



# Progress Energy

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10 CFR 50.90

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
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  
Request for License Amendment - Technical Specification 3.3.1.2, "Source Range Monitor (SRM) Instrumentation"

Ladies and Gentlemen:

In accordance with the Code of Federal Regulations, Title 10, Part 50.90, Carolina Power & Light Company (CP&L), now doing business as Progress Energy Carolinas, Inc., is requesting a revision to the Technical Specifications (TSs) for the Brunswick Steam Electric Plant (BSEP), Unit Nos. 1 and 2. The proposed license amendment revises Table 3.3.1.2-1, "Source Range Monitor Instrumentation" to add a footnote which specifies the required locations of operable Source Range Monitors (SRMs) in Mode 5, during core alterations. Additionally, an administrative correction is made to Surveillance Requirement 3.3.1.2.2 in the Unit 1 TSs. An evaluation of the proposed license amendment is provided in Enclosure 1.

CP&L has evaluated the proposed change in accordance with 10 CFR 50.91(a)(1), using the criteria in 10 CFR 50.92(c), and determined that this change involves no significant hazards considerations.

CP&L is providing, in accordance with 10 CFR 50.91(b), a copy of the proposed license amendment to the designated representative for the State of North Carolina.

CP&L requests approval of the proposed amendment by August 29, 2008, and that once approved, the amendment shall be implemented within 90 days.

No regulatory commitments are contained in this submittal. Please refer any questions regarding this submittal to Mr. Randy C. Ivey, Manager - Support Services, at (910) 457-2447.

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## Evaluation of Proposed License Amendment Request

Subject: Technical Specification 3.3.1.2, "Source Range Monitor (SRM) Instrumentation"

### 1.0 Description

This letter is a request to amend Renewed Operating Licenses DPR-71 and DPR-62 for the Brunswick Steam Electric Plant (BSEP), Unit Nos. 1 and 2.

The proposed change revises Table 3.3.1.2-1, "Source Range Monitor Instrumentation," of Technical Specification (TS) 3.3.1.2, "Source Range Monitor (SRM) Instrumentation," to add a footnote which specifies the required locations of operable Source Range Monitors (SRMs) in Mode 5, during core alterations.

Currently, Surveillance Requirement (SR) 3.3.1.2.2, verifies that, during core alterations, an operable SRM is located in: (a) the fueled region, (b) the core quadrant where core alterations are being performed, when the associated SRM is included in the fueled region; and (c) a core quadrant adjacent to where core alterations are being performed, when the associated SRM is included in the fueled region. Note 2 of SR 3.3.1.2.2 indicates that one SRM may be used to satisfy more than one of the above requirements. The Limiting Condition for Operation (LCO) bases section for TS 3.3.1.2 also reflects these operable SRM location requirements.

The Table 3.3.1.2-1 currently indicates that, in Mode 5, two operable SRMs are required but it does not provide the details of where these operable SRMs must be located during core alterations. The proposed change adds a footnote to Table 3.3.1.2-1 which duplicates the location requirements specified in SR 3.3.1.2.2.

Additionally, an administrative correction to SR 3.3.1.2.2 in the Unit 1 TSs is being made. During development of this license amendment request, a typographical error was identified in SR 3.3.1.2.2 for Unit 1. Item c of SR 3.3.1.2.2 refers to "the fuel region." This is corrected to "the fueled region" consistent with other locations within the Unit 1 and Unit 2 TSs as well as the current version of NUREG-1433, Revision 3.1, "Standard Technical Specifications General Electric Plants, BWR/4."

### 2.0 Proposed Change

The proposed change adds footnote (c) to the Mode 5 SRM Required Channels in Table 3.3.1.2-1 which duplicates the location requirements specified in SR 3.3.1.2.2 for operable SRMs during core alterations. The existing wording of Table 3.3.1.2-1, with the new footnote (c), follows. The added text is shown in bolded font.

