

August 6, 1991

Docket No. 50-368

Mr. Neil S. Carns
Vice President, Operations ANO
Entergy Operations, Inc.
Route 3 Box 137G
Russellville, Arkansas 72801

Dear Mr. Carns:

SUBJECT: ISSUANCE OF AMENDMENT NO. 122 TO FACILITY OPERATING LICENSE
NO. NPF-6 - ARKANSAS NUCLEAR ONE, UNIT NO. 2 (TAC NO. 79694)

The Commission has issued the enclosed Amendment No.122 to Facility Operating License No. NPF-6 for the Arkansas Nuclear One, Unit No. 2 (ANO-2). This amendment consists of changes to the Technical Specifications (TSs) in response to your application dated January 29, 1991, as revised July 29, 1991.

The amendment changes the ANO-2 TS by revising the time limits for monitoring linear heat rate and departure from nucleate boiling ratio using the core protection calculators when the core operating limit supervisory system is inoperable.

A copy of our related Safety Evaluation is also enclosed. A Notice of Issuance will be included in the Commission's next biweekly Federal Register notice.

Sincerely,

Original signed by

Sheri R. Peterson, Project Manager
Project Directorate IV-1
Division of Reactor Projects III, IV, and V
Office of Nuclear Reactor Regulation

9108150037 910806
PDR ADOCK 05000368
P PDR

Enclosures:

- 1. Amendment No.122 to NPF-6
- 2. Safety Evaluation

cc w/enclosures:

See next page

DISTRIBUTION:

Docket File NRC/Local PDR PD4-1 Reading S. Peterson (2)
M. Virgilio(MS13E4) T. Quay P. Noonan ACRS(10)(MSP315)
OGC(MS15B18) D. Hagan(MS3206) G. Hill(4)(PI-37)
Wanda Jones(MS7103) J. Calvo(MS11F22) PD4-1 Plant File
GPA/PA(MS2G5) ARM/LFMB(MS4503) T. Westerman, RIV

*See previous concurrence.

CP
DF01

OFC	: PD4-1/LA	: PD4-1/PM	: *SRXB	: *OGC	: PD4-1/(A)D	:	:	111
NAME	: PNoonan	: SPeterson	: lh:RJones	:	: TQuay	:	:	
DATE	: 8/5/91	: 8/5/91	: 05/10/91	: 06/24/91	: 8/6/91	:	:	

Docket No. 50-368

Mr. Neil S. Carns
Vice President, Operations ANO
Energy Operations, Inc.
Route 3 Box 137G
Russellville, Arkansas 72801

Dear Mr. Carns:

SUBJECT: ISSUANCE OF AMENDMENT NO. TO FACILITY OPERATING LICENSE
NO. NPF-6 - ARKANSAS NUCLEAR ONE, UNIT NO. 2 (TAC NO. 79694)

The Commission has issued the enclosed Amendment No. to Facility Operating License No. NPF-6 for the Arkansas Nuclear One, Unit No. 2 (ANO-2). This amendment consists of changes to the Technical Specifications (TSs) in response to your application dated January 29, 1991.

The amendment changes the ANO-2 TS by revising the time limits for monitoring linear heat rate and departure from nucleate boiling ratio using the core protection calculators when the core operating limit supervisory system is inoperable.

A copy of our related Safety Evaluation is also enclosed. A Notice of Issuance will be included in the Commission's next biweekly Federal Register notice.

Sincerely,

Sheri R. Peterson, Project Manager
Project Directorate IV-1
Division of Reactor Projects III, IV, and V
Office of Nuclear Reactor Regulation

Enclosures:

- 1. Amendment No. to NPF-6
- 2. Safety Evaluation

cc w/enclosures:
See next page

DISTRIBUTION:

Docket File	NRC/Local PDR	PD4-1 Reading	S. Peterson (2)
M. Virgilio(MS13E4)	T. Quay	P. Noonan	ACRS(10)(MSP315)
OGC(MS15B18)	D. Hagan(MS3206)	G. Hill(4)(P1-37)	
Wanda Jones(MS7103)	J. Calvo(MS11F22)	PD4-1 Plant File	
GPA/PA(MS2G5)	ARM/LFMB(MS4503)	T. Westerman, RIV	

