Serial: BSEP 04-0006), "Application for Renewal of Operating Licenses," dated October 18, 2004 (ML043060406)

Ladies and Gentlemen:

On October 18, 2004, Carolina Power & Light Company, now doing business as Progress Energy Carolinas, Inc. (PEC), requested the renewal of the operating licenses for Brunswick Steam Electric Plant (BSEP), Unit Nos. 1 and 2, to extend the terms of their operating licenses an additional 20 years beyond the current expiration dates.

In recent discussions with the Nuclear Regulatory Commission, PEC has been asked to provide further clarification of its responses to previous NRC requests for additional information. In addition, the recent NRC License Renewal Inspection has resulted in the need to provide further clarification of planned BSEP aging management activities. Enclosure 1 of this letter provides the requested clarifications together with an applicant-identified revision to the License Renewal Application for BSEP.

Enclosure 2 is the summary list of regulatory commitments for License Renewal, revised to conform to the clarifications provided in Enclosure 1.

Please refer any questions regarding this submittal to Mr. Mike Heath, Supervisor - License Renewal, at (910) 457-3487.

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I declare, under penalty of perjury, that the foregoing is true and correct. Executed on July 18, 2005.

Sincerely,

Cornelius J. Gannon

MHF/mhf

Enclosures:

1. Additional Information Supporting the BSEP License Renewal Application
2. BSEP License Renewal Commitments, Revision 6

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Additional Information Supporting the BSEP License Renewal Application

Background

On October 18, 2004, Carolina Power & Light Company, now doing business as Progress Energy Carolinas, Inc. (PEC), submitted a License Renewal Application (LRA) that requested the renewal of the operating licenses for Brunswick Steam Electric Plant (BSEP), Unit Nos. 1 and 2, to extend the terms of their operating licenses an additional 20 years beyond the current expiration dates.

In recent discussions with the NRC, PEC has been asked to provide further clarification of responses provided to previous requests for additional information (RAIs). In addition, the NRC License Renewal Inspection has resulted in the need to provide further clarification of planned BSEP aging management activities. This enclosure provides the requested clarifications together with an applicant-identified revision to the LRA for BSEP.

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TABLE OF ACRONYMS AND ABBREVIATIONS	
AMR	Aging Management Review
ASM	American Society for Metals
ASME	American Society of Mechanical Engineers
BSEP	Brunswick Steam Electric Plant
BWRVIP	Boiling Water Reactor Vessel and Internals Project
CPI	Chemistry Performance Index
GALL	Generic Aging Lessons Learned (the GALL Report is NUREG-1801)
INPO	Institute for Nuclear Power Operations
ISI	Inservice Inspection
LRA	License Renewal Application
NFPA	National Fire Protection Association

TABLE OF ACRONYMS AND ABBREVIATIONS	
NRC	Nuclear Regulatory Commission
PEC	Progress Energy Carolinas
P-T	Pressure-Temperature
RAI	Request for Additional Information
RBCCW	Reactor Building Closed Cooling Water
RI-ISI	Risk-Informed Inservice Inspection
RPV	Reactor Pressure Vessel
RT	Radiographic Testing
UFSAR	Updated Final Safety Analysis Report
UT	Ultrasonic Testing

NRC RAI 2.4-4 (Supplemental Response)

PEC letter to the NRC (i.e., Serial: BSEP 05-0055), dated May 11, 2005, provided the original response to this RAI. Following further discussions with the NRC, BSEP is providing the following supplemental information regarding the Chlorination Building and the Auxiliary Boiler House.

Chlorination Building

The Chlorination Building is an unclassified sheet metal structure attached to the south side of the Service Water Intake Structure. The Service Water Intake Structure is a Class I reinforced concrete structure designed for seismic, tornado, and hurricane loads. Based on the lightweight design of the Chlorination Building compared to the robust design of the Service Water Intake Structure, any loading of the Chlorination Building on the Service Water Intake Structure would be enveloped by the Class I design criteria. As such, the Chlorination Building is not a seismic II/I risk for the Service Water Intake Structure and does not support any License Renewal intended function.

Auxiliary Boiler House

The Auxiliary Boiler House does not support a License Renewal intended function under 10 CFR 54.4(a)(2), as it is not adjacent to any Class I structure and does not pose a seismic II/I risk for any Class I structure.

NRC RAI 3.3.2-1-2 (Supplemental Response)

PEC letter to the NRC (i.e., Serial: BSEP 05-0055), dated May 11, 2005, provided the original response to this RAI. The information below is provided to address NRC follow-up questions concerning the use of American Society of Mechanical Engineers (ASME) Section XI, Inservice Inspection (ISI), specifically, the BSEP ASME Subsection IWB, IWC, and IWD Inservice Inspection Program, for verification of Water Chemistry Program effectiveness in mitigating crevice, pitting and general corrosion in aging management review (AMR) line items associated with 4-inch and greater class 1 piping.

Follow-up Question 1:

Provide the basis for concluding that the potential for internal corrosion is the greatest at Class 1 ISI welds due to sensitization and geometry changes associated with the weldment.

