

September 29, 1994

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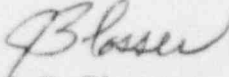
ULNRC-03080

Gentlemen:

**DOCKET NUMBER 50-483
CALLAWAY PLANT UNIT 1
FACILITY OPERATING LICENSE NPF-30
SPECIAL REPORT 93-03 (SOS 93-1622)
RESULTS OF THE SIXTH STEAM GENERATOR
TUBE INSERVICE INSPECTION**

REF: ULNRC-2904, dated 11/8/93

The enclosed Special Report is submitted pursuant to the requirements of Callaway Technical Specification 4.4.5.5.b concerning the seventh inservice Eddy Current Inspection of Steam Generators 'A' and 'D' performed in October 1993, during Callaway Plant's sixth refueling outage. This report documents the final Conam inspection results.


J. D. Blosser
Manager, Callaway Plant

JDB/HDB/MAH /lrj

Enclosure

cc: Distribution attached

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SPECIAL REPORT 93-03
RESULTS OF SEVENTH STEAM GENERATOR
TUBE INSERVICE INSPECTION

This report is submitted in accordance with Technical Specification (T/S) 4.4.5.5.b, which states:

"The complete results of the steam generator tube inservice inspection shall be submitted to the Commission in a Special Report pursuant to Specification 6.9.2 within 12 months following the completion of the inspection.

This Special Report shall include:

- (1) Number and extent of tubes inspected,
- (2) Location and percent of wall-thickness penetration for each indication of an imperfection, and
- (3) Identification of tubes plugged."

In October 1993, with the plant in Mode 6 - Refueling for the sixth refueling outage, the seventh plant Steam Generator (S/G) Eddy Current Inservice Inspection was performed. S/G's 'A' and 'D' were inspected. The inspection was performed by Conam Nuclear, Inc., and their formal results are detailed in the Eddy Current Examination (ECE) which is submitted with this Special Report.

Although the Conam ECE provides details on the inspection, the results are summarized below and are numbered to correspond with the information requested by T/S 4.4.5.5.b:

(1) Number/Extent of Inspected Tubes

(a) Inspection Summary:

	<u>S/G 'A'</u>	<u>S/G 'D'</u>
Tubes Plugged (Refuel 6)	19	18
Tubes Previously Plugged	<u>17</u>	<u>30</u>
Total Tubes Plugged	36	48

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	<u>S/G 'A'</u>	<u>S/G 'D'</u>
Tubes evaluated with standard bobbin coil	5609	5596
Tubes plugged previously	<u>17</u>	<u>30</u>
Total Tubes	5626	5626

Tubes further evaluated with MRPC probes:**STEAM GENERATOR 'A':**

07C-06C	5
06H-07H	4
03H-04H	1
04C-03C	3
01H-02H	4
02H-03H	1
04H-05H	1
05C-04C	1
02C-01C	1
03C-02C	1
TSH-01H	1
O1C-TSC	1
01C-FBC	1
05H-05H	2
TSH-TSH	126
TSC-TSC	64
03C-03C	4
07H-07H	3
02H-02H	3
03H-03H	1
05C-05C	2
01H-01H	1
02C-02C	4
04H-04H	1
04C-04C	1
SUBTOTAL	226

STEAM GENERATOR 'D':

06H-07H	1
07C-06C	1
05C-04C	2
04H-05H	1
05H-06H	2
02C-01Cc	3
03C-02C	3
02H-03H	2
06C-05C	1
04C-03C	2
01H-02H	1
01C-TSC	1
TSH-FBH	1
FBC-TSC	1
FBH-01H	1
TSH-TSH	482
07H-07H	2
01H-01H	1
04H-04H	1
02H-02H	2
04C-04C	1
01C-01C	2
03H-03H	1
06C-06C	2
06H-06H	1
SUBTOTAL	512

(b) Steam Generator 'A'

One hundred percent of the unplugged tubes or five thousand six hundred nine (5609) tubes were tested full length using the standard bobbin coil probe. In addition to the bobbin probe examination, 126 inlet leg tube sheet interfaces were examined using a three-coil MRPC (motorized rotating pancake coil) probe. This probe utilizes one pancake coil, one coil sensitive to axial indications and one coil sensitive to circumferential indications. There were no indications reported at the inlet tube sheet interface.

