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April 15, 1994

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

Gentlemen:

Subject: Docket No. 50-361  
Special Report Inservice Inspection of Steam Generator Tubes  
San Onofre Nuclear Generating Station, Unit 2

- References:
1. PWR Steam Generator Examination Guidelines, Revision 2, Electric Power Research Institute (EPRI) Report Number NP-6201, dated December 1988.
  2. Letter from M. O. Medford (SCE) to Mr. G. W. Knighton (USNRC) dated April 5, 1985.

Pursuant to Surveillance Requirement 4.4.4.5(b) of Appendix A, Technical Specifications to Facility Operating License NPF-10, this report is being submitted to the Commission following the completion of an inservice inspection of steam generator tubes at San Onofre Unit 2.

Eddy current inspection of the steam generator tubing was completed on July 20, 1993. A total of 11,937 tubes (66.0% of the tubes in service) in two steam generators were inspected full length and 32 tubes were removed from service by mechanical plugging. This inspection significantly exceeded the amount of tubing required to be inspected per Surveillance Requirements 4.4.4.0 through 4.4.4.2, including all prospective C-2 expansions [i.e., a 3% sample plus a 6% (2S) and a 12% (4S) expansion in each steam generator].

The planned inspection programs for both steam generators were fully consistent with industry recommendations in the "PWR Steam Generator Examination Guidelines" (Reference 1). The programs included inspection of the full length of 100% of the tubing in the central cavity region of the tube bundle where the batwing wear mechanism previously described in Reference 2 is active, and tubes adjacent to tie-rods.

The inspection programs for both steam generators were expanded. The expansions included local bounding of tubes to be plugged, inspection of the full length of all tubes not in the inspection programs within the past four years, and inspection of all tubes with a motorized rotating pancake coil (MRPC) probe at the inlet top-of-tubesheet location.

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In Steam Generator E-088, 5987 tubes were inspected full length. Two tubes were found with the MRPC probe to have a circumferential indication at the inlet top-of-tubesheet location and were plugged. One tube was found with the MRPC probe to have axial indications at the inlet top-of-tubesheet, and was plugged. One tube was found with the MRPC probe to have a volumetric indication (i.e., no specific axial or circumferential aspect) at the inlet top-of-tubesheet, and was plugged. One tube was preventively plugged due to tie-rod denting. Three tubes were preventively plugged due to degradation at a vertical strap support. Three tubes were preventively plugged due to degradation at a batwing support.

In Steam Generator E-089, 5950 tubes were inspected full length. Ten tubes were found with the MRPC probe to have circumferential indications at the inlet top-of-tubesheet location and were plugged. One tube was found with the MRPC probe to have an axial indication at the inlet top-of-tubesheet, and was plugged. One tube was found to be defective due to a 57% throughwall indication one inch above the inlet top-of-tubesheet, and was plugged. MRPC probe testing of this indication revealed that the indication is axially oriented. Two tubes were found to be defective, due to greater than 90% throughwall indications within the explosively expanded region within the tubesheet, and were plugged. MRPC probe testing of these two tubes within the tubesheet revealed that the indications are axially oriented.

One tube in E-089 was found to be defective, due to a 89% throughwall indication at the sixth eggcrate support on the inlet side of the tube, and was plugged. MRPC probe testing of this indication, and an indication in this tube at the fifth eggcrate support on the inlet side of the tube, revealed an axial indication at each of these locations. One other tube in E-089 had a similar axial indication at the sixth eggcrate support on the inlet side of the tube, and it was plugged.

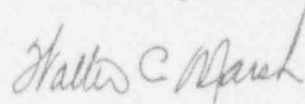
Also, in E-089 two tubes were preventively plugged due to degradation at a vertical strap support. One tube was preventively plugged due to degradation at an eggcrate support. Two tubes were preventively plugged due to degradation at a batwing support.

As required by Surveillance Requirement 4.4.4.5(b), complete results of the recently completed inservice inspection of steam generator tubing are provided in the enclosures. Enclosure 1 provides the steam generator internal location reference guide. The eddy current indication locations listed in the remaining enclosures are based upon this guide. Enclosure 2 provides a list of abbreviations used to describe the indications from MRPC probe testing in the remaining enclosures.

Enclosures 3 and 5 provide a list of eddy current testing indications, including tube identification, indication depth for bobbin probe indications, indication description for MRPC probe indications, and the axial location of the indication in the tube. Enclosures 4 and 6 provide a list of tubes plugged after completion of the inservice inspection.

If you require any additional information, please so advise.

