



ARKANSAS POWER & LIGHT COMPANY  
P. O. BOX 551/LITTLE ROCK, ARKANSAS 72203/(501) 377-3525

T. GENE CAMPBELL  
Vice President - Nuclear

June 15, 1989

2CAN068902

U. S. Nuclear Regulatory Commission  
Mail Stop: DWFN 13-D-18  
Washington, DC 20555



ATTN: Mr. Frederick J. Hebdon, Director  
Project Directorate - IV  
Division of Reactor Projects -  
III, IV, V and Special Projects

SUBJECT: Arkansas Nuclear One - Unit 2  
Docket No. 50-368  
License No. NPF-6  
Control Element Assembly Drop Time  
Technical Specification Change Request

Dear Mr. Hebdon:

Attached for your review and approval are proposed Technical Specification changes revising the control element assembly (CEA) drop time limits for ANO, Unit 2. These Technical Specification changes are requested to support CEA drop time testing during the upcoming refueling outage.

The proposed changes are based on analyses performed by Combustion Engineering which demonstrate that drop time testing acceptance criteria based on average CEA drop times, rather than on the slowest individual CEA drop time, are equally conservative. These analyses have already been presented to the NRC staff in a meeting held April 6, 1989 in the NRC Rockville, Maryland offices. Other owners of CE units, also anticipating similar Technical Specification change requests, were represented at the meeting. The assumptions and methodology of the analyses for ANO-2 are documented in the attached report, which supports the Technical Specification change request.

A001  
11

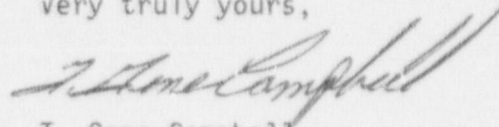
B906260087 B90615  
PDR ADOCK 05000368  
P PNU

June 15, 1989

AP&L has evaluated the proposed changes in accordance with 10CFR50.91(a)(3) using the criteria in 10CFR50.92(c) and has determined that these changes involve no significant hazards consideration. The bases for these determinations are included in the enclosed submittal. The circumstances of this proposed amendment is not exigent or emergency. However, we do request your prompt review as our current projections are for an ANO-2 refueling outage beginning in early September with CEA drop time testing preparations commencing in early October of 1989.

A copy of this amendment request and enclosure has been sent to Ms. Greta Dicus, Director, Division of Radiation Control and Emergency Management, Arkansas State Department of Health, in accordance with 10CFR50.91(b)(1).

very truly yours,



T. Gene Campbell

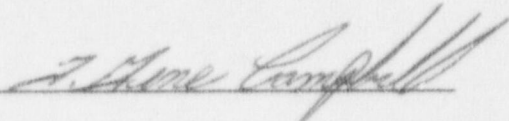
TGC/lg

Attachments/Enclosures

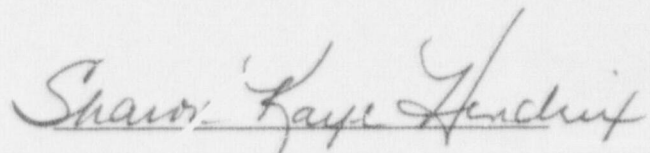
cc: Ms. Greta Dicus, Director  
Division of Radiation Control  
and Emergency Management  
Arkansas Department of Health  
4815 West Markham St.  
Little Rock, Arkansas 72201

STATE OF ARKANSAS )  
                          )           SS  
COUNTY OF PULASKI )

I, T. Gene Campbell, being duly sworn, subscribe to and say that I am Vice President, Nuclear for Arkansas Power & Light Company; that I have full authority to execute this oath; that I have read the document numbered 2CAN068902 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 15<sup>th</sup> day of June, 1989.

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

My Commission Expires:

9-19-89

ENCLOSURE

PROPOSED TECHNICAL SPECIFICATION

AND

RESPECTIVE SAFETY ANALYSES

IN THE MATTER OF AMENDING

LICENSE NO. NPF-6

ARKANSAS POWER & LIGHT COMPANY

ARKANSAS NUCLEAR ONE, UNIT 2

DOCKET NO. 368

## PROPOSED CHANGES

The proposed amendment will modify the control element assembly (CEA) drop time requirements of Technical Specification 3.1.3.4. The Technical Specification has been expanded to include the average drop time of all full-length CEAs. The average drop time must be less than or equal to the 3.2 second limit previously applied to individual CEAs. The maximum CEA drop time for any individual full-length CEA will be changed from 3.2 seconds to 3.5 seconds.

The action statement applicable to the current drop time limit is modified to apply to both the average drop time and the new maximum drop time. Bases section B 3/4.1.3 has been modified to reflect the relationship between the CEA drop time limits and the accident analyses.

Revised copies of the affected pages of the Technical Specifications are included in this attachment.