Response:

The scope of Section XI ISI is not limited to weldments, rather, weldments are generally specified as inspection locations on the basis of susceptibility. Likewise, under Risk-Informed Inservice Inspection (RI-ISI), the selection of inspection locations is not limited to weldments, but rather based on identification of applicable corrosion mechanisms and evaluation of susceptible locations. See the response to Follow-up Question 3 below. Welds are typically specified for inspection because the assessment of degradation mechanisms identifies these as the areas of most concern. The increased susceptibility at welds is attributed to metallurgical changes and surface imperfections associated with the welding process. The American Society for Metals (ASM) Handbook, Volume 13, contains the following discussion pertaining to crevice and pitting corrosion of the heat affected zone of weldments:

> The localized nature of pitting and crevice corrosion dictates that materials that have been developed and fabricated to resist these types of attack must have reasonably continuous surfaces, must be fabricated without the introduction of crevices and laps, and must have reasonable chemical homogeneity on a microscopic scale. These requirements are not difficult to achieve in wrought alloy forms (hot-rolled plate, rod and bar, and so on). The initial requirements of chemical homogeneity can be met with weldments, but homogeneity within an as-deposited weld cannot be achieved. A weld is a casting, and dendrite formation and growth occur first from the highest melting point constituents as the weld puddle solidifies. As dendrite growth continues, lower melting point materials are typically relegated to the interdendritic spaces, which causes chemical segregation within the weld.

The ASM Handbook contains a similar discussion of the potential for sensitization at weldments of stainless steels and nickel base alloys. While measures can be specified to minimize the potential for corrosion in welds, the variables associated with welding activities introduce a set of liabilities to welds not applicable to the balance of piping base metal.

Follow-up Question 2:

The GALL ISI Program does not specifically call for inspections at other susceptible internal surfaces of piping and fittings.

Response:

The current approved version of NUREG-1801, "Generic Aging Lessons Learned (GALL)," does not address crevice, pitting, and general corrosion of Class 1 piping because the industry has been effective in mitigating these mechanisms with water chemistry. Crevice and pitting

corrosion, and general corrosion, where applicable, were being included in BSEP LRA due to the conservative, deterministic methods being used in AMRs; namely, assuming no water chemistry controls. The industry working group recently submitted comments to the draft revision of GALL, including a comment to include a line item in Section IV addressing crevice and pitting corrosion of stainless steel reactor coolant pressure boundary components. The purpose of this comment was to allow utilities to align to an NRC approved approach to aging management.

Follow-up Question 3:

The ability of volumetric examination methods (UT and RT) to detect loss of material for internal surfaces need to be assured for the system components in question.

Response:

Consistent with Electric Power Research Institute Guidance, and as approved by the NRC, the RI-ISI methodology BSEP utilizes includes: (1) identification and evaluation of potentially active degradation mechanisms, (2) selection of inspection locations in which the impact of each degradation mechanism is most severe, and (3) implementation of appropriate inspection methods, such as, Ultrasonic Testing (UT) or Radiographic Testing (RT), with qualified inspectors. The assessment of applicable degradation mechanisms is piping/component-specific, and includes consideration of range of factors including materials, pipe size/schedule, component type, geometry/configuration, fabricating methods, operating conditions, and service experience. The type of inspections utilized, area to be examined, and qualification requirements for inspection personnel are specific to the degradation mechanism of concern.

Similarly, the types of flaws required to be detected under Section XI, Subsection IWB, are not limited to cracks, but include other types of imperfections and inclusions meeting the flaw size criteria of IWB-3500. Qualification requirements for personnel performing volumetric examinations are intended to assure the inspection would find minor surface imperfections on the inside of piping geometries, consistent with the flaw size requirements and acceptance criteria of the ASME Code.

Follow-up Question 4:

An augmented inspection program should be required to verify the effectiveness of the Water Chemistry Program and ISI Program.

Response:

An augmented inspection is not needed to address the potential for loss of material due to crevice, pitting or general corrosion of Class 1 piping. As prescribed by 10 CFR 50.55a, Section XI ISI requirements, and NRC-approved alternatives such as RI-ISI, are not limited to detection of cracking, and are intended to provide an acceptable level of quality and safety.

Loss of material due to crevice, pitting and general corrosion are not known to be latent aging mechanisms to the extent they would not be of concern during the current license period, but

might be manifest during the period of extended operation. The same Section XI inspection program that is used to ensure an acceptable level of quality and safety exist during the current license period will continue to fulfill that role in the period of extended operation.

Follow-up Question 5:

Both Class 1 boundaries and those outside of Class 1 boundaries need to be discussed.

Response:

The line items addressed in this discussion pertain only to 4-inch and greater Class 1 piping. Components outside of Class 1 boundaries which credit Water Chemistry for aging management are subject to the One-Time Inspection Program for verification of program effectiveness, consistent with GALL. Note that GALL does not specify One-Time Inspections for 4-inch and larger Class 1 piping, because it is subject to volumetric examination. Less than 4-inch Class 1 piping is not subject to volumetric examination, and has been included in the One-Time Inspection Program.