Sincerely,

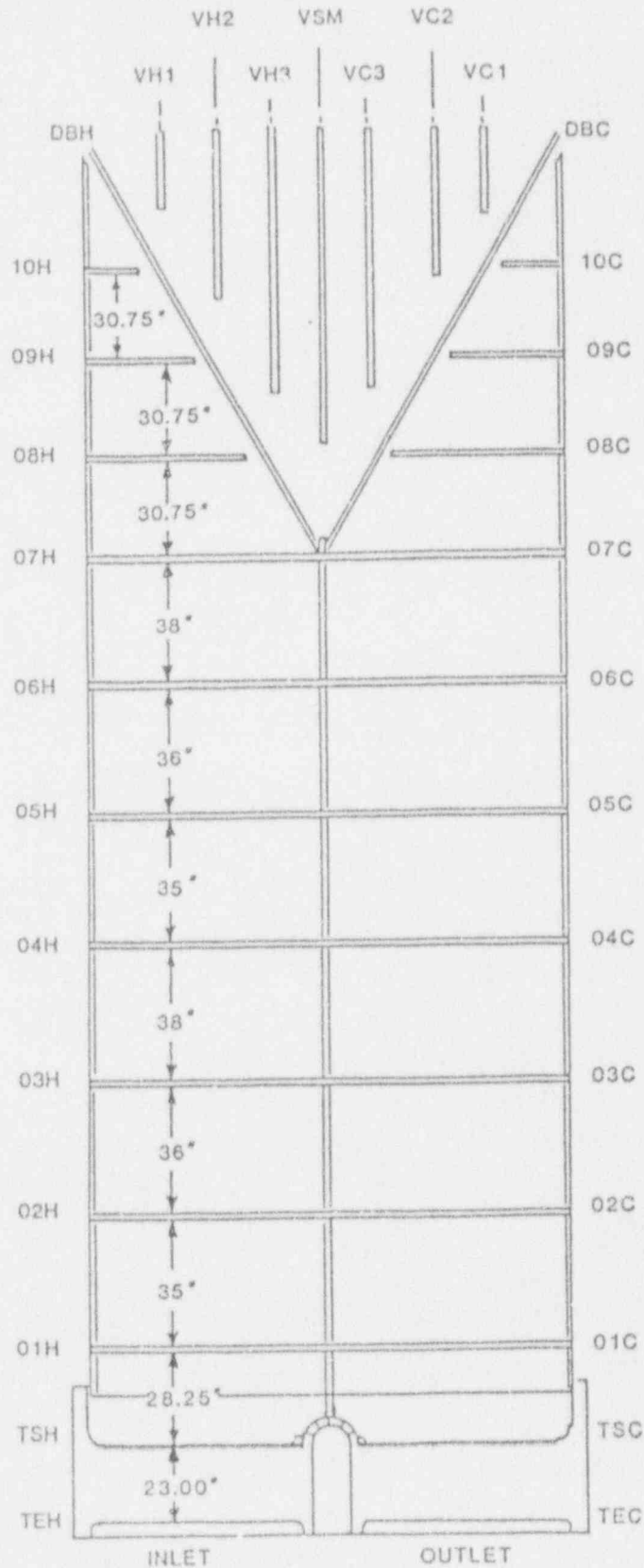


Enclosures (6)

cc: L. J. Callan, Regional Administrator, NRC Region IV  
K. E. Perkins, Jr., Director, Walnut Creek Field Office, NRC Region IV  
J. A. Sloan, NRC Senior Resident, San Onofre Units 1, 2 & 3  
M. B. Fields, NRC Project Manager, San Onofre Units 2 and 3  
Institute of Nuclear Power Operations (INPO)

