Docket File

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

March 29, 1989

Docket No. 50-313

Mr. T. Gene Campbell
Vice President, Nuclear
Operations
Arkansas Power and Light Company
P. O. Box 551
Little Rock, Arkansas 72203

Dear Mr. Campbell:

SUBJECT: ISSUANCE OF AMENDMENT NO. 119 TO FACILITY OPERATING LICENSE NO. DPR-51 - ARKANSAS NUCLEAR ONE, UNIT 1 (ANO-1)

The Commission has issued the enclosed Amendment No. 119 to Facility Operating License No. DPR-51 for the Arkansas Nuclear One, Unit No. 1 (ANO-1). This amendment consists of changes in response to your application dated March 23, 1989. In that application you requested that the ANO-1 license be amended on an emergency basis to reflect a reduction in the approved power level to 74% (1915 megawatts thermal). You determined that this request was necessary after you identified a new postulated small break in the High Pressure Injection (HPI) system which was not bounded by existing small break loss of cooling accident (LOCA) analysis.

We have reviewed your submittal and supporting analysis provided by Babock and Wilcox, "HPI Line Break Evaluation" dated March 23, 1989, and have determined that a maximum power level of 50% is justified. These facts were discussed with you in a telephone conversation conducted on March 27, 1989 between Arkansas Power and Light Company (AP&L), NRR and Region IV staff when NRC granted to AP&L a verbal waiver of compliance from Technical Specification 3.3.2 to begin heatup of ANO-1. Based on the staff's finding, with Region IV concurrence, we are issuing the enclosed amendment. The amendment authorizes the licensee to operate ANO-1 at steady state reactor core power levels not in excess of 1284 megawatts thermal. This maximum power level of 50% is authorized for a maximum of 50 effective full power days (EFPD). As a result of this reduction in the maximum power level, AP&L has committed to making all appropriate temporary changes to plant operating procedures and administrative controls for the maximum power level and for the Reactor Protection System high power trip setpoint.

We have rejected portions of your request, specifically the 74% level of power operation and the effective period for the amendment. We have provided the reasons in the enclosed Safety Evaluation (Enclosure 2), and also have enclosed a Notice of Denial (Enclosure 3). A subsequent amendment request with a full Appendix K analysis of the postulated HPI LOCA would be required if you desire to increase the authorized power level above 50%.

Your letter of March 25, 1989 requested that this amendment be processed as an emergency licensing action under the provisions of 10 CFR 50.91(a)(5). You stated that your staff was unaware of this unanalyzed accident condition before March 18th and have defined an appropriate response to the condition. Since

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you have provided a request in a timely manner, and had been scheduled to startup at the completion of your current maintenance outage on March 26, 1989, we have therefore processed this action in an expeditious manner.

A copy of the Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's next Bi-weekly Federal Register notice.

Sincerely,

/s/

C. Craig Harbuck, Project Manager
Project Directorate - IV
Division of Reactor Projects - III,
IV, V and Special Projects
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 119 to DPR-51
2. Safety Evaluation
3. Notice of Denial

cc w/enclosures:
See next page

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Sincerely,

Chester Poslusny for

C. Craig Harbuck, Project Manager
Project Directorate - IV
Division of Reactor Projects - III,
IV, V and Special Projects
Office of Nuclear Reactor Regulation

Enclosures:
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cc w/enclosures:
See next page

cc:

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

ARKANSAS POWER AND LIGHT COMPANY

DOCKET NO. 50-313

ARKANSAS NUCLEAR ONE, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 119
License No. DPR-51

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Arkansas Power and Light Company (the licensee) dated March 23, 1989, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, as amended, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance: (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this license amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

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2. Accordingly, paragraph 2.c.(1) of Facility Operating License No. DPR-51 is hereby amended to read as follows:

   (1) Maximum Power Level

   The licensee is authorized to operate the facility at steady state reactor core power levels not in excess of 1284 megawatts thermal for a period of time not to exceed 50 effective full power days.