NRC RAI 3.6.2.3-1.b.3 (Supplemental Response)

PEC letter to the NRC (i.e., Serial: BSEP 05-0071), dated June 14, 2005, provided the original response to this RAI. Following further discussions with the NRC, BSEP is providing the following supplemental information related to RAI paragraph b.3 for visual inspection of inaccessible bolted connections to address the parameters monitored/inspected and the frequency of this inspection.

Accessible and inaccessible Phase Bus bolted connections will be checked for loose connections by thermography or by measuring connection resistance using a low range ohmmeter on a 10 year frequency. Thermography will be performed while the bus is energized and loaded.

NRC RAI 4.2.4-1 (Supplemental Response)

PEC letter to the NRC (i.e., Serial: BSEP 05-0050), dated May 4, 2005, provided the original response to this RAI. Following further discussions with the NRC, BSEP is providing the following supplemental information.

BSEP Letter to the NRC (i.e., Serial: BSEP 01-0034), "Request for License Amendments - Changes to Reactor Coolant System Pressure-Temperature Limits and Request for Exemption from 10 CFR 50, Appendix G Requirements," dated May 1, 2001, requested an exemption from the requirements of 10 CFR 50, Appendix G. BSEP proposed to use ASME Code Case N-640 in lieu of Appendix G of ASME Section XI as an alternate method for determining the fracture toughness of reactor pressure vessel materials for use in generation of updated Pressure-Temperature (P-T) limit curves. NRC Letter to BSEP (i.e., Accession No. ML012760157), "BSEP Units 1 and 2 - Exemption from the Requirements of 10 CFR Part 50, Appendix G: Use

of ASME Code Case N-640 in Lieu of Appendix G of ASME Section XI for the Generation of Updated Pressure-Temperature Limit Curves," dated October 3, 2001, approved the exemption and the use of Code Case N-640. The exemption applied for the development of P-T limit curves applicable for 32 Effective Full Power Years, which corresponds with 40 years of operation. These P-T limit curves were determined to be a TLAA.

In order to evaluate this TLAA for 60 years, new P-T limit curves applicable for 54 Effective Full Power Years were developed. These curves demonstrate that adequate operational margins will exist during the license renewal period. However, these 54 Effective Full Power Year curves were not submitted for NRC approval as a part of the LRA; and no new exemption request was prepared at that time. Rather, new P-T limit curves will be submitted for NRC review and approval at least one year prior to the expiration of the 32 Effective Full Power Year curves. If a new exemption request is needed to support the methods used to develop the new P-T limit curves, it will be also be submitted for NRC review and approval at that time.

Based on the above, the commitment associated with Section A.1.2.1.3 of the BSEP UFSAR Supplement will be revised to state:

> P-T limit curves for use during the periods of extended operation of BSEP Units 1 and 2 will be submitted for NRC review and approval in accordance with the 10 CFR 50.90 license amendment process at least one year prior to expiration of the 32 EFPY P-T limit curves that are currently approved in the BSEP Technical Specifications. Also, if an exemption request to permit the use of ASME Code Case N-640 is required as part of the submittal, an exemption request will be included as part of the license amendment request.

NRC RAI B.2.28-1 (Supplemental Response)

PEC letter to the NRC (i.e., Serial: BSEP 05-0071), dated June 14, 2005, provided the original response to this RAI. Following further discussions with the NRC, BSEP is providing the following supplemental information to parts a and b of the RAI.

a. BSEP will manage loss of material and cracking of the internal jet pump sensing lines with a combination of the Water Chemistry Program and the Reactor Vessel and Internals Structural Integrity Program.

b. Boiling Water Reactor Vessel and Internals Project (BWRVIP) guidelines BWRVIP-03 and BWRVIP-139 are also in the scope of the Reactor Vessel and Internals Structural Integrity Program. As a member of the BWRVIP, BSEP complies with its reporting requirements.

NRC RAI B.2.28-5 (Supplemental Response)

PEC letter to the NRC (i.e., Serial: BSEP 05-0071), dated June 14, 2005, provided the original response to this RAI. Following further discussions with the NRC, BSEP is providing the following supplemental information.

Based on current fluence projections, the replacement of the spring-loaded core plate plugs installed in Unit 2 will occur during the refueling outage that is currently scheduled for 2011. Any evaluation to extend the service life of the spring-loaded core plate plugs will be submitted to the NRC for review and approval.

NRC RAI B.2.28-6 (Supplemental Response)

PEC letter to the NRC (i.e., Serial: BSEP 05-0071), dated June 14, 2005, provided the original response to this RAI. Following further discussions with the NRC, BSEP is providing the following supplemental information to Part A of the RAI.

BSEP will revise the Reactor Vessel and Internals Structural Integrity Program such that either an ultrasonic examination or an ultrasonic examination in combination with a visual examination will be performed for the Access Hole Cover welds until such time as specific guidance is provided by the BWRVIP.

