January 26, 1996

Mr. C. S. Hinnant, Vice President
Carolina Power & Light Company
H. B. Robinson Steam Electric Plant
Unit No. 2
3581 West Entrance Road
Hartsville, South Carolina 29551-0790

SUBJECT: ISSUANCE OF AMENDMENT NO. 167 TO FACILITY OPERATING LICENSE NO. DPR-23 REGARDING FULL LENGTH CONTROL ROD INSERTION LIMITS FOR THE H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2 (TAC NO. M93785)

Dear Mr. Hinnant:

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 167 to Facility Operating License No. DPR-23 for the H. B. Robinson Steam Electric Plant, Unit No. 2. This amendment changes the Technical Specifications in response to your request dated September 11, 1995.

The amendment changes TS 3.10.1.3 to add an allowance for rod insertion limits (RILs) to be exceeded for a time no greater than the time criteria established by the axial power distribution methodology or 1 hour, whichever is sooner. An action is also added for the reactor to be placed in the hot shutdown condition within 6 hours if compliance with the RILs cannot be restored within the specified time period.

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

Sincerely,

Original signed by:

Brenda L. Mozafari, Project Manager
Project Directorate II-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-261

Enclosures:
1. Amendment No. 167 to DPR-23
2. Safety Evaluation

cc w/enclosures:
See next page

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AMENDMENT NO. 167 TO FACILITY OPERATING LICENSE NO. DPR-23 - H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

January 26, 1996

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Brenda L. Mozafari, Project Manager
Project Directorate II-1
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Office of Nuclear Reactor Regulation

Docket No. 50-261

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cc w/enclosures:
See next page

Mr. C. S. Hinnant
Carolina Power & Light Company

H. B. Robinson Steam Electric
Plant, Unit No. 2

cc:

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

CAROLINA POWER & LIGHT COMPANY

DOCKET NO. 50-261

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 167
License No. DPR-23

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

   A. The application for amendment by Carolina Power & Light Company (the licensee), dated September 11, 1995, 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 3.B. of Facility Operating License No. DPR-23 is hereby amended to read as follows:

B. Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 167 , are hereby incorporated in the license. Carolina Power & Light Company shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 60 days.

FOR THE NUCLEAR REGULATORY COMMISSION

B.C. Buckley for

David B. Matthews, Director
Project Directorate II-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: January 26, 1996

ATTACHMENT TO LICENSE AMENDMENT NO. 167

FACILITY OPERATING LICENSE NO. DPR-23

DOCKET NO. 50-261

Replace the following pages of the Appendix A Technical Specifications with the enclosed pages. The revised areas are indicated by marginal lines.

Remove Pages	Insert Pages
3.10-1	3.10-1
3.10-11	3.10-11
3.10-15	3.10-15

3.10 REQUIRED SHUTDOWN MARGINS, CONTROL ROD, AND POWER DISTRIBUTION LIMITS

Applicability

Applies to the required shutdown margins, operation of the control rods, and power distribution limits.

Objective

To ensure (1) core subcriticality after a reactor trip and during normal shutdown conditions, (2) limited potential reactivity insertions from a hypothetical control rod ejection, and (3) an acceptable core power distribution during power operation.

Specification

3.10.1 Full Length Control Rod Insertion Limits

3.10.1.1 (Deleted by Change No. 21 issued 7/6/73)

3.10.1.2 When the reactor is critical, except for physics tests and full length control rod exercises, the shutdown control rods shall be limited in physical insertion as specified in the CORE OPERATING LIMITS REPORT (COLR).

3.10.1.3 When the reactor is critical, except for physics tests and full length control rod exercises, the control rods shall be limited in physical insertion as specified in the COLR. Control rod bank insertion beyond the limits specified in the COLR shall be corrected within the time criteria established by the axial power distribution methodology or within one (1) hour, whichever occurs sooner. If bank insertion is not restored to the specified limits (i.e., within one (1) hour or within the time criteria established by the axial power distribution methodology, whichever is sooner) the reactor shall be placed in the hot shutdown condition utilizing normal operating procedures within six (6) hours.

3.10.1.4 At 50 percent of the cycle as defined by burnup, the limits shall be adjusted to the end-of-core values as specified in the COLR.

shutdown margin. The specified control rod insertion limits meet the design basis criteria on (1) potential ejected control rod worth and peaking factor,[4] (2) radial power peaking factors, $F_{\Delta H}$, and (3) required shutdown margin.

When the control Rod Banks are outside the acceptable insertion limits, they must be restored to within those limits. The restoration may be accomplished either by repositioning control rods to the insertion limits consistent with core power or by boration to reduce power to be consistent with the power limit associated with the existing rod position. Restoration of rod position to the power dependent insertion limit ensures adequate Shutdown Margin in accordance with Figure 3.10-2.

Operation beyond the insertion limits is allowed (for a short time period in order to take conservative action) because the simultaneous occurrence of either a LOCA, loss of reactor coolant flow accident, ejected rod accident, or other accident during this short time period, together with an inadequate power distribution or reactivity capability, has an acceptably low probability. The allowed completion time of one hour for restoring the banks to within the insertion limits provides an acceptable time for evaluating and repairing minor problems without allowing the plant to remain in an unacceptable condition for an extended period of time.

The various control rod banks (shutdown banks, control banks) are each to be moved as a bank; that is, with all rods in the bank within one step (5/8 inch) of the bank position. Position indication is provided by two methods: a digital count of actuation pulses which shows the demand position of the banks, and a linear position indicator (LVDT) which indicates the actual rod position.[2] At rod positions $\geq$ 200 steps, full power reactivity worths of the control rods are sufficiently small such that a 15-inch indicated misalignment from the rod bank has no significant effect on the incore power distribution and is therefore allowable. For rod positions $<$ 200 steps, maintaining indicated rod position within 7.5 inches of the average of the indicated bank position provides an enforceable limit which assures design distribution is not exceeded. In the event that an LVDT is not in service, the effects of a malpositioned control rod are observable on nuclear and process information displayed in the control room and by core thermocouples and in-core movable detectors. The determination of the hot channel factors will be performed by means of the movable in-core detectors.

