



ARKANSAS POWER & LIGHT COMPANY
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April 24, 1989

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Vice President - Nuclear

1CAN048915

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ATTN: Mr. Jose A. Calvo, Director
Project Directorate, Region IV
Division of Reactor Projects
III, IV, V and Special Projects

SUBJECT: Arkansas Nuclear One - Unit 1
Docket No. 50-313
License No. DPR-51
Request for Exigent License Amendment
Increase in Power to Analyzed Level of 80%

Dear Mr. Calvo:

Facility Operating License Amendment 119, transmitted by NRC letter dated March 29, 1989 (1CNA038905), authorized operation of ANO-1 up to an approved power level of 50% full power (1284 megawatts thermal) for a period not to exceed 50 effective full power days (EFPD). This amendment was in response to our emergency amendment request dated March 23, 1989 (1CAN038914). The amendment covered a newly-identified postulated small break in the High Pressure Injection (HPI) system which appeared not to be bounded by existing small break loss of cooling accident (LOCA) analyses.

In response to our request (which proposed a 74% power limitation, based on a comparative evaluation) the NRC staff approved a 50% power limit and indicated that a subsequent amendment request with a full 10CFR50 Appendix K analysis of the postulated HPI LOCA at ANO-1 would be required in order to increase the authorized power level above 50%. The ANO-1 vendor, Babcock & Wilcox (B&W), is presently performing an ANO-1 specific reanalysis of the postulated HPI LOCA which will provide justification for an increase in the present authorized power of ANO-1 to 80% of full power (2054 megawatts thermal). This analysis will be a plant specific full 10CFR50 Appendix K analysis performed utilizing the NRC approved CRAFT-2 computer code. This analysis is expected to demonstrate adequate core cooling for this postulated accident up to a power level of 80% of full power. Upon completion of this analysis, AP&L will provide written confirmation of the results.

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The 50 EFPD operating time restriction included in Amendment 119 originated based upon conditions imposed by B&W in order to assure that appropriate maneuvering limits were in place prior to power escalation. AP&L has evaluated this cycle's operating history and projected operation, assuming this amendment request is accepted, to determine if additional Technical Specification changes are necessary. This evaluation has concluded that no additional changes are necessary to accommodate increasing the power level to 80% and to continue operation at that power level until the end of the current cycle. Therefore, the 50 EFPD restriction is being removed as part of the proposed amendment.

In order to minimize the impact of continued derating of ANO-1, including the financial impact on the AP&L customers and our stockholders due to operation at a power level lower than demonstrated acceptable by the appropriate analysis, AP&L requests that the attached proposed change be processed in accordance with the "exigent" provisions of 10CFR50.91(a)(6), such that the license may be amended promptly following confirmation of the CRAFT-2 results. Application of 10CFR50.91(a)(6) is warranted because, as described in our previous submittal, AP&L was unaware of the consequences of this new limiting break before March 18, 1989, and thus could not avoid this situation. Prior to that time, the previous LOCA analyses were considered to be bounding. Further, AP&L promptly undertook measures to define an appropriate response to this newly identified condition, as described in our previous submittal, and prepared and submitted this request as soon as practical after the staff notified us that an ANO-1 specific 10CFR50 Appendix K analysis would be required for operation above 50% power. Also, as noted above, this exigent change is needed in order to permit a timely increase in power level to minimize the impact of continued derated operation, including financial hardship on the customers and stockholders of AP&L pending the full 30 day notice period. Based upon preliminary evaluations AP&L believes the conservative licensing basis Appendix K analysis will demonstrate acceptable ECCS performance for a power level of 80%. Therefore, continued limitation of ANO-1 operation below that power level will no longer be necessary.

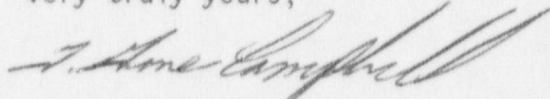
AP&L is currently in the process of designing a modification which will address the HPI line break accident and allow for full power operation. The design change we are pursuing will provide HPI injection demonstrated as adequate by the current HPI line break Evaluation Model (EM) analysis, without crediting operator action. In advance of implementation, AP&L will make the NRC Staff aware of our plans and will submit appropriate Technical Specification changes to allow for subsequent full power operation. These changes will be submitted sufficiently in advance for NRC normal processing.