NRC RAI B.2.28-7/3.1.2.3.1.2-3 (Supplemental Response)

PEC letter to the NRC (i.e., Serial: BSEP 05-0071), dated June 14, 2005, provided the original response to this RAI. Following further discussions with the NRC, BSEP is providing the following supplemental information to Part A of the RAI.

The BSEP Water Chemistry Program has been effective in mitigating loss of material and cracking. The Chemistry Performance Index (CPI) was developed by the Institute for Nuclear Power Operations (INPO) to provide a single performance indicator for plant chemistry performance. This formula compares three factors monitored in BWR Feedwater/Reactor Water. These three factors are Final Feedwater Iron, Reactor Pressure Vessel (RPV) Sulfates and RPV Chlorides. These results are compared to INPO-compiled Industry Mean Values from 1993 for all BWR plants.

The BSEP CPI trend since 2002 has been:

	Unit 1	Unit 2
2002	1.049	1.036
2003	1.012	1.000
2004	1.169	1.000

Specific data on chemistry parameters follows:

Parameter	2002	2003	2004
RPV Chlorides			
Unit 1	0.504 ppb	0.301 ppb	0.351 ppb
Unit 2	0.499 ppb	0.331 ppb	0.236 ppb
FW Iron			
Unit 1	0.812 ppb	0.367 ppb	0.575 ppb
Unit 2	0.318 ppb	0.439 ppb	0.201 ppb
RPV SO_4			
Unit 1	2.046 ppb	1.686 ppb	1.990 ppb
Unit 2	1.779 ppb	0.891 ppb	0.469 ppb

In addition, the structural integrity of the core spray spargers will be verified by performing inspections so that the original core spray distribution will be preserved during the extended period of operation.

Therefore, the combination of the Water Chemistry Program and the Reactor Vessel and Internals Structural Integrity Program are effective in managing flow blockage due to fouling of the core spray nozzles.

NRC RAI B.2.28-8 (Supplemental Response)

PEC letter to the NRC (i.e., Serial: BSEP 05-0071), dated June 14, 2005, provided the original response to this RAI. Following further discussions with the NRC, BSEP is providing the following supplemental information.

A plant-specific commitment will be added that the Reactor Vessel and Internals Structural Integrity Program, in conjunction with the Water Chemistry Program as appropriate, will be used to manage the non-safety related steam dryers and the feedwater spargers. The revised commitment is provided in the supplemental response to RAI B.2.28-15, Part B, below.

The non-safety related core shroud head and separators and the surveillance capsule holder will be managed with a combination of the Water Chemistry Program and the One-Time Inspection Program.

NRC RAI B.2.28-11 (Supplemental Response)

PEC letter to the NRC (i.e., Serial: BSEP 05-0071), dated June 14, 2005, provided the original response to this RAI. Following further discussions with the NRC, BSEP is providing the following supplemental information to Part A of the RAI.

Based on BSEP's plant-specific evaluation, the core plate rim hold down bolts are only required for shear capacity. BWRVIP-03, BWR Vessel and Internals Project, Reactor Pressure Vessel and Internals Examination Guidelines, describes this technique in Section 8, Core Plate. Section 8.4.4, UT Demonstration 4, states:

> This technique does not detect bolt flaws. The purpose is to verify the presence of the bolt in the bolt hole through the core plate support ring. The transducer is scanned over the outside surface of the core plate support ring, using existing equipment for shroud inspection. The transducer is in contact with the ring surface.

BWRVIP-03, which has been reviewed and approved by the NRC, provides this inspection technique for use in BWRVIP-25 related inspections. Therefore, it is not an alternative to its requirements. The Reactor Vessel and Internals Structural Integrity Program incorporates the BWRVIP-03 examination guidelines.

NRC RAI B.2.28-15 (Supplemental Response)

PEC letter to the NRC (i.e., Serial: BSEP 05-0071), dated June 14, 2005, provided the original response to this RAI. Following further discussions with the NRC, BSEP is providing the following information which incorporates the applicable supplemental responses provided previously in this submittal.

Part A.1: The supplemental response to RAI B.2.28-1 documents that the following guidelines are part of the Reactor Vessel and Internals Structural Integrity Program:

BWRVIP-03	BWRVIP-18	BWRVIP-25
BWRVIP-26	BWRVIP-27	BWRVIP-38
BWRVIP-41	BWRVIP-47	BWRVIP-48
BWRVIP-49	BWRVIP-74-A	BWRVIP-76
BWRVIP-94	BWRVIP-139 when reviewed and approved by the NRC	

This information also applies to the response to Part B.1 of the RAI.

Part A.2: The supplemental response to RAI B.2.28-5 documents that the Reactor Vessel and Internals Structural Integrity Program (i.e., BSEP LRA Section B.2.28) will manage loss of preload due to stress relaxation of the spring-loaded core plate plugs installed in Unit 2 by replacement. Based on current fluence projections, the replacement of the spring-loaded core

plate plugs installed in Unit 2 will occur during the refueling outage currently scheduled for 2011. Any evaluation to extend the service life of the spring-loaded core plate plugs will be submitted to the NRC for review and approval.