During this outage, there were nineteen (19) tubes plugged in Steam Generator 'A'. Fourteen (14) tubes removed from service for indications at anti-vibration bars AVB...five (5) for indications greater than 48 percent through wall and nine (9) tubes for indications from between 35 and 47 percent through wall. The other five (5) tubes were plugged due to possible wall thinning from a foreign object lodged outside the tubes. A Foreign Object Search and Retrieval (FOSAR) was performed to locate and remove the foreign object. The foreign object was later determined to be weld slag.

(c) Steam Generator 'D':

One hundred percent of the unplugged tubes or five thousand five hundred ninety-six (5596) tubes were tested full length using the bobbin coil probe. In addition to the bobbin probe examination, 482 inlet tube sheet interfaces were examined with a three-coil MRPC probe. There were no indications reported at the inlet tube sheet interface. There were 18 tubes removed from service for indications at AVB. Three (3) tubes were removed from service for indications greater than 48 percent through wall. The other 15 tubes had indications from between 35 and 47 percent through wall.

(2) Location/Percent of Wall-Thickness Penetration for Each Indication of Imperfection

See Tables 1 and 2

(Percent of wall-thickness penetrations are shown for indications of $\geq 20\%$.)

- (3) Identification of Tubes Plugged from the Seventh Inservice Inspection -
All tubes plugged in the seventh inservice inspection used Inconel
690 plugs.

<u>STEAM GENERATOR 'A'</u>			<u>STEAM GENERATOR 'D'</u>		
<u>ROW</u>	<u>COLUMN</u>	<u>% INDI- CATION</u>	<u>ROW</u>	<u>COLUMN</u>	<u>% INDI- CATION</u>
39	16	41	29	9	35
41	18	41	39	17	36
52	32	DTI/LP	43	24	48
52	34	60	48	25	42
56	45	DTI/LP	47	27	35
57	45	SUI/LP	44	28	38
46	46	36	47	33	37
55	46	DTI/LP	46	39	54
56	46	LP	13	59	NQI
42	47	38	52	65	48
46	47	40	52	66	43
47	53	41	50	83	46
51	59	55	47	84	34
54	60	52	49	90	40
51	61	39	48	92	38
46	88	35	48	93	40
46	90	49	36	110	45
42	96	38	33	112	40
46	96	43			

DEFINITIONS:

DTI - Distorted Top of Tubesheet with Indication.

SUI - Single Volumetric Indication.

NQI - Non-Quantifiable Indication.

LP - Loose Part.

KEY - TABLES 1 AND 2

AV1,2,3,4,5,6 - Anti-Vibration Bars

02H, 07H, 07C, etc. - Tube Support Plate Numbers/Cold Leg (C), Hot Leg (H)

TSH - Tubesheet Hot

SPECIAL REPORT
TABLE 1
TUBE IMPERFECTIONS - STEAM GENERATOR 'A'

ROW	COLUMN	INDICATION % WALL THINNING	LOCATION	INCH(+) FROM LOCATION
31	11	21	AV5	0.00
32	11	20	AV2	0.00
33	11	35	AV2	0.00
33	11	22	AV5	0.00
32	12	30	AV3	0.00
36	13	30	AV4	0.00
39	16	41	AV4	0.00
35	17	26	AV4	0.00
39	18	23	AV3	0.00
39	18	23	AV4	0.00
39	18	22	AV6	0.00
41	18	36	AV2	0.00
41	18	41	AV4	0.00
41	18	32	AV6	0.00
35	20	27	AV3	0.00
32	22	26	AV2	0.00
36	23	20	AV4	0.00
43	27	24	AV2	0.00
46	29	31	AV4	0.00
46	29	25	AV5	0.00
39	30	21	AV3	0.00
39	30	21	AV4	0.00
39	34	26	AV3	0.00
39	34	36	AV4	0.00
52	34	60	AV2	0.00
52	34	25	AV3	0.00
52	34	42	AV4	0.00
52	34	52	AV5	0.00
52	34	35	AV6	0.00
53	34	26	AV5	0.00
53	34	36	AV6	0.00

