ARKANSAS POWER & LIGHT COMPANY
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T. GENE CAMPBELL
Vice President
Nuclear Operations

September 10, 1986

1CANØ986Ø4

Mr. John F. Stolz, Director
PWR Project Directorate No. 6
Division of PWR Licensing - B
U. S. Nuclear Regulatory Commission
Washington, DC 20555

SUBJECT: Arkansas Nuclear One - Unit 1
Docket No. 50-313
License No. DPR-51
Cycle 8 Reload Report and Proposed
Technical Specification Change Request

Dear Mr. Stolz:

Attached is the ANO-1 Cycle 8 Reload Report for your review. Included with the report are proposed Technical Specification changes required as a result of the reload.

As we agreed in the August 4 conference call, we have revised our reload analysis (originally scheduled to be submitted in August) by reanalyzing Cycle 8. The revised analysis does not take credit for the analytical methods in the revised Reports submitted to the NRC by B&W letters dated May 19, 1986 from J. Taylor to H. Denton, and May 19, 1986 from J. Taylor to W. Paulson. This has resulted in an overall effect of reducing Cycle 8's operating margin. In order to mitigate the reduced operating limits, we are submitting burnup-dependent technical specifications as were used in Cycles 4, 5 and 6.

In accordance with 10CFR50.92 we have determined the proposed Technical Specification amendment request as having no Significant Hazards Considerations (SHC) and are including the basis of our SHC determination as a part of this amendment package. Additionally, a copy of this amendment package has been sent to Ms. Greta Dicus, Acting Director, Division of Environmental Health Protection, State Department of Health.

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Rec'd w/out check

Also, pursuant to 10CFR170.12(c), we are including a check in the amount of $150.00 as application fee. The circumstances of this proposed amendment are not exigent or emergency. However, we do request your prompt review as our current projections are for an ANO-1 Cycle 8 startup approximately November 15, 1986.

Very truly yours,

T. Gene Campbell

TGC/DEB/sg

Attachment

cc: Ms. Greta Dicus, Acting 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 1CANØ98604 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

T. Gene Campbell

SUBSCRIBED AND SWORN TO before me, a Notary Public in and for the County and State above named, this 10th day of September, 1986.

Sharon Kaye Hendrix

Notary Public

My Commission Expires:
9-14-89

PROPOSED TECHNICAL SPECIFICATION CHANGES

LICENSE AMENDMENT REQUEST

IN THE MATTER OF AMENDING

LICENSE NO. DPR-51

ARKANSAS POWER & LIGHT COMPANY

ARKANSAS NUCLEAR ONE, UNIT 1

DOCKET NO. 50-313

SEPTEMBER 10, 1986

1CAN098604

PROPOSED TECHNICAL SPECIFICATION CHANGES

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ARKANSAS POWER AND LIGHT COMPANY

PROPOSED CHANGE NO. 1

As indicated on revised copies of the Unit 1 Technical Specifications attached to this transmittal, the following changes are proposed:

a. change Figure 3.2-1 to provide acceptable boron concentration levels to slightly greater than current levels in order to assure cold shutdown capability required for Cycle 8 operation;

b. change Figure 3.5.2-4 to provide acceptable maximum linear heat rates such that the maximum cladding temperature will not exceed 10CFR50, Appendix K Final Acceptance Criteria for Cycle 8 operation;

c. change Figures 3.5.2-1(A-D), 3.5.2-2(A-D), and 3.5.2-3(A-D) to provide acceptable rod positions versus power level to ensure shutdown margin requirements of Specification 3.5.2.1 and power peaking criteria are met for Cycle 8 operation;

d. change Figures 3.5.2-6(A-D) to provide acceptable Axial Power Shaping Rod (APSR) positions at any given power level for Cycle 8 operation; and

e. change Figures 3.5.2-4(A-D) to provide acceptable operational power imbalance setpoints at any given power level for Cycle 8 operation.

