Indian Point 3
Nuclear Power Plant
P.O. Box 215
Buchanan, New York 10511
914 739.8200

New York Power Authority

November 6, 1984
IPN-84-53

Director of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Mr. Steven A. Varga, Chief
Operating Reactors Branch No. 1
Division of Licensing

Subject: Indian Point 3 Nuclear Power Plant
Docket No. 50-286
Indian Point 3 Midcycle Steam Generator Inspection

Dear Sir:

Attached please find information the NRC staff requested at the November 2, 1984 meeting held in Bethesda, Maryland concerning the Indian Point 3 midcycle steam generator inspection. In addition, a revised Figure 2, submitted to the NRC in Attachment II of Application for Amendment to the Operating License, dated November 1, 1984 (IPN-84-52), is also provided herein.

Should you or your staff have any questions regarding this matter please contact Mr. P. Kokolakis.

Very truly yours,

John C. Brons
Resident Manager

cc: Resident Inspector's Office
Indian Point Unit 3
U. S. Nuclear Regulatory Commission
P. O. Box 66
Buchanan, New York 10511

Mr. Don Neighbors
Project Manager Operating Reactors
Branch #1 Division of Licensing
7920 Norfolk Ave.
Bethesda, MD 20014

A001
1/1

INDIAN POINT 3
NEW YORK POWER AUTHORITY

CURRENT STEAM GENERATOR ECT STATUS*
(CRITICAL SIZE RANGES - PRESENT PLUGGING LIMITS)

PROGRAM DESCRIPTION	EXTENT COMPLETE	NUMBER OF DEGRADED TUBES <50%	≥50%	TOTAL
31 OUTLET	99%	186	48	234
32 OUTLET	75%	198	27	225
33 OUTLET	75%	173	19	192
34 OUTLET	100%	232	20	252

PROGRAM DESCRIPTION	EXTENT COMPLETE	NUMBER OF DEGRADED TUBES <40%	≥40%	TOTAL
31 INLET	99%	48	11	59
32 INLET	0%	-	-	-
33 INLET	19%	5	2	7
34 INLET	100%	9	11	20

*ECT INSPECTION AND DATA ANALYSIS IS PRESENTLY INCOMPLETE, RESULTS PRESENTED HEREIN ARE PRELIMINARY.

INDIAN POINT 3
NEW YORK POWER AUTHORITY

CURRENT STEAM GENERATOR ECT STATUS*
(CRITICAL SIZE RANGES - PROPOSED PLUGGING LIMITS)

PROGRAM DESCRIPTION	EXTENT COMPLETE	NUMBER OF DEGRADED TUBES < 63%	≥ 63%	TOTAL
31 OUTLET	99%	226	8	234
32 OUTLET	75%	221	4	225
33 OUTLET	75%	188	4	192
34 OUTLET	100%	246	6	252

PROGRAM DESCRIPTION	EXTENT COMPLETE	NUMBER OF DEGRADED TUBES <40%	≥ 40%	TOTAL
31 INLET	99%	48	11	59
32 INLET	0%	-	-	-
33 INLET	19%	5	2	7
34 INLET	100%	9	11	20

* ECT INSPECTION AND DATA ANALYSIS IS PRESENTLY INCOMPLETE; RESULTS PRESENTED HEREIN ARE PRELIMINARY.

Indian Point 3
1982/1984 Indication Growth Distribution
(Sample Program)