Enclosure 1

CE MODEL 3410 TUBE SUPPORT DRAWING



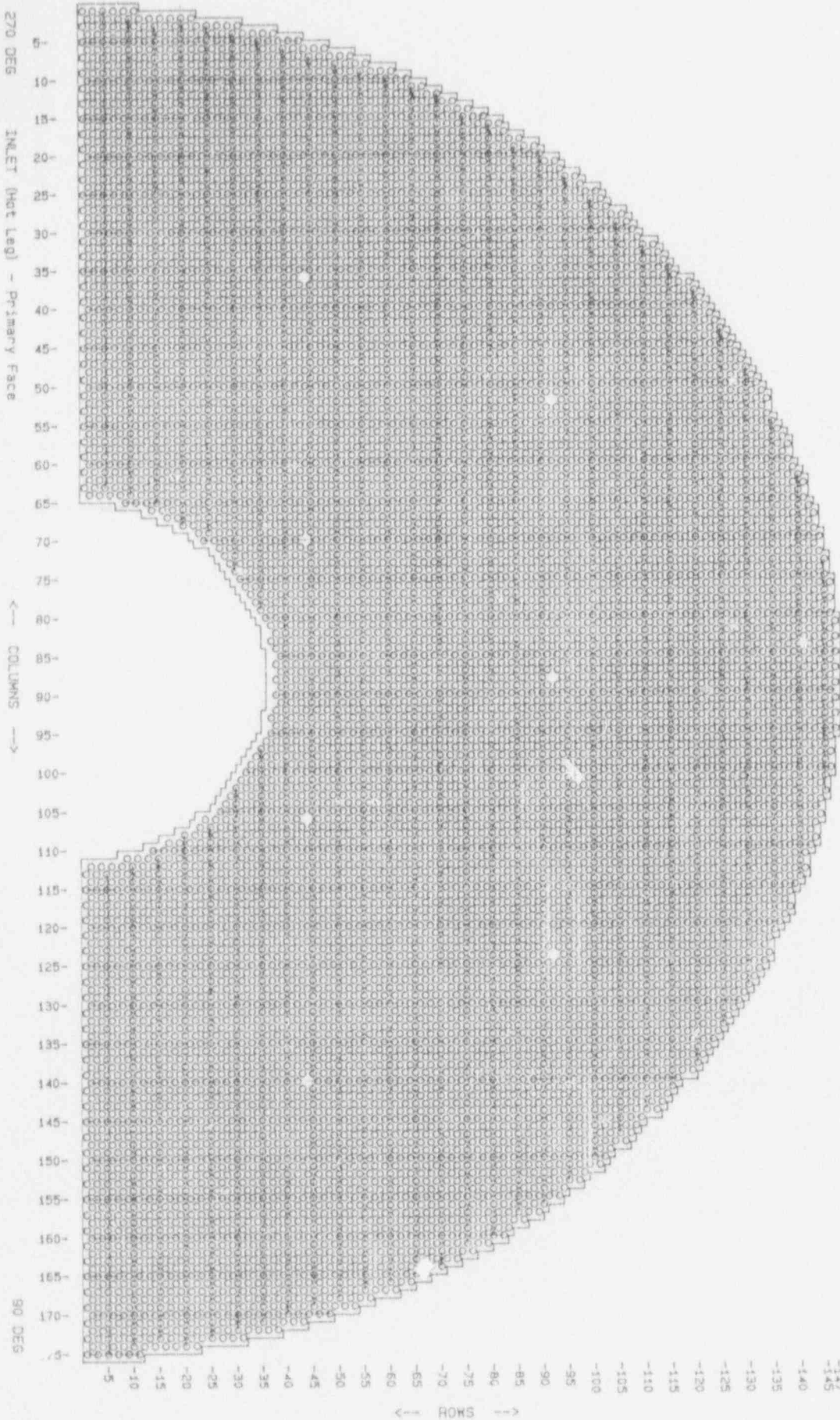
## Enclosure 1

CLARIFICATION OF TUBING/SUPPORT INTERFACES  
 ABOVE THE 7TH FULL EGGCRATE SUPPORT

<u>ROW(S)</u>	<u>TUBING/SUPPORT INTERFACES</u>					
120-147	08H,09H,10H, DBH, VH1, VH2, VH3, VSM, VC3, VC2, VC1, DBC, 10C, 09C, 08C					
115-119	08H,09H	DBH, VH1, VH2, VH3, VSM, VC3, VC2, VC1, DBC	09C, 08C			
84-114	08H,09H	DBH	VH2, VH3, VSM, VC3, VC2	DBC	09C, 08C	
83	08H	DBH	VH2, VH3, VSM, VC3, VC2	DBC	08C	
51-82	08H	DBH	VH3, VSM, VC3,	DBC	08C	
49-50	08H	DBH	VSM	DBC	08C	
19-48		DBH	VSM	DBC		
1-18		DBH		DBC		

COMBUSTION ENGINEERING MODEL 3410 STEAM GENERATOR TUBESHEET MAP

TOTAL TUBES : 9350



Enclosure 2

LIST OF ABBREVIATIONS USED TO DESCRIBE THE INDICATIONS  
FROM MRPC PROBE TESTING

<u>Abbreviation</u>	<u>Explanation of the Abbreviation</u>
SCI	Single Circumferential Indication
MCI	Multiple Circumferential Indications
SAI	Single Axial Indication
MAI	Multiple Axial Indications
SVI	Single Volumetric Indication (i.e., no specific axial or circumferential aspect)

Enclosure 3

CUMULATIVE REPORT

06/93, SOUTHERN CALIFORNIA EDISON, SAN ONOFRE, UNIT 2

STEAM GENERATOR : 88  
 OUTAGE DATA SET : CURRENT  
 SELECTION VARIABLES: Percent

PAGE: 1 OF 2  
 DATE: 02/02/94  
 TIME: 12:06:44

ROW	COL	EXP #	LEG	EXAM EXTENT		EXP	CAL	PROBE	LOCATION	CURRENT				
				PROGRAM	ACTUAL					VOLTS	MIL	DEG	%	CH
76	14	7,8,5	C	TEC-TEH	TEC-TEH		00035	580UL	VSM- 0.82	0.64		74	<20	2
			C	TEC-TEH	TEC-TEH		00035	580UL	VSM+ 0.61	1.54		146	30	2
			C	TEC-TEH	TEC-TEH		00035	580UL	VC3- 0.93	0.69		149	<20	2
			C	TEC-TEH	TEC-TEH		00035	580UL	VC3- 0.58	0.54		117	<20	2
43	19	7,8	C	TEC-TEH	TEC-TEH		00036	580UL	O2H+ 0.88	0.71		115	<20	1
89	19	7,8	C	TEC-TEH	TEC-TEH		00036	580UL	DBC- 1.49	0.82		106	21	P 2
78	22	8	C	TEC-TEH	TEC-TEH		00011	580UL	VC3- 0.93	1.08		31	<20	P 2
54	28	8	C	TEC-TEH	TEC-TEH		00001	580UL	O5C+ 19.31	0.74		158	<20	1
19	33	8	C	TEC-TEH	TEC-TEH		00001	580UL	O2C+ 5.83	0.66		154	<20	1
27	33	8	C	TEC-TEH	TEC-TEH		00001	580UL	O4H+ 2.05	1.96		155	<20	1
111	35	2,8,5	C	TEC-TEH	TEC-TEH		00021	580UL	VSM+ 0.00	1.30		143	30	P 2
82	38	1,3	C	TEC-TEH	TEC-TEH		00011	580UL	VC3- 0.39	1.13		50	21	P 2
21	39	7,8	C	TEC-TEH	TEC-TEH		00038	580UL	O5C+ 15.64	0.93		147	21	1
11	53	8	C	TEC-TEH	TEC-TEH		00004	580UL	O5C+ 20.23	0.85		148	<20	1
29	57	8,7	H	TSH-TSH	TSH-TSH		00077	600RC	TSH+ 0.00	5.49		19	SCI	6
58	68		C	TEC-TEH	TEC-TEH		00006	580UL	TSH+ 1.60	0.75		145	20	1
46	70		C	TEC-TEH	TEC-TEH		00007	580UL	TSH+ 2.00	1.67		155	<20	1
52	70	7,8	C	TEC-TEH	TEC-TEH		00045	580UL	VH3+ 0.83	0.63		111	<20	2
144	70	7,8,5	C	TEC-TEH	TEC-TEH		00046	580UL	DBC+ 1.82	1.64		120	34	2
123	73	8	C	TEC-TEH	TEC-TEH		00007	580UL	TSH+ 0.80	0.98		152	<20	1
69	75	7,8	C	TEC-TEH	TEC-TEH		00047	580UL	VH3- 0.82	0.37		11	<20	2
			C	TEC-TEH	TEC-TEH		00047	580UL	VSM+ 1.12	0.53		55	<20	2
133	75	7,8	C	TEC-TEH	TEC-TEH		00047	580UL	DBH+ 2.34	0.47		127	<20	2
135	75	7,8	C	TEC-TEH	TEC-TEH		00047	580UL	DBH+ 2.23	1.50		123	30	2
145	75	7,8	C	TEC-TEH	TEC-TEH		00047	580UL	DBH+ 2.20	0.92		52	22	2
101	77	5,8	C	TEC-TEH	TEC-TEH		00021	580UL	DBH+ 1.17	0.92		108	25	P 2
119	77	8	C	TEC-TEH	TEC-TEH		00021	580UL	VH2+ 0.00	0.82		63	24	P 2
146	78	1,8	C	TEC-TEH	TEC-TEH		00020	580UL	DBC- 1.37	1.08		90	28	P 2
143	79	7,8	C	TEC-TEH	TEC-TEH		00047	580UL	DBC+ 1.31	1.26		36	27	2
147	81	8,7	C	TEC-TEH	TEC-TEH		00082	580UL	DBC- 1.85	0.48		40	<20	2
55	83	1	C	TEC-TEH	TEC-TEH		00010	580UL	DBH- 2.06	0.73		153	<20	P 2
61	83	1	H	TSH-TSH	TSH-TSH		00002	600RC	TSH+ 0.18	2.20		103	SVI	4
147	83	1,8,5	C	TEC-TEH	TEC-TEH		00020	580UL	DBC+ 1.21	2.26		120	42	P 2
52	84	8	C	TEC-TEH	TEC-TEH		00010	580UL	DBC- 1.60	0.54		98	<20	P 2
147	89	7,8	C	TEC-TEH	TEC-TEH		00051	580UL	VC1+ 0.58	0.39		99	<20	2
49	93	1	C	TEC-TEH	TEC-TEH		00012	580UL	DBC- 1.59	1.02		107	<20	P 2
107	93	1,3	C	TEC-TEH	TEC-TEH		00012	580UL	DBH+ 0.00	0.28		27	<20	P 2
50	94	8	C	TEC-TEH	TEC-TEH		00012	580UL	DBC- 2.03	0.64		62	<20	P 2
147	95	7,8	C	TEC-TEH	TEC-TEH		00052	580UL	VC1+ 0.76	0.85		87	23	2
72	98		C	TEC-TEH	TEC-TEH		00013	580UL	O2C+ 2.74	0.99		147	24	1
118	102	5,8	C	TEC-TEH	TEC-TEH		00014	580UL	DBH- 2.58	0.56		86	<20	P 2
			C	TEC-TEH	TEC-TEH		00014	580UL	DBH+ 2.30	0.81		147	23	P 2
138	102	5,8	C	TEC-TEH	TEC-TEH		00014	580UL	DBH- 1.30	1.29		153	29	P 2
71	103		H	TSH-TSH	TSH-TSH		00007	600RC	TSH+ 0.00	1.26		82	SCI	6
58	108		C	TEC-TEH	TEC-TEH		00025	580UL	TSH+ 3.16	0.73		147	22	1