In accordance with 10CFR50.91(a)(1), and using the criteria in 10CFR50.92(c), AP&L has determined that this change involves no significant hazards consideration. The request for amendment and detailed bases are set forth in the attached submittal. In accordance with 10CFR50.91(b)(1), a copy of this amendment request and attachment has been sent to Ms. Greta

April 24, 1989

Dicus, Director, Division of Radiation Control and Emergency Management,
Arkansas Department of Health. A check in the amount of \$150.00 is included
herein as an application fee in accordance with 10CFR170.12(c).

Very truly yours,



T. Gene Campbell

TGC


Attachments

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


STATE OF ARKANSAS)
)
COUNTY OF PULASKI)

SS

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 1CANØ48915 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 24 day of April, 1989.


Notary Public

My Commission Expires:

9/00/92

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

APRIL 24, 1989

INTRODUCTION

Arkansas Power & Light Company (AP&L) herein requests an amendment to the Arkansas Nuclear One, Unit 1 (ANO-1) Operating License. This amendment will limit the maximum operating power level to 2054 megawatts thermal (80% of full power operation). This change will allow increasing our maximum power level from its current limit of 1284 megawatts thermal (50% of full power operation) which was imposed by Amendment 119 to the ANO-1 License. Amendment 119 was in response to AP&L's request for license amendment dated March 23, 1989. The March 23 request was based upon AP&L's discovery of a more limiting postulated small break LOCA of one of the HPI injection lines. The increase in power level is justified based upon extensive analysis performed utilizing the CRAFT-2 computer code, which has previously been reviewed and approved by the NRC staff. Because this change is necessary to prevent unnecessary derating of the unit's power operation, it is requested that this change be processed expeditiously, in accordance with the exigent circumstance provision of 10CFR50.91(a)(6).

BACKGROUND

On January 20, 1989, ANO-1 experienced a reactor trip initiated by a generator lockout. Following the trip, certain conditions required the operators to manually initiate additional HPI flow to the RCS. It was later discovered that the check valve in the "B" HPI injection line had failed to reseal after HPI flow was terminated. This allowed reactor coolant to flow into the HPI line resulting in the line being overheated. This event was described in Mr. T. Gene Campbell's letter to Mr. Jose A. Calvo of February 19, 1989 (1CAN028909) and LER 89-002-00, dated March 31, 1989 (1CAN038906).

As a result of the January 1989 transient, AP&L undertook a thorough review of the HPI system. This review included a reevaluation of the qualification and ability of both the individual components and the HPI system as a whole to withstand all conditions that could result from transients and steady state operations. During this review, it was discovered that a postulated break of an HPI injection line, just upstream of the RCS cold leg connection and downstream of the first check valve, could constitute a small break LOCA not currently enveloped by the approved 10CFR50.46 and Appendix K analyses. AP&L requested that Babcock & Wilcox (B&W), the nuclear steam supply system vendor for ANO-1, evaluate the impact of this postulated break on current ECCS evaluations. B&W analyzed the break and informed AP&L that the postulated break did not appear to be enveloped by previously postulated breaks and that the ANO-1 HPI system might not be able to provide adequate core cooling (using conservative Appendix K assumptions) should the break occur at high power operation. AP&L promptly reported this finding pursuant to 10CFR50.72 on March 18, 1989. B&W thereafter undertook to define the operating parameters for which this postulated break may not be addressed with the current ECCS response capabilities at ANO-1. B&W determined, based upon a comparative analysis of the ANO-1 system with a representative analysis for another similar B&W plant, that for power operation up to 74% of full power, the current ECCS response using the HPI system would provide adequate core cooling in the event the postulated break were to occur.

This analysis was the basis for AP&L submittal of March 23, 1989. Upon review of this submittal the NRC issued Amendment 19 to the ANO-1 License (1CNA038905). This amendment limited maximum power to 50% for a maximum of 50 effective full power days (EFPD). The staff indicated that the 74% power level initially proposed would require further evaluation, since an actual LOCA evaluation model analysis was not performed for the ANO-1 core (Midland Unit 1 & 2 was used as the base case). The amendment transmittal letter stated that "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%".

Upon evaluation of the options available to us, AP&L embarked upon a full 10CFR50 Appendix K analysis of the postulated HPI LOCA to justify an increase in power operation until permanent modifications can be designed and installed to place the unit back into conformance with the original small break LOCA assumptions. To provide assurance that the CRAFT-2 analysis (NRC approved licensing code) would be successful, a plant specific Appendix K RELAP-5 Mod 2 computer run was initiated. This analyses showed acceptable results with margin for 80% power operation. Based upon these results, AP&L has begun a full ANO-1 specific Appendix K analysis utilizing CRAFT-2 to demonstrate acceptable operation at 80% power.

