

February 23, 1993

Mr. Jerry W. Yelverton  
Vice President, Operations ANO  
Entergy Operations, Inc.  
Route 3 Box 137G  
Russellville, Arkansas 72801

Dear Mr. Yelverton:

SUBJECT: ISSUANCE OF AMENDMENT NO. 143 TO FACILITY OPERATING LICENSE  
NO. NPF-6 - ARKANSAS NUCLEAR ONE, UNIT NO. 2 (TAC NO. M85215)

The Commission has issued the enclosed Amendment No. 143 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 December 22, 1992.

The amendment revises TS Table 4.4-2, "Steam Generator Tube Inspection," to allow ANO-2 to continue operating with two uninspected tubes in the "B" steam generator until the next planned steam generator tube inspection.

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,

/s/  
Thomas W. Alexion, Project Manager  
Project Directorate IV-1  
Division of Reactor Projects - III/IV/V  
Office of Nuclear Reactor Regulation

Enclosures:

- 1. Amendment No. 143 to NPF-6
- 2. Safety Evaluation

cc w/enclosures:  
See next page

DISTRIBUTION:

Docket File	NRC/Local PDR	PD4-1 Reading
T. Alexion (2)	M. Virgilio	G. Hubbard
P. Noonan	ACRS (10) (P315)	OGC(15B18)
D. Hagan (3206)	G. Hill (4)	Wanda Jones (7103)
C. Grimes (11E22)	PD4-1 Plant File	OPA (2G5)
OC/LFMB (4503)	W. Johnson, RIV	J. Roe

\* See previous concurrence

OFC	LA:PD4-1	PM:PD4-1	BC:EMCB	OGC	D:PD4-1
NAME	PNoonan	TAlexion:pk	JStrosnider*	JHu11*	GHubbard
DATE	2/14/93	2/14/93	1/19/93	1/26/93	2/23/93

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

February 23, 1993

Docket No. 50-368

Mr. Jerry W. Yelverton  
Vice President, Operations ANO  
Entergy Operations, Inc.  
Route 3 Box 137G  
Russellville, Arkansas 72801

Dear Mr. Yelverton:

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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 cursive script that reads "Thomas W. Alexion".

Thomas W. Alexion, Project Manager  
Project Directorate IV-1  
Division of Reactor Projects - III/IV/V  
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 143 to NPF-6
2. Safety Evaluation

cc w/enclosures:  
See next page

Mr. Jerry W. Yelverton  
Entergy Operations, Inc.

Arkansas Nuclear One, Unit 2

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Honorable Joe W. Phillips  
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Ms. Greta Dicus, Director  
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Little Rock, Arkansas 72205-3867



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

ENERGY OPERATIONS, INC.

DOCKET NO. 50-368

ARKANSAS NUCLEAR ONE, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 143  
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 December 22, 1992, 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.

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. 143, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION



George T. Hubbard, Acting Director  
Project Directorate IV-1  
Division of Reactor Projects - III/IV/V  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: February 23, 1993

ATTACHMENT TO LICENSE AMENDMENT NO. 143

FACILITY OPERATING LICENSE NO. NPF-6

DOCKET NO. 50-368

Revise the following page of the Appendix "A" Technical Specifications with the attached page. The revised page is identified by Amendment number and contains vertical lines indicating the area of change.