FC	: PD4-1/LA	: PD4-1/PM	: SRXB	: OGC	: PD4-1/(A)D	:	:
NAME	: PNoonan	: SPeterson	: h:RJones	: TQuay	:	:	:
DATE	: 2/14/91	: 2/25/91	: 5/10/91	: 6/24/91	: 1/91	:	:



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555

August 6, 1991

Docket No. 50-368

Mr. Neil S. Carns
Vice President, Operations ANO
Entergy Operations, Inc.
Route 3 Box 137G
Russellville, Arkansas 72801

Dear Mr. Carns:

SUBJECT: ISSUANCE OF AMENDMENT NO. 122 TO FACILITY OPERATING LICENSE
NO. NPF-6 - ARKANSAS NUCLEAR ONE, UNIT NO. 2 (TAC NO. 79694)

The Commission has issued the enclosed Amendment No. 122 to Facility Operating License No. NPF-6 for the Arkansas Nuclear One, Unit No. 2 (ANO-2). This amendment consists of changes to the Technical Specifications (TSs) in response to your application dated January 29, 1991, as revised July 29, 1991.

The amendment changes the ANO-2 TS by revising the time limits for monitoring linear heat rate and departure from nucleate boiling ratio using the core protection calculators when the core operating limit supervisory system is inoperable.

A copy of our related Safety Evaluation is also enclosed. A Notice of Issuance will be included in the Commission's next biweekly Federal Register notice.

Sincerely,

A handwritten signature in black ink that reads "Sheri R. Peterson".

Sheri R. Peterson, Project Manager
Project Directorate IV-1
Division of Reactor Projects III, IV, and V
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 122 to NPF-6
2. Safety Evaluation

cc w/enclosures:
See next page

Mr. Neil S. Carns
Entergy Operations, Inc.

Arkansas Nuclear One, Unit 2

cc:

Mr. Donald C. Hintz
Executive Vice President
and Chief Operating Officer
Entergy Operations, Inc.
P. O. Box 31995
Jackson, Mississippi 39286

Mr. Gerald Muench
Vice President Operations Support
Entergy Operations, Inc.
P. O. Box 31995
Jackson, Mississippi 39286

Mr. Jerry Yelverton
Director Nuclear Operations
Arkansas Nuclear One
Route 3 Box 137G
Russellville, Arkansas 72801

Mr. Robert B. McGehee
Wise, Carter, Child & Caraway
P. O. Box 651
Jackson, Mississippi 39205

Mr. Nicholas S. Reynolds
Winston & Strawn
1400 L Street, N.W.
Washington, D.C. 20005-3502

Mr. Charles B. Brinkman, Manager
Washington Nuclear Operations
Combustion Engineering, Inc.
12300 Twinbrook Parkway, Suite 330
Rockville, Maryland 20852

Mr. Robert B. Borsum
Babcock & Wilcox
Nuclear Power Generation Division
1700 Rockville Pike, Suite 525
Rockville, Maryland 20852

Admiral Kinnaird R. McKee, USN (Ret)
Post Office Box 41
Oxford, Maryland 21654

Senior Resident Inspector
U.S. Nuclear Regulatory Commission
1 Nuclear Plant Road
Russellville, Arkansas 72801

Mr. Tom Nickels
Arkansas Nuclear One
Route 3, Box 137G
Russellville, Arkansas 72801

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
Office of Executive Director
for Operations
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011

Honorable Joe W. Phillips
County Judge of Pope County
Pope County Courthouse
Russellville, Arkansas 72801

Ms. Greta Dicus, Director
Division of Environmental Health
Protection
Arkansas Department of Health
4815 West Markam Street
Little Rock, Arkansas 72201



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

ENTERGY OPERATIONS, INC.

DOCKET NO. 50-368

ARKANSAS NUCLEAR ONE, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 122
License No. NPF-6

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Entergy Operations, Inc. (the licensee) dated January 29, 1991, as revised July 29, 1991, 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, 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.