3. The license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

L.S. Rubenstein

Lester S. Rubenstein, Assistant Director
for Region IV Reactors and Special Projects
Division of Reactor Projects - III,
IV, V and Special Projects
Office of Nuclear Reactor Regulation

Attachment:

Date of Issuance: March 29, 1989

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 119 TO

FACILITY OPERATING LICENSE NO. DPR-51

ARKANSAS POWER AND LIGHT COMPANY

ARKANSAS NUCLEAR ONE, UNIT NO. 1

DOCKET NO. 50-313

INTRODUCTION

By letter dated March 23, 1989, Arkansas Power and Light Company (AP&L or the licensee) requested an amendment to the Facility Operating License No. DPR-51 for Arkansas Nuclear One, Unit 1 (ANO-1). The proposed amendment would reduce the authorized steady state reactor core power levels to a maximum of 1915 megawatts thermal, pending NRC approval and licensee implementation of a permanent modification to address a High Pressure Injection (HPI) System small break loss of coolant accident (LOCA) at which time full power operation may resume at steady state reactor core power levels not in excess of 2568 megawatts thermal.

BACKGROUND

During a recent AP&L review of the High Pressure Injection (HPI) system, it was discovered by the licensee that a postulated break of an HPI injection line, just upstream of the reactor coolant system cold leg connection and downstream of the first check valve, could constitute a small break LOCA not currently enveloped by the approved 10 CFR 50.46 and Appendix K analyses. Subsequent Babcock and Wilcox (B&W) analysis determined that the ANO-1 HPI system might not be able to provide adequate core cooling should the break occur at high power operation. B&W then further determined that the HPI system would provide adequate core cooling at up to approximately 74% of full power. B&W provided an analysis (Reference 1) to the NRC in support of the AP&L request for license amendment.

The B&W analysis estimated the amount of water which would remain above the core assuming a 74% initial power level. This estimate used Appendix K requirements (including a 1.2 mg decay heat factor) but relied on a base case full LOCA evaluation model analysis of the HPI line break which was previously performed for the Consumer Power Company Midland Units 1 and 2. The Midland base case was used to determine the HPI flow rates since the HPI line break is not usually a limiting break and was not explicitly calculated in B&W's generic small break LOCA analysis. The B&W analysis included the following assumptions:

1) No HPI flow reaches the RCS for 10 minutes

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2) After 10 minutes, the operator balances HPI flow.

   A 50/50 split is obtained between the intact and broken HPI lines.

3) BAW-1976 HPI flow curve was assumed.

4) The RCS pressure response for the base case HPI line break was assumed applicable to the reduced HPI flow case.

The objective of the B&W estimate was to determine if the configuration for the ANO-1 system was adequate to mitigate an HPI line break event. For the case of 74.6% power, B&W calculated that HPI cooling would match core decay heat at 2500 seconds after the initial break. At this point in the transient the core would remain covered with approximately 6882 lbm of water (1.5 feet) above the core.

EVALUATION

In response to the AP&L request for license amendment, the staff reviewed the licensee's submittal and the Babcock & Wilcox (B&W) analysis (Reference 1). Based on this review, we have determined that a maximum power level of 50% is justified to ensure adequate mitigation of a postulated HPI line break event. Therefore the staff has rejected that part of the request that would permit achieving a power level above 50%.

The staff has determined that the B&W calculations reasonably approximate formal LOCA model calculations. But since an actual LOCA evaluation model analysis was not performed for the ANO-1 core (Midland Unit 1&2 was used as a base case) the staff believes that the 74.6% power level calculated by B&W is not acceptable because of the uncertainties in the B&W analysis. However, the staff finds that at the 50% power level (proposed by AP&L in its March 23, 1989 amendment request as a temporary power level) the plant will have considerable LOCA margin to account for uncertainties in extrapolating the Midland base case results to ANO-1. This is based on the fact that the designs of the two plants are very similar and the staff anticipates that the estimated HPI break flow is reasonably accurate. Therefore the staff finds that operation of the ANO-1 plant up to 50% of full power provides a desired margin of safety relative to the mitigation of a postulated LOCA in the high pressure injection system and is acceptable. Further, in order for NRC to consider an increase in the authorized power level for ANO-1 to the 74% level as requested, a full Appendix K analysis would be required for NRC review as part of a subsequent amendment request.

