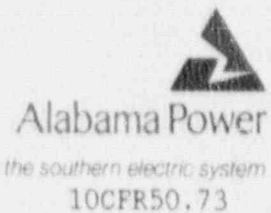


Alabama Power Company
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W. G. Hairston, III
Senior Vice President
Nuclear Operations



December 21, 1990

Docket No. 50-364

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

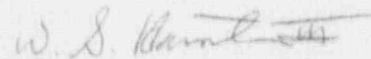
Gentlemen:

Joseph M. Farley Nuclear Plant - Unit 2
Licensee Event Report No. LER 90-005-00

Joseph M. Farley Nuclear Plant, Unit 2, Licensee Event Report No. LER 90-005-00 is being submitted in accordance with 10CFR50.73.

If you have any questions, please advise.

Respectfully submitted,


W. G. Hairston, III

WGH,III/BHW:maf24.20

Enclosure

cc: Mr. S. D. Ebnetter
Mr. G. F. Maxwell

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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 RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION WASHINGTON, DC 20555 AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET WASHINGTON, DC 20503.

FACILITY NAME (1) Joseph M. Farley - Unit 2 DOCKET NUMBER (2) 364 050000 PAGE (3) 5 1 OF 1

TITLE (4) Steam Generator Tube Degradation

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 NAMES	DOCKET NUMBER(S)
12	16	90	90	005	00	12	21	90		050000
										050000

OPERATING MODE (9) 6 THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)

20.402(b)	20.406(c)	60.73(a)(2)(iv)	73.71(b)
20.406(a)(1)(ii)	60.36(a)(1)	60.73(a)(2)(v)	73.71(e)
20.406(a)(1)(iii)	60.36(a)(2)	60.73(a)(2)(vi)	<input checked="" type="checkbox"/> OTHER (Specify in Abstract below and in Text, NRC Form 766A)
20.406(a)(1)(iii)	60.73(a)(2)(ii)	60.73(a)(2)(vii)(A)	Report per Tech. Spec. 4.4.6.5.a&c
20.406(a)(1)(iv)	60.73(a)(2)(ii)	60.73(a)(2)(viii)(B)	
20.406(a)(1)(iv)	60.73(a)(2)(iii)	60.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME D. N. Morey, General Manager - Nuclear Plant TELEPHONE NUMBER 205899-5156

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 (If yes, complete EXPECTED SUBMISSION DATE) NO

EXPECTED SUBMISSION DATE (15)

MONTH	DAY	YEAR

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

The following report is being submitted in accordance with Technical Specification 4.4.6.5.a and c.

During the Unit 2 Seventh Refueling Outage (U2RF7), eddy current inspections were performed on 100% of the available tubes in all three steam generators (SGs). As a result of this inspection a total of 574 tubes previously in service (5.76% of the total number of tubes inspected), were found to be defective which requires inspection results to be classified as Category C-3. Plugs were removed from a total of 303 previously plugged tubes and these tubes were returned to service. As a result of this inspection 239 tubes were designated F*. Following these actions, the percentage of tubes plugged in each SG is 8.85%, 5.25%, and 8.97% in SGs 2A, 2B, and 2C, respectively.

In addition to the required tube plugging, several ongoing programs have been established to reduce the probability of future tube degradation.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-630), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20565, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Farley Nuclear Plant - Unit 2	DOCKET NUMBER (2) 0500036490	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		00	05	00	2	5

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

Plant and System Identification

Westinghouse - Pressurized Water Reactor
Energy Industry Identification System codes are identified in the text as [XX].

Summary of Event

During the Unit 2 Seventh Refueling Outage (U2RF7), eddy current inspections were performed on 100% of the available tubes in all three steam generators (SGs). As a result of this inspection a total of 574 tubes previously in service (5.76% of the total number of tubes inspected), were found to be defective which requires inspection results to be classified as Category C-3. Plugs were removed from a total of 303 previously plugged tubes and these tubes were returned to service. As a result of this inspection 239 tubes were designated F*. Following these actions, the percentage of tubes plugged in each SG is 8.85%, 5.25%, and 8.97% in SGs 2A, 2B, and 2C, respectively.

Description of Event

Prior to the U2RF7, Alabama Power Company developed an eddy current inspection plan to inspect all non-plugged tubes in all three SGs. All Row 1 tubes were plugged prior to initial operation of the unit. In previous outages, several tubes with defects in the tubesheet region were plugged prior to NRC approval of the F* Technical Specification. During the U2RF7 plugs were removed from 279 row one tubes, 23 tubes previously designated as F* and one tube containing a stuck eddy current probe. These 303 tubes were successfully returned to service. All the U-bends of the tubes in Row 1 and Row 2 were heat treated to reduce stresses in short radius U-bend tubes. Sections from five different hot leg tubes were removed to obtain data in support of an alternate plugging criteria: three in 2B and two in 2C.

