Duke Energy

H. B. Barron
Vice President

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May 30, 2002

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555-0001

Subject: McGuire Nuclear Station
Docket Nos. 50-370
Steam Generator In-Service Inspection Summary Report
Unit 2, End of Cycle (EOC) 14

Please find attached the Steam Generator In-Service Inspection (ISI) Outage Summary Report for the McGuire Unit 2, EOC 14 refueling outage. This report in submitted pursuant to the filing requirements of ASME Section XI Code 1989 Edition, paragraph IWA-6230.

Questions regarding this submittal should be directed to Kay Crane, McGuire Regulatory Compliance (704) 875-4306.

HB Barron

H. B. Barron

Attachment

A047

cc: L. A. Reyes
U. S. Nuclear Regulatory Commission
Regional Administrator, Region II
Atlanta Federal Center
61 Forsyth St. Suite 23T85
Atlanta, GA 30303

R. E. Martin
NRC Senior Project Manager (MNS)
U. S. Nuclear Regulatory Commission
Mail Stop 0-8 H12
Washington, DC 20555-0001

S. M. Shaeffer
Senior Resident Inspector (MNS)
U. S. Nuclear Regulatory Commission

bxc: G. W. Crump
EC050-ELL
Master File
RGC File

Steam Generator Outage Summary Report

McGuire Unit 2 2002
Outage EOC 14

Location: Hwy. 73, Cowans Ford, North Carolina 28216

NRC Docket No. 50-370

National Board No. 84

Commercial Service Date: March 1, 1984

Owner: Duke Energy Corporation
526 South Church St.
Charlotte, N.C. 28201-1006

Revision 0

Prepared By: _____ Date: 5/14/02

Reviewed By: _____ Date: 5·14·02

Approved By: _____ Date: 5/14/02

Copy No. 1 Assigned To: NRC Document Control

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Controlled Distribution

Copy No.	Assigned To
Original	McGuire Nuclear Station Document Control Master File MC 1201.35
1	NRC Document Control

Uncontrolled Distribution

2	Hartford Steam Boiler Inspection and Insurance Company of Connecticut (AIA)
3	State of North Carolina Department of Labor C/o J. M. Givens, Jr.

FORM NIS-1 OWNER'S DATA REPORT FOR INSERVICE INSPECTIONS

As required by the Provisions of the ASME Code Rules

1. **Owner:** Duke Power Company, 526 S. Church St.. Charlotte, NC 28201-1006
   (Name and Address of Owner)
2. **Plant:** McGuire Nuclear Station, 12700 Hagers Ferry Rd., Huntersville, NC 28078
   (Name and Address of Plant)
3. **Plant Unit:** 2 **4. Owner Certificate of Authorization (if required)** N/A
5. **Commercial Service Date** March 1, 1984 **6. National Board Number for Unit** 84
7. **Components Inspected:**

Component or Appurtenance	Manufacturer or Installer	Manufacturer or Installer Serial No.	State or Province No.	National Board No.
2B Steam Generator	B&W Canada	7700-04	N/A	161
2C Steam Generator	B&W Canada	7700-01	N/A	158

Note:Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is $8^1/_2$ in. x 11 in., (2) information in items 1 through 6 on this data report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

FORM NIS-1 (Back)

8. Examination Dates March 4, 2002 to March 13, 2002

9. Inspection Period Identification: 3rd Period of the 2nd Interval

10. Inspection Interval Identification: 2nd Interval

11. Applicable Edition of Section XI 1989 Addenda None

12. Date/Revision of Inspection Plan: 3/14/2002 Rev.1

13. Abstract of Examinations and Test. Refer to Attached Steam Generator Outage Summary Report

14. Abstract of Results of Examination and Tests. Refer to Attached Steam Generator Outage Summary Report

15. Abstract of Corrective Measures. Refer to Attached Steam Generator Outage Summary Report

We certify that a) the statements made in this report are correct b) the examinations and tests meet the Inspection Plan as required by the ASME Code, Section XI, and c) corrective measures taken conform to the rules of the ASME Code, Section XI.

Certificate of Authorization No. (if applicable) N/A Expiration Date N/A

Date May 21 20 02 Signed Duke Power Co. By William N Sample
Owner

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State of Province of North Carolina employed by * HSB CT have inspected the components described in this Owners' Report during the period March 4, 2002 to May 23, 2002, and state that to the best of my knowledge and belief, the Owner has performed examinations and tests and taken corrective measures described in the Owners' Report in accordance with the Inspection Plan and as required by the ASME Code, Section XI.

By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the examinations, test, and corrective measures described in this Owners' Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

[signature] Commissions NB7728, NC853, "N+I"
Inspector's Signature National Board, State, Province, and Endorsements

Date May 23 ~~19~~ 2002

* The Hartford Steam Boiler Inspection & Insurance Company of Connecticut
200 Ashford Center North
Suite 300
Atlanta, GA. 30338

DE&S

Duke Engineering & Services

Outage Summary Report

for

McGuire Nuclear Station

Unit 2 EOC 14

Project Manager _____ Date 5 - 9 - 02

1.0 Introduction

The Inconel 690 tubing in the two Babcock and Wilcox Canada (BWC) CFR 80 series recirculating steam generators (RSG's) B and C, at Duke Power Company's McGuire Unit 2 were examined with eddy current techniques in March 2002. The tubing in the steam generators measures 0.688" nominal O.D. X 0.040" nominal wall thickness. The eddy current examination was performed by DE&S and Framatome ANP personnel during the MNS 2-EOC-14 inservice inspection.

