



Carolina Power & Light Company

September 11, 1979

FILE: NG-3514(B)

SERIAL NO.: GD-79-2289

Office of Nuclear Reactor Regulation  
Attention: Mr. T. A. Ippolito, Chief  
Operating Reactors Branch No. 3  
United States Nuclear Regulatory Commission  
Washington, D.C. 20555

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NO. 1

DOCKET NO. 50-325

LICENSE NO. DPR-71

REQUEST FOR LICENSE AMENDMENT - MCPR LIMIT REVISION

Dear Mr. Ippolito:

In accordance with the Code of Federal Regulations, Title 10, Part 50.90 and Part 2.101, Carolina Power & Light Company (CP&L) hereby requests a revision to the Technical Specifications for its Brunswick Steam Electric Plant (3SEP) Unit No. 1. This revision ensures that the reload analysis for Cycle 2 is conservatively met for fuel bundle LJ0197 which is misoriented by 180°.

The attached letter from General Electric summarizes the results of the reanalyses performed for this fuel bundle. Since the peaking factors used to determine the linear heat generation rate will be adjusted to their correct values in the process computer, the current technical specification limit is still appropriate. The attached revised Technical Specification page provides time dependent operating MCPR adjustment factors to be used to ensure the conservative operation of bundle LJ0197. Until approval of this request, the unit will operate with the interim rotated bundle limits that were discussed with your staff on August 30, 1979.

In accordance with 10 CFR 170.12(c), we have determined that this request constitutes one Class III amendment because it involves a single technical issue. Therefore, our check for \$4,000 is enclosed as payment for this fee.

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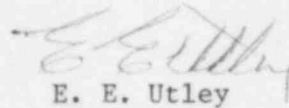
Mr. T. A. Ippolito

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September 11, 1979

Please call if you have any questions regarding this request.

Yours very truly,

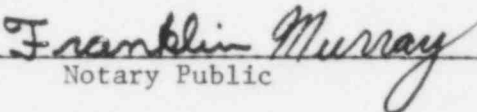


E. E. Utley  
Executive Vice President  
Power Supply & Customer Services

EEU/jcb

Attachments

Sworn and subscribed before me this 11th day of September, 1979.

  
\_\_\_\_\_  
Notary Public

My Commission Expires October 4, 1981.



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# GENERAL ELECTRIC

NUCLEAR ENERGY

PROJECTS DIVISION

GENERAL ELECTRIC COMPANY, 175 CURTNER AVE., SAN JOSE, CALIFORNIA 95125

September 7, 1979  
GRH:79-158

cc: FR Channon	LH Martin/RG Matthews
OA de Diego	CJ Paone
RE Engel	JL Rash
WA Golub	GJ Scatena
CM Itow	SR Specker
MA Jones	AC Tollison, Jr.
DJ Kempainen	RG Tunell

Mr. H. W. Bowles  
CAROLINA POWER & LIGHT CO.  
P. O. Box 1551  
Raleigh, NC 27602

SUBJECT: Brunswick 1 Rotated Bundle Monitoring With the Process Computer

Dear Harry:

Following the discovery that bundle LJ0197 was improperly loaded during the first refueling outage, General Electric investigated the impact of this error on plant operation and the adequacy of the current license basis. It is General Electric's opinion that the single mis-oriented bundle does not compromise the current license basis. The following procedures, which take account of the improper orientation, may be used to determine the operating status of bundle LJ0197.

## Calculation of Linear Heat Generation Rate

In order to calculate the LHGR of bundle LJ0197, the local peaking factors for this bundle should be modified to reflect the increase in local peaking due to the rotation. These modified peaking factors will be supplied in a subsequent letter. Until these modified local peaking factors are available, the process computer calculated LHGR for bundle LJ0197 should be conservatively increased by 20%. This includes the power spiking penalty to account for fuel densification.

## Calculation of APLHGR

Since the Brunswick initial core fuel bundles are limited by LHGR, not MAPLHGR, the increase in the process computer monitored LHGR, as discussed above, will compensate for APLHGR increases in bundle LJ0197 due to changes in peaking factors because of its rotation.