Function	Applicable Modes Or Other Specified Conditions	Required Channels	Surveillance Requirements
1. Source Range Monitor	2 <sup>(a)</sup>	3	SR 3.3.1.2.1 SR 3.3.1.2.4 SR 3.3.1.2.6 SR 3.3.1.2.7
	3,4	2	SR 3.3.1.2.3 SR 3.3.1.2.4 SR 3.3.1.2.6 SR 3.3.1.2.7
	5	2 <sup>(b)(c)</sup>	SR 3.3.1.2.1 SR 3.3.1.2.2 SR 3.3.1.2.4 SR 3.3.1.2.5 SR 3.3.1.2.7

- (a) With IRMs on Range 2 or below.
- (b) Special movable detectors may be used in place of SRMs if connected to normal SRM circuits.
- (c) **During CORE ALTERATIONS, an OPERABLE SRM shall be located in:**
  - (1) **The fueled region;**
  - (2) **The core quadrant where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region; and**
  - (3) **A core quadrant adjacent to where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region.**

**One SRM may be used to satisfy more than one of the above.**

The proposed change also revises SR 3.3.1.2.2 for Unit 1 to correct a typographical error. Item c of SR 3.3.1.2.2 refers to "the fuel region." This is corrected to "the fueled region." The specific wording of the proposed change follows. The corrected text is shown in bolded font.

Existing Requirement	Proposed Requirement
<p>SR 3.3.1.2.2 -----NOTES-----</p> <ol style="list-style-type: none"> <li>1. Only required to be met during CORE ALTERATIONS.</li> <li>2. One SRM may be used to satisfy more than one of the following.</li> </ol> <p>-----</p> <p>Verify an OPERABLE SRM detector is located in:</p> <ol style="list-style-type: none"> <li>a. The fueled region;</li> <li>b. The core quadrant where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region; and</li> <li>c. A core quadrant adjacent to where CORE ALTERATIONS are being performed, when the associated SRM is included in the fuel region.</li> </ol>	<p>SR 3.3.1.2.2 -----NOTES-----</p> <ol style="list-style-type: none"> <li>1. Only required to be met during CORE ALTERATIONS.</li> <li>2. One SRM may be used to satisfy more than one of the following.</li> </ol> <p>-----</p> <p>Verify an OPERABLE SRM detector is located in:</p> <ol style="list-style-type: none"> <li>a. The fueled region;</li> <li>b. The core quadrant where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region; and</li> <li>c. A core quadrant adjacent to where CORE ALTERATIONS are being performed, when the associated SRM is included in the <b>fueled</b> region.</li> </ol>

In summary, the proposed changes are administrative in nature. The change to Table 3.3.1.2-1 adds a footnote to Table 3.3.1.2-1 which duplicates the Mode 5 operable SRM location requirements currently specified in SR 3.3.1.2.2 and discussed in the LCO bases section for TS 3.3.1.2. This is being done as an aid to Operations personnel, to help prevent inadvertently missing the requirements. The change to SR 3.3.1.2.2 for Unit 1 corrects a typographical error to be consistent with other locations within the Unit 1 and Unit 2 TSs, as well as the current version of NUREG-1433. There are no requirements being added, deleted, or altered as a result of either of the proposed changes.

For convenience, Enclosure 2 contains a marked-up version of the Unit 1 TSs showing the proposed changes. Since TS Table 3.3.1.2-1 for Unit 1 and Unit 2 are identical and the change to SR 3.3.1.2.2 is not applicable to Unit 2, only the mark-up for Unit 1 is provided. Enclosures 3 and 4 provide typed versions of the Unit 1 and Unit 2 TSs, respectively. These typed TS pages are to be used for issuance of the proposed amendment.

Carolina Power & Light Company (CP&L), now doing business as Progress Energy Carolinas, Inc., will make supporting changes to the TS Bases in accordance with TS 5.5.10, "Technical Specifications (TS) Bases Control Program." Enclosure 5 provides marked-up TS Bases pages for Unit 1. These pages are being submitted for information only and do not require issuance by the NRC.

