ARKANSAS POWER & LIGHT COMPANY
FIRST COMMERCIAL BUILDING/P.O. BOX 551/LITTLE ROCK, ARKANSAS 72203/(501) 371-7901

August 30, 1985

T. GENE CAMPBELL
Vice President
Nuclear Operations

2CAN088501

Director of Nuclear Reactor Regulation
ATTN: Mr. Edward J. Butcher, Acting Chief
Operating Reactors Branch #3
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, DC 20555

SUBJECT: Arkansas Nuclear One - Unit 2
Docket No. 50-368
License No. NPF-6
CPC System Response to CEA Inward Deviation
Technical Specifications Change Request

Gentlemen:

AP&L is actively participating in the Core Protection Calculator (CPC) Oversight Committee along with representatives of the three other utilities that have Combustion Engineering (CE) plants equipped with CPCs. A detailed presentation of the ongoing CPC Improvement Program was made to the NRC on April 18, 1985 and formally transmitted as CEN-302(S)-P by letter dated June 7, 1985 from Southern California Edison (SCE) to their NRR Branch Chief, George W. Knighton. SCE's San Onofre Nuclear Generating Station Unit 2 (SONGS-2) is the lead plant for implementation of the CPC Improvement Program.

An important part of this program involves a change which modifies the response of the CPC system to eliminate unnecessary reactor trips due to Control Element Assembly (CEA) inward deviation events. An inward deviation is defined as an indication in the CPC system of one CEA of a CEA subgroup being inserted substantially further than the remaining CEAs in the subgroup. ANO-2 has experienced numerous trips due to such events, which have been caused by erroneous CEA position indication (due to electrical noise or a faulty position transmitter) or actual CEA drops. Due to the emphasis AP&L management has placed on reducing the number of reactor trips, AP&L has cooperated with CE and SCE in altering the original schedule to allow early implementation of this particular part of the CPC Improvement Program at ANO-2.

Revisions to ANO-2 Technical Specification 3.1.3.1 and the related Surveillance Requirement 4.1.3.1.1, a new Figure 3.1-1A and a revised Figure 3.2-4 have been prepared for your review and approval. These Technical Specification revisions are necessary before this improvement can be implemented; therefore, AP&L requests that NRC review and approval be performed in an expeditious manner.

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Implementation of this change is planned for mid to late October. Because a Technical Specifications amendment is required to support this change, AP&L requests that the revised Technical Specifications become effective concurrent with implementation of the revised software. A similar change has been previously approved for SCE SONGS-2 and 3 by Amendments 30 and 19, respectively, dated January 9, 1985.

This proposed change reduces the sensitivity of the Control Element Assembly Calculators (CEACs) to inward deviations of the CEAs by reducing the inward deviation penalty factors in the CEACs. The outward deviation penalty factors are retained at their present values. The CPCs receive two penalty factors from the CEACs, one for the Departure from Nucleate Boiling Ratio (DNBR) and one for the Local Power Density (LPD) calculations. Each of these penalty factors is generated within the CEACs from two components. The first, a static penalty, is applied upon detection of an inward deviation event (such as a dropped CEA). The second, a Xenon redistribution penalty, is applied linearly as a function of time after the event. The CEAC penalty factor selection algorithm determines the DNBR and LPD penalty factors based on the magnitude and direction of the deviation, the general configuration of the regulating and part length CEAs and the specific CEA that is indicated as deviated. This proposed change reduces the CEAC data base values of the static and Xenon redistribution components so that the penalty factors transmitted to the CPCs remain equal to 1.0 in the event of an inward CEA deviation.

The reduction of the CEA inward deviation penalty factors is accounted for in two ways. Thermal margin is preserved by the Limiting Condition for Operation (LCO) on DNBR margin (Technical Specification 3.2.4) to accomodate various anticipated operational occurrences (AOOs). Additionally, a power reduction is required within a specified time limit in accordance with the new Figure 3.1-1A.

At full power, sufficient margin is initially reserved for single CEA inward deviations by crediting margin which is reserved for the loss of flow (LOF) event. Subsequently, additional margin is provided by the required power reduction. The margin required by Technical Specification 3.2.4 has historically been set to reserve sufficient margin for the LOF event, and confirmed or adjusted to cover other AOOs, such as a CEA drop. A power dependent bias will be applied to the Core Operating Limit Supervisory System (COLSS) Power Operating Limit (POL) calculation to provide additional margin at lower powers. The revised CPC DNBR limit curve (Figure 3.2-4) ensures sufficient margin is reserved for the single CEA inward deviation event when COLSS is out of service.

ANO-2 Technical Specifications Amendment 37, dated November 5, 1982 (2CNA118202), previously restricted full and part length CEA movement (Figures 3.1-2 and 3.1-3) to reduce the analytical complexity of CPC/CEAC software validation for future cycles. No further changes to these figures are required as a result of this proposed amendment. In addition, unlike the similar change to the SONGS Technical Specifications, no new restriction in the Power Dependent Insertion Limits, Specifications 3.1.3.6 and 3.1.3.7, is required for ANO-2 when COLSS is out of service.

The proposed modification to Surveillance Requirement 4.1.3.1.1 eliminates a redundant requirement that is already present in Table 3.3-1 ACTION 5, which is also a more appropriate location for the specific requirement.

This change does not require algorithm or data base constant modifications to the CPC software; only modifications to the data base constant values of the inward deviation penalty factors in the CEAC. The existing algorithms in both systems are sufficiently general to support the reduction of inward deviation penalty factors without algorithm changes.

In accordance with 10CFR50.92(c), the attached changes have been determined to have no significant hazards considerations. To satisfy the Sholly provisions, a document providing the bases for this determination is attached. Also, a copy of this amendment package has been sent to Mr. E. Frank Wilson, Director, Division of Environmental Health Protection, State Department of Health.

Pursuant to 10CFR170.12(c) we are including a check for the amount of $150 as an application fee.

Very truly yours,

T. Gene Campbell

TGC:RBT

Attachment

cc: Mr. E. Frank Wilson, Director
Division of Environmental Health Protection
State Department of Health
4815 West Markham Street
Little Rock, AR 72201

STATE OF ARKANSAS)
) SS
COUNTY OF PULASKI)

I, T. Gene Campbell, being duly sworn, subscribe to and say that I am Vice President, Nuclear Operations, for Arkansas Power & Light Company; that I have full authority to execute this oath; that I have read the document numbered 2CAN088501 and know the contents thereof; and that to the best of my knowledge, information and belief the statements in it are true.

T. Gene Campbell

SUBSCRIBED AND SWORN TO before me, a Notary Public in and for the County and State above named, this 3 day of September, 1985.

Susan K. Ajotay
Notary Public

My Commission Expires:
May 7, 1993