9108150039 910806
PDR ADDCK 05000368
P PDR

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and Paragraph 2.C.(2) of Facility Operating License No. NPF-6 is hereby amended to read as follows:

2. Technical Specifications

- The Technical Specifications contained in Appendix A, as revised through Amendment No. 122, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. The license amendment is effective 30 days from date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Theodore R. Quay, Director
Project Directorate IV-1
Division of Reactor Projects III, IV, and V
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: August 6, 1991

ATTACHMENT TO LICENSE AMENDMENT NO. 122

FACILITY OPERATING LICENSE NO. NPF-6

DOCKET NO. 50-368

Revise the following pages of the Appendix "A" Technical Specifications with the attached pages. The revised pages are identified by Amendment number and contain vertical lines indicating the area of change. The corresponding overleaf pages are also provided to maintain document completeness.

REMOVE PAGES

3/4 2-1
3/4 2-7

INSERT PAGES

3/4 2-1
3/4 2-7

3/4.2 POWER DISTRIBUTION LIMITS

3/4.2.1 LINEAR HEAT RATE

LIMITING CONDITION FOR OPERATION

3.2.1 The linear heat rate limit shall be maintained by either:

- a. Maintaining COLSS calculated core power less than or equal to COLSS calculated core power operating limit based on linear heat rate (when COLSS is in service); or
- b. Operating within the region of acceptable operation of Figure 3.2-1 using any operable CPC Channel (when COLSS is out of service).

APPLICABILITY: MODE 1 above 20% of RATED THERMAL POWER.

ACTION:

- a. With COLSS in service and the linear heat rate limit not being maintained as indicated by COLSS calculated core power-exceeding the COLSS calculated core power operating limit based on linear heat rate, within 15 minutes initiate corrective action to reduce the linear heat rate to within the limit and either:
 1. Restore the linear heat rate to within its limits within 1 hour of the initiating event, or
 2. Reduce THERMAL POWER to less than or equal to 20% of RATED THERMAL POWER within the next 6 hours.
- b. With COLSS out of service and the linear heat rate limit not being maintained as indicated by operation outside the region of acceptable operation in Figure 3.2-1, either:
 1. Restore the linear heat rate to within its limits within 2 hours of the initiating event, or
 2. Reduce THERMAL POWER to less than or equal to 20% of RATED THERMAL POWER within the next 6 hours.

SURVEILLANCE REQUIREMENTS

4.2.1.1 The provisions of Specification 4.0.4 are not applicable.

4.2.1.2 The linear heat rate shall be determined to be within its limits when THERMAL POWER is above 20% of RATED THERMAL POWER by continuously monitoring the core power distribution with the Core Operating Limit Supervisory System (COLSS) or, with the COLSS out of service, by verifying at least once per 2 hours that the linear heat rate, as indicated on any OPERABLE CPC channel, is within the limit shown on Figure 3.2-1.

4.2.1.3 At least once per 31 days, the COLSS Margin Alarm shall be verified to actuate at a THERMAL POWER level less than or equal to the core power operating limit based on linear heat rate.

THIS PAGE LEFT BLANK INTENTIONALLY

POWER DISTRIBUTION LIMITS

DNBR MARGIN

LIMITING CONDITION FOR OPERATION

- 3.2.4 The DNBR limit shall be maintained by one of the following methods:
- a. Maintaining COLSS calculated core power less than or equal to COLSS calculated core power operating limit based on DNBR (when COLSS is in service, and at least one CEAC is operable); or
 - b. Maintaining COLSS calculated core power less than or equal to COLSS calculated core power operating limit based on DNBR decreased by 13.0% (when COLSS is in service and neither CEAC is operable); or
 - c. Operating within the region of acceptable operation of Figure 3.2-2 using any operable CPC channel (when COLSS is out of service and at least one CEAC is operable); or
 - d. Operating within the region of acceptable operation of Figure 3.2-3 using any operable CPC channel (when COLSS is out of service and neither CEAC is operable).

APPLICABILITY: MODE 1 above 20% of RATED THERMAL POWER.

ACTION:

- a. With COLSS in service and the DNBR limit not being maintained as indicated by COLSS calculated core power exceeding the COLSS calculated core power operating limit based on DNBR, within 15 minutes initiate corrective action to reduce the DNBR to within the limits and either:
 1. Restore the DNBR to within its limits within 1 hour of the initiating event, or
 2. Reduce THERMAL POWER to less than or equal to 20% of RATED THERMAL POWER within the next 6 hours.
- b. With COLSS out of service and the DNBR limit not being maintained as indicated by operation outside the region of acceptable operation in Figure 3.2-2 or 3.2-3 as applicable, either:
 1. Restore the DNBR to within its limits within 2 hours of the initiating event, or
 2. Reduce THERMAL POWER to less than or equal to 20% of RATED THERMAL POWER within the next 6 hours.