### **3.0 Background**

#### *System Description/Applicable Safety Analysis*

The SRMs provide the operator with information relative to the neutron flux level at very low flux levels in the core. As such, the SRM indication is used by the operator to monitor the approach to criticality and determine when criticality is achieved. During refueling, shutdown, and low power operations, the primary indication of neutron flux levels is provided by the SRMs or special movable detectors connected to the normal SRM circuits. The SRMs provide monitoring of reactivity changes during fuel or control rod movement and give the control room operator early indication of unexpected subcritical multiplication that could be indicative of an approach to criticality. The SRMs have no safety function and are not assumed to function during any design basis accident or transient analysis. However, the SRMs provide on-scale monitoring of neutron flux levels during startup and refueling.

#### *Need for Change*

On March 26, 2007, during Unit 2 refueling activities, control rod 10-35 was withdrawn a single notch in a fueled quadrant of the core where there was not an operable SRM. Licensee Event Report 2-2007-001, dated May 22, 2007 (i.e., ADAMS Accession Number ML071510084), documents this event. Although not the root cause of the event, the detailed requirements within SR 3.3.1.2.2 (i.e., specific location requirements for operable SRMs during core alterations) were not provided in the requirements contained in Table 3.3.1.2-1. Had Table 3.3.1.2-1 included the requirements, consistent with those of SR 3.3.1.2.2, the event reported in LER 2-2007-001 would likely have been avoided since Operators referred to the table prior to initiating activities that included the single notch movement of control rod 10-35.

### **4.0 Technical Analysis**

The proposed changes are administrative in nature. There are no requirements being added, deleted, or altered as a result of either of the proposed changes.

The change to Table 3.3.1.2-1 adds a footnote to Table 3.3.1.2-1 which duplicates the Mode 5 operable SRM location requirements currently specified in SR 3.3.1.2.2 and discussed in the LCO bases section for TS 3.3.1.2. The specific Mode 5 operable SRM location requirements are not being changed and are consistent with the requirements provided in the current version of

NUREG-1433. This change is being done as an aid to Operations personnel, to help prevent inadvertently missing the requirements.

The change to SR 3.3.1.2.2 for Unit 1 corrects a typographical error to be consistent with other locations within the Unit 1 and Unit 2 TSs as well as the current version of NUREG-1433.

## **5.0 Regulatory Safety Analysis**

### **5.1 No Significant Hazards Consideration**

CP&L has evaluated whether or not a significant hazards consideration is involved with the proposed amendments by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No

The proposed changes are administrative in nature. There are no requirements being added, deleted, or altered as a result of either of the proposed changes.

The change to Table 3.3.1.2-1 adds a footnote to Table 3.3.1.2-1 which duplicates the Mode 5 operable SRM location requirements currently specified in SR 3.3.1.2.2 and discussed in the LCO bases section for TS 3.3.1.2. The specific Mode 5 operable SRM location requirements are not being changed and are consistent with the requirements provided in the current version of NUREG-1433. This change is being done as an aid to Operations personnel, to help prevent inadvertently missing the requirements.

The change to SR 3.3.1.2.2 for Unit 1 corrects a typographical error to be consistent with other locations within the Unit 1 and Unit 2 TSs as well as the current version of NUREG-1433.

The proposed changes do not involve a physical change to the SRMs, nor do they alter the assumptions of the accident analyses. Therefore, the probability and the consequences of an accident previously evaluated are not affected.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

The proposed changes do not involve a physical change to the SRMs, nor do they alter the assumptions of the accident analyses. The changes are purely administrative in nature.

Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No

The proposed changes are administrative in nature, being done as an aid to Operations personnel, to help prevent inadvertently missing the Mode 5 operable SRM location requirements and to correct a typographical error. There are no requirements being added, deleted, or altered as a result of either of the proposed changes. As such, the proposed changes do not involve a reduction in a margin of safety.