The two hours in 3.10.1.5 are acceptable because the misalignment of a single control rod up to 9 feet above its bank or 12 feet below its bank does not result in exceeding core safety limits in steady state operation at rated power and is short with respect to probability of an independent accident. If the condition cannot be readily corrected, the specified reduction in power will ensure that design margins to core limits will be maintained under both steady state and anticipated transient conditions.

Strict control of the i[illegible] difference is not possible du[illegible]g certain physics tests, control rod exercises, or during the required periodic excore calibration which require larger flux differences than permitted. Therefore, the specification on power distribution are not applicable during physics tests, control rod exercises, or excore calibrations; this is acceptable due to the extremely low probability of a significant accident occurring during these operations. Excore calibration includes that period of time necessary to return to equilibrium operating conditions. In some instances of rapid plant power reduction, automatic rod motion will cause the flux difference to deviate from the target band when the reduced power level is reached. This does not necessarily affect the xenon distribution sufficiently to change the envelope of peaking factors which can be reached on a subsequent return to full power within the target band; however, to simplify the specification, a limitation of one hour in any period of 24 hours is placed on operation outside the band. This ensures that the resulting xenon distributions are not significantly different from those resulting from operation within the target band. The instantaneous consequence of being outside the band, provided control rods inserted beyond the physical insertion limits specified in the COLR are returned to within said physical insertion limits within the time criteria established by the axial power distribution methodology or one hour, whichever occurs sooner, is not worse than a 10 percent increment in peaking factor for flux differences in the allowable range specified in the COLR for 90 percent of rated power or 0.9 x APL (whichever is less). Therefore, while the deviation exists, the power level is limited to 90 percent of rated power or 0.9 x APL (whichever is less) or lower depending on the indicated flux difference.

If, for any reason, flux difference is not controlled with the target band for as long a period as one hour, then xenon distributions may be significantly changed and operation at 50 percent of rated power is required to protect against potentially more severe consequences of some accidents.

As discussed above, the essence of the limits is to maintain the xenon distribution in the core as close to the equilibrium full power condition as possible. This is accomplished by using the chemical volume control system to position the full length control rods to produce the required indication flux difference.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 167 TO FACILITY OPERATING LICENSE NO. DPR-23

CAROLINA POWER & LIGHT COMPANY

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

DOCKET NO. 50-261

1.0 INTRODUCTION

By letter dated September 11, 1995, the Carolina Power & Light Company (licensee) submitted a request for changes to the H. B. Robinson Steam Electric Plant, Unit No. 2 (HBR), Technical Specifications (TS). The requested change to TS 3.10.1.3 would modify the time allowance that the full length control rod insertion limits (RILs) specified in the Core Operating Limits Report (COLR) can be exceeded. Specifically, the proposed change would add an allowance for RILs to be exceeded for a time no greater than the time criteria established by the axial power distribution methodology or 1 hour, whichever is sooner. An action is also added for the reactor to be placed in the hot shutdown condition within 6 hours if compliance with the RILs cannot be restored within the specified time period.

2.0 EVALUATION

The limits on control rod insertion have been established to ensure (1) core subcriticality after a reactor trip and during normal shutdown conditions, (2) limited potential reactivity insertions from a hypothetical control rod ejection event, and (3) an acceptable core power distribution during power operation. When the control rods are outside of the acceptable insertion limits, they must be restored by either repositioning the rods to the insertion limits consistent with the core power level or by boration to reduce power to be consistent with the power limit associated with the existing rod position.

The proposed change adds an allowance for RILs to be exceeded for a maximum of 1 hour. Operation beyond the RILs is allowed for a short time period in order to take conservative action because the simultaneous occurrence of either a loss-of-coolant accident (LOCA), loss-of-flow accident, ejected rod accident, or other accident during this short time period, together with an inadequate power distribution or reactivity capability, has an extremely low probability. The maximum allowed time of 1 hour for restoring the control rods to within the RILs provides an acceptable time for evaluating and repairing minor problems without allowing the plant to remain in an unacceptable condition for an extended period of time. In addition, this time period is more restrictive than the comparable time period of 2 hours which has been accepted in the improved Standard Technical Specifications for Westinghouse plants (NUREG-1431, Revision 1, TS Section 3.1.7). If, however, the axial power distribution methodology stated in TS 3.10.2.6 through 3.10.2.8 indicates that

the axial flux difference has exceeded the allowed cumulative time that it may deviate from its target band and an immediate correction is required, this shorter time requirement will govern. The NRC staff finds this requested change acceptable.

If compliance with the RILs cannot be restored within the above specified time requirement, another proposed action consists of placing the reactor in the hot shutdown condition within 6 hours utilizing normal operating procedures. Based on operating experience, this proposed action and completion time are reasonable for reaching hot shutdown conditions from full power conditions in an orderly manner and without challenging plant systems. In addition, they are comparable to the corresponding action in NUREG-1431, Revision 1, TS Section 3.1.7 and are consistent with the text of similar requirements in other HBR TS Sections. Therefore, the staff finds this requested change acceptable.

The proposed Bases changes for TS Section 3.10.1.3 provide the justification for the proposed TS changes and the NRC staff has no objection.

3.0 STATE CONSULTATION

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

4.0 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. 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 (60 FR 54716). 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.

5.0 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.

Principal Contributor: L. Kopp
Date: January 26, 1996