This report documents the bobbin coil and MRPC examination results.

2.0 Summary

The following is a summary of indications and/or tubes examined with eddy current for each steam generator.

Note: All bobbin examinations were performed with a Zetec or R/D Tech "tuned" probe in both steam generators.

2.1 RSG B

Bobbin

- 6630 tubes were examined full length
- 634 tubes (rows 1-9) were examined straight length from the cold leg
- 634 tubes (rows 1-9) were examined over the u-bend length from the hot leg

MRPC

- 1 outlet special interest location
- 27 u-bend special interest locations
- 3 inlet special interest location
- No mechanical plug inspection

2.3 RSG C

Bobbin

- 6632 tubes were examined full length
- 634 tubes (rows 1-9) were examined straight length from the cold leg
- 634 tubes (rows 1-9) were examined over the u-bend length from the hot leg

MRPC

- 20 outlet special interest locations
- 49 u-bend special interest locations
- 11 inlet special interest location
- No mechanical plug inspection

3.0 Examination

The examinations, equipment, and personnel were in compliance with the requirements of the DE&S NDE Procedure Manual for Inservice Inspection, the applicable Duke Power Technical Specifications, the ASME Boiler and Pressure Vessel Code Section XI, 1989 Edition, and industry standards. Analysis of the eddy current data was performed in accordance with "Eddy Current Analysis Guidelines for McGuire Unit 2 EOC 14".

The steam generator tubing examinations were performed by technicians qualified to Level II or higher, Level I personnel were under the direct supervision of a qualified Level II or higher. Personnel qualified to a minimum of Level IIA evaluated the data. The examination and evaluation techniques were approved by personnel qualified to Level III.

The bobbin coil examinations were performed with .560 inch diameter probes at frequencies of 650, 320, 170 and 35 kHz operating in differential and absolute modes. The frequencies were generated with a Zetec MIZ-30 Remote Data Acquisition Unit.

A 650/170 kHz differential tube support plate (TSP) suppression mix was used to enhance the detection of indications at TSP intersections. In addition, a 320/170 kHz absolute mix was used to detect wear indications at support plates and fan bars.

A 650/320/170/35 differential turbo mix was also used to enhance the detection of indications at tubesheet transitions and NQI indications. Additional process channels were used for automated analysis to enhance detection.

The MRPC examination was used as a supplemental examination to detect and characterize indications reported by bobbin.

The MRPC examination was performed with .540 or .520 inch diameter probes at frequencies of 400, 300, 200, 100 and 15 kHz. A 300/100 kHz absolute mix was used to improve the detection of indications at TSP locations.

Official results of the data analysis were recorded on optical disks and then loaded into the "Eddy current Inspection Management System" (EIMS) and the "Framatome Data Management System" (FDMS) data management systems. These systems were used to check the data for invalid analysis entries, perform data sorting routines, ensure that the required extents of all tubes in the inspection plan were examined, and to print out final data sheets.

Note: A list of all three-digit codes and acronyms used throughout this report can be found in "Attachment 3A" of the Bobbin Analysis Guidelines and "Attachment 1B" of the Rotating Coil Analysis Guidelines.

4.0 Results

The McGuire Unit 2 CFR 80 series steam generators have minimal manufacturing discontinuities with the eddy current results verifying a number of manufacturing burnish marks (MBM).

The "Absolute Drift Indications" (ADI) code was used for reporting absolute signals for indications where an adequate differential response was not present and the absolute signal was indicative of degradation.

The "Non-Quantifiable Indications" (NQI) code was used for reporting signals of interests where two differential channels did not correlate within 10% or an accurate percent throughwall could not be assigned.

The following are results from the Bobbin and MRPC examinations:

4.1 RSG B:

4.1.1 Bobbin Coil Examination

3 tubes with 4 ADI indications
0 tubes with 0 DNT indications
0 tubes with 0 NQI indications
26 tubes with 27 Fan Bar Wear indications
2 tubes with 2 PLP indications

4.1.2 All MRPC Examinations

1 tube with 1 Volumetric indication
No I code indications
24 tubes with 24 Fan Bar Wear indications (Confirmed with Pancake)
2 tubes with 2 PLP indications (confirmed with MRPC)
No tubes required repair

4.2 RSG C:

4.2.1 Bobbin Coil Examination

6 tubes with 7 ADI indications
1 tube with 1 DNT indication
0 tubes with 0 NQI indications
22 tubes with 22 PLP indications
55 tubes with 55 Fan Bar Wear indications

4.2.2 MRPC Examination

0 tubes with 0 Volumetric indications
No I code indications
55 tubes with 44 Fan Bar Wear indications (Confirmed with Pancake)
22 tubes with 2 PLP indications (confirmed with MRPC)
No tubes required repair

5.0 Documentation

All optical disks (working copies) and row/column examination results will be retained by DE&S.