CUMULATIVE REPORT  
06/93, SOUTHERN CALIFORNIA EDISON, SAN ONOFRE, UNIT 2

STEAM GENERATOR : 88  
OUTAGE DATA SET : CURRENT  
SELECTION VARIABLES: Percent

PAGE: 2 OF 2  
DATE: 02/02/94  
TIME: 12:06:44

ROW	COL	EXP #	LEG	EXAM EXTENT		EXP	CAL	PROBE	LOCATION	CURRENT				
				PROGRAM	ACTUAL					VOLTS	MIL	DEG	%	CH
54	110	6,8	H	TSH-TSH	TSH-TSH		00120	600RC	TSH+ 0.98	4.41		79	MAI	4
			C	TEC-TEH	TEC-TEH		00032	58OUL	TSH+ 1.26	1.95		141	27	1
78	110	6,8	C	TEC-TEH	TEC-TEH		00032	58OUL	VH3- 0.83	0.31		64	<20	P 2
90	110	6,8	C	TEC-TEH	TEC-TEH		00032	58OUL	VH3+ 0.86	0.26		127	<20	P 2
53	111	6,8	C	TEC-TEH	TEC-TEH		00032	58OUL	TSH+ 1.49	1.32		150	24	1
27	117	8,5	C	TEC-TEH	TEC-TEH		00082	58OUL	VSM- 0.87	1.07		45	28	2
			C	TEC-TEH	TEC-TEH		00016	58OUL	VSM+ 0.00	1.87		83	35	P 2
112	120	7,8	C	TEC-TEH	TEC-TEH		00063	58OUL	DBC+ 0.00	0.89		202	20	2
51	123		C	TEC-TEH	TEC-TEH		00018	58OUL	DBC- 0.05	0.25		74	<20	P 2
122	124	1,3	C	TEC-TEH	TEC-TEH		00019	58OUL	DBH+ 2.03	0.43		87	<20	P 2
73	133	8	C	TEC-TEH	TEC-TEH		00020	58OUL	VH3+ 0.00	0.47		31	<20	P 2
28	134	7,8	C	TEC-TEH	TEC-TEH		00062	58OUL	VSM+ 0.84	0.53		46	<20	2
112	144	7,8	C	TEC-TEH	TEC-TEH		00066	58OUL	DBH+ 2.12	1.51		113	28	2
15	165	7,8	C	TEC-TEH	TEC-TEH		00068	58OUL	O4H+ 24.38	0.66		152	<20	1
67	165	7,8	C	TEC-TEH	TEC-TEH		00068	58OUL	VH3- 0.72	1.08		71	23	2

NUMBER OF TUBES SELECTED FROM CURRENT OUTAGE: 53  
NUMBER OF DATA RECORDS SELECTED FROM CURRENT OUTAGE: 60

NO TREND ANALYSIS REQUESTED

DATA SELECTION CRITERIA:  
Percent: MAI, MCI, SCI, SAI, SVI, 0 to 100%

REPORT OPTIONS:  
Only examination results matching criteria are included

MAP OPTIONS:  
Plot Variable = Percent ThruWall  
Plot data from current examination only

