August 16, 2004

Mr. James Scarola, Vice President
Shearon Harris Nuclear Power Plant
Carolina Power & Light Company
Post Office Box 165, Mail Code: Zone 1
New Hill, North Carolina 27562-0165

SUBJECT: SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1 - ISSUANCE OF AMENDMENT ON STEAM GENERATOR WATER LEVEL INSTRUMENTATION USAGE (TAC NO. MC1942)

Dear Mr. Scarola:

The Nuclear Regulatory Commission has issued Amendment No. 116 to Facility Operating License No. NPF-63 for the Shearon Harris Nuclear Power Plant, Unit 1. This amendment changes the Technical Specifications (TS) in response to your application dated February 4, 2004, as supplemented by letter dated June 9, 2004.

The amendment revises TS Surveillance Requirement 4.4.1.3.2, "Reactor Coolant System Hot Shutdown Surveillance Requirements," and Limiting Condition for Operation (LCO) 3.4.1.4.1.b, "Reactor Coolant System Cold Shutdown - Loops Filled Limiting Condition For Operation," by eliminating a requirement that the wide-range instrumentation be inoperable before the narrow-range instrumentation can be used for confirmation of the minimum steam generator secondary side water level. The amendment also revises the TS Index to restore consistency with other sections of the TS.

A copy of the related Safety Evaluation is enclosed. Notice of Issuance will be included in the Commission's regular bi-weekly *Federal Register* notice.

Sincerely,

/RA/

Chandu P. Patel, Project Manager, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-400

Enclosures:
1. Amendment No. 116 to NPF-63
2. Safety Evaluation

cc w/enclosures:
See next page

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CAROLINA POWER & LIGHT COMPANY, et al.

DOCKET NO. 50-400

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 116
License No. NPF-63

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Carolina Power & Light Company, (the licensee), dated February 4, 2004, as supplemented by letter dated June 9, 2004, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications, as indicated in the attachment to this license amendment; and paragraph 2.C.(2) of Facility Operating License No. NPF-63 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, as revised through Amendment No. 116, are hereby incorporated into this license. Carolina Power & Light Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 120 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Michael L. Marshall, Acting Chief, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: August 16, 2004

ATTACHMENT TO LICENSE AMENDMENT NO. 116

FACILITY OPERATING LICENSE NO. NPF-63

DOCKET NO. 50-400

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove Pages	Insert Pages
iii	iii
xiii	xiii
xv	xv
xvi	xvi
xvii	xvii
xviii	xviii
xix	xix
3/4 4-5	3/4 4-5
3/4 4-6	3/4 4-6

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 116 TO FACILITY OPERATING LICENSE NO. NPF-63

CAROLINA POWER & LIGHT COMPANY

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1

DOCKET NO. 50-400

1.0 INTRODUCTION

By letter dated February 4, 2004, as supplemented by letter dated June 9, 2004, the Carolina Power & Light Company (the licensee) submitted a request for changes to the Shearon Harris Nuclear Power Plant, Unit 1 (HNP), Technical Specifications (TS). The requested changes would revise TS Surveillance Requirement (SR) 4.4.1.3.2, "Reactor Coolant System Hot Shutdown Surveillance Requirements," and Limiting Condition for Operation (LCO) 3.4.1.4.1.b, "Reactor Coolant System Cold Shutdown - Loops Filled Limiting Condition For Operation." The proposed changes to SR 4.4.1.3.2 and LCO 3.4.1.4.1.b would eliminate a requirement that the wide-range instrumentation be inoperable before the narrow-range instrumentation can be used for confirmation of the minimum steam generator secondary side water level. The proposed change would also revise the TS Index to restore consistency with other sections of the TS.

The June 9, 2004, letter provided clarifying information that did not change the scope of the proposed amendment as described in the original notice of proposed action published in the *Federal Register* and did not change the initial proposed no significant hazards consideration determination.

2.0 BACKGROUND

The purpose of SR 4.4.1.3.2 and LCO 3.4.1.4.1.b is to ensure that a sufficient level exists in the steam generator to provide an adequate heat sink for decay heat. The proposed amendment is intended to reduce an operational burden that was identified during a cooldown at the end of the cycle following Refueling Outage 10 (RFO10). While in MODE 3 conditions, the operability of the steam generators had been determined by the narrow-range instrumentation indicating more than the minimum value required by SR 4.4.1.3.2. As the cooldown continued, the indication of the wide-range instrumentation did not support a transition to MODE 4 under SR 4.4.1.3.2. Although the narrow-range instrumentation indicated above the minimum value, SR 4.4.1.3.2 did not permit the use of the narrow-range instrumentation because the wide-range instrumentation was operable. The cooldown was suspended to permit sufficient inventory to be added to the steam generator secondary side so that the wide-range instrumentation satisfied the minimum value required by SR 4.4.1.3.2.