March 18, 2002

Michael T. Cash
Regulatory Compliance -MG02RC

Attention: Kay Crane

Subject: McGuire Nuclear Station
Unit 2 Steam Generator
NRC Inspection Report - 15 Day & 12 Month

Dear Sir,

Pursuant to Technical Specification 5.6.8 part b., the following information is submitted:

1. The following quantity of tubes were inspected from either side of the Generator.

Steam Generator	Quantity	Inspection Method
B	6630	Bobbin
B	29	MRPC
C	6632	Bobbin
C	79	MRPC

2. The following information is submitted concerning tube indications of imperfections. (The attached list identifies the tubes with imperfections, their locations and their size.)

Steam Generator	Attachment
B	1
C	2

3. There were no tubes removed from service by plugging.

For further information, please contact me at 704-875-5563.

Sincerely,

Emma N. Currence

Emma N. Currence
Eddy Current Data Administrator

cc:	w/o Attachments	W.F. Brady	- EC090
		R.W. Eaker	- EC07E
		W.M. Sample	- EC07E
		W.K. Davis	- EC07E
	w/Attachments	G.W. Crump	- EC07E
		D.E. Kinard	- MG01MM

Indications of Imperfection

Attachment 1

ROW	COL	VOLTS	DEG	CHN	IND	%TW	LOCATION	EXT	EXT	UTIL 1	UTIL 2	CAL #	LEG	PROBE
2	123	0.65	42	6	HNI		08H +30.70	09C	TEH			50	HOT	560BP
9	130	0.20	83	6	HNI		03H +18.51	09C	TEH			48	HOT	560BP
12	85	0.30	78	6	ADI		08C +36.49	TEC	TEH			26	HOT	560RD
25	24	0.35	76	6	HNI		06C +34.56	TEH	TEC			41	COLD	560RD
47	80	0.27	88	6	HNI		04H +30.70	TEC	TEH			24	HOT	560RD
49	70	0.35	84	6	HNI		01H +27.87	TEH	TEC			33	COLD	560RD
49	82	0.71	18	P 1	HNI		09C +12.11	TEC	TEH			26	HOT	560RD
54	73	0.14	86	6	HNI		05H +13.51	TEC	TEH			24	HOT	560RD
54	83	0.15	93	6	HNI		04H +16.44	TEC	TEH			28	HOT	560RD
58	71	0.37	91	6	ADI		02H +20.55	TEH	TEC			35	COLD	560UL
		0.58	96	6	ADI		06H +14.06	TEH	TEC			35	COLD	560UL
62	61	1.58	16	1	HNI		09C +13.02	TEH	TEC			53	COLD	560RD
62	93	0.23	92	P 2	TWD	6	FB5 +1.64	TEH	TEC	WAR		91	COLD	560RD
		0.15	18	P 3	TWD	5	FB5 +2.05	FB5	FB5	WAR		99	COLD	460SI
64	77	0.18	81	6	ADI		05H +12.09	TEC	TEH			24	HOT	560RD
66	83	0.19	84	6	HNI		05H +10.77	TEC	TEH			28	HOT	560RD
68	71	0.33	131	P 1	HNI		CBH +3.03	TEH	TEC			33	COLD	560RD
70	67	0.18	0	P 2	TWD	5	FB5 +0.56	TEC	TEH	WAR		100	HOT	560UL
		0.26	0	P 3	TWD	8	FB5 +0.35	FB5	FB5	WAR		108	HOT	540SI
72	53	0.37	86	6	HNI		01H +24.66	TEH	TEC			21	COLD	560UL
72	89	0.13	77	P 2	TWD	4	FB8 +1.22	TEC	TEH	WAR		76	HOT	560BP
		0.10	0	P 3	TWD	3	FB8 +0.83	FB8	FB8	WAR		97	COLD	540SI
73	66	0.14	0	P 2	TWD	4	FB4 +0.58	TEC	TEH	WAR		100	HOT	560UL
		0.24	0	P 3	TWD	7	FB4 +0.73	FB4	FB4	WAR		108	HOT	540SI
75	108	0.22	66	6	HNI		04H +24.41	TEC	TEH			18	HOT	560RD
76	77	0.53	97	6	HNI		02C +20.64	TEC	TEH			8	HOT	560RD
77	66	0.12	0	P 2	TWD	3	FB4 +0.49	TEC	TEH	WAR		100	HOT	560UL