DESCRIPTION OF ANALYSIS

AP&L is performing a full 10CFR50 Appendix K analysis utilizing the NRC approved licensing code CRAFT-2 to demonstrate acceptable operation at 80% full power. The CRAFT-2 is documented in BAW-10092P, Rev 3 and BAW-10154. Approval was received by NRC for the CRAFT-2 code on January 27, 1985. To assure ourselves of a successful CRAFT-2 analysis at 80% power a plant specific Appendix K RELAP-5 analysis was first performed. The RELAP-5 analysis indicated that for 80% power operation, an HPI line break could be mitigated, retaining margin to core uncover. Due to the similarity in the models, AP&L is confident analysis of the same HPI line break using the CRAFT-2 code will produce similar results. The CRAFT-2 code is a part of the B&W ECCS Evaluation Model (EM) which has been approved by NRC for use in analyzing loss of coolant accidents (LOCAs). The code models conform to 10CFR50 Appendix K requirements for LOCA analysis.

The CRAFT-2 analysis will be run until core recovery occurs (match point between core decay heat and HPI injection cooling) at approximately 3600 to 4000 seconds. Beyond this point existing analyses remains valid for long term cooling. The CRAFT-2 input assumptions conservatively characterize a HPI line break at 80% power operation for ANO-1 as described below.

Following is a description of the assumptions for the RELAP-5 and CRAFT-2 HPI line break analysis:

1. Initial power level of eighty-two percent (82%) of 2568 MWt, plus pump heat.

This power level represents an eighty percent (80%) operating point with a two percent (2%) full power heat balance error included.

2. Decay heat assumption of one hundred twenty percent (120%) of ANS 5.1 1973 (Appendix K assumption).
3. HPI flow of zero (0) for the first 10 minutes after Engineered Safeguards Actuation System (ESAS) actuation, representing a complete loss of HPI flow prior to operator balancing. (It should be noted that system evaluations indicate that some HPI flow will reach the RCS prior to operator balancing.)

After 10 minutes one-half of the Evaluation Model assumed HPI flow, less 15 gpm to account for the available operating band, is assumed to reach the core. Actions necessary to balance the HPI flow can be accomplished from the control room. Previous analyses credited similar operator action within 10 minutes.

4. Break size of 0.025 ft², which represents a complete guillotine break of an HPI injection line.
5. Emergency Feedwater (EFW) flow of 500 gpm per steam generator, which results in early termination of EFW flow and conservatively minimizes steam generator cooling of the RCS.

The EFW is controlled automatically to raise SG levels to 50% on the operate range to simulate Emergency Feedwater Initiation and Control (EFIC) performance. Operator action to raise the level further, as directed in the Emergency Operating Procedure (EOP), is not modeled. Flow limitations in EFIC are modeled.

6. Secondary pressure controlled by Main Steam Safety Valves (MSSVs) with no operator action to depressurize the RCS via steam generator cooldown.

These assumptions are conservative when analyzing the HPI line break event.

The CRAFT-2 analysis is expected to be completed by B&W on May 5, 1989. We anticipate submittal of the results in support of this amendment request by May 8, 1989.

DESCRIPTION OF PROPOSED LICENSE CHANGE

The specific amendment AP&L proposes involves Section 2.1.1, Maximum Power Level of the ANO-1 Facility Operating License. In this section of the license, the maximum steady state reactor core power level would be increased from 1284 megawatts thermal to 2054 megawatts thermal. A copy of the proposed amendment is attached. Further, although not involving license changes, AP&L is implementing administrative controls to ensure that the restriction to 80% is carried out. Specifically, to preclude operation above this power level, ANO-1 operating procedures will be modified prior to attaining the new power level to administratively limit power operation to 2054 megawatts thermal. Finally, although safety analyses which credit the high power trip remain enveloped at reduced power levels, AP&L will reduce the trip setpoint to a setting of 92% to provide additional available margin for those trip scenarios.

The 50 EFPD operating time restriction is also proposed to be removed. This restriction resulted from conditions imposed by B&W in order to assure that appropriate maneuvering limits were in place prior to power escalation. AP&L has evaluated the operating history and projected operation for this cycle assuming this amendment request is granted, and determined that no additional changes are necessary to accommodate increasing power to 80% and continuing operation there for the duration of the current cycle.