Prior to RFO10, SR 4.4.1.3.2 and LCO 3.4.1.4.1.b specified the use of the narrow-range instrumentation to perform the SR. Use of the wide-range instrumentation was added as part of the amendment requested for the steam generator replacement (Reference 1). Although the design basis for the steam generator replacement supported the use of the wide-range instrumentation as a fully acceptable alternative to the narrow-range instrumentation, it was translated into the amendment request as the preferential use of the wide-range instrumentation and conditional use of the narrow-range instrumentation.

The proposed change revises both SR 4.4.1.3.2 and LCO 3.4.1.4.1.b to remove the words, "if WR channel is inoperable." This revision would eliminate the restriction on the use of the narrow-range instrumentation for verifying an adequate level in the steam generators to ensure an adequate heat sink for the removal of decay heat.

The proposed administrative change would make the section headings, figure title, and page numbers in the Index consistent with the existing information in the TS. The TS Bases would also be changed to clarify that the specification of a level value for the wide-range instrumentation and another level value for the narrow-range instrumentation does not imply that the respective instrumentation will simultaneously indicate those values.

3.0 REGULATORY EVALUATION

10 CFR 50.36(c)(2)(ii)(C) states that LCOs must be established for each structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design-basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

10 CFR 50.36(c)(3) states that SRs are requirements relating to test, calibration, or inspection 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.

10 CFR 50, Appendix A, General Design Criterion 44 states that a system to transfer heat from structures, systems, and components important to safety, to an ultimate heat sink shall be provided. The system safety function shall be to transfer the combined heat load of these structures, systems, and components under normal operating and accident conditions.

4.0 TECHNICAL EVALUATION

The HNP is a three-loop Westinghouse pressurized water reactor. During RFO10, the three steam generators were replaced with Westinghouse Delta 75 models. Each steam generator has four channels of narrow-range level instrumentation and one channel of wide-range instrumentation. The narrow-range instrumentation covers a nominal reference span of about 240 inches and the wide-range instrumentation covers a nominal reference span of about 610 inches. The narrow-range instrumentation is calibrated for hot conditions and the wide-range instrumentation is calibrated for cold conditions. For both the narrow-range and the wide-range instrumentation, the 100 percent indication occurs near the upper taps, which are just below the chevron separators. The 0 percent indication occurs near the lower taps, which for the narrow-range lower taps are near the middle of the transition cone and for the wide-range lower tap is just above the tube sheet.

The basis for SR 4.4.1.3.2 and LCO 3.4.1.4.1.b is to confirm steam generator operability in MODE 4 and in MODE 5 with the reactor coolant loops filled by verifying that the indicated steam generator level is above the top of the tubes. To meet the requirements of 10 CFR 50.36(c)(2)(ii) and 10 CFR 50.36(c)(3) for the steam generator level, the licensee relies on SR 4.4.1.3.2 and LCO 3.4.1.4.1.b. The verification of level above the top of the tubes can be performed using the narrow-range instrumentation or the wide-range instrumentation. Based upon the previously accepted vendor's thermal and hydraulic design data report for HNP, the level that corresponds to the top of the tubes, in both the narrow-range and wide-range spans, was determined to be:

> Narrow range level without uncertainties: 16.8 percent narrow-range span
> Wide range level without uncertainties: 67.0 percent wide-range span

The NRC staff requested the licensee to clarify whether both the narrow-range and wide-range instrumentation sets were able to reliably detect the minimum steam generator secondary side water level independent of each other. The NRC staff also requested that the licensee clarify the parameters accounted for in the uncertainty allowances for both the wide-range and narrow-range instrumentation devices. In its June 9, 2004, letter, the licensee indicated that the functional capability of the narrow-range instrumentation is not impacted by the operability status of the wide-range instrumentation. The narrow-range instrumentation is designed as a safety-related system and it is designed to meet the independence and separation criteria specified in 10 CFR 50, Appendix A, General Design Criterion 22 and 24, and Section 4.6 of IEEE-279-1971, "Criteria for Protection Systems for Nuclear Power Generating Stations." The licensee also provided details of the parameters used in establishing the uncertainty allowances for both the narrow-range and the wide-range instrumentation sets.