Enclosure 4

LIST OF TUBES PLUGGED

San Onofre Unit 2 Steam Generator E-088

<u>Row</u>	<u>Column</u>	<u>Reason</u>
76	14	Preventive Maintenance
111	35	Preventive Maintenance
29	57	SCI at TSH + 0.0 inches
144	70	Preventive Maintenance
135	75	Preventive Maintenance
61	83	Preventive Maintenance
147	83	Preventive Maintenance
71	103	SCI at TSH + 0.0 inches
54	110	MAI at TSH + 0.98 inches
27	117	Preventive Maintenance
45	139	Preventive Maintenance

Enclosure 5

CUMULATIVE REPORT

06/93, SOUTHERN CALIFORNIA EDISON, SAN ONOFRE, UNIT 2

STEAM GENERATOR : 89  
 OUTAGE DATA SET : CURRENT  
 SELECTION VARIABLES: Percent

PAGE: 1 OF 4  
 DATE: 02/02/94  
 TIME: 12:25:37

ROW	COL	EXP#	LEG	EXAM EXTENT		EXP	CAL	PROBE	LOCATION	CURRENT				
				PROGRAM	ACTUAL					VOLTS	MIL	DEG	%	CH
22	2	8,5	C	TEC-TEH	TEC-TEH		00000	58OUL	VSM- 0.78	0.70		53	26	P 2
48	8	8	C	TEC-TEH	TEC-TEH		00000	58OUL	DBH- 1.78	0.45		52	20	P 2
13	9	8,7	C	TEC-TEH	TEC-TEH		00030	58OUL	O2C+ 6.69	0.79		154	<20	1
54	10	8,7	C	TEC-TEH	TEC-TEH		00029	58OUL	VH3+ 0.85	0.51		295	<20	P 2
64	10	8,7	C	TEC-TEH	TEC-TEH		00029	58OUL	O3C- 1.08	0.40		144	<20	P 2
59	13	8	C	TEC-TEH	TEC-TEH		00000	58OUL	VH3+ 0.52	0.33		17	<20	P 2
26	14	8,7	C	TEC-TEH	TEC-TEH		00029	58OUL	VSM+ 0.82	0.52		47	<20	P 2
44	18	8	C	TEC-TEH	TEC-TEH		00000	58OUL	VSM- 1.16	0.35		67	<20	P 2
62	18	1,3	C	TEC-TEH	TEC-TEH		00000	58OUL	VH3+ 0.53	0.36		17	<20	P 2
53	19	8,7	C	TEC-TEH	TEC-TEH		00032	58OUL	VC3+ 0.83	0.40		120	<20	P 2
			C	TEC-TEH	TEC-TEH		00031	58OUL	VC3+ 0.83	0.40		120	<20	P 2
77	25	8,7	C	TEC-TEH	TEC-TEH		00032	58OUL	VH3- 0.96	0.32		57	<20	P 2
91	27	8,7	H	06H-06H	06H-06H		00111	60ORC	O6H+ 0.48	16.64		14	SAI	4
56	28	8	C	TEC-TEH	TEC-TEH		00002	58OUL	VC3- 0.72	0.27		93	<20	P 2
72	28	1,3	C	TEC-TEH	TEC-TEH		00001	58OUL	DBC- 0.35	0.39		25	<20	P 2
91	29	8,7	H	TSH-TSH	TEH-TSH		00043	60ORC	TEH+ 15.39	13.24		23	SAI	4
			C	TEC-TEH	TEC-TEH		00032	58OUL	TEH+ 18.48	5.71		58	92	P 1
			H	TSH-TSH	TEH-TSH		00043	60ORC	TEH+ 18.93	40.32		28	SAI	4
84	30	8,7	C	TEC-TEH	TEC-TEH		00032	58OUL	O7H+ 27.05	0.88		153	<20	1
91	31	8,4	C	TEC-TEH	TEC-TEH		00017	58OUL	VH2+ 0.65	0.31		78	<20	P 2
47	33	8	C	TEC-TEH	TEC-TEH		00002	58OUL	DBH+ 2.46	0.60		28	22	P 2
91	33	8	H	05H-06H	05H-06H		00002	60ORC	O5H+ 0.67	9.03		19	SAI	P 1
			H	05H-06H	05H-06H		00002	60ORC	O6H+ 0.67	56.43		33	SAI	4
			C	TEC-TEH	TEC-TEH		00002	58OUL	O6H+ 0.79	28.03		47	89	P 1
99	33	8	C	TEC-TEH	TEC-TEH		00002	58OUL	VSM- 0.81	0.37		67	<20	P 2
			C	TEC-TEH	TEC-TEH		00002	58OUL	VSM+ 0.60	0.33		65	<20	P 2
			C	TEC-TEH	TEC-TEH		00002	58OUL	VC2- 0.98	0.55		70	20	P 2
111	33	8	C	TEC-TEH	TEC-TEH		00002	58OUL	VH2- 0.74	1.19		113	32	P 2
94	34	8,4	C	TEC-TEH	TEC-TEH		00017	58OUL	VH2+ 0.83	0.41		35	<20	P 2
101	35	8,7	C	TEC-TEH	TEC-TEH		00033	58OUL	VH3- 0.99	0.26		83	<20	P 2
113	35	8,7	C	TEC-TEH	TEC-TEH		00033	58OUL	VSM- 0.62	1.02		59	30	P 2
			C	TEC-TEH	TEC-TEH		00033	58OUL	VC3- 1.02	0.68		154	23	P 2
108	38	8	C	TEC-TEH	TEC-TEH		00003	58OUL	VH2+ 0.38	0.42		57	<20	P 2
118	38	8	C	TEC-TEH	TEC-TEH		00003	58OUL	O3H- 1.22	0.18		154	<20	P 2
49	39	8,7	C	TEC-TEH	TEC-TEH		00033	58OUL	VSM- 0.68	0.35		117	<20	P 2
108	42	8	C	TEC-TEH	TEC-TEH		00004	58OUL	DBH- 2.57	0.52		98	22	P 2
			C	TEC-TEH	TEC-TEH		00004	58OUL	DBH+ 2.25	0.53		108	22	P 2
116	42	8	C	TEC-TEH	TEC-TEH		00004	58OUL	O4H+ 9.76	0.74		155	<20	1
122	42	8	C	TEC-TEH	TEC-TEH		00004	58OUL	DBC- 2.80	0.74		118	27	P 2
48	44	8,7	C	TEC-TEH	TEC-TEH		00035	58OUL	VSM- 0.76	0.33		53	<20	P 2
81	45	8,7	C	TEC-TEH	TEC-TEH		00035	58OUL	O7H+ 0.41	0.25		55	<20	P 2
121	45	1,3	C	TEC-TEH	TEC-TEH		00005	58OUL	VC2- 0.71	0.79		114	25	P 2
			C	TEC-TEH	TEC-TEH		00036	58OUL	VC2- 0.48	0.68		104	23	P 2
			C	TEC-TEH	TEC-TEH		00005	58OUL	VC1- 0.99	0.42		135	<20	P 2
39	47	8,7	H	TSH-TSH	TSH-TSH		00057	60ORC	TSH+ 0.01	8.24		33	SCI	6