BASIS FOR EXIGENT REQUEST

Pursuant to 10CFR50.91(a)(6), AP&L hereby requests NRC approval on an exigent basis to amend Operating License DPR-51 for the ANO-1 Plant. Exigent authorization is required so as to minimize continued derated operation of the facility as a result of restrictions imposed by the current power limit. The presently proposed power limit reflects the results of an ANO-1 specific ECCS analysis in accordance with 10CFR50 Appendix K for the postulated HPI LOCA, as requested by the NRC staff. The requested amendment will therefore provide for operation within the approved design criteria and applicable regulations. The requested amendment also removes the 50 EFPD operating limit previously imposed. Operation at the proposed power level is acceptable until development of modifications necessary to address the HPI LOCA issue can be implemented. The 50 EFPD restriction was applied by B&W to assure that appropriate maneuvering limits were considered before substantially increasing power. An evaluation for increasing from 50 to 80% power has been completed which showed no Technical Specification limitations need be imposed.

The requested exigent authorization is further warranted because it involves no significant hazards consideration, as demonstrated below. The present situation could not have been avoided. As noted above, and described in our previous submittal on this issue, AP&L promptly notified the NRC upon determining the potential significance of this condition and has pursued an expeditious resolution of the matter, including comprehensive measures to identify and confirm appropriate short and long-term responses.

BASES FOR PROPOSED NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

In accordance with 10CFR50.92, AP&L has assessed whether the proposed change involves a significant hazards consideration. AP&L has concluded that the proposed change to limit operation to 80% 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 remain positive as the reactor will still trip from a lower maximum power level than for accidents previously considered.

Further, the proposed change does not adversely affect the probability or consequences of the postulated HPI small break at issue here. Because an ANO-1 specific ECCS analysis per 10CFR50 Appendix K has been performed, it has been demonstrated that this break will be fully addressed by available ECCS mechanisms consistent with applicable ECCS requirements.

Overall, therefore, this change will neither reduce nor adversely impact 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. The increase in maximum allowable power level 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 increase the maximum power level at which any transient could occur. However, this proposed power level is still below the level at which ANO-1 was originally licensed. The response to transients terminated at lower power levels is typically milder and more easily controlled than the response to transients terminated at the higher power level at which ANO-1 was originally evaluated. Therefore, this increase of the maximum permissible power level would not involve a significant reduction in the margin of safety previously provided. With respect to the HPI break at issue, the margin of safety provided by the proposed maximum power level now reflects the margins provided by specific application of the conservative assumptions and analytical approaches of 10CFR50.46 and 10CFR50 Appendix K to ANO-1. Thus, the inherent margins of safety provided by those criteria are provided for this postulated break.

The Commission has provided guidance concerning the application of these standards by providing examples of changes involving no significant hazards considerations. The proposed amendment most closely matches example (ii) "A change that constitutes an additional limitation, restriction, or control not presently included in the Technical Specifications." Although this amendment request does involve an increase in the maximum power level presently authorized, the proposed power level is still below that at which ANO-1 was originally licensed to operate, and therefore continues to represent an additional limitation or restriction not presently included in the ANO-1 Technical Specifications.

Therefore, based on the above, AP&L has concluded that the proposed change does not involve a significant hazards consideration.

- c. This license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations in 10 CFR Chapter I: Part 20, Section 30.34 of Part 30, Section 40.41 of Part 40, Sections 50.54 and 50.59 of Part 50, and Section 70.32 of Part 70; is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

The licensee is authorized to operate the facility at steady state reactor core power levels not in excess of 2054 megawatts thermal.

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 117 are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

- (3) The licensee may proceed with and is required to complete the modifications identified in Paragraphs 3.1 through 3.19 of the NRC's Fire Protection Safety Evaluation (SE) on the facility dated August 22, 1978 and supplements thereto. These modifications shall be completed as specified in Table 3.1 of the Safety Evaluation Report or supplements thereto. In addition, the licensee may proceed with and is required to complete the modifications identified in Supplement 1 to the Fire Protection Safety Evaluation Report, and any future supplements. These modifications shall be completed by the dates identified in the supplement.

(4) Physical Protection

The licensee shall fully implement and maintain in effect all provisions of the Commission-approved physical security, guard training and qualification, and safeguards contingency plans including amendments made pursuant to provisions of the Miscellaneous Amendments and Search Requirements revisions to 10 CFR 73.55 (51 FR 27817 and 27822) and to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The plans, which contain Safeguards Information protected under 10 CFR 73.21, are entitled.

- (a) "Arkansas Nuclear One Physical Security Plan," with revisions submitted through February 24, 1988;