Part A.3: The supplemental response to RAI B.2.28-7 documents that flow blockage due to fouling of the "Core Spray Lines and Spargers (Spray Nozzles)" will be managed with a combination of the Water Chemistry Program and the guidelines of BWRVIP-18 which are part of the Reactor Vessel and Internals Structural Integrity Program. This information also applies to the response to Part B.2 of the RAI.

Part A.4: The supplemental response to RAI B.2.28-8 documents the aging management activities for the non-safety related Steam Dryers and Feedwater Spargers. The Shroud Head and Separators and the Surveillance Capsule Holders will be managed by the combination of the Water Chemistry Program and the One-Time Inspection Program. This information also applies to the response to Part B.3 of the RAI.

The supplemental response to Parts A and B of RAI B.2.28-11 documents that BSEP inspection strategy for the core plate rim hold-down bolts are per the existing BWRVIP-25 requirements. No unique commitment is required. This information applies to the response to Part B.4 of the RAI.

Based on the above information, Updated Final Safety Analysis Report (UFSAR) Supplement Section A.1.1.30 has been revised to read as follows:

A.1.1.30 Reactor Vessel and Internals Structural Integrity Program

The Reactor Vessel and Internals Structural Integrity Program includes inspection of reactor vessel and internal components in accordance with the ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD Program and inspection and flaw evaluation in conformance with the guidelines of applicable Boiling Water Reactor Vessel and Internals Project (BWRVIP) documents. In addition, monitoring and control of reactor coolant water chemistry, through the use of the BSEP Water Chemistry Program, in accordance with the latest guidelines of the BWRVIP, helps ensure the long-term integrity and safe operation of the Reactor Vessel and Internals components. This Program has been prepared using BWRVIP-74-A, BWR Reactor Pressure Vessel Inspection and Flaw Evaluation Guidelines for License Renewal, and was based on the guidance set forth in BWRVIP-94, BWR Vessel and Internals Project Program Implementation Guide. The scope of the Program includes the following activities performed in accordance with following or latest BWRVIP guidelines:

Activity	BWRVIP Guideline
BWR Vessel and Internals Project, Reactor Pressure Vessel and Internals Examination Guidelines	BWRVIP-03
Core Spray Internals Inspection and Flaw Evaluation including management of potential fouling of Core Spray lines and spargers.	BWRVIP-18

Core Plate Inspection and Flaw Evaluation	BWRVIP-25
Top Guide Inspection and Flaw Evaluation	BWRVIP-26
Standby Liquid Control System/Core ΔP Inspection and Flaw Evaluation	BWRVIP-27
Shroud Support Inspection and Flaw Evaluation	BWRVIP-38
Jet Pump Assembly Inspection and Flaw Evaluation	BWRVIP-41
Lower Plenum Inspection and Flaw Evaluation	BWRVIP-47
Vessel ID Attachment Weld Inspection and Flaw Evaluation	BWRVIP-48
Instrument Penetration Inspection and Flaw Evaluation	BWRVIP-49
Core Shroud Inspection and Flaw Evaluation	BWRVIP-76
Steam Dryer Inspection and Flaw Evaluation Guidelines (when reviewed and approved by the NRC)	BWRVIP-139

The scope of the Program includes aging management of steam dryers and the feedwater spargers. Loss of preload due to stress relaxation of the Unit 2 spring-loaded core plate plugs will be managed by replacing the plugs or by extending the service life of the plugs by evaluation. Flow blockage due to fouling of the Core Spray Lines and Spargers (Spray Nozzles) will be managed with a combination of the Water Chemistry Program and the guidelines of BWRVIP-18.

Prior to the period of extended operation, the Program will be enhanced to: (1) incorporate augmented inspections of the top guide using enhanced visual examination or other acceptable inspection methods that will focus on the high fluence region and (2) establish inspection criteria for the VT-3 examination of the Core Shroud Repair Brackets.

The commitment to the Reactor Vessel and Internals Structural Integrity Program will be revised to state:

Brunswick Steam Electric Plant (BSEP) License Renewal Commitments, Revision 5		
License Renewal Commitment Subject	**LRA, Appendix A, Section**	**Scope of Commitment**
Reactor Vessel and Internals Structural Integrity Program	A.1.1.30	Prior to the period of extended operation, the Reactor Vessel and Internals Structural Integrity Program will be enhanced to: (1) incorporate augmented inspections of the top guide using enhanced visual examination or other acceptable inspection methods that will focus on the high fluence region, (2) establish inspection criteria for the VT-3 examination of the Core Shroud Repair Brackets, (3) the scope of the program described in the UFSAR Supplement will be revised to state that the program implements the following or latest BWRVIP guidelines: BWRVIP-03, BWRVIP-18, BWRVIP-25, BWRVIP-26, BWRVIP-27, BWRVIP-38,

consistent with the corresponding program described in NUREG-1801 and subsequent NRC interim staff guidance.