## DISCUSSION

Technical Specification Amendment 84 extended the CEA drop time from 3.0 seconds to 3.2 seconds. To support that change, all accident analyses were revised to credit space-time kinetics, in conjunction with the new CEA drop time curve to calculate the time dependent reactivity insertion for a reactor trip (see 2CAN/588/2, "Request for Emergency License Amendment, Technical Specification 3/4.1.3.4 - CEA Drop Time," dated May 9, 1988).

The revised analyses, which are the current ANO-2 safety analyses, assume that all CEAs drop into the core at the same time and at the same rate following a reactor trip. The drop time is assumed to be governed by the slowest CEA. Hence, the Technical Specifications require that all CEAs fall within the 3.2 second drop time to 90% insertion. The proposed Technical Specification changes are based on a revision to this restrictive assumption by considering a realistic CEA drop pattern in which some CEAs fall faster than others.

The worth of a CEA is a direct function of the power or neutron flux environment surrounding the CEA. Consequently, the worth of all the CEAs at any time during the trip depends on the average flux level seen by all the CEAs. During the critical part of the trip, the faster CEAs will be in higher axial flux regions and will make a greater relative contribution to the net negative reactivity insertion than the slower CEAs. Therefore, the negative reactivity insertion for any reasonable distribution of CEAs is more directly correlated to and can be represented by, the average CEA insertion rather than by the slowest. Based on measured data, the CEAs do not fall at the same time and at the same rate, but have a predictable spatial distribution about the average. Details of measured CEA drop patterns are presented in the attached report, "ANO-2 CEA Drop Time Technical Specification Change Justification."

Combustion Engineering has performed a set of 3D HERMITE space time calculations which are also described in the attached report. These calculations show that the same reactivity will be inserted by CEAs

falling in a reasonable distribution about an average CEA position, as the reactivity inserted by all CEAs falling at the same average position. Consequently, the current Technical Specification drop time limit of 3.2 seconds for all individual CEAs can be applied to the average of all CEAs. This change will still assure that the actual reactivity insertion is at least equal to that assumed in the accident analyses.

The revised Technical Specifications also establish a maximum drop time limit of 3.5 seconds for the slowest CEA. This limit provides assurance that the spatial distribution of CEAs about the average remains consistent with that assumed in Combustion Engineering's analyses.

The 3D HERMITE calculations are a one-time analysis to demonstrate that the use of the average CEA drop time is conservative with respect to the use of the measured CEA drop time distribution. For future reloads, the safety analysis methodology will be unchanged from the present methods, except that the CEA drop time will be characterized by the average drop time. Cycle specific re-verification is not required as long as the fuel management and CEA drop time characteristics are not significantly changed.

#### DETERMINATION OF SIGNIFICANT HAZARDS

Arkansas Power & Light Company has performed an analysis of the proposed change in accordance with 10CFR50.91(a)(1) regarding no significant hazards consideration using the standards in 10CFR50.92(c). A discussion of those standards as they relate to this amendment request follows:

##### Criterion 1 - Does Not Involve a Significant Increase in the Probability or Consequences of an Accident Previously Evaluated

The proposed changes to the CEA drop time requirements have been evaluated for impact on the ANO-2 accident analyses. The change involves only an acceptance criteria for equipment performance and no physical changes. The CEA drop time acceptance criteria are used to develop trip reactivity insertion rates which are in turn used as inputs to the accident analyses.

The Combustion Engineering analyses have demonstrated that the calculated trip reactivity for a distributed CEA drop pattern is the same as the trip reactivity calculated for the unrealistic non-distributed pattern currently assumed. Since the trip reactivity assumed in the accident analyses is not adversely impacted by consideration of a distributed CEA drop pattern, the proposed limits will not increase the probability or consequences of an accident previously evaluated.

##### Criterion 2 - Does Not Create the Possibility of a New or Different Kind of Accident from any Previously Evaluated

The proposed change does not involve any new or modified structures, systems, or components; rather, it affects only an acceptance criteria for confirming the required performance of the existing CEA hardware. Therefore, the proposed change would not create the possibility of a new or different kind of accident from any previously evaluated.

Criterion 3 - Does Not Involve a Significant Reduction in a Margin of Safety

The margins of safety related to CEA insertion are defined by the analyzed events in the Safety Analysis Report which credit the insertion. As demonstrated in Criterion 1 above, the proposed limits on CEA drop time have no adverse impact on the accident analyses. Therefore, the margins of safety reflected in the accident analysis conclusions are not reduced.

The Commission has provided guidance concerning the application of the standards for determining whether a significant hazards consideration exists. This guidance includes examples (51FR7750) of types of amendments that are considered not likely to involve significant hazards considerations. The change proposed in this amendment is not directly comparable to any of the examples identified in 51FR7750.

Based on the above evaluation, AP&L has determined that the proposed change does not involve a significant hazards consideration.

PROPOSED TECHNICAL SPECIFICATION CHANGES