SURVEILLANCE REQUIREMENTS

- 4.2.4.1 The provisions of Specification 4.0.4 are not applicable.

POWER DISTRIBUTION LIMITS

SURVEILLANCE REQUIREMENTS (continued)

4.2.4.2 The DNBR shall be determined to be within its limits when THERMAL POWER is above 20% of RATED THERMAL POWER by continuously monitoring the core power distribution with the Core Operating Limit Supervisory System (COLSS) or, with the COLSS out of service, by verifying at least once per 2 hours that the DNBR, as indicated on any OPERABLE CPC channel, is within the limit shown on Figures 3.2-2 or 3.2-3, as applicable.

4.2.4.3 At least once per 31 days, the COLSS Margin Alarm shall be verified to actuate at a THERMAL POWER level less than or equal to the core power operating limit based on DNBR.

POWER DISTRIBUTION LIMITS

SURVEILLANCE REQUIREMENTS (continued)

4.2.4.2 The DNBR shall be determined to be within its limits when THERMAL POWER is above 20% of RATED THERMAL POWER by continuously monitoring the core power distribution with the Core Operating Limit Supervisory System (COLSS) or, with the COLSS out of service, by verifying at least once per 2 hours that the DNBR, as indicated on any OPERABLE CPC channel, is within the limit shown on Figures 3.2-2 or 3.2-3, as applicable.

4.2.4.3 At least once per 31 days, the COLSS Margin Alarm shall be verified to actuate at a THERMAL POWER level less than or equal to the core power operating limit based on DNBR.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 122 TO

FACILITY OPERATING LICENSE NO. NPF-6

ENTERGY OPERATIONS, INC.,

ARKANSAS NUCLEAR ONE, UNIT NO. 2

DOCKET NO. 50-368

INTRODUCTION

By letter dated January 29, 1991 as revised July 29, 1991, Entergy Operations, Inc. (the licensee) requested an amendment to the Technical Specifications (TS) appended to Facility Operating License No. NPF-6 for Arkansas Nuclear One, Unit No. 2 (ANO-2). The proposed amendment would revise TS 3.2.1 and 3.2.4 for ANO-2. The change increases the time limit that the Core Operating Limit Supervisory System (COLSS) may be out of service before the action requirements based on the more restrictive Core Protection Calculator (CPC) limits apply. The proposed amendment also adds a distinction between the action requirements for exceeding a COLSS calculated power operating limit and a CPC calculated operating limit (when COLSS is out of service). Finally, the proposed change modifies the minimum power required by action requirements to be consistent with the present TS applicability. The July 29, 1991, letter provided clarifying information that did not change the initial proposed no significant hazards consideration determination.

EVALUATION

Presently, if COLSS is out of service, TS 3.2.1, Linear Heat Rate (LHR), and TS 3.2.4, Departure from Nucleate Boiling Ratio (DNBR) Margin, require that LHR and DNBR must be maintained within a more restrictive set of limits based on the CPCs. With these limits not being maintained, corrective action must be initiated within 15 minutes to restore LHR and DNBR to within the applicable set of limits (depending on whether or not COLSS is operable) within 1 hour or the plant must be in at least Hot Standby within the next 6 hours.

With COLSS out of service, the proposed changes will replace the current 15 minute time limit for initiating corrective action with a requirement to restore the DNBR and LHR limits within 2 hours. If the DNBR and LHR limits are not restored within the proposed 2 hours, the proposed change would require reactor power to be reduced to less than or equal to 20% of rated thermal power within the next 6 hours.

The intent of TS 3.2.1 and 3.2.4 is to maintain the reactor within the range of initial conditions that was assumed in the licensee's safety analysis. Maintaining the LHR within the specified range ensures that in the event of a

loss of coolant accident (LOCA), the fuel cladding temperature will not exceed the 2200°F limit imposed by 10 CFR 50.46. Maintaining the DNBR within the specified range will ensure that no postulated accident will result in consequences more severe than those described in Chapter 15 of the licensee's Final Safety Analysis Report.

