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February 5, 1997

U. S. Nuclear Regulatory Commission  
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Subject: River Bend Station - Unit 1  
Docket No. 50-458  
License No. NPF-47  
License Amendment Request (LAR) 96-42, Change to Technical Specification  
2.1.1.2, "Reactor Core [Safety Limits]"

File Nos.: G9.5, G9.42

RBF1-97-0032  
RBG-43663

Reference: LAR 96-42, Change to Technical Specification 2.1.1.2, "Reactor Core [Safety Limits]," RBG-43326 dated October 25, 1996

Gentlemen:

In the reference, Entergy Operations, Inc. (EOI) applied for an amendment to the River Bend Station (RBS) Technical Specification for Safety Limit Minimum Critical Power Ratio (SLMCPR). General Electric (GE), EOI and the NRC discussed this request in a telephone conference on January 8, 1997. During this discussion the NRC requested additional information on the control rod pattern development for the RBS Cycle 7 SLMCPR analysis. Based on input from GE the description below provides our response to the NRC request.

Projected control blade patterns for the rodged burn through the cycle were used to deplete the core to the cycle exposures to be analyzed. At the desired cycle exposures, the bundle exposure distributions and their associated R-factors, determined in accordance with NEDC-32505P, "R-Factor Calculation Method for GE11, GE12 and GE13 Fuel," November 1995, were used for the SLMCPR cases to be analyzed. The use of different rod patterns to achieve the desired cycle exposure has been shown to have a negligible impact on the actual calculated SLMCPR. An estimated SLMCPR was obtained for an exposure point near beginning of cycle, point of peak hot excess

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reactivity, and end of cycle to establish which exposure point(s) would produce the highest (most conservative) calculated SLMCPR for subsequent more-detailed evaluation.

At each cycle exposure the SLMCPR is analyzed with radial power distributions that yield the maximum reasonably achievable number of bundles at or near the Operating Limit MCPR during rated power operation. This approach satisfies the stipulation in Licensing Topical Report, NEDO-10958-A, "General Electric BWR Thermal Analysis Basis (GETAB): Data, Correlation and Design Application," January 1977, that the number of rods susceptible to boiling transition be maximized. GE has established criteria to determine if the control rod patterns and resulting radial power distributions are acceptable. These criteria were discussed with the NRC inspection team during the May 5-9, 1996 inspection and have since been incorporated into the GE technical design procedures. These criteria include no gross violations of Technical Specification operating limits (e.g., MCPR, MAPLHGR, LHGR), criticality (calculated, normalized  $k_{eff}$  near one) and total number of bundles within 0.20 of the MCPR of the core. Different rod patterns were analyzed until the criteria of the above parameters were met. The rod pattern search was narrowed by starting from a defined set of patterns known from prior experience to yield the flattest reasonably achievable MCPR distributions. This was done for all three exposure points in the cycle. The beginning of cycle point was not sufficiently low to allow it to be excluded by criteria as non-limiting. A Monte Carlo analysis was then performed for these exposure points using the associated limiting rod pattern at each point to establish the maximum SLMCPR for the cycle.

This information is consistent with the methods used in the development of the RBS Cycle 7 SLMCPR and is based on NEDE-24011-P-A-10-US, "General Electric Standard Application for Reactor Fuel," March 1991, Revision 10, which includes amendments through 22. Revision 10 has been superseded by Revision 11, dated November 1995, and Revision 13, dated August 1996. Revision 12 included proposed SLMCPR methods which were withdrawn in amendment 13. Therefore, the Revision 11 and 13 material pertinent to this application is unchanged from Revision 10.

The information supplied by this letter is consistent with the basis of the initial amendment request and therefore does not affect the No Significant Hazards Consideration provided earlier.

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If you have any questions regarding this request or require additional information, please contact Mr. T. W. Gates at (504) 381-4866.

Sincerely,



RJK/TWG/BMB/kvm

cc: Mr. David L. Wigginton  
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