		0.28	0	P 3	TWD	8	FB4 +0.69	FB4	FB4	WAR		108	HOT	540SI
78	61	0.18	0	P 2	TWD	5	FB5 -1.89	TEC	TEH	WAR		100	HOT	560UL
		0.17	0	P 3	TWD	5	FB5 -1.89	FB4	FB5	WAR		108	HOT	540SI
78	77	0.17	99	P 2	TWD	5	FB2 +0.81	TEC	TEH	WAR		76	HOT	560BP
79	66	0.15	0	P 2	TWD	4	FB4 +0.58	TEC	TEH	WAR		100	HOT	560UL
80	67	0.23	0	P 3	TWD	8	FB3 -1.75	FB2	FB3	WAR		106	HOT	540SI
		0.23	0	P 2	TWD	6	FB3 -1.75	TEC	TEH	WAR		100	HOT	560UL
81	78	0.21	87	P 2	TWD	6	FB5 +0.98	TEC	TEH	WAR		76	HOT	560BP
84	67	0.24	0	P 3	TWD	9	FB4 +1.67	FB4	FB5	WAR		106	HOT	540SI
		0.15	0	P 2	TWD	4	FB4 +1.67	TEC	TEH	WAR		100	HOT	560UL
85	64	0.32	108	P 3	TWD	7	FB7 +0.59	FB7	FB7	WAR		97	COLD	540SI
		0.17	0	P 2	TWD	5	FB7 +0.62	TEC	TEH	WAR		100	HOT	560UL
87	66	0.14	0	P 3	TWD	5	FB3 +0.70	09H	FB3	WAR		106	HOT	540SI
		0.19	0	P 2	TWD	5	FB3 +0.51	TEC	TEH	WAR		100	HOT	560UL
87	78	0.20	85	6	HNI		01C +31.78	TEC	TEH			6	HOT	560RD
89	72	0.27	74	6	HNI		09C +15.20	TEH	TEC			27	COLD	560RD
90	67	0.32	0	P 3	TWD	11	FB4 -1.09	FB4	FB4	WAR		106	HOT	540SI
		0.41	0	P 2	TWD	11	FB4 -0.73	TEC	TEH	WAR		100	HOT	560UL
		0.08	0	P 2	TWD	2	FB5 -1.07	TEC	TEH	WAR		100	HOT	560UL
		0.60	84	P 2	VOL		FB5 -1.25	FB5	FB5			101	COLD	460SI
91	60	0.24	0	P 3	TWD	9	FB3 -0.68	FB3	FB3	WAR		106	HOT	540SI
		0.18	0	P 2	TWD	5	FB3 -0.53	TEC	TEH	WAR		100	HOT	560UL
91	66	0.15	0	P 3	TWD	5	FB3 +0.62	FB3	FB3	WAR		106	HOT	540SI
		0.18	0	P 2	TWD	5	FB3 +0.64	TEC	TEH	WAR		100	HOT	560UL
91	68	0.16	0	P 3	TWD	6	FB3 +0.60	FB3	FB3	WAR		106	HOT	540SI
		0.12	0	P 2	TWD	3	FB3 +0.60	TEC	TEH	WAR		100	HOT	560UL
93	114	1.14	164	5	PLP		FB3 +7.13	TEC	TEH			20	HOT	560RD
		0.22	87	10	PLP		FB3 +6.89	FB3	FB4			108	HOT	540SI
		0.11	91	10	PLP		FB3 +7.69	FB3	FB4			108	HOT	540SI
95	114	1.39	160	5	PLP		FB3 +6.76	TEC	TEH			18	HOT	560RD
		0.21	68	10	PLP		FB3 +6.80	FB3	FB4			108	HOT	540SI
		0.10	94	10	PLP		FB3 +7.63	FB3	FB4			108	HOT	540SI
98	75	0.14	76	P 2	TWD	4	FB6 +1.80	TEC	TEH	WAR		76	HOT	560BP
		0.09	10	P 3	TWD	2	FB6 +1.85	FB6	FB6	WAR		97	COLD	540SI
99	74	0.28	53	P 2	TWD	8	FB4 +1.00	TEC	TEH	WAR		76	HOT	560BP
		0.16	0	P 3	TWD	6	FB4 +1.02	FB4	FB4	WAR		106	HOT	540SI
99	80	1.17	72	6	HNI		08C +31.55	TEC	TEH			12	HOT	560RD
100	95	0.47	71	6	HNI		TSH +8.73	TEC	TEH			14	HOT	560RB
101	66	0.15	0	P 3	TWD	6	FB3 +0.67	FB3	FB3	WAR		106	HOT	540SI
		0.17	0	P 2	TWD	4	FB3 +0.56	TEC	TEH	WAR		100	HOT	560UL
102	61	0.30	0	P 3	TWD	11	FB4 -1.13	FB4	FB4	WAR		106	HOT	540SI
		0.47	0	P 2	TWD	12	FB4 -1.20	TEC	TEH	WAR		100	HOT	560UL
103	76	0.13	115	P 2	TWD	4	FB3 +1.69	TEC	TEH	WAR		76	HOT	560BP
		0.15	0	P 3	TWD	6	FB3 +1.69	FB3	FB4	WAR		106	HOT	540SI
104	49	0.25	91	6	HNI		04H +25.66	TEH	TEC			19	COLD	560UL
105	66	0.27	0	P 2	TWD	7	FB3 +0.70	TEC	TEH	WAR		100	HOT	560UL
		0.33	0	P 3	TWD	10	FB3 +0.70	FB3	FB3	WAR		108	HOT	540SI