CUMULATIVE REPORT  
06/93, SOUTHERN CALIFORNIA EDISON, SAN ONOFRE, UNIT 2

STEAM GENERATOR : 89  
OUTAGE DATA SET : CURRENT  
SELECTION VARIABLES: Percent

PAGE: 2 OF 4  
DATE: 02/02/94  
TIME: 12:25:37

ROW	COL	ZXP#	LEG	EXAM EXTENT		EXP	CAL	PROBE	LOCATION	CURRENT					
				PROGRAM	ACTUAL					VOLTS	MIL	DEG	%	CH	
87	49	8,7	C	TEC-TEH	TEC-TEH		00036	580UL	VH2+	0.57	0.35		24	<20	P 2
129	49	8,7	C	TEC-TEH	TEC-TEH		00036	580UL	VH1+	6.62	0.66		176	<20	1
74	54	8	C	TEC-TEH	TEC-TEH		00008	580UL	04H+	24.22	0.63		146	<20	1
			C	TEC-TEH	TEC-TEH		00037	580UL	04H+	24.42	0.65		153	<20	1
118	54	8,7	C	TEC-TEH	TEC-TEH		00037	580UL	VH1-	0.84	0.32		117	<20	P 2
101	63	8	C	TEC-TEH	TEC-TEH		00011	580UL	VC2-	1.30	0.44		132	<20	P 2
44	64	8,7	H	TSH-TSH	TSH-TSH		00064	600RC	TSH+	0.11	6.71		97	SCI	4
88	64	8,7	H	TSH-TSH	TSH-TSH		00043	600RC	TSH+	0.97	2.52		93	SAI	4
			C	TEC-TEH	TEC-TEH		00039	580UL	TSH+	1.17	1.62		124	57	1
133	65	8,7	C	TEC-TEH	TEC-TEH		00040	580UL	DBC-	2.58	0.27		33	<20	P 2
143	67	8	C	TEC-TEH	TEC-TEH		00012	580UL	DBH-	1.90	0.49		154	20	P 2
			C	TEC-TEH	TEC-TEH		00012	580UL	DBH+	2.10	0.61		88	22	P 2
143	69	8	C	TEC-TEH	TEC-TEH		00012	580UL	10H+	1.23	0.57		137	22	2
50	70	8,7	C	TEC-TEH	TEC-TEH		00073	580UL	08H+	0.94	0.41		53	<20	P 2
52	70	8,7	H	TSH-TSH	TSH-TSH		00069	600RC	TSH+	0.12	1.51		153	SCI	4
138	70	8	C	TEC-TEH	TEC-TEH		00012	580UL	DBH+	0.57	0.26		19	<20	P 2
31	71	8	C	TEC-TEH	TEC-TEH		00073	580UL	DBH-	2.05	0.48		120	<20	P 2
			C	TEC-TEH	TEC-TEH		00073	580UL	DBC-	1.34	0.43		45	<20	P 2
141	71	8	C	TEC-TEH	TEC-TEH		00013	580UL	DBH+	27.53	0.41		109	<20	P 2
58	72	8	C	TEC-TEH	TEC-TEH		00097	580UL	DBC-	1.96	0.50		126	<20	P 2
143	73	8	C	TEC-TEH	TEC-TEH		00013	580UL	DBC-	1.64	0.15		107	<20	P 2
145	73	1,8	C	TEC-TEH	TEC-TEH		00013	580UL	VC1-	0.74	0.27		81	<20	P 2
			C	TEC-TEH	TEC-TEH		00013	580UL	DBC-	1.69	0.27		158	<20	P 2
44	76	8	C	TEC-TEH	TEC-TEH		00074	580UL	DBC-	1.21	0.44		157	<20	P 2
54	78		C	TEC-TEH	TEC-TEH		00015	580UL	04H+	8.43	0.57		146	22	1
72	78		C	TEC-TEH	TEC-TEH		00015	580UL	VH3-	0.60	0.70		36	24	P 2
76	78		C	TEC-TEH	TEC-TEH		00015	580UL	VC3+	0.71	0.44		93	<20	P 2
119	79	8	C	TEC-TEH	TEC-TEH		00015	580UL	VH3+	1.48	0.17		163	<20	P 2
60	80	8	C	TEC-TEH	TEC-TEH		00089	580UL	VH3+	0.65	0.41		135	<20	P 2
145	81	8	C	TEC-TEH	TEC-TEH		00108	580UL	VH1+	0.91	0.38		105	<20	P 2
52	84	8	C	TEC-TEH	TEC-TEH		00016	580UL	DBH+	1.96	0.34		72	<20	P 2
147	85	8,7	C	TEC-TEH	TEC-TEH		00044	580UL	DBC-	1.77	0.43		12	<20	P 2
146	86	8,7	C	TEC-TEH	TEC-TEH		00087	580UL	DBH+	1.98	0.86		154	29	P 2
56	88	1,3	C	TEC-TEH	TEC-TEH		00016	580UL	VSM-	0.77	0.56		102	<20	P 2
68	88		C	TEC-TEH	TEC-TEH		00016	580UL	TSH+	1.20	0.59		148	21	1
82	88	1	C	TEC-TEH	TEC-TEH		00016	580UL	DBH+	0.00	0.32		59	<20	P 2
63	89	8	H	TSH-TSH	TSH-TSH		00072	600RC	TSH+	0.23	2.59		233	SAI	4
147	89	8,7,5	C	TEC-TEH	TEC-TEH		00044	580UL	DBH+	2.20	1.74		85	38	P 2
			C	TEC-TEH	TEC-TEH		00044	580UL	DBC+	1.60	0.88		103	26	P 2
62	90	8	C	TEC-TEH	TEC-TEH		00018	580UL	VC3+	0.89	0.37		278	<20	P 2
125	91	8	C	TEC-TEH	TEC-TEH		00018	580UL	03H+	27.69	0.79		157	<20	1
127	93	1,3	C	TEC-TEH	TEC-TEH		00018	580UL	03H+	0.91	0.33		121	<20	P 1
147	93	1,8	C	TEC-TEH	TEC-TEH		00018	580UL	VC1+	1.01	0.55		145	<20	P 2
54	94	8	C	TEC-TEH	TEC-TEH		00019	580UL	VSM+	0.92	0.52		204	<20	P 2
			C	TEC-TEH	TEC-TEH		00019	580UL	VC3-	0.49	0.29		146	<20	P 2