SPECIAL REPORT
TABLE 1
TUBE IMPERFECTIONS - STEAM GENERATOR 'A'

ROW	COLUMN	INDICATION % WALL THINNING	LOCATION	INCH(+) FROM LOCATION
47	38	23	AV3	0.00
47	38	31	AV5	0.00
42	40	26	AV4	0.00
42	46	35	AV3	0.00
46	46	25	AV2	0.00
46	46	36	AV3	0.00
46	46	30	AV4	0.00
35	47	25	AV2	0.00
35	47	33	AV4	0.00
35	47	24	AV5	0.00
42	47	38	AV3	0.00
42	47	22	AV4	0.00
46	47	40	AV3	0.00
26	48	25	AV5	0.00
32	48	20	AV3	0.00
32	48	20	AV4	0.00
46	48	25	AV3	0.00
46	48	32	AV4	0.00
47	53	20	AV2	0.00
47	53	30	AV3	0.00
47	53	41	AV4	0.00
47	55	25	AV2	0.00
47	57	30	AV4	0.00
47	59	28	AV3	0.00
47	59	27	AV5	0.00
51	59	40	AV2	0.00
51	59	49	AV3	0.00
51	59	55	AV4	0.00
51	59	21	AV5	0.00
54	60	50	AV3	0.00
54	60	52	AV4	0.00
54	60	52	AV5	0.00
54	60	23	AV6	0.00

SPECIAL REPORT
TABLE 1
TUBE IMPERFECTIONS - STEAM GENERATOR 'A'

ROW	COLUMN	INDICATION % WALL THINNING	LOCATION	INCH(+) FROM LOCATION
41	61	21	AV3	0.00
41	61	27	AV4	0.00
51	61	31	AV1	0.00
51	61	28	AV2	0.00
51	61	39	AV3	0.00
51	61	23	AV4	0.00
51	61	25	AV6	0.00
53	64	24	AV5	0.00
53	64	30	AV6	0.00
46	65	20	AV5	0.00
46	67	29	AV4	0.00
32	78	24	AV6	0.00
50	79	23	AV3	0.00
50	79	22	AV4	0.00
46	83	20	AV3	0.00
39	86	26	AV4	0.00
46	88	35	AV2	0.00
46	88	29	AV3	0.00
46	88	26	AV4	0.00
46	88	25	AV5	0.00
46	90	49	AV4	0.00
39	92	20	AV4	0.00
42	94	22	AV3	0.00
42	94	23	AV5	0.00
42	96	35	AV2	0.00
42	96	38	AV3	0.00
42	96	21	AV5	0.00
46	96	31	AV2	0.00
46	96	43	AV5	0.00
42	97	20	AV5	0.00

SPECIAL REPORT
TABLE 1
TUBE IMPERFECTIONS - STEAM GENERATOR 'A'

ROW	COLUMN	INDICATION % WALL THINNING	LOCATION	INCH(+) FROM LOCATION
39	100	30	AV3	0.00
33	111	28	AV3	0.00
33	111	27	AV5	0.00
32	112	27	AV2	0.00
29	114	22	AV2	0.00
29	114	21	AV6	0.00

SPECIAL REPORT
TABLE 1
TUBE IMPERFECTIONS - STEAM GENERATOR 'D'