Indications of Imperfection
Attachment 1

QUERY: QueryM1

ROW	COL	VOLTS	DEG	CHN	IND	%TW	LOCATION		EXT	EXT	UTIL 1	UTIL 2	CAL #	LEG	PROBE
106	75	0.12	115	P 2	TWD	3	FB6	+1.79	TEC	TEH	WAR		76	HOT	560BP
		0.17	0	P 3	TWD	5	FB6	+1.69	FB6	FB6	WAR		97	COLD	540SI
107	66	0.10	0	P 2	TWD	2	FB3	+0.62	TEC	TEH	WAR		100	HOT	560UL
		0.17	0	P 3	TWD	5	FB3	+0.62	FB3	FB3	WAR		108	HOT	540SI
108	61	0.26	0	P 3	TWD	9	FB4	+1.22	FB4	FB4	WAR		106	HOT	540SI
		0.36	0	P 2	TWD	10	FB4	+0.64	TEC	TEH	WAR		100	HOT	560UL

Total Tubes : 50
Total Records: 80

McGUIRE UNIT 2 S/G B REPAIR LETTER RFO-02

STEAM GENERATOR	ROW	COL	COMMENTS
B			No Tubes To Be Repair

Independent QDA Review Analysts:

Carson R. Black III _____

Prepared & Approved By :

Ronald D. Smathers _____ 3/11/02

ECT Concurrence :