DISCUSSION

These proposed changes are all enveloped by the ANO Unit 1, Cycle 8 Reload Report, based on analyses as outlined in USNRC "Guidance for Proposed License Amendments Relating to Refueling," June 1975. Analytical techniques and design bases were employed which have been accepted by the USNRC. References noted in the Reload Report describe the techniques utilized in the analyses. As a result of the reload, each accident analysis addressed in the ANO-1 FSAR has been examined in Section 7 of the Cycle 8 Reload Report with respect to changes in Cycle 8 parameters and to ensure that thermal performance during hypothetical transients is not degraded. For the reload modification, considerations with respect to margins of safety for the fuel system design, nuclear design, and thermal-hydraulic design are addressed in Sections 4, 5 and 6 of the Cycle 8 Reload Report. The applicable value limits and margins have been determined to be within allowable limits and requirements for acceptable Cycle 8 operation.

The revised boron concentrations will ensure acceptable boration under all normal operating and worst case conditions to provide adequate subcritical cold shutdown, based on the analyses in the Reload Report. All of the associated systems, piping and pumps are designed to accommodate the increased concentrations.

Based on a worst case range of power distribution, shapes and peaking factors within the core which result in the most severe calculated consequences for the spectrum of postulated accidents, the revised linear

heat rates continue to provide assurance that the fuel rod cladding temperature remains below the final acceptance criteria of 10CFR50, Appendix K. These parameters have been analyzed using NRC approved ECCS evaluation codes and methodology, referenced in the Cycle 8 Reload Report, to ensure that the fuel pin cladding will remain intact during a LOCA and that the core remains in a safe configuration during Cycle 8 operations.

The revised rod insertion limits provide for assurance in achieving hot shutdown by reactor trip at any time and ensure that power peaking criteria associated with Loss of Coolant Accident (LOCA) and Loss of Flow Accident (LOFA) analyses are not exceeded. These limits preclude the insertion of rod groups which could result in any single rod worth greater than the safety analysis assumption for rod ejection transient. The physical design and actual rod worths of the control rods have not changed as well as cycle operation except for the small change in position limits.

The revised APSR position limits have been analyzed using worst case conditions and time of core life such that core peaking limits are not violated. The physical design and actual reactivity worths of the APSRs have not significantly changed. Additionally, the procedure for the end of cycle withdrawal used in all previous withdrawals has not changed. Although the actual means for defining time of withdrawal has changed, the actual time limitation remains unchanged in that APSRs will be pulled at the same time relative to cycle burnup. Except for a small change in position limits to protect the core axial imbalance, cycle operation with the APSRs will not significantly change. Revised APSR position limits have no effect on the actual power imbalance setpoints and related analyses for such setpoints.

Bounded by the analyses of the Cycle 8 Reload Report, power imbalance setpoints have been revised for Cycle 8 operation to assure that the maximum cladding temperature will not exceed the final acceptance criteria in 10CFR50, Appendix K, assuming worst case power distribution. These revised setpoints have been determined using USNRC approved codes and methodology, taking into account all perceived uncertainties, worst case conditions and core burnup.

DETERMINATION OF SIGNIFICANT HAZARDS

Arkansas Power and Light Company has performed an analysis of the proposed change in accordance with 10CFR90.91(a)(1) regarding no significant hazards consideration, using the standards in 10CFR90.92(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 change would not increase the probability or consequences of any accident previously evaluated since Section 7 of the Reload Report examined accidents addressed in the ANO-1 FSAR and determined that changes in Cycle 8 parameters as a result of the core reload are bound by previously accepted analyses.

Criterion 2 - Does not create the possibility of a new or different kind of accident from any previously evaluated.

The proposed changes would not create the possibility of a new or different kind of accident from any previously analyzed since fuel assemblies to be loaded into the Unit 1 Cycle 8 core will not be of a significantly different design than those used previously and found to be acceptable by the USNRC.

Criterion 3 - Does not involve a significant reduction in a margin of safety.

The proposed changes would not involve a significant reduction in the margin of safety since, as shown in the Reload Report, Cycle 8 setpoints and safety limits are bounded by the same margins of safety as previous core reloads.

The Commission has provided guidance concerning the application of these standards by providing examples. The proposed amendment is most closely encompassed by Example (iii): "A change resulting from a core reloading, if no fuel assemblies significantly different from those found previously acceptable to the NRC for a previous core at the facility in question are involved. This assumes that no significant changes are made to the acceptance criteria for the technical specifications, that the analytical methods used to demonstrate conformance with the technical specifications and regulations are not significantly changed, and the NRC has previously found such methods acceptable."

