ARKANSAS POWER & LIGHT COMPANY
POST OFFICE BOX 551 LITTLE ROCK, ARKANSAS 72203 (501) 371-4000

October 26, 1981

2CAN108112

Director of Nuclear Reactor Regulation
ATTN: Mr. Robert A. Clark, Chief
Operating Reactors Branch #3
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Arkansas Nuclear One - Unit 2
Docket No. 50-368
License No. NPF-6
Amendment 24
Boron Dilution Analysis
(File: 2-0521)

Gentlemen:

Please refer to your letter (2CNA068103) to William Cavanaugh III dated June 19, 1981 which transmitted Amendment No. 24 to Facility Operating License No. NPF-6 for ANO-2.

The subject letter requests our response to the following item:

Item: Provide a positive means to alert the control room operators of a boron dilution event when the reactor is shutdown. Your description of such a means should be submitted to the staff within 120 days of the date of this amendment. If the positive means involves the installation of hardware, it should be completed as soon as practical.

Response: AP&L has taken the following action as an interim action to reduce the consequences of an inadvertent boron dilution event:

In the subcritical Modes 3, 4 and 5 with the CEAs capable of withdrawal and the RCS not drained, we have procedurally required that CEA shutdown bank "A" be withdrawn for "cocked rod" protection. This action thus provides an available reactor shutdown capability should an inadvertent boron dilution occur. The reactivity worth of the bank "A" CEAs is at least 3.5% $\Delta K/K$ in all Cycle 2 operating conditions. In the unlikely event that an inadvertent boron dilution should proceed undetected and a loss of shutdown margin occurs, then a high logarithmic power level pre-trip alarm will occur when the

8111090631 811026
PDR ADOCK 05000368
P PDR

A001
S1/0

indicated neutron flux level reaches 10^{-2}% power and a high logarithmic power level trip will occur at 0.75% power. This allows in excess of 30 minutes following CEA insertion for corrective action prior to again losing shutdown margin.

Since the likelihood of an undetected boron dilution, although small, is increased during mode changes between Modes 3 and 5, (particularly during cooldown) our interim action provides considerable assurance that operator action can be taken to terminate an inadvertent boron dilution event and avoid plant damage or radiation releases.

In the longer term, we propose the addition of audible control room alarms on count rate from our startup range neutron detectors. These alarms will be placed on two independent channels and will be equipped with a variable setpoint such that the alarm can be adjusted using plant procedures which account for the existing plant conditions. The alarm will be activated upon count rate increase indicative of a reduction in shutdown margin early enough to allow an operator action time of at least 15 minutes in Mode 5 and 30 minutes in Mode 6. The setpoint will be adjustable such that the case with vessel water level drained to the lip of the outlet nozzle as well as all other anticipated operating conditions can be accommodated.

We propose that the addition of the required hardware for the alarms be added during the second refueling outage which is presently scheduled for the fourth quarter of 1982. Appropriate Technical Specification changes will be submitted at least 90 days prior to the restart of the third cycle of ANO-2 operation.

Very truly yours,

David C. Trimble

David C. Trimble
Manager, Licensing

DCT:LVP:nak