Indications of Imperfection

Attachment 2

ROW	COL	VOLTS	DEG	CHN	IND	%TW	LOCATION		EXT	EXT	UTIL 1	UTIL 2	CAL #	LEG	PROBE
1	28	1.22	257	7	PLP		07H	+3.64	09C	TEH			38	HOT	560BP
1	128	11.08	179	1	DNT		CBH	+6.23	09C	TEH			46	HOT	560BP
2	11	1.16	65	6	ADI		04C	+32.04	CBC	TEC			73	COLD	560RD
7	6	1.16	258	7	PLP		06H	+7.82	09C	TEH			36	HOT	560BP
11	52	0.15	86	6	ADI		01C	+7.14	TEC	TEH			34	HOT	560RD
13	128	1.09	259	7	PLP		06C	+20.44	TEH	TEC			31	COLD	560RD
27	30	0.85	78	6	HNI		03H	+13.06 TO+24.71	TEC	TEH			16	HOT	560RD
27	44	0.15	86	6	HNI		01H	+25.53	TEC	TEH			30	HOT	560RD
		0.12	84	6	HNI		01H	+23.64	TEC	TEH			30	HOT	560RD
43	60	0.16	87	6	HNI		01H	+5.69	TEC	TEH			62	HOT	560UL
47	50	0.23	0	P 2	TWD	6	FB4	+0.56	TEC	TEH	WAR		84	HOT	560BP
48	71	1.25	67	6	HNI		01H	+20.16	TEC	TEH			56	HOT	560UL
48	77	0.04	0	P 2	TWD	1	FB5	+1.59	TEH	TEC	WAR		103	COLD	560RD
		0.15	0	P 3	TWD	2	FB5	+1.49	FB5	FB5	WAR		104	HOT	520SI
49	34	0.23	86	6	ADI		02H	+21.67	TEC	TEH			18	HOT	560RD
		0.16	72	6	ADI		02H	+19.11	TEC	TEH			18	HOT	560RD
49	46	0.22	79	6	HNI		02C	+7.74	TEC	TEH			32	HOT	560RD
		0.16	74	6	HNI		02C	+8.60	TEC	TEH			32	HOT	560RD
51	86	0.22	0	P 2	TWD	5	FB4	-1.60	TEH	TEC	WAR		103	COLD	560RD
53	94	0.17	0	P 2	TWD	4	FB5	+1.63	TEH	TEC	WAR		103	COLD	560RD
		0.28	0	P 3	TWD	4	FB5	+1.68	FB5	FB5	WAR		104	HOT	520SI
54	67	0.19	0	P 2	TWD	5	FB4	-1.63	TEC	TEH	WAR		84	HOT	560BP
		0.22	0	P 3	TWD	4	FB4	-1.66	FB4	FB4	WAR		102	HOT	520SI
54	75	0.14	0	P 2	TWD	3	FB4	+0.97	TEH	TEC	WAR		103	COLD	560RD
54	91	0.07	65	7	PLP		TSC	+11.47	TEH	TEC			49	COLD	560RD
56	61	0.17	0	P 2	TWD	5	FB5	+1.65	TEC	TEH	WAR		84	HOT	560BP
		0.20	0	P 3	TWD	3	FB5	+1.53	FB5	FB5	WAR		104	HOT	520SI
57	82	0.09	0	P 2	TWD	2	FB3	-1.57	TEH	TEC	WAR		103	COLD	560RD
		0.21	0	P 3	TWD	3	FB3	-1.52	FB3	FB3	WAR		104	HOT	520SI
57	90	0.35	55	7	PLP		TSC	+11.50	TEH	TEC			51	COLD	560RD
58	51	0.10	0	P 2	TWD	3	FB4	-1.20	TEC	TEH	WAR		84	HOT	560BP
58	79	0.17	0	P 2	TWD	4	FB5	+1.54	TEH	TEC	WAR		103	COLD	560RD
		0.18	0	P 3	TWD	3	FB5	+1.54	FB5	FB5	WAR		104	HOT	520SI
58	89	0.33	56	7	PLP		TSC	+11.55	TEH	TEC			51	COLD	560RD
58	91	0.26	54	7	PLP		TSC	+11.45	TEH	TEC			49	COLD	560RD
59	92	0.14	59	7	PLP		TSC	+11.50	TEH	TEC			49	COLD	560RD
60	91	0.26	59	7	PLP		TSC	+11.66	TEH	TEC			47	COLD	560RD
61	64	0.18	0	P 2	TWD	5	FB4	-1.69	TEC	TEH	WAR		84	HOT	560BP
		0.22	0	P 3	TWD	4	FB4	-1.80	FB4	FB4	WAR		102	HOT	520SI
61	80	0.17	0	P 2	TWD	4	FB5	-0.94	TEH	TEC	WAR		103	COLD	560RD
		0.22	0	P 3	TWD	3	FB5	-1.04	FB5	FB5	WAR		104	HOT	520SI
61	90	0.28	52	7	PLP		TSC	+11.56	TEH	TEC			51	COLD	560RD
61	92	0.15	50	7	PLP		TSC	+11.46	TEH	TEC			47	COLD	560RD
62	89	0.17	61	7	PLP		TSC	+11.53	TEH	TEC			51	COLD	560RD
62	91	0.18	52	7	PLP		TSC	+11.42	TEH	TEC			49	COLD	560RD
63	60	0.14	0	P 2	TWD	4	FB5	+0.80	TEC	TEH	WAR		84	HOT	560BP
		0.16	0	P 3	TWD	2	FB5	+0.64	FB5	FB5	WAR		104	HOT	520SI
63	92	0.10	60	7	PLP		TSC	+11.52	TEH	TEC			49	COLD	560RD
64	91	0.17	50	7	PLP		TSC	+11.68	TEH	TEC			47	COLD	560RD
65	54	0.11	0	P 2	TWD	3	FB5	+0.82	TEC	TEH	WAR		84	HOT	560BP
65	90	0.19	51	7	PLP		TSC	+11.49	TEH	TEC			51	COLD	560RD
66	89	0.12	51	7	PLP		TSC	+11.50	TEH	TEC			51	COLD	560RD
66	91	0.17	54	7	PLP		TSC	+11.47	TEH	TEC			49	COLD	560RD
68	15	0.49	80	6	HNI		02H	+19.14	TEC	TEH			18	HOT	560RD
		0.24	50	6	HNI		TSH	+14.81	TEC	TEH			18	HOT	560RD
68	49	0.18	0	P 2	TWD	5	FB5	-0.60	TEC	TEH	WAR		84	HOT	560BP
68	53	0.17	0	P 2	TWD	5	FB4	+1.07	TEC	TEH	WAR		84	HOT	560BP
68	63	0.15	0	P 2	TWD	4	FB5	-1.71	TEC	TEH	WAR		84	HOT	560BP
68	85	0.29	0	P 2	TWD	7	FB5	+0.94	TEH	TEC	WAR		103	COLD	560RD
68	91	0.12	56	7	PLP		TSC	+11.47	TEH	TEC			47	COLD	560RD
69	90	0.15	58	7	PLP		TSC	+11.56	TEH	TEC			51	COLD	560RD
71	64	0.11	0	P 2	TWD	3	FB5	+1.19	TEC	TEH	WAR		90	HOT	560BP
71	88	0.46	0	P 3	TWD	9	FB5	+1.51	FB5	FB5	WAR		102	HOT	520SI
		0.22	0	P 2	TWD	6	FB5	+1.42	TEC	TEH	WAR		90	HOT	560BP
72	73	0.25	165	P 3	TWD	6	FB4	-0.97	FB4	FB4	WAR		100	HOT	540SI
		0.16	0	P 2	TWD	4	FB4	-0.98	TEC	TEH	WAR		90	HOT	560BP
75	66	0.10	27	P 3	TWD	2	FB4	-1.18	FB4	FB4	WAR		100	HOT	540SI
		0.08	0	P 2	TWD	2	FB4	-1.01	TEC	TEH	WAR		90	HOT	560BP
78	67	0.16	135	P 3	TWD	4	FB5	-0.90	FB5	FB5	WAR		100	HOT	540SI
		0.06	0	P 2	TWD	1	FB5	-0.93	TEC	TEH	WAR		90	HOT	560BP
80	45	0.42	70	6	ADI		08H	+32.97	TEC	TEH			74	HOT	560BP
80	67	0.58	109	P 3	TWD	13	FB5	+1.35	FB5	FB5	WAR		100	HOT	540SI
		0.38	0	P 2	TWD	10	FB5	+1.22	TEC	TEH	WAR		90	HOT	560BP
80	79	0.14	133	P 3	TWD	3	FB4	-1.86	FB4	FB4	WAR		100	HOT	540SI
		0.25	0	P 2	TWD	6	FB4	-1.68	TEC	TEH	WAR		90	HOT	560BP