REMOVE PAGE

3/4 4-12

INSERT PAGE

3/4 4-12

STEAM GENERATOR TUBE INSPECTION<sup>1</sup>

1ST SAMPLE INSPECTION			2ND SAMPLE INSPECTION		3RD SAMPLE INSPECTION	
Sample Size	Result	Action Required	Result	Action Required	Result	Action Required
A minimum of S Tubes per S.G.	C-1	None	N/A	N/A	N/A	N/A
	C-2	Plug or sleeve defective tubes and inspect additional 2S tubes in this S.G.	C-1	None	N/A	N/A
			C-2	Plug or sleeve defective tubes and inspect additional 4S tubes in this S.G.	C-1	None
			C-3	Perform action for C-3 result of first sample	C-2	Plug or sleeve defective tubes
	C-3	Inspect all tubes in this S.G., plug or sleeve defective tubes and inspect 2S tubes in each other S.G.  Special Report to NRC per Specification 6.9.2	C-1	None	N/A	N/A
			C-2	Perform action for C-2 result of second sample	C-3	Perform action for C-3 result of first sample
			C-3	Additional S.G. is C-3	N/A	N/A
			Inspect all tubes in each S. G. and plug or sleeve defective tubes. Special Report to NRC per Spec. 6.9.2.	N/A	N/A	

$S = 3 \frac{N}{n} \%$  Where N is the number of steam generators in the unit, and n is the number of steam generators inspected during an inspection

<sup>1</sup>A one time exemption to the C-3 inspection requirements has been granted for the 2R9 inspection of 'B' Steam Generator tubes 38-66 and 37-67 for the period of November 27, 1992, through May 30, 1993.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 143 TO

FACILITY OPERATING LICENSE NO. NPF-6

ENTERGY OPERATIONS, INC.,

ARKANSAS NUCLEAR ONE, UNIT NO. 2

DOCKET NO. 50-368

1.0 INTRODUCTION

By letter dated December 22, 1992, Entergy Operations, Inc. (the licensee) submitted a request for changes to the Arkansas Nuclear One, Unit No. 2 (ANO-2) Technical Specifications (TSs). The requested changes would revise TS Table 4.4-2, "Steam Generator Tube Inspection," to allow ANO-2 to continue operating with two uninspected tubes in the "B" steam generator until the next planned steam generator tube inspection.

2.0 BACKGROUND

On November 25, 1992, at approximately 1300 hours, ABB-Combustion Engineering (CE) informed the licensee that two tubes (38-66 and 37-67) in the ANO-2 'B' steam generator (SG) were not inspected with the bobbin coil probe during the ninth refueling outage (2R9) ending October 1992. Tubes 38-66 and 37-67 were in a group of tubes under the baseplate of the GENESIS manipulator. The analysts were instructed by the analysis guidelines to identify the two tubes as "RFX" to indicate that the tubes were to be tested, but the analyst entered the "RFX" code in the wrong location. The software subsequently interpreted that the tubes had been tested and had no degradation. The comparison programs did not flag these two tubes. This condition was discovered during the final review of the 2R9 inspection data by CE. The final CE review has been completed and no other missed tubes were identified in either SG.

ANO-2 TS 4.4.5.2 requires that the first sample inspection of a surveillance be categorized in accordance with the number of defective or degraded tubes. In 2R9, a 100% bobbin coil probe inspection of both SGs was planned. Additionally, 100% of the tubes of both SGs were to be inspected at the hot leg expansion transition region with the rotating pancake coil (RPC) for detection of circumferential cracking. In the 'B' SG, 8289 of 8291 tubes were inspected with the bobbin coil. The 'B' SG had 132 defective tubes out of 8291, or 1.6% defective. This placed the 'B' SG in Category C-3, requiring an inspection of 100% of the tubes in 'B' SG and an additional 6% in the 'A' SG. The 'A' SG was already undergoing a 100% inspection. CE reviewed the inspection data during the outage and incorrectly determined that 100% of the tubes in both SGs, including 'B' SG tubes 38-66 and 37-67, were inspected with the bobbin coil probe.

The licensee requested a temporary waiver of compliance from the surveillance requirement of TS 4.4.5.2, Table 4.4-2, to allow continued operation of ANO-2 until completion of a planned SG tube inspection outage no later than the end of the second quarter of 1993. The licensee's request for continued operation until the end of the second quarter of 1993 was based on their review of previous 2R8 'B' SG sample inspection data for tube locations 38-66 and 37-67, 2R9 specific RPC data, and other adjacent eddy current tube inspections. There was no prior evidence of mechanical damage, progressive degradation, or stress corrosion cracking in 'B' SG tubes 38-66 or 37-67. The licensee, therefore, concluded that the structural integrity of this part of the reactor coolant system (RCS) will be maintained.