Based on the above, CP&L concludes that the proposed amendments present no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

## 5.2 Applicable Regulatory Requirements/Criteria

Title 10 of the Code of Federal Regulations (10 CFR), Part 50, Section 36(c)(2)(ii)(A) requires that a TS Limiting Condition for Operation (LCO) must be established for "instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary." In addition, 10 CFR 50.36(c)(3), "Surveillance Requirements," specifies that TSs are to include surveillance requirements for testing, calibrating, or inspecting to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the LCOs will be met. The proposed changes are administrative in nature and do not involve a physical change to the SRMs. Additionally, no requirements of existing LCOs or Surveillance Requirements are being added, deleted, or altered as a result of the proposed changes.

## 6.0 Environmental Considerations

A review has determined that the proposed amendment is administrative in nature and does not change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, and does not change an inspection or surveillance requirement. The proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9).

Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.



BSEP 07-0080  
Enclosure 2

Marked-up Technical Specification Pages - Unit 1

SURVEILLANCE REQUIREMENTS

-----NOTE-----  
Refer to Table 3.3.1.2-1 to determine which SRs apply for each applicable MODE or other specified condition.  
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SURVEILLANCE		FREQUENCY
SR 3.3.1.2.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.1.2.2	<p>-----NOTES-----</p> <ol style="list-style-type: none"> <li>1. Only required to be met during CORE ALTERATIONS.</li> <li>2. One SRM may be used to satisfy more than one of the following.</li> </ol> <p>-----</p> <p>Verify an OPERABLE SRM detector is located in:</p> <ol style="list-style-type: none"> <li>a. The fueled region;</li> <li>b. The core quadrant where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region; and</li> <li>c. A core quadrant adjacent to where CORE ALTERATIONS are being performed, when the associated SRM is included in the <del>fuel</del> region.</li> </ol>	12 hours
SR 3.3.1.2.3	Perform CHANNEL CHECK.	24 hours

*fueled*

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Table 3.3.1.2-1 (page 1 of 1)  
Source Range Monitor Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS
1. Source Range Monitor	2 <sup>(a)</sup>	3	SR 3.3.1.2.1 SR 3.3.1.2.4 SR 3.3.1.2.6 SR 3.3.1.2.7
	3,4	2	SR 3.3.1.2.3 SR 3.3.1.2.4 SR 3.3.1.2.6 SR 3.3.1.2.7
	5	2 <sup>(b)</sup>	SR 3.3.1.2.1 SR 3.3.1.2.2 SR 3.3.1.2.4 SR 3.3.1.2.5 SR 3.3.1.2.7

(C)

(a) With IRMs on Range 2 or below.

(b) Special movable detectors may be used in place of SRMs if connected to normal SRM circuits.

*Insert 1 - Next Page*

## INSERT 1

- (c) During CORE ALTERATIONS, an OPERABLE SRM shall be located in:
- (1) The fueled region;
  - (2) The core quadrant where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region; and
  - (3) A core quadrant adjacent to where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region.

One SRM may be used to satisfy more than one of the above.

BSEP 07-0080  
Enclosure 3

Typed Technical Specification Pages - Unit 1

SURVEILLANCE REQUIREMENTS

----- NOTE -----  
 Refer to Table 3.3.1.2-1 to determine which SRs apply for each applicable MODE or other specified condition.  
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SURVEILLANCE		FREQUENCY
SR 3.3.1.2.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.1.2.2	<p>-----NOTES-----</p> <ol style="list-style-type: none"> <li>1. Only required to be met during CORE ALTERATIONS.</li> <li>2. One SRM may be used to satisfy more than one of the following.</li> </ol> <p>-----</p> <p>Verify an OPERABLE SRM detector is located in:</p> <ol style="list-style-type: none"> <li>a. The fueled region;</li> <li>b. The core quadrant where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region; and</li> <li>c. A core quadrant adjacent to where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region.</li> </ol>	12 hours
SR 3.3.1.2.3	Perform CHANNEL CHECK.	24 hours

(continued)

Table 3.3.1.2-1 (page 1 of 1)  
Source Range Monitor Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS
1. Source Range Monitor	2 <sup>(a)</sup>	3	SR 3.3.1.2.1 SR 3.3.1.2.4 SR 3.3.1.2.6 SR 3.3.1.2.7
	3,4	2	SR 3.3.1.2.3 SR 3.3.1.2.4 SR 3.3.1.2.6 SR 3.3.1.2.7
	5	2 <sup>(b)(c)</sup>	SR 3.3.1.2.1 SR 3.3.1.2.2 SR 3.3.1.2.4 SR 3.3.1.2.5 SR 3.3.1.2.7

(a) With IRMs on Range 2 or below.