Indications of Imperfection
Attachment 2

QUERY: QueryM1

ROW	COL	VOLTS	DEG	CHN	IND	%TW	LOCATION		EXT	EXT	UTIL 1	UTIL 2	CAL #	LEG	PROBE
81	64	0.39	15	P 3	TWD	9	FB4	+1.28	FB4	FB4	WAR		100	HOT	540SI
		0.21	0	P 2	TWD	6	FB4	+1.22	TEC	TEH	WAR		90	HOT	560BP
82	61	0.08	12	P 3	TWD	2	FB5	-1.55	FB5	FB5	WAR		100	HOT	540SI
		0.03	0	P 2	TWD	1	FB5	-1.48	TEC	TEH	WAR		90	HOT	560BP
82	79	0.08	15	P 3	TWD	2	FB4	-1.58	FB4	FB4	WAR		100	HOT	540SI
		0.19	0	P 2	TWD	5	FB4	-1.60	TEC	TEH	WAR		90	HOT	560BP
82	85	0.13	56	P 2	TWD	3	FB5	-0.71	TEC	TEH	WAR		90	HOT	560BP
		0.24	0	P 3	TWD	4	FB5	-0.84	FB5	FB5	WAR		104	HOT	520SI
86	65	0.12	166	P 3	TWD	3	FB5	-0.61	FB5	FB5	WAR		100	HOT	540SI
		0.03	0	P 2	TWD	1	FB5	-0.63	TEC	TEH	WAR		90	HOT	560BP
86	79	0.11	111	P 3	TWD	3	FB4	-1.79	FB4	FB4	WAR		100	HOT	540SI
		0.20	0	P 2	TWD	5	FB4	-1.68	TEC	TEH	WAR		90	HOT	560BP
86	89	0.10	34	P 3	TWD	3	FB4	+1.51	FB4	FB4	WAR		100	HOT	540SI
		0.09	0	P 2	TWD	2	FB4	+1.39	TEC	TEH	WAR		90	HOT	560BP
87	84	0.08	0	P 2	TWD	2	FB5	+0.76	TEC	TEH	WAR		90	HOT	560BP
88	85	0.15	151	P 3	TWD	4	FB4	-1.57	FB4	FB4	WAR		100	HOT	540SI
		0.21	0	P 2	TWD	5	FB4	-1.71	TEC	TEH	WAR		90	HOT	560BP
90	61	0.19	0	P 2	TWD	5	FB4	-0.93	TEC	TEH	WAR		90	HOT	560BP
		0.13	0	P 3	TWD	5	FB4	-1.05	FB4	FB4	WAR		117	COLD	540SI
90	117	0.84	61	6	HNI		09H	+10.17	TEH	TEC	HR		11	COLD	560RD
92	73	0.15	133	P 3	TWD	4	FB5	-0.76	FB5	FB5	WAR		98	HOT	540SI
		0.18	0	P 2	TWD	5	FB5	-0.79	TEC	TEH	WAR		90	HOT	560BP
93	80	0.15	163	P 3	TWD	5	FB7	+1.79	FB7	FB7	WAR		96	HOT	540SI
		0.19	0	P 2	TWD	5	FB7	+1.86	TEC	TEH	WAR		90	HOT	560BP
94	87	0.14	23	P 3	TWD	4	FB5	+1.48	FB5	FB5	WAR		96	HOT	540SI
		0.23	0	P 2	TWD	6	FB5	+1.68	TEC	TEH	WAR		90	HOT	560BP
95	76	0.18	44	P 3	TWD	6	FB4	-0.70	FB4	FB4	WAR		96	HOT	540SI
		0.13	0	P 2	TWD	3	FB4	-0.73	TEC	TEH	WAR		90	HOT	560BP
96	83	0.23	85	P 2	TWD	6	FB5	-1.31	TEC	TEH	WAR		90	HOT	560BP
		0.12	0	P 3	TWD	5	FB5	-1.26	FB5	FB5	WAR		117	COLD	540SI
98	79	0.16	83	6	ADI		01H	+19.29	TEH	TEC			23	COLD	560RD
98	85	0.21	159	P 3	TWD	7	FB5	-1.54	FB5	FB5	WAR		96	HOT	540SI
		0.29	0	P 2	TWD	7	FB5	-1.69	TEC	TEH	WAR		90	HOT	560BP
98	89	0.14	82	6	ADI		01H	+20.53	TEH	TEC			17	COLD	560RD
99	86	0.32	124	P 3	TWD	10	FB4	+0.75	FB4	FB4	WAR		96	HOT	540SI
		0.28	0	P 2	TWD	7	FB4	+0.68	TEC	TEH	WAR		90	HOT	560BP
101	80	0.25	146	P 3	TWD	8	FB4	+0.77	FB4	FB4	WAR		96	HOT	540SI
		0.30	0	P 2	TWD	8	FB4	+0.58	TEC	TEH	WAR		90	HOT	560BP
102	77	0.27	43	P 3	TWD	9	FB3	+0.56	FB3	FB3	WAR		96	HOT	540SI
		0.19	0	P 2	TWD	5	FB3	+0.52	TEC	TEH	WAR		90	HOT	560BP
104	57	1.15	77	6	HNI		06C	+29.03 TO+16.71	TEC	TEH			68	HOT	560BP
105	78	0.17	0	P 2	TWD	4	FB4	+1.33	TEC	TEH	WAR		90	HOT	560BP
105	84	0.12	131	P 3	TWD	4	FB4	+0.74	FB4	FB4	WAR		96	HOT	540SI
		0.23	0	P 2	TWD	6	FB4	+0.68	TEC	TEH	WAR		90	HOT	560BP
107	78	0.08	196	P 3	TWD	2	FB3	+1.65	FB3	FB3	WAR		96	HOT	540SI
		0.17	0	P 2	TWD	4	FB3	+1.86	TEC	TEH	WAR		90	HOT	560BP
107	80	0.10	163	P 3	TWD	3	FB7	+1.66	FB7	FB7	WAR		96	HOT	540SI
		0.17	0	P 2	TWD	4	FB7	+1.86	TEC	TEH	WAR		90	HOT	560BP
108	75	0.10	8	P 3	TWD	3	FB4	-1.68	FB4	FB4	WAR		96	HOT	540SI
		0.10	0	P 2	TWD	3	FB4	-1.75	TEC	TEH	WAR		90	HOT	560BP
110	77	0.09	0	P 3	TWD	2	FB3	+0.58	FB3	FB3	WAR		96	HOT	540SI
		0.13	0	P 2	TWD	3	FB3	+0.71	TEC	TEH	WAR		90	HOT	560BP
110	79	0.06	8	P 3	TWD	2	FB7	+0.59	FB7	FB7	WAR		96	HOT	540SI
		0.05	0	P 2	TWD	1	FB7	+0.58	TEC	TEH	WAR		90	HOT	560BP
110	91	0.20	71	P 3	TWD	6	FB4	+1.30	FB4	FB4	WAR		96	HOT	540SI
		0.07	0	P 2	TWD	2	FB4	+1.37	TEC	TEH	WAR		90	HOT	560BP
111	80	0.14	17	P 3	TWD	4	FB4	-1.05	FB4	FB4	WAR		96	HOT	540SI
		0.07	169	P 3	TWD	2	FB4	+1.21	FB4	FB4	WAR		96	HOT	540SI
		0.03	0	P 2	TWD	1	FB4	+1.34	TEC	TEH	WAR		90	HOT	560BP
112	73	2.63	144	7	PLP		TSH	+13.87	TSH	01H			92	HOT	540SI
		1.56	63	7	PLP		TSH	+13.65	TEH	TEC			21	COLD	560RD
113	72	0.72	52	7	PLP		TSH	+13.91	TEC	TEH			64	HOT	560BP
		2.18	144	7	PLP		TSH	+13.81	TSH	01H			92	HOT	540SI
114	83	0.12	92	P 3	TWD	4	FB4	-1.50	FB4	FB4	WAR		96	HOT	540SI
		0.07	0	P 2	TWD	2	FB4	-1.47	TEC	TEH	WAR		90	HOT	560BP
115	76	0.13	99	P 3	TWD	4	FB3	+1.59	FB3	FB3	WAR		96	HOT	540SI
		0.12	0	P 2	TWD	3	FB3	+1.80	TEC	TEH	WAR		90	HOT	560BP