Therefore, based on the reasoning presented above and the previous discussion of the amendment request, AP&L has determined that the requested changes do not involve a significant hazards consideration.

PROPOSED CHANGE NO. 2

Change Specifications 3.5.2.4 and 3.5.2.5 to remove the 92% full power hold requirement for the equilibrium xenon.

DISCUSSION

Technical Specifications 3.5.2.4 and 3.5.2.5 provide power level hold requirements for xenon reactivity effects on power peaking. The standard calculational methodology for setting the Limiting Condition for Operation assumed that the core was at equilibrium xenon conditions. To accommodate the effects of transient xenon reactivity and distribution on power peaking, xenon peaking multipliers were applied during calculation of LOCA and DNB margins. The power level cutoff (92% FP) was established to assure the xenon peaking factors were conservative at full power.

For removing the 92% power level cutoff specification, specific transient xenon analyses were performed for Cycle 7 and Cycle 8. These analyses were conducted to ensure that LOCA and initial-condition DNB margins which are used to calculate the LCO limits are more limiting than those margins derived using specific transient xenon distributions above the power level cutoff. Results indicate that the B&W generic 1.05 total xenon factor which is used to evaluate margin to LOCA linear heat rate criteria is conservative. In addition, margins to the Initial Condition - Departure

From Nucleate Boiling criteria were also evaluated, and the B&W generic radial 1.025 xenon factor was found to be conservative in worst case conditions for all power levels. Since the generic xenon factors were found to be conservative in all cases and power levels including above the 92% cutoff level hold point, all Limiting Conditions for Operation (LCO) limits remain unchanged and are not affected by removing the 92% FP hold requirement.

DETERMINATION OF SIGNIFICANT HAZARDS

Arkansas Power and Light Company has performed an analysis of the proposed change in accordance with 10CFR90.91(a)(1) regarding no significant hazards consideration, using the standards in 10CFR90.92(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 change would not increase the probability or consequences of any accident previously evaluated since the accident mitigation features of the plant are not affected.

Criterion 2 - Does not create the possibility of a new or different kind of accident from any previously evaluated.

The proposed change would not create the possibility of a new or different kind of accident from any previously analyzed since it does not involve a change to any systems or equipment, and the scope of the change does not establish a potential new accident precursor.

Criterion 3 - Does not involve a significant reduction in a margin of safety.

The propose change would not involve a significant reduction in the margin of safety since it does not affect an LCO limit, a safety limit, or a surveillance requirement required to operate the station.

Therefore, based on the reasoning presented above and the previous discussion of the amendment request, AP&L has determined that the requested changes do not involve a significant hazards consideration.

PROPOSED CHANGE NO. 3

Change Specification 4.7.1.1 to revise the control rod trip insertion time.

DISCUSSION

Technical Specification 4.7.1.1 provides control rod trip insertion time from power interruption at the control rod drive breakers until the control rod has completed 104 inches of travel from the fully withdrawn position. This insures the assumptions used in the safety analysis remain conservative.

The initial safety analysis for Cycle 1 was based on a 1.66 second insertion time. However, this was reduced to a 1.46 insertion rate in Cycle 2 to offset a rod bow penalty effect on DNBR margins.

Since rod bow is no longer applicable to the B&W 177 fuel assembly (Topical Report BAW-10147P-1, Revision 1), the 1.66 second insertion rate is now conservative with respect to the Cycle 8 safety analysis.

DETERMINATION OF SIGNIFICANT HAZARDS

Arkansas Power and Light Company has performed an analysis of the proposed change in accordance with 10CFR90.91(a)(1) regarding no significant hazards consideration, using the standards in 10CFR90.92(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 change would not increase the probability or consequences of any accident previously evaluated since the change maintains conservative restrictions on control rod insertion rates such that accident mitigation features are not affected.

Criterion 2 - Does not create the possibility of a new or different kind of accident from any previously evaluated.

The proposed changes would not create the possibility of a new or different kind of accident from any previously analyzed since there is no change to the control rods or control rod drive system configuration or operability.

Criterion 3 - Does not involve a significant reduction in a margin of safety.

The proposed change would not involve a significant reduction in the margin of safety since the insertion rate does not affect actual shutdown margins.

Therefore, based on the reasoning presented above and the previous discussion of the amendment request, AP&L has determined that the requested changes do not involve a significant hazards consideration.