CUMULATIVE REPORT  
06/93, SOUTHERN CALIFORNIA EDISON, SAN ONOFRE, UNIT 2

STEAM GENERATOR : 89  
OUTAGE DATA SET : CURRENT  
SELECTION VARIABLES: Percent

PAGE: 3 OF 4  
DATE: 02/02/94  
TIME: 12:25:37

ROW	COL	EXP#	LEG	EXAM EXTENT		EXP	CAL	PROBE	LOCATION	CURRENT				
				PROGRAM	ACTUAL					VOLTS	MIL	DEG	%	CH
59	95	8	C	TEC-TEH	TEC-TEH		00044	580UL	DBC- 0.80	0.44		26	<20	P 2
91	95	8,7	H	TSH-TSH	TSH-TSH		00074	600RC	TSH- 0.04	10.34		20	SCI	4
117	95	8,7	C	TEC-TEH	TEC-TEH		00053	580UL	DBC+ 0.72	0.48		102	<20	P 2
147	95	8,7	C	TEC-TEH	TEC-TEH		00059	580UL	DBH+ 1.63	1.40		72	32	P 2
88	96	8,7	H	TSH-TSH	TSH-TSH		00074	600RC	TSH+ 0.00	12.31		17	MCI	4
89	97	8,7	H	TSH-TSH	TSH-TSH		00074	600RC	TSH- 0.04	8.25		13	SCI	4
56	98		C	TEC-TEH	TEC-TEH		00019	580UL	VSM+ 0.77	0.32		106	<20	P 2
112	98	1,3	C	TEC-TEH	TEC-TEH		00020	580UL	03C- 0.17	0.42		131	<20	P 2
49	99	8	C	TEC-TEH	TEC-TEH		00020	580UL	DBH- 2.02	0.39		18	<20	P 2
51	99	8	C	TEC-TEH	TEC-TEH		00020	580UL	VSM- 0.95	0.40		77	<20	P 2
99	99	8,7	H	TSH-TSH	TSH-TSH		00075	600RC	TSH- 0.11	12.74		26	SCI	4
78	100	8,7	H	TSH-TSH	TSH-TSH		00075	600RC	TSH- 0.13	12.55		24	SCI	4
126	100	8,7	C	TEC-TEH	TEC-TEH		00058	580UL	10H- 1.00	2.38		86	41	P 2
146	100	8,7	C	TEC-TEH	TEC-TEH		00058	580UL	DBH+ 2.13	0.68		156	20	P 2
36	102	8	C	TEC-TEH	TEC-TEH		00020	580UL	DBC- 0.65	0.13		4	<20	P 2
69	103		C	TEC-TEH	TEC-TEH		00021	580UL	TSH+ 4.33	1.44		157	<20	1
38	106	8	C	TEC-TEH	TEC-TEH		00021	580UL	VSM- 0.56	0.22		128	<20	P 2
50	108	3	H	TSH-TSH	TSH-TSH		00109	600RC	TSH+ 0.06	2.72		88	SCI	6
56	108	3	C	TEC-TEH	TEC-TEH		00021	580UL	VSM+ 0.00	0.28		73	<20	P 2
106	108	8	C	TEC-TEH	TEC-TEH		00021	580UL	VC2- 0.61	0.28		76	<20	P 2
99	109	8,7	C	TEC-TEH	TEC-TEH		00057	580UL	VSM- 1.12	0.48		54	<20	P 2
141	109	8	C	TEC-TEH	TEC-TEH		00025	580UL	VH3- 0.17	0.67		48	26	P 2
40	112	8	H	TSH-TSH	TSH-TSH		00081	600RC	TSH+ 0.00	3.98		11	MCI	4
44	112	8	C	TEC-TEH	TEC-TEH		00026	580UL	VSM- 0.81	0.36		161	<20	P 2
124	114	8	C	TEC-TEH	TEC-TEH		00056	580UL	TSC+ 5.92	0.80		156	<20	1
14	116	8	C	TEC-TEH	TEC-TEH		00097	580UL	07H- 0.20	0.44		94	<20	P 2
126	118	8	C	TEC-TEH	TEC-TEH		00024	580UL	06C+ 0.85	0.47		13	<20	P 2
55	123		C	TEC-TEH	TEC-TEH		00028	580UL	VH2- 0.92	0.32		55	<20	P 2
95	123		C	TEC-TEH	TEC-TEH		00024	580UL	VH2- 0.91	0.44		146	<20	P 2
			C	TEC-TEH	TEC-TEH		00024	580UL	VH2+ 0.17	0.22		23	<20	P 2
127	123	1,3	C	TEC-TEH	TEC-TEH		00023	580UL	08H+ 26.27	1.38		160	<20	1
134	124	8,7	C	TEC-TEH	TEC-TEH		00046	580UL	VC3+ 0.62	0.28		64	<20	P 2
122	126	1,3	C	TEC-TEH	TEC-TEH		00023	580UL	VH1+ 1.11	0.38		138	22	P 2
81	127	8	C	TEC-TEH	TEC-TEH		00028	580UL	VSM- 0.54	0.54		151	20	P 2
			C	TEC-TEH	TEC-TEH		00028	580UL	VC3- 0.82	0.81		133	26	P 2
74	128	5	C	TEC-TEH	TEC-TEH		00102	58412	VSM- 0.85	0.92		76	28	P 2
			C	TEC-TEH	TEC-TEH		00028	580UL	VSM- 0.40	0.92		41	28	P 2
95	129	8,7	C	TEC-TEH	TEC-TEH		00054	580UL	04C+ 5.91	0.84		155	<20	1
119	129	1,3	C	TEC-TEH	TEC-TEH		00023	580UL	VH2+ 0.59	0.17		128	<20	P 2
78	130	8,7	C	TEC-TEH	TEC-TEH		00052	580UL	VSM- 1.15	0.25		144	<20	P 2
85	133	8	C	TEC-TEH	TEC-TEH		00028	580UL	VH2- 0.66	0.31		95	<20	P 2
80	136	8,5	C	TEC-TEH	TEC-TEH		00028	580UL	VH3- 0.94	0.80		71	26	P 2
			C	TEC-TEH	TEC-TEH		00102	58412	VH3- 0.93	0.81		81	26	P 2
62	140	8,7	C	TEC-TEH	TEC-TEH		00060	580UL	VSM- 0.72	0.39		40	<20	P 2
68	140	8,7	C	TEC-TEH	TEC-TEH		00060	580UL	TSH+ 3.62	0.44		124	23	P 1