Since COLSS does not provide any trip functions, continued power operation when COLSS is out of service is permissible provided an alternate means of monitoring the approach to the specified limits is available. The TS allows the CPC to be utilized to maintain the appropriate parameters within limits. However, the CPCs cannot perform the required LHR and DNBR calculations as accurately as COLSS. As a result, the TS limits based on the CPC's monitoring capability are more restrictive than the TS limits based on the COLSS monitoring capabilities. Due to the more restrictive CPC limits when COLSS is out of service, the current LCOs cannot be satisfied without a reduction in the core power level. The percentage of power reduction depends upon the cycle specific core design and the specific conditions that exist when COLSS indication is lost, however, a power reduction of approximately 15% per hour is necessary if COLSS is out of service. The magnitude of the required power reduction increases near the end of the fuel cycle due to changes in the axial core power distribution.

Since the end of cycle core power distribution may necessitate core power reductions of up to 25 to 30%, the current COLSS out of service limits may force power reductions at a rate approaching 30% per hour. Power reductions of this magnitude performed in 1 hour or less subject the plant to large transients and increase the probability that an avoidable challenge to the Reactor Protection System (RPS) would occur. In addition, maneuvers such as this are difficult to perform near the end of the fuel cycle due to the reduced capability of rapidly deborating the Reactor Coolant System to offset the buildup of Xenon. These considerations contribute to the potential for increased RPS actuations and subsequent challenges to safety systems. However, the proposed change would increase the allowed out of service and power reduction times to bring them in line with current core design restraints without decreasing existing safety protections.

Increasing to two hours the time to restore LHR and DNBR to within limits would reduce the number and rate of power reductions. While decreasing the potential for RPS actuations, the proposed change would not significantly increase the probability of exceeding the core power operating limits based on LHR and DNBR. While COLSS is out of service, detection of changes in LHR and DNBR is made easier by maintaining steady-state conditions and by increasing the monitoring frequency of the CPC calculated values of LHR and DNBR. If the CPC LHR and DNBR limits cannot be restored within the proposed 2 hours, the proposed change will require a further power reduction to "less than or equal to 20% of Rated Thermal Power" within 6 hours. The LHR and DNBR LCOs currently require the reactor to be brought to at least Hot Standby conditions if the LHR and DNBR limits cannot be restored. This change maintains consistency with the current TS Applicability Statement which requires limits on LHR and DNBR only when the thermal power exceeds 20%.

The primary consideration in extending the COLSS out of service time limit is the remote possibility of a slow, undetectable transient that degrades the LHR and/or DNBR slowly over the 2 hour period and is then followed by an anticipated operational occurrence or an accident. Upon approval of the proposed change the licensee will increase the monitoring frequency of the CPC-calculated values of LHR and DNBR. Currently, immediately following the loss of COLSS and every 2 hours thereafter, the licensee records (among other things) the CPC-calculated values of LHR and DNBR. Following approval of the proposed change, the licensee will increase the monitoring frequency for LHR and DNBR from once every 2 hours to once every 15 minutes. Moreover, the licensee is currently working to define a maximum allowable change in the CPC-calculated LHR or DNBR such that further degradation will require the operators to take immediate action to reduce reactor power and comply with the appropriate COLSS out of service Technical Specification limits. Implementation of this change will provide additional assurance that potential reductions in core thermal margin will be quickly detected and, should it prove necessary, result in a decrease in reactor power and subsequent compliance with the existing COLSS out of service Technical Specification limits. Operation in the proposed manner is an acceptable balance between CPC determination and extending the period before power changes are required. The level of safety is maintained.

The proposed changes do not alter the current power operating limits nor do they involve any changes to COLSS or CPC software. The licensee will make no physical change to plant systems, structures or components nor will the proposed changes affect the ability of any of the safety-related equipment required to mitigate accidents. Therefore, for the reasons stated above, the staff concludes that the proposed changes to Technical Specifications 3.2.1 and 3.2.4 are acceptable.

STATE CONSULTATION

In accordance with the Commission's regulations, the Arkansas State official was notified of the proposed issuance of the amendment. The State official had no comments.

ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes in surveillance requirements. The NRC 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 exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (56 FR 9378). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 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 Commission 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, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: S. Peterson

Date: August 6, 1991