Applicant Identified Item (Reactor Building Closed Cooling Water System Description)

The purpose of this RAI is to correct Section 2.3.3.8 of the LRA. The third paragraph of Section 2.3.3.8 of the LRA states:

> The RBCCW System pumps, heat exchangers, and equipment required for normal system heat removal are designed to Class II requirements. To minimize potential damage from a pipe break and flooding to Class I equipment inside the Drywell, the portion of the system within the Drywell was designed to a higher level of quality and designated safety related.

Contrary to this statement, the Reactor Building Closed Cooling Water (RBCCW) System inside the drywell is not considered safety related, but rather has an augmented quality designation related to seismic design.

The first two sentences of the third paragraph of Section 2.3.3.8 of the License Renewal Application should read:

> The RBCCW System pumps, heat exchangers, and equipment required for normal system heat removal are designed to Class II requirements. To minimize possible damage from a pipe break and flooding to Class I equipment inside the Drywell, the portion of the system within the Drywell was designed to a higher level of quality control.

This change does not impact scoping, screening, aging management review, or aging management program results for the RBCCW System. For additional information, refer to the discussion of RBCCW piping in Section 3.2.1.6 of the BSEP UFSAR.

Brunswick Steam Electric Plant (BSEP) License Renewal Commitments, Revision 6		
License Renewal Commitment Subject	**LRA, Appendix A, Section**	**Scope of Commitment**
Quality Assurance (QA)	A.1.1	Prior to the period of extended operation, the elements of corrective action, confirmation process, and administrative controls in the BSEP QA Program will be applied to required aging management activities for both safety related and non-safety related structures and components subject to aging management review.
Flow-Accelerated Corrosion (FAC) Program	A.1.1.5	Prior to the period of extended operation, the BSEP FAC susceptibility analyses will be updated to include additional components potentially susceptible to FAC.
Bolting Integrity Program	A.1.1.6	Prior to the period of extended operation, a precautionary note will be added to plant bolting guidelines to limit the sulfur content of compounds used on bolted connections.
Open-Cycle Cooling Water System Program	A.1.1.7	Prior to the period of extended operation, the Open-Cycle Cooling Water System Program will be enhanced to require that: (1) Program scope include portions of the Service Water (SW) System credited in the Aging Management Review, including non-safety related piping, (2) the Residual Heat Removal (RHR) Heat Exchangers will be subject to eddy current testing with results compared to previous testing to evaluate degradation and aging, (3) A representative sampling of SW Pump casings be inspected, (4) Program procedures be enhanced to include verification of cooling flow and heat transfer effectiveness of SW Pump Oil Cooling Coils, inspections associated with SW flow to the Diesel Generators (including inspection of expansion joints), and inspection and replacement criteria for RHR Seal Coolers, (5) Piping inspections will include locations where throttling or changes in flow direction might result in erosion of copper-nickel piping, and (6) Performance testing of the RHR and Emergency Diesel Generator Jacket Water heat exchangers will be performed to verify heat transfer capability.
Closed-Cycle Cooling Water System Program	A.1.1.8	Prior to the period of extended operation, Closed-Cycle Cooling Water System Program activities will be enhanced to assure that Preventive Maintenance activities include inspections of DG combustion air intercoolers and heat exchangers.
Inspection of Overhead Heavy Load and Light Load Handling	A.1.1.9	Administrative controls for the Program will be enhanced, prior to the period of extended operation to: (1) include in the Program all cranes/platforms within the scope of License Renewal, (2) specify an annual inspection frequency for the Reactor Building Bridge Cranes and the Intake Structure Gantry Crane, and every fuel cycle for the Refuel Platforms, (3) allow use of maintenance crane inspections as input for the condition monitoring of License Renewal cranes, (4) require maintenance inspection reports to be forwarded to the responsible engineer, and (5) include inspection of structural component corrosion and monitoring crane rails for abnormal wear.
Fire Water System Program <u>Revised commitment</u>	A.1.1.11	Prior to the period of extended operation, Program administrative controls will be enhanced to require: (1) obtaining non-intrusive baseline pipe thickness measurements at various locations, and (2) replacing the remainder of the plant's sprinkler heads prior to 50 years of sprinkler head service life. The results of the non-intrusive Fire Water System piping thickness measurements will be trended throughout the extended period of operation; the specific measurement intervals will be determined by engineering evaluation performed after each inspection to detect degradation prior to the loss of intended function.