In its submittal the licensee also stated that B&W and AP&L evaluated the impact of reduced power level upon fuel-related analyses as part of the reload methodology. The licensee further stated that no impact was identified on the various fuel-related analyses for operation of an additional 50 effective full power days (EFPD) and that AP&L would perform a specific reanalysis to determine any impact upon Technical Specifications for operation beyond 50 EFPD at a lower power level. Based on this, the staff determined that the reduced power level should be maintained not longer than that time period. Thus, the amendment

worded to be effective for a period not to exceed the 50 EFPD. The portion of the requested amendment to license section (1) indicating the return to an authorized power level of 100% starting with the words "pending NRC approval" and continuing through the end of the paragraph is rejected.

EMERGENCY CIRCUMSTANCES:

In its March 23, 1989 letter, the licensee requested that this amendment be treated as an emergency for the following reasons. ANO-1 has been in a maintenance outage which was scheduled for completion on March 26, 1989. Under the current schedule, the unit would have begun heat-up the morning of March 26, with criticality scheduled for the evening of March 27th. In order to avoid a delay in plant heatup after an extended outage pending the completion of the normal amendment process, the licensee requested the processing of the amendment request in accordance with 10 CFR 50.91(a)(5).

The licensee explained that its staff was unaware of the consequences of this new limiting postulated break before March 18, 1989 and thus could not avoid this situation. Before that date, the previous LOCA analyses were considered to be bounding. Further, AP&L promptly undertook measures to define an appropriate response to the newly identified condition, and has provided the request as soon as practical. Based on the above information, the Commission has determined that there are emergency circumstances warranting prompt approval of this amendment by the NRC.

FINAL NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

The Commission has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92(c). A proposed amendment to an operating license for a facility involves no significant hazards consideration if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety.

In accordance with 10 CFR 50.92, the licensee assessed whether the proposed amendment involves a significant hazards consideration. AP&L has concluded that the proposed change to limit operation to 74% of full power does not involve a significant hazards consideration because operation of Arkansas Nuclear One Unit-1 in accordance with this change would not:

(1) Involve a significant increase in the probability or consequences of an accident previously analyzed.

First, this change does not alter the probability of any previously analyzed accident occurring. The change merely addresses a particular

accident scenario without impacting accident-initiating events. Further, this proposed change will not adversely affect the consequences of accidents which have been previously analyzed. Any effect on previously analyzed accidents will be positive as the reactor will trip from a lower maximum power level as a result of the proposed change.

Further, the proposed change does not adversely affect the probability or consequences of the postulated HPI small break at issue here. Upon implementation of the proposed change, this break will be fully addressed by available emergency core cooling system (ECCS) mechanisms consistent with applicable ECCS requirements. In fact, this response capability might not have been available without the change under the present conservative licensing basis assumptions.

Therefore, this change will neither increase nor adversely affect the probability or consequences of accidents previously analyzed.

(2) Create the possibility of a new or different kind of accident from any previously analyzed.

First, the ECCS response to other previously postulated accidents remains unchanged and within previously assessed limits of flow paths and flow distributions. Further, all systems and ECCS coolant delivery mechanisms remain, respectively, within their applicable performance limits and flow delivery capabilities. Thus, system and component performance is not adversely affected by this change, thereby assuring that design capabilities of those systems are not challenged in a manner not previously assessed so as to create the possibility of a new or different kind of accident. Further, the proposed change would result in a reduction of the maximum allowable power level. This would not create the possibility of a new or different kind of accident from any previously analyzed as the possibility of reactor trips at lower power levels had already been considered in previous accident analyses.

(3) Involve a significant reduction in the margin of safety.

The proposed change to the maximum operating power level would reduce the maximum power level at which any transient could occur. The response to transients terminated at lower power levels is typically milder and more easily controlled than the response to transients terminated at a higher power level. Therefore, the reduction of the maximum permissible power level would not involve a significant reduction in the margin of safety previously provided and, in fact, would generally increase the margin. With respect to the HPI break at issue, the margin of safety provided by reducing the maximum power level now reflects the margins provided by application of the conservative assumptions and analytical approaches of 10 CFR 50.46 and 10 CFR Part 50, Appendix K. Thus, the inherent margins of safety provided by those criteria now also are provided for this postulated break.

The staff evaluated the licensees information in light of the reduction to a 50% power level which provides additional safety margin and has determined that the proposed amendment does not involve a significant hazards consideration.

STATE CONSULTATION

In accordance with the Commission's regulations, efforts were made to contact the Arkansas State representative. A representative was contacted and had no comments.

