

February 28, 1997

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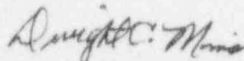
U. S. Nuclear Regulatory Commission
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Subject: Arkansas Nuclear One - Unit 2
Docket No. 50-368
License No. NPF-6
Licensee Event Report 50-368/97-001-00

Gentlemen:

In accordance with 10CFR50.73(a)(2)(i)(B), enclosed is the subject report concerning steam generator tube surveillance testing.

Very truly yours,


Dwight C. Mims
Director, Licensing

DCM/rhs

enclosure

IE22/1

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PDR ADOCK 05000368
S PDR



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LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

Arkansas Nuclear One - Unit 2

DOCKET NUMBER (2)

05000368

PAGE (3)

1 OF 4

TITLE (4) Inadequate Surveillance Caused By Personnel Error Resulted In Two Degraded Steam Generator Tubes Being Left In Service During The Subsequent Cycle Of Operation

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
01	29	97	97	001	00	02	28	97	FACILITY NAME	DOCKET NUMBER
OPERATING MODE (9)		1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR: (Check one or more) (11)							
POWER LEVEL (10)		97	20.402(b)		20.405(c)		50.73(a)(2)(iv)		70.71(b)	
			20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)		70.71(c)	
			20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		OTHER	
			20.405(a)(1)(iii)		X 50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		Specify in	
			20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)		Abstract Below	
			20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(x)		and in Text	

LICENSEE CONTACT FOR THIS LER (12)

NAME

Richard H. Scheide, Nuclear Safety and Licensing Specialist

TELEPHONE NUMBER (Include Area Code)

501-858-4618

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)

YES		NO		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
(If yes, complete EXPECTED SUBMISSION DATE)		X					

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On January 29, 1997, it was determined that steam generator tube surveillances which were performed during refueling outage 2R11 had failed to identify existing tube flaws for further evaluation as required by the steam generator tube surveillance program. Testing conducted during the next outage (2F96-1) identified tubes 16-56 and 70-98 in the "A" steam generator as being degraded equal to or greater than 40 percent through-wall. A review of 2R11 data revealed that tube 16-56 had been classified as clean by one analyst and as a non-quantifiable indication by another. Ultimately tube 16-56 was dispositioned as clean and removed from further testing scrutiny. Review of the 2R11 data concluded that this tube should have been classified as a distorted support indication and would likely have been removed from service if further testing had been conducted. Additionally, the review identified that tube 70-98, which was dispositioned as clean during 2R11, should also have been identified for further testing. Both tubes contained axial cracks at the first tube support plate on the hot side of the generator. The root cause of this event was personnel error with contributing causes of inadequate training and a lack of adequate oversight of the testing process. Corrective actions will include increased Entergy oversight of the testing process and enhancements to the analyst training process.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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Arkansas Nuclear One - Unit 2		005000368		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 4
				97	001	00	

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

A. Plant Status

At the time this condition was identified, Arkansas Nuclear One, Unit-2 (ANO-2) was operating in normal steady-state conditions at approximately 97 percent power.

B. Event Description

On January 29, 1997, it was determined that steam generator tube surveillances which were performed during refueling outage 2R11 (9/95 - 11/95) had failed to identify existing tube flaws for further evaluation as required by the steam generator tube surveillance program.

Eddy current analysts are qualified by their respective companies in accordance with industry standards. They are also supplied with site guidelines and are required to undergo ANO site specific training and performance tests. At ANO, test data for each tube is analyzed by independent analysts from different companies. A computer generated report is then produced which identifies any significant differences in the independent analysts' determinations. These differences are reviewed by a resolution analyst team made up of two individuals from different companies who must agree on the final disposition of the tube test data. If the resolution team cannot agree, the test data is submitted to the Senior Analyst for disposition.

During outage 2F96-1, (11/96 - 12/96) 100 percent full length bobbin eddy current testing was performed on the steam generator tubing. Diagnostic testing of certain tubes was performed with a motorized rotating pancake coil which utilized a 0.115 inch pancake coil along with a circumferential and an axial coil.

During this examination, tubes 16-56 and 70-98 in the "A" steam generator were identified as degraded equal to or greater than 40 percent through-wall. A review of 2R11 data revealed that tube 16-56 had been classified as "clean" by the primary analyst and as a non-quantifiable indication by the secondary analyst. The resolution team agreed with the primary analyst and no further testing was performed on the tube. Consequently, tube 16-56 was left in service during the following cycle of operation. The 2R11 test data for tube 16-56 was reviewed by the 2F96-1 Senior Analyst who concluded that it was worthy of being classified as a distorted support indication and would likely have been removed from service if further testing had been conducted during 2R11.

Review of 2R11 test data for tube 70-98 identified that it should also have been classified as a distorted support indication. This tube had been classified as clean by both the primary and secondary analysts. Both tubes contained axial cracks at the first support plate on the hot side of the generator.

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

Tubes 16-56 and 70-98 were pulled during 2F96-1 and sent to Combustion Engineering to undergo pressure testing. Subsequently, both tubes burst at approximately 3200 psig. This pressure is less than the acceptable burst pressure specified in Regulatory Guide 1.121 but well above the maximum differential pressure expected during a design basis accident.

C. Root Cause

The root cause of this condition was determined to be personnel error in that the analysts failed to identify tubes 16-56 and 70-98 for further evaluation during 2R11. However, a review of the eddy current testing program identified several contributing causes.

- **Inadequate Training:** The materials used to train the analysts do not include examples of recent ANO degradation mechanisms or of "difficult to analyze" indications such as those discussed in this report. In addition, resolution analysts receive no special training for their function.
- **Inadequate Oversight of Process:** Senior Analyst oversight of the process is minimal as is routine auditing of analysts' performance. In addition, Entergy oversight of the process is inadequate.

D. Corrective Actions

During 2F96-1, all tubes which had indications equal to or greater than 40 percent through-wall were removed from service, including tubes 16-56 and 70-98. As a preventive measure, additional tubes were removed from service based on percent through-wall growth and/or volume (voltage).

A review of all 2F96-1 tube flaw indications which were dispositioned as "non-repairable" by the resolution team was conducted by an independent Level III analyst. The independent reviewer agreed with all determinations made by the 2F96-1 resolution team.

ANO-2 specific training for eddy current testing analysts will be enhanced by April 30, 1997. This training will include performance data pertaining to ANO degradation mechanisms as well as specific training for resolution analysts.

The eddy current testing process will be revised by April 30, 1997, to include increased Entergy oversight at various stages of the process.

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E. Safety Significance

Tubes 16-56 and 70-98 burst at approximately 3200 psig. During design basis accident conditions, these tubes would not have burst but may have leaked. Using the as-found 2F96-1 tube data, an analysis was completed to determine the effect the leaking tubes would have on off-site dose during design basis accident conditions. This analysis concluded that the resultant off-site dose would be within the calculated acceptable limits included in the operational assessment for cycle 12 (2CAN079604). Therefore, this condition is considered to be of low safety significance.

F. Basis for Reportability

Failure to identify steam generator tubes 16-56 and 70-98 for further testing during 2R11 is considered to be an inadequate surveillance which is reportable pursuant to 10CFR50.73(a)(2)(i)(B) as operation prohibited by the plant's Technical Specifications.

G. Additional Information

There have been no previous LERs submitted by ANO regarding inadequate steam generator tube surveillances that resulted in degraded tubes being left in service.