The eddy current inspection plan included: 100% full length bobbin probe inspection of all available tubes, 100% hot leg roll transition rotating pancake (RPC) probe inspection of all available tubes, RPC inspection of Row 1 and Row 2 U-bends (after heat treatment), RPC inspection of all distorted indications, and RPC inspection of all greater than or equal to 40% through wall indications. Ultrasonic testing of several hot leg roll transitions and hot leg support plates was performed to obtain data in support of an alternate plugging criteria. The tube plugging was completed on December 15, 1990.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-30), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20556 AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Farley Nuclear Plant - Unit 2	DOCKET NUMBER (2) 05000364	LER NUMBER (6)			PAGE (3)		
		YEAR 90	SEQUENTIAL NUMBER 005	REVISION NUMBER 000			

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

Description of Event (continued)

The following is a summary of the tube status for each individual SG:

	SG 2A	SG 2B	SG 2C
Plugged prior to U2RF7	148	160	203
Determined defective during U2RF7	243	114	217
Returned to service during U2RF7	91	96	116
Total plugged after U2RF7	300	178	304
% plugged after U2RF7	8.85	5.25	9.97
Designated F* tubes	22	38	179

There were two major degradation mechanisms for the tubes found defective during this inspection: PWSCC in the roll transition zone of the tubesheet and OD SCC at support plates. Table 1 provides a summary of the above indications. These are similar to the mechanisms reported in LERs 86-004-00 and 87-004-02.

Tube Support Plate

A total of 249 tubes were plugged due to indications at support plate intersections: 31 in SG 2A, 65 in SG 2B, and 153 in SG 2C.

Tubesheet

A total of 339 tubes were plugged due to indications in the hot leg tubesheet region (from above the top of the roll transition to the F* elevation): 216 in SG 2A, 51 in SG 2B, and 72 in SG 2C. This area was inspected by a 100% bobbin inspection and for the first time by a 100% RPC inspection.

Cause of Event

Investigations and evaluations performed identified two areas where tube defects were observed: PWSCC in the tubesheet area and OD SCC at support plates.

Reportability Analysis and Safety Assessment

This event is being reported in accordance with Technical Specification 4.4.6.5.a and c.

In the past, Alabama Power Company has used a minimum voltage criteria in the analysis of bobbin probe eddy current data. This outage, elimination of the minimum voltage criteria resulted in an increased number of tubes which were evaluated as defective at the tube support plates. In addition, the first 100% RPC inspection of the roll transition zone in the tubesheet increased the plugging percentage compared to previous inspections. These enhancements to the inspection program had a significant impact on the number of tubes evaluated as being defective this outage. The higher number of tubes plugged this outage is not expected to be indicative of future tube plugging rates.

The health and safety of the public were not affected.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Farley Nuclear Plant - Unit 2	DOCKET NUMBER (2) 0 5 0 0 0 3 6 4 9 0	LER NUMBER (6)		PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
		-005	-000	0	4 OF 5

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

Corrective Action

Tubes have been plugged as required. In addition, the following actions have been taken in order to reduce the probability of future tube degradation:

1. A program of boric acid addition is being continued to reduce the potential for OL SCC.
2. A program of morpholine addition is being continued to reduce the potential for sludge accumulation.
3. The Westinghouse pressure pulse cleaning process was used in all three SGs to remove contaminants from the crevices between the tubes and support plates.
4. The Westinghouse/Framatome shot peening process was utilized during the Unit Two Fifth Refueling Outage in the hot leg tubesheet area of all non-plugged tubes to relieve residual stresses from the hard rolling process.
5. The Westinghouse U-bend heat treat process has been completed on all Row 1 and Row 2 tubes returned to service to reduce the potential of U-bend SCC.
6. During the Unit 2 Second, Third, and Fourth Refueling Outages, many of the secondary components containing copper were replaced with components containing stainless steel.

Additional Information

Similar events were reported in Unit 2 LERs 86-004-00 and 87-004-02.

No components failed during this event.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545; AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

DOCKET NUMBER (2)

LER NUMBER (6)

PAGE (3)

Farley Nuclear Plant - Unit 2

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TEXT (If more space is required, use additional NRC Form 363A's) (17)

TABLE 1

	Steam Generator		
	A	B	C
No. of Tubes Probed	3332	3324	3303
Tubes Pluggable *	243	114	217
No. Defective Indications * at Tubesheet	216	51	72
No. Defective Indications * at Support Plate	31	65	153
Tubes F*	22	38	179

* The sum of the number of defective indications at the tubesheet and at the support plate does not equal the number of pluggable tubes since some tubes had multiple indications.