On November 27, 1992, the NRC staff granted a temporary waiver of compliance for a period of 90 days to allow for the preparation, application, NRC review and approval, and implementation of this TS change. During a December 3, 1992, meeting, the licensee informed the staff of their intent to inspect the SG tubes during an outage scheduled to begin on April 30, 1993.

### 3.0 EVALUATION

A review of the bobbin coil inspection history of the two tubes has been performed. Both tubes were inspected during 2R8 (March 1991). The eddy current testing revealed no indication on either tube, i.e., no detectable degradation. Additionally, the 2R8 data for these two tubes were reanalyzed using the 2R9 analysis guidelines, and no indications were discovered. Also, the 2R9 eddy current data for the 28 tubes surrounding the two missed tubes (two rows of tubes around each of the two missed tubes) revealed only one indication in one of these 28 tubes (a 28% throughwall [% TW] indication at the #3 batwing tube support strap). This particular indication is most likely wear due to crossflow steam velocities on the horizontal part of the tubes. One other tube of the 28 had previously been plugged for a batwing indication.

The 2R8 and 2R9 data bases were also reviewed to determine the maximum growth for both eggcrate and batwing supports. Based on the 2R8 exam of these two tubes showing no detectable degradation and applying maximum growth rates, development of a flaw in either of these tubes that would challenge Regulatory Guide 1.121 limits is not expected to occur before the next SG inspection. Additionally, these two tubes were inspected for circumferential cracking at the top of the tubesheet with an RPC probe.

As a result of not inspecting tubes 38-66 and 37-67 in the 'B' SG, the licensee has several contingency actions in place:

- The licensee is currently operating ANO-2 at a reduced hot leg temperature of approximately 599°F to mitigate the consequences of intergranular stress corrosion cracking (IGSCC), a SG tube damage mechanism.

- SG tube leaks would be detected and confirmed by the main steam line nitrogen-16 (N-16) monitors, condenser off-gas monitor, SG blowdown monitors, main steam line radiation monitors, chemistry analysis (using argon and/or tritium), or RCS inventory balance. The use of these components and methods is incorporated in the existing plant procedures for identifying and mitigating SG tube leaks.
- The main steam line N-16 monitors provide continuous trending capability with readouts in the Control Room and have dedicated annunciation to alert operators to increasing activity levels in the SGs which would indicate tube leakage. Other secondary radiation monitors also supply continuous trending with Control Room readout and, additionally, have procedurally controlled adjustable annunciation alarm setpoints to allow the operator to monitor existing tube leakage for any further degradation.
- The licensee has an administrative primary-to-secondary leakage limit for ANO-2 of 0.1 gallons per minute (GPM), below the TS specified value of 0.5 GPM for leakage through any one SG. The licensee is sensitive to the potential rapid progression of tube leakage and will take the necessary measures to mitigate tube leakage in excess of 0.1 GPM confirmed leakage.
- Continuing operator training at ANO-2 routinely stresses identification and mitigation of SG tube leaks by way of procedure review, classroom instruction, and ongoing participation in simulator scenarios.
- Shift briefings were conducted to ensure Operations personnel are aware that two tubes in the 'B' SG were not tested.

The May 30, 1993, expiration date proposed by the licensee for a one-time exemption to TS Table 4.4-2 takes into account the anticipated performance of the planned SG tube inspection scheduled to begin on April 30, 1993. An additional 30-day contingency has been added to facilitate any forced outages that may delay the start of the planned SG tube inspection outage. Any change in schedule will be mutually agreed to by the licensee and the NRC.

#### 4.0 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.

#### 5.0 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 (58FR5430). 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.

#### 6.0 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: T. Alexion

Date: February 23, 1993