ROW	COLUMN	INDICATION % WALL THINNING	LOCATION	INCH(+) FROM LOCATION
27	8	25	AV1	0.00
28	8	20	AV6	0.00
29	9	35	AV5	0.00
31	10	32	AV2	0.00
31	10	21	AV5	0.00
31	12	21	AV2	0.00
34	14	28	AV3	0.00
34	14	26	AV4	0.00
35	16	34	AV3	0.00
35	17	29	AV3	0.00
19	17	36	AV3	0.00
39	17	36	AV4	0.00
40	23	30	AV5	0.00
41	23	30	AV3	0.00
41	23	30	AV4	0.00
40	24	21	AV4	0.00
40	24	21	AV5	0.00
43	24	48	AV4	0.00
43	25	23	AV2	0.00
43	25	25	AV4	0.00
43	25	31	AV5	0.00
48	25	42	AV4	0.00
41	26	26	AV4	0.00
47	27	28	AV3	0.00
47	27	35	AV5	0.00
44	28	28	AV2	0.00
44	28	38	AV3	0.00
44	28	22	AV4	0.00
45	28	27	AV2	0.00
45	28	21	AV4	0.00

SPECIAL REPORT
TABLE 1
TUBE IMPERFECTIONS - STEAM GENERATOR 'D'

ROW	COLUMN	INDICATION % WALL THINNING	LOCATION	INCH(+) FROM LOCATION
45	28	21	AV5	0.00
41	29	33	AV4	0.00
47	33	28	AV3	0.00
47	33	37	AV5	0.00
47	34	25	AV2	0.00
47	34	32	AV4	0.00
47	34	29	AV5	0.00
46	39	25	AV3	0.00
46	39	54	AV4	0.00
46	39	25	AV5	0.00
48	42	26	AV4	0.00
47	43	30	AV4	0.00
47	43	24	AV5	0.00
37	44	20	AV3	0.00
47	44	23	AV3	0.00
47	44	27	AV4	0.00
47	44	26	AV5	0.00
51	47	30	AV2	0.00
46	50	27	AV3	0.00
46	50	24	AV4	0.00
52	65	48	AV2	0.00
52	65	40	AV3	0.00
52	65	41	AV4	0.00
52	65	21	AV5	0.00
52	66	43	AV2	0.00
52	66	38	AV3	0.00
52	66	34	AV4	0.00
16	68	23	O3H	31.49
52	68	28	AV2	0.00
52	68	31	AV3	0.00

SPECIAL REPORT
TABLE 1
TUBE IMPERFECTIONS - STEAM GENERATOR 'D'

ROW	COLUMN	INDICATION % WALL THINNING	LOCATION	INCH(+) FROM LOCATION
52	68	28	AV5	0.00
37	72	27	AV4	0.00
52	73	25	AV2	0.00
52	73	28	AV3	0.00
52	73	23	AV4	0.00
46	81	23	AV3	0.00
46	83	22	AV2	0.00
46	83	22	AV3	0.00
50	83	46	AV4	0.00
27	84	21	AV5	0.00
47	84	34	AV4	0.00
49	84	27	AV3	0.00
49	84	30	AV4	0.00
49	84	28	AV5	0.00
42	89	22	AV4	0.00
48	89	33	AV3	0.00
49	90	40	AV2	0.00
39	91	24	AV4	0.00
48	92	38	AV2	0.00
48	92	25	AV4	0.00
48	92	21	AV6	0.00
48	93	40	AV3	0.00
49	94	21	AV2	0.00
49	94	24	AV5	0.00
36	110	28	AV3	0.00
36	110	4F	AV4	0.00
36	110	27	AV6	0.00
32	112	30	AV6	0.00
33	112	30	AV4	0.00

SPECIAL REPORT
TABLE 1
TUBE IMPERFECTIONS - STEAM GENERATOR 'D'

ROW	COLUMN	INDICATION % WALL THINNING	LOCATION	INCH(+) FROM LOCATION
33	112	40	AV5	0.00
32	113	22	AV2	0.00
32	113	22	AV6	0.00