Brunswick Steam Electric Plant (BSEP) License Renewal Commitments, Revision 6		
License Renewal Commitment Subject	**LRA, Appendix A, Section**	**Scope of Commitment**
Aboveground Carbon Steel Tanks Program	A.1.1.12	The Aboveground Carbon Steel Tanks Program is a new aging management program that will be implemented prior to the period of extended operation.
Fuel Oil Chemistry Program	A.1.1.13	Prior to the period of extended operation: (1) Fuel Oil Chemistry Program administrative controls will be enhanced to add a requirement to trend data for water and particulates, (2) the condition of the in-scope fuel oil tanks will be verified by means of thickness measurements under the One-Time Inspection Program, and (3) an internal inspection of the Main Fuel Oil Storage Tank will be performed under the One-Time Inspection Program.
Reactor Vessel Surveillance Program	A.1.1.14	The Reactor Vessel Surveillance Program will be enhanced to ensure that any additional requirements that result from the NRC review of Boiling Water Reactor Vessel Internals Program (BWRVIP)-116 are addressed prior to the period of extended operation.
One-Time Inspection Program	A.1.1.15	This is a new aging management program that requires procedural controls for implementation and tracking of One-Time Inspection Program activities. The One-Time Inspection Program will be implemented prior to the period of extended operation.
Selective Leaching of Materials Program	A.1.1.16	The Selective Leaching of Materials Program is a new aging management program that requires a sample population of susceptible components to be selected for inspection. The Selective Leaching of Materials Program will be implemented prior to the period of extended operation.
Buried Piping and Tanks Inspection Program	A.1.1.17	The Buried Piping and Tanks Inspection Program is a new aging management program that will be implemented prior to the period of extended operation and will include procedural requirements to (1) ensure an appropriate as-found pipe coating and material condition inspection is performed whenever buried piping within the scope of the Buried Piping and Tanks Inspection Program is exposed, or, as a minimum, once every 10 years, (2) add precautions concerning excavation and use of backfill to the excavation procedure to include precautions for License Renewal piping, (3) add a requirement that coating inspection shall be performed by qualified personnel to assess its condition, and (4) add a requirement that a coating engineer or other qualified individual should assist in evaluation of any coating degradation noted during the inspection.
ASME Section XI, Subsection IWF Program	A.1.1.20	Prior to the period of extended operation, the ASME Section XI, Subsection IWF Program will be enhanced to include the torus vent system supports within the scope of the Program.
Masonry Wall Program	A.1.1.22	Prior to the period of extended operation, the administrative controls for the Masonry Wall Program will be enhanced to require inspecting all accessible surfaces of the walls for evidence of cracking.

Brunswick Steam Electric Plant (BSEP) License Renewal Commitments, Revision 6		
License Renewal Commitment Subject	**LRA, Appendix A, Section**	**Scope of Commitment**
Structures Monitoring Program	A.1.1.23	Prior to the period of extended operation, the Structures Monitoring Program will be enhanced to: (1) identify License Renewal systems managed by the Program and inspection boundaries between structures and systems, (2) require notification of the responsible engineer regarding availability of exposed below-grade concrete for inspection and require that an inspection be performed, (3) identify specific license renewal commodities and inspection attributes, (4) require responsible engineer review of groundwater monitoring results, (5) specify that an increase in sample size for component supports shall be implemented (rather than should be) commensurate with the degradation mechanisms found, (6) improve training of system engineers in condition monitoring of structures, (7) include inspections of the submerged portions of the Service Water Intake Structure on a frequency not to exceed five years, (8) specify an annual groundwater monitoring inspection frequency for concrete structures, and (9) specify the inspection frequency for the Service Water Intake Structure and Intake Canal to not exceed five years. Following enhancement, the Structures Monitoring Program will be consistent with the corresponding program described in NUREG-1801.
Protective Coating Monitoring an Maintenance Program	A.1.1.24	Prior to the period of extended operation, the Protective Coating Monitoring an Maintenance Program administrative controls will be enhanced to: (1) add a requirement for a walk-through, general inspection of containment areas during each refueling outage, including all accessible pressure-boundary coatings not inspected under the ASME Section XI, Subsection IWE Program, (2) add a requirement for a detailed, focused inspection of areas noted as deficient during the general inspection, (3) assure that the qualification requirements for persons evaluating coatings are consistent among the Service Level I coating specifications, inspection procedures, and application procedures, and meet the requirements of ANSI N 101.4, "Quality Assurance for Protective Coatings Applied to Nuclear Facilities," and (4) document the results of inspections and compare the results to previous inspection results and to acceptance criteria.
Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program	A.1.1.25	The Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program is a new aging management program that will be implemented prior to the period of extended operation.
Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits Program	A.1.1.26	The Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits Program is a new aging management program that will be implemented prior to the period of extended operation.