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Calculation of Minimum Critical Power Ratio

In order to calculate the operating MCPR for bundle LJ0197, an additional  $\Delta$ CPR, as indicated in Table 1, should be subtracted from the process computer calculated MCPR for this bundle. This includes the 0.02  $\Delta$ CPR allowance required by the NRC when using the axially varying water gap method for analyzing the rotated Bundle Loading Error.

Table 1

ΔCPR ADJUSTMENT TO PROCESS COMPUTER  
CALCULATED MCPR FOR ROTATED BUNDLE LJ0197

<u>Cycle 2 Exposure Range</u>	<u>Bundle LJ0197 ΔCPR Adjustment</u>
BCC-2 to EOC-2 - 2,000 MWd/ST	0.11
EOC-2 - 2,000 MWd/ST to EOC-2 - 1,000 MWd/ST	0.12
EOC-2 - 1,000 MWd/ST to EOC-2	0.13

Core-Wide Transients

The response to core-wide transients is not significantly affected by the misoriented fuel bundle LJ0197.

Rod Withdrawal Error

The worth of control rod 30-11 (adjacent to bundle LJ0197) has been investigated and is less than 60% of the worth of the limiting control rod analyzed for the Reload 1 Rod Withdrawal Error. If control rod 30-11 were erroneously withdrawn to the Rod Block Monitor setpoint, the  $\Delta$ CPR would be less than that calculated in the Reload 1 license analysis.

Rod Drop Accident

The effect of the rotated bundle on the Rod Drop Accident, as analyzed for the Reload 1 license, has been investigated. The cold reactivity worth of control rod 30-11 is 0.95%  $\Delta$ k compared with 1.21%  $\Delta$ k for the maximum worth control rod. Even with the increased local peaking due to the rotation of LJ0197, the peak enthalpy resulting from a Rod Drop Accident of control rod 30-11 will be less than that reported in the Reload 1 license analysis (i.e., 208 cal/gm).

Very truly yours,

*G. R. Hull*

G. R. Hull  
Fuel Project Manager  
Brunswick 1&2  
M/C 174; (408) 925-6176

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## POWER DISTRIBUTION LIMITS

### 3/4.2.3 MINIMUM CRITICAL POWER RATIO

#### LIMITING CONDITION FOR OPERATION

3.2.3 The MINIMUM CRITICAL POWER RATIO (MCPR), as a function of core flow, shall be equal to or greater than MCPR x the  $K_f$  shown in Figure 3.2.3-1 where:\*\*\*

- a. MCPR = 1.22 from BOC2\* to (EOC2\*\* - 2000 MWD/t).
- b. MCPR = 1.23 from (EOC2 - 2000 MWD/t) to (EOC2 - 1000 MWD/t).
- c. MCPR = 1.28 from (EOC2 - 1000 MWD/t) to EOC2.

APPLICABILITY: CONDITION 1, when THERMAL POWER  $\geq$  25% RATED THERMAL POWER

#### ACTION:

With MCPR less than the applicable limit determined from Figure 3.2.3-1, initiate corrective action within 15 minutes and continue corrective action so that MCPR is equal to or greater than the applicable limit within 4 hours or reduce THERMAL POWER to less than 25% of RATED THERMAL POWER within the next 4 hours.

#### SURVEILLANCE REQUIREMENTS

4.2.3 MCPR shall be determined to be equal to or greater than the applicable limit determined from Figure 3.2.3-1:

- a. At least once per 24 hours,
- b. Whenever THERMAL POWER has been increased by at least 15% of RATED THERMAL POWER and steady state operating conditions have been established, and
- c. Initially and at least once per 12 hours when the reactor is operating with a LIMITING CONTROL ROD PATTERN for MCPR.

\*Beginning of Cycle 2.

\*\*End of Cycle 2.

\*\*\*The operating MCPR for bundle LJ0197 shall be adjusted by subtracting the following correction factors from the calculated values (a - 0.11, b - 0.12, c - 0.13)

Brunswick Unit 1