The licensee described the narrow-range instrumentation as hot calibrated, which increases the indicated level of the narrow-range instrumentation at cold conditions with respect to actual level. To offset this difference, the licensee used the uncertainty allowance of 6 percent as established by the Nuclear Steam Supply System (NSSS) vendor. For additional conservatism, the licensee added an additional 6 percent to the vendor's recommendation. This uncertainty includes the normal sensor reference and calibration accuracy, sensor temperature and pressure effects, sensor drift, rack calibration accuracy, rack temperature, rack drift effects, and the Measuring and Test Equipment (M&TE) errors. Therefore, the 30 percent minimum operating value identified in the existing TS was based on the combination of the 16.8 percent level for the top of the steam generator tube, the 6 percent uncertainty allowance established by the NSSS vendor, the 6 percent added by the licensee, and an allowance for a readable value on the level indicator.

The licensee indicated that the wide-range instrumentation is cold calibrated, which decreases the indicated level of the wide-range instrumentation at hot conditions with respect to actual level. To offset this difference, an uncertainty allowance of 5.3 percent was determined to include sensor and process rack reference accuracy, temperature effects, drift, and M&TE errors. The applicable process sensor, rack, reference leg heat-up effects, sensor static pressure effects, control board level indication errors and main control board level uncertainties were also considered in establishing the steam generator wide-range operating value. The total uncertainty, combined with the 67 percent level for the top of the steam generator tubes and an

allowance for a readable value on the level indicator, resulted in the minimum operating value of 74 percent that is specified for the steam generator wide-range level in the existing TS.

The proposed changes to SR 4.4.1.3.2 and LCO 3.4.1.4.1.b would eliminate the restriction on the use of the narrow-range instrumentation for verifying an adequate level in the steam generators to ensure an adequate heat sink for the removal of decay heat. The NRC staff agrees that the TS revisions would remain within the regulatory aspects of 10 CFR 50, Appendix A, General Design Criterion 44 in maintaining an ultimate heat sink in regard to safety. The revision would allow the 30 percent minimum narrow-range value in the TS to be used as an alternative to the 74 percent minimum wide-range value, without first requiring that the wide-range instrumentation be inoperable.

The NRC staff has previously accepted the operating values for both the wide range and narrow-range instrumentation in the steam generator replacement amendment (Reference 2). The NRC staff has previously agreed that the methodology used to calculate the current minimum values specified by the TS for the wide-range and the narrow-range instrumentation conservatively incorporate the applicable uncertainties necessary to make either instrument suitable for use over the expected range of operating conditions (Reference 2). Consequently, the use of either the narrow-range or the wide-range instruments with the respective minimum level values specified in the TS provides assurance of adequate secondary side water level to permit the determination of steam generator operability during the transition between MODE 4 and MODE 5 with reactor coolant loops filled.

Based on above discussion, the NRC staff determined that: (1) the operation of the narrow-range instrumentation is not affected by the operability status of the wide-range instrumentation; and (2) the minimum value specified by TS for use of the narrow-range instrumentation is appropriate for the expected range of operating conditions independent of the operability status of the wide-range instrumentation. Therefore, the NRC staff concludes that the proposed TS changes are in accordance with the current licensing basis and are acceptable.

The proposed changes to the Index are administrative and make section headings, figure title, and page numbers consistent with existing information in the TS. For example, the change to the title of Figure 2.1-1, as listed in the Index, is corrected to match the title of Figure 2.1-1, as listed on Page 2-2. These are editorial changes and are acceptable to the NRC staff.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the State of North Carolina official was notified of the proposed issuance of the amendment. The State official had no comments.

6.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes the Surveillance Requirements. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding

that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (69 FR 12365). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

7.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

8.0 REFERENCE

1. Shearon Harris Nuclear Power Plant, Docket No. 50-400, License No. NPF-63, Steam Generator Replacement Technical Specification Amendment Application, Serial: HNP-00-142, October 4, 2000, ADAMS Accession Nos. ML003758761, ML003758772, ML003758798, ML003758821, and ML003758890.

2. Letter from US Nuclear Regulatory Commission to James Scarola (CP&L), Document Control Desk, "Shearon Harris, Unit 1- Issuance of Amendment re Steam Generator replacement and Power Uprate," October 12, 2001, ADAMS Accession No. ML012830516.

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Date: August 16, 2004

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