CUMULATIVE REPORT  
06/93, SOUTHERN CALIFORNIA EDISON, SAN ONOFRE, UNIT 2

STEAM GENERATOR : 89  
OUTAGE DATA SET : CURRENT  
SELECTION VARIABLES: Percent

PAGE: 4 OF 4  
DATE: 02/02/94  
TIME: 12:25:37

ROW	COL	EXP#	LEG	EXAM EXTENT		EXP	CAL	PROBL	LOCATION	CURRENT				
				PROGRAM	ACTUAL					VOLTS	MIL	DEG	%	CH
66	144	8,7	C	TEC-TEH	TEC-TEH		00076	580UL	VH3- 0.80	0.43		108	<20	P 2
74	156	8,7	C	TEC-TEH	TEC-TEH		00087	580UL	VSM- 0.89	0.46		120	<20	P 2
49	157	8	C	TEC-TEH	TEC-TEH		00079	580UL	VSM- 0.87	0.91		54	28	P 2
			C	TEC-TEH	TEC-TEH		00102	58412	VSM- 0.78	0.81		63	26	P 2
69	159	8,7	C	TEC-TEH	TEC-TEH		00080	580UL	07C+ 6.26	2.09		165	<20	1
77	159	8,7	H	TSH-TSH	TSH-TSH		00099	600RC	TSH- 5.69to- 6.02	0.86		0	SAI	4
			C	TEC-TEH	TEC-TEH		00080	580UL	TEH+ 19.29	5.99		41	91	P 1
			H	TSH-TSH	TSH-TSH		00099	600RC	TSH- 2.01to- 4.17	1.67		0	SAI	4
70	160	8,7	C	TEC-TEH	TEC-TEH		00080	580UL	VSM+ 2.71	1.02		158	<20	1
74	160	8,7	C	TEC-TEH	TEC-TEH		00080	580UL	VH3- 0.84	0.44		104	<20	P 2

NUMFR OF TUBES SELECTED FROM CURRENT OUTAGE: 120

NUMBER OF DATA RECORDS SELECTED FROM CURRENT OUTAGE: 145

NO TREND ANALYSIS REQUESTED

DATA SELECTION CRITERIA:

Percent: SCI,MAI,MCI,SAI,SVI, 0 to 100%

REPORT OPTIONS:

Only examination results matching criteria are included

MAP OPTIONS:

Plot Variable = Percent ThruWall

Plot data from current examination only

Enclosure 6

LIST OF TUBES PLUGGED

San Onofre Unit 2 Steam Generator E-089

<u>Row</u>	<u>Column</u>	<u>Reason</u>
91	27	SAI at 06H + 0.48 inches
91	29	92% Indication at TEH + 18.48 inches
91	33	89% Indication at 06H + 0.79 inches
111	33	Preventive Maintenance
113	35	Preventive Maintenance
39	47	SCI at TSH + 0.01 inches
44	64	SCI at TSH + 0.11 inches
88	64	57% Indication at TSH + 1.17 inches
52	70	SCI at TSH + 0.12 inches
63	89	SAI at TSH + 0.23 inches
147	89	Preventive Maintenance
91	95	SCI at TSH - 0.04 inches
147	95	Preventive Maintenance
88	96	MCI at TSH + 0.00 inches
89	97	SCI at TSH - 0.04 inches
99	99	SCI at TSH - 0.11 inches
78	100	SCI at TSH - 0.13 inches
126	100	Preventive Maintenance
50	108	SCI at TSH + 0.06 inches
40	112	MCI at TSH + 0.0 inches
77	159	91% Indication at TEH + 19.29 inches