(b) Special movable detectors may be used in place of SRMs if connected to normal SRM circuits.

(c) During CORE ALTERATIONS, an OPERABLE SRM shall be located in:

- (1) The fueled region;
- (2) The core quadrant where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region; and
- (3) A core quadrant adjacent to where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region.

One SRM may be used to satisfy more than one of the above.

Typed Technical Specification Page - Unit 2



Table 3.3.1.2-1 (page 1 of 1)  
Source Range Monitor Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS
1. Source Range Monitor	2 <sup>(a)</sup>	3	SR 3.3.1.2.1 SR 3.3.1.2.4 SR 3.3.1.2.6 SR 3.3.1.2.7
	3,4	2	SR 3.3.1.2.3 SR 3.3.1.2.4 SR 3.3.1.2.6 SR 3.3.1.2.7
	5	2 <sup>(b)(c)</sup>	SR 3.3.1.2.1 SR 3.3.1.2.2 SR 3.3.1.2.4 SR 3.3.1.2.5 SR 3.3.1.2.7

(a) With IRMs on Range 2 or below.

(b) Special movable detectors may be used in place of SRMs if connected to normal SRM circuits.

(c) During CORE ALTERATIONS, an OPERABLE SRM shall be located in:

- (1) The fueled region;
- (2) The core quadrant where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region; and
- (3) A core quadrant adjacent to where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region.

One SRM may be used to satisfy more than one of the above.

Marked-up Technical Specification Bases Page - Unit 1  
(For Information Only)

BASES (continued)

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APPLICABLE SAFETY ANALYSES      Prevention and mitigation of prompt reactivity excursions during refueling and low power operation is provided by LCO 3.9.1, "Refueling Equipment Interlocks"; LCO 3.1.1, "SHUTDOWN MARGIN (SDM)"; LCO 3.3.1.1, "Reactor Protection System (RPS) Instrumentation"; IRM Neutron Flux—High and Average Power Range Monitor (APRM) Neutron Flux—High (Setdown) Functions; and LCO 3.3.2.1, "Control Rod Block Instrumentation."

The SRMs have no safety function and are not assumed to function during any UFSAR design basis accident or transient analysis. However, the SRMs provide the only on scale monitoring of neutron flux levels during startup and refueling. Therefore, they are being retained in Technical Specifications.

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LCO      During startup in MODE 2, three of the four SRM channels are required to be OPERABLE to monitor the reactor flux level prior to and during control rod withdrawal, subcritical multiplication and reactor criticality, and neutron flux level and reactor period until the flux level is sufficient to maintain the IRM on Range 3 or above. All but one of the channels are required in order to provide a representation of the overall core response during those periods when reactivity changes are occurring throughout the core.

In MODES 3 and 4, with the reactor shut down, two SRM channels provide redundant monitoring of flux levels in the core.

In MODE 5, two SRMs are required to be OPERABLE to provide redundant monitoring of reactivity changes occurring in the reactor core. Because of the local nature of reactivity changes during refueling, adequate coverage is provided by requiring one SRM to be OPERABLE in the quadrant of the reactor core where CORE ALTERATIONS are being performed, and the other SRM to be OPERABLE in an adjacent quadrant containing fuel. These requirements ensure that the reactivity of the core will be continuously monitored during CORE ALTERATIONS.

Special movable detectors, according to footnote (b) of Table 3.3.1.2-1, may be used in MODE 5 in place of the normal SRM nuclear detectors. These special detectors must be connected to the normal SRM circuits in the NMS, such that the applicable neutron flux indication can be

(continued)

*and are reflected in SR 3.3.1.2.2 as well as footnote (c) of Table 3.3.1.2-1.*