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

JUL 8 1985

MEMORANDUM FOR: T. M. Novak, Assistant Director
for Licensing, DL

FROM: L. S. Rubenstein, Assistant Director
for Core and Plant Systems, DSI

SUBJECT: SSER FOR RIVER BEND

The Core Performance Branch has prepared the enclosed Supplemental Safety Evaluation Report for the River Bend Station Unit 1. This document addresses the impact on Chapter 15 analyses of the change in the core loading from the conventional three-enrichment configuration to a five-enrichment control-cell configuration.

L. S. Rubenstein

L. S. Rubenstein, Assistant Director
for Core and Plant Systems, DSI

Enclosure:
As stated

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15.4.3 Operation of a Fuel Assembly in an Improper Position--Fuel Misloading Event

Two sorts of fuel misloading events may be considered: misorientation of a fuel assembly in its proper location and loading a fuel assembly into an improper location. The first of these events has trivial consequences for an S-lattice in the first cycle because the assembly fuel design is symmetric with respect to rotation. The slight tilt in the assembly caused by the misorientation has a negligible effect on the thermal-hydraulic performance of the fuel in the first cycle and tends to improve that performance in succeeding cycles.

The initial core consists of five bundle types with average enrichments in the high, low, and medium ranges with corresponding different gadolinium enrichments. The fuel bundle loading error consists of interchanging a bundle of one enrichment range with another bundle of a different enrichment range. The limiting fuel bundle loading error is that of interchanging a 2.78 percent enrichment bundle with a 0.94 percent enrichment bundle in the center of the core and away from a LPRM string. When the mirror image location (assumed to be instrumented) is placed on thermal limits the misloaded bundle will exceed operating limits.

The consequences of this event have been evaluated using the BWR simulator code which has been reviewed and approved by the staff. The results of the analysis show that a change in critical power ratio of 0.10 and a change in linear heat generation rate of 1.3 kW/ft occur for this event. These changes are well below the operating margin to fuel thermal limits. The staff concludes that the analysis of the fuel misloading event is acceptable.

The staff has evaluated the consequences of a spectrum of postulated fuel loading errors and concludes that the analyses provided by the applicant have shown for each case considered that either the error is detectable by the available instrumentation (and hence remediable) or the error is undetectable but the offsite consequences of any fuel rod failures are a small fraction of 10 CFR 100 guidelines.

The staff concludes that the applicant has met the requirements of GDC 13 with respect to providing adequate provisions to minimize the potential of a misloaded fuel assembly going undetected and has met 10 CFR 100 with respect to mitigating the consequences of reactor operations with a misloaded fuel assembly. These requirements have been met by providing acceptable procedures and design features that will minimize the likelihood of loading fuel in a location other than its designated place.

15.4.2 Rod Withdrawal Error at Power

Replace the paragraph (page 15-3 of the January 31, 1984 memo, "SER Input From River Bend Units 1 and 2") which begins: "It should be noted that this analysis is not applicable..." with the following: It should be noted that the statistical analysis described may not be applied to cores with a control cell core loading or those loaded to accommodate a high energy/high-discharge exposure cycle unless a compliance check is performed to demonstrate its applicability. Since the River Bend first cycle loading is a control-cell core the applicant has provided assurance that such a compliance check has been done (see letter dated June 19, 1985 to H. Denton, NRC from J. E. Booker, Gulf States). We therefore conclude that the withdrawal limits resulting from the generic analysis are acceptable for River Bend.