ENVIRONMENTAL CONSIDERATION

The amendment involves a change in the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposures. The Commission has made a final no significant hazards consideration finding with respect to this amendment. Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR Section 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

CONCLUSION

The staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

REFERENCES

Letter J. H. Taylor (B&W) to J. A. Calvo (NRC) "HPI Line Break Evaluation," dated March 23, 1989.

Date: March 29, 1989

Printipal Contributors:

G. Schwenk
C. Poslusny

UNITED STATES NUCLEAR REGULATORY COMMISSION

ARKANSAS POWER & LIGHT COMPANY

DOCKET NO. 50-313

ARKANSAS NUCLEAR ONE, UNIT 1

NOTICE OF DENIAL OF AMENDMENT TO FACILITY OPERATING LICENSE

AND OPPORTUNITY FOR HEARING

The U.S. Nuclear Regulatory Commission (the Commission) has denied, in part, a request by the Arkansas Power & light Company (AP&L or the licensee) for an amendment to Facility Operating License No. DPR-51 issued to the Arkansas Nuclear One, Unit 1 (ANO-1), located in Pope County, Arkansas.

During an AP&L review of the High Pressure Injection (HPI) system, it was discovered by the licensee that a postulated break of an HPI injection line, just upstream of the reactor coolant system cold leg connection and downstream of the first check valve, could constitute a small break loss of coolant accident (LOCA) not currently enveloped by the approved 10 CFR 50.46 and Appendix K analyses. Subsequent Babcock and Wilcox (B&W) analysis determined that the ANO-1 HPI system might not be able to provide adequate core cooling should the break occur at high power operation. B&W then further determined that the HPI system would provide adequate core cooling at up to 74% of full power based on a best estimate analysis.

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The purpose of the licensee's amendment application dated March 23, 1989 was to temporarily reduce the authorized power level for ANO-1 to the 74% level for a period of time until an acceptable hardware modification could be achieved.

The staff reviewed the licensee's request for amendment and supporting analysis provided by B&W and determined that the amendment was partially acceptable. Specifically, the staff approved the licensee's request to operate at a lower power level, but only would approve 50% of full power based on the nature of the B&W analysis. The power level above 50% was rejected pending the submittal of a full, Appendix K, LOCA analysis for the postulated accident. Further the licensee had requested in the suggested wording of the proposed amendment that it would return to an authorized 100% power level upon approval and implementation of a permanent modification to address the problem of the unanalyzed postulated break. This change was rejected and instead a maximum duration of 50 equivalent full power days for continuation of operation was authorized by the NRC in the amendment. This was necessary because of limitations of existing fuel related analyses related to the reload methodology. Further, future modifications to the authorized power level will require separate routine amendment applications. Notice of Issuance of that amendment will be published in the Commission's biweekly Federal Register notice.

The licensee was notified of the Commission's partial denial of the proposed amendment by a letter transmitting Amendment No. 119.

By May 5, 1989 , the licensee may demand a hearing with respect to the denial described above. Any person whose interest may be affected by this proceeding may file a written petition for leave to intervene.

A request for hearing or petition for leave to intervene must be filed with the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Docketing and Service Branch, or may be delivered to the Commission's Public Document Room, the Gelman Building, 2120 L Street, N.W., Washington, D.C., by the above date.

A copy of any petitions should be also be sent to the Office of the General Counsel, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, and to Mr. Nicholas S. Reynolds Bishop, Cook, Purcell & Reynolds, 1400 L Street, N.W., Washington, D.C. 20005-3502, attorney for the licensee.

For further details with respect to this action, see (1) the application for amendment dated March 23, 1989, and (2) the Commission's letter to the licensee dated March 29, 1989 , and (3)the Commission's Safety Evaluation dated March 29, 1989 , issued with Amendment No.119to DPR-51.

These documents are available for public inspection at the Commission's Public Document Room, the Gelman Building, 2120 L Street, N.W., Washington, D.C., and at the local public document room located at Tomlinson Library, Arkansas Tech University, Russellville, Arkansas 72801. A copy of item (2) may be obtained upon request addressed to the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Document Control Desk.

Dated at Rockville, Maryland, this 29th day of March, 1989.

FOR THE NUCLEAR REGULATORY COMMISSION

José A. Calvo

Jose A. Calvo, Director
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Division of Reactor Projects - III,
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Office of Nuclear Reactor Regulation