Brunswick Steam Electric Plant (BSEP) License Renewal Commitments, Revision 6		
License Renewal Commitment Subject	**LRA, Appendix A, Section**	**Scope of Commitment**
Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program	A.1.1.27	The Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program is a new aging management program that will be implemented prior to the period of extended operation.
Reactor Coolant Pressure Boundary (RCPB) Fatigue Monitoring Program	A.1.1.28	Prior to the period of extended operation, the Program will be enhanced to: (1) expand the Program scope to include an evaluation of each reactor coolant pressure boundary component included in NUREG/CR-6260, (2) provide preventive action requirements including requirement for trending and consideration of operational changes to reduce the number or severity of transients affecting a component, (3) include a requirement to reassess the locations that are monitored considering the RCPB locations that were added to the Program scope, (4) specify the selection criterion to be locations with a 60-year CUF value (including environmental effects where applicable) of 0.5 or greater, other than those identified in NUREG/CR-6260, (5) address corrective actions for components approaching limits, with options to include a revised fatigue analysis, repair or replacement of the component, or in-service inspection of the component (with prior NRC approval), and (6) address criteria for increasing sample size for monitoring if a limiting location is determined to be approaching the design limit.
Reactor Vessel and Internals Structural Integrity Program <u>Revised commitment</u>	A.1.1.30	Prior to the period of extended operation, the Reactor Vessel and Internals Structural Integrity Program will be enhanced to: (1) incorporate augmented inspections of the top guide using enhanced visual examination or other acceptable inspection methods that will focus on the high fluence region, (2) establish inspection criteria for the VT-3 examination of the Core Shroud Repair Brackets, (3) the scope of the program described in the UFSAR Supplement will be revised to state that the program implements the following or latest BWRVIP guidelines: BWRVIP-03, BWRVIP-18, BWRVIP-25, BWRVIP-26, BWRVIP-27, BWRVIP-38, BWRVIP-41, BWRVIP-47, BWRVIP-48, BWRVIP-49, BWRVIP-74-A, BWRVIP-76, BWRVIP-94, and BWRVIP-139 (when reviewed and approved by the NRC), and (4) the scope of the program described in the UFSAR Supplement will be revised to state that: • the Reactor Vessel and Internals Structural Integrity Program in conjunction with the Water Chemistry Program will be used to manage flow blockage due to fouling of the Core Spray lines and spargers (spray nozzles), • the Reactor Vessel and Internals Structural Integrity Program will be used to manage the aging of the non-safety related steam dryers and feedwater spargers, and • loss of preload due to stress relaxation of the Unit 2 spring-loaded core plate plugs will be managed by replacing the plugs. Any evaluation to extend the service life of the spring-loaded core plate plugs will be submitted to the NRC for review and approval.

Brunswick Steam Electric Plant (BSEP) License Renewal Commitments, Revision 6		
License Renewal Commitment Subject	**LRA, Appendix A, Section**	**Scope of Commitment**
Systems Monitoring Program	A.1.1.31	Prior to the period of extended operation, a procedure will be developed to implement: 1) inspection of in-scope License Renewal components for identified aging effects, 2) guidelines for establishing inspection frequency requirements, 3) listing of inspection criteria in checklist form, 4) recording of extent of condition during system walkdowns and 5) addressing of appropriate corrective action(s) for degradations discovered.
Preventive Maintenance (PM) Program	A.1.1.32	Prior to the period of extended operation, preventive maintenance activities will be incorporated into the PM Program, as needed, to satisfy aging management reviews of components that rely on the PM Program for management of aging effects.
Phase Bus Aging Management Program	A.1.1.33	The Phase Bus Aging Management Program is a new aging management program that will be implemented prior to the period of extended operation.
Fuel Pool Girder Tendon Inspection Program	A.1.1.34	Prior to the period of extended operation, the Fuel Pool Girder Tendon Inspection Program will be enhanced to: (1) specify inspection frequencies, numbers of tendons to be inspected, and requirements for expansion of sample size, (2) identify test requirements and acceptance criteria for tendon lift-off forces, measurement of tendon elongation, and determination of ultimate strength, (3) specify inspections for tendons, tendon anchor assemblies, surrounding concrete, and grease, (4) require prestress values to be trended and compared to projected values, and (5) identify acceptable corrective actions for tendons that fail to meet testing criteria.
Time Limited Aging Analysis (TLAA) - RPV Operating Pressure-Temperature (P-T) Limits Revised commitment	A.1.2.1.3	P-T limit curves for use during the periods of extended operation of BSEP Units 1 and 2 will be submitted for NRC review and approval in accordance with the 10 CFR 50.90 license amendment process at least one year prior to expiration of the 32 EFPY P-T limit curves that are currently approved in the BSEP Technical Specifications. Also, if an exemption request to permit the use of ASME Code Case N-640 is required as part of the submittal, an exemption request will be included as part of the license amendment request.
TLAA – Core Plate Plug Spring Stress Relaxation	A.1.2.1.7 A.1.1.30	Management of Core Plate Plug Spring Stress Relaxation will be performed by means of the Reactor Vessel and Internals Structural Integrity Program.
TLAA – Fuel Pool Girder Tendon Loss of Prestress	A.1.2.6 A.1.1.34	Prior to the period of extended operation, a Fuel Pool Girder Tendon Inspection Program will be implemented to assure design basis anchor forces required for the tendons to perform their intended function will continue to be maintained.
TLAA – Torus Component Corrosion Allowance	A.1.2.8 A.1.1.15	Prior to the period of extended operation, measurements are planned, using the One-Time Inspection Program, to verify by volumetric measurements the actual rate of corrosion of the supports and platform steel in the Torus.
Potential Aging Effects/Mechanisms Resulting from Power Uprate	None	An evaluation of plant and industry operating experience will be submitted for NRC review at least one year prior to the period of extended operation. The purpose of the evaluation will be to assure that relevant aging effects caused by operation at power uprate conditions are adequately addressed by aging management programs. Refer to the ACRS letter report on license renewal of Dresden/Quad Cities, dated September 16, 2004.