Total Tubes : 92
Total Records: 142

Indications of Imperfection
Attachment 2

QUERY: QueryM1

ROW	COL	VOLTS	DEG	CHN	IND	%TW	LOCATION	EXT	EXT	UTIL 1	UTIL 2	CAL #	LEG	PROBE

STEAM GENERATOR	ROW	COL	COMMENTS
C			No Tubes To Be Repair

Independent QDA Review Analysts:

Carson R. Black III

Prepared & Approved By :

Ronald D. Smathers 7/12/02

ECT Concurrence :

STEAM GENERATOR TUBE REPAIR LIST

Station/Unit/Outage MNS2 EOC14 Date 3/12/02 REVISION 0

STEAM GENERATOR	ROW	COL	REPAIR METHOD HL	CL	COMMENTS
A	**Not Inspected**				
B	**No Tubes Require Repair**				
C	**No Tubes Require Repair**				
D	**Not Inspected**				

APPROVALS:

SGME Engineering

ECT Coordinator or Designee

KEY TO REPAIRS

P - Inconel 690 Rolled Mechanical Plug
ST- Rolled Plug with a Wire Rope Stabilizer (Length)
RWP - Remote Welded Plug
MWP -Manual Welded Plug
SP- Sleeve Plug
ROLL- Upper Tube Sheet Re-roll