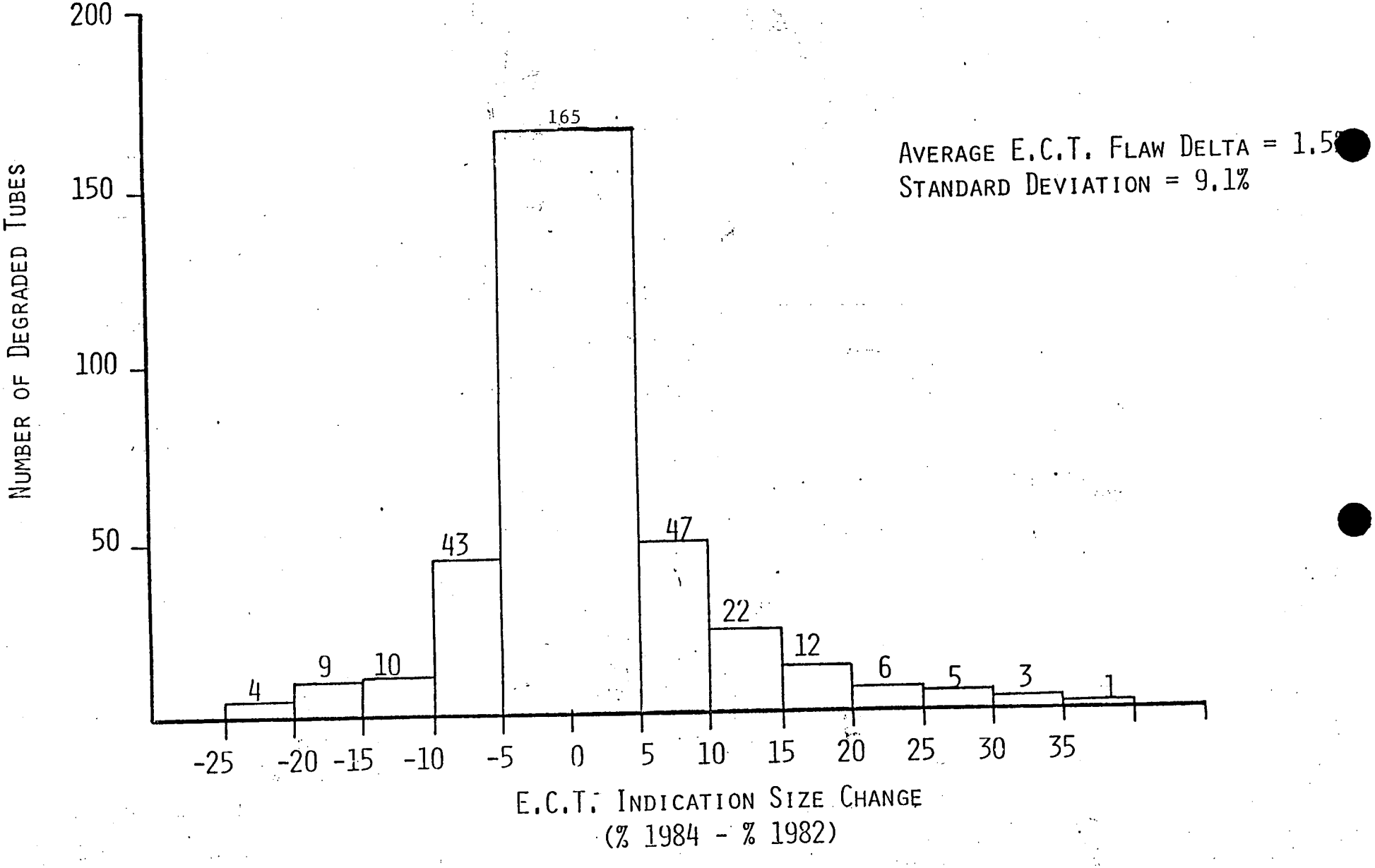


Figure 2 Rev 1

NEW YORK POWER AUTHORITY
Indian Point 3

RESPONSE TO NRC QUESTIONS FROM MEETING OF NOVEMBER 2, 1984

Question: Provide the 1982 ECT results for the approximately 70 tubes with cold leg indications exceeding 50% wall degradation as determined by the ongoing mid-cycle inspection.

Response: A tube by tube comparison of the 1982 data with the 1984 mid-cycle test results is attached for this worst case sample of tubes. In order to make this comparison valid, the 1982 data for these tubes were reanalyzed using the same equipment being used for the entire mid-cycle (1984) inspection. This data reanalysis is exactly as that described to the NRC on 11/2/84 for the initial 600 tube cold leg sample.

As would be expected by looking at only the tubes with pluggable defects, certain tubes exhibit substantial change from the reanalyzed 1982 data for these tubes. The major reason for this change is the low voltage signals which have been a characteristic of the tube pitting problem at Indian Point 3. These small defects approach the limits of detectability of the current state of the art in eddy current testing. Indicative of this point is the fact that 38 tubes which appeared to have defects in 1982 have been determined to have no degradation at all using equipment with improved sensitivity. It must also be noted that several tubes which had been determined to be degraded less than 50% in 1982 are now determined by reanalysis to have had very small volume defects in excess of 50%. Both facts are considered to be expected results of technique improvements.

On average, the tubes with greater than 50% wall degradation (attached list) have exhibited a change from the reanalyzed 1982 data of 16%. This is considered acceptable since for the past nine month operating period, the entire population of degraded tubes was expected to change by 15%. As reported to the NRC on 11/2/84 the average change of all previously degraded tubes was only 1.5% for the nine month operating period.

Finally, it is important to recall that pitting represents an operational problem rather than a problem of safety significance. Pitted tubes have been demonstrated to fail by leakage. Lab testing as reported in previous meetings and operational experience has borne this out. As noted during our meeting, Indian Point 3 has the Standard Technical Specification limits of .3 gpm for primary to

secondary leakage. The plant successfully operated during the last nine months with no indications of leakage using a plugging criteria developed from growth rates of overall tube population.

This information is considered sufficient to conclude that a cold leg plugging limit of 63% is allowable because:

1. Pitted tubes exhibit leakage and do not constitute a safety problem.

2. The worst case tubes exhibited change from 1982 approximately equal to that expected for all degraded tubes.

3. The average growth rate of degraded tubes on the cold leg was an order of magnitude less than that expected for the nine month period.

4. The remainder of Cycle 4 is not expected to result in change which exceeds the 10% allowance for ECT uncertainty and the 2% average allowance for corrosion. Of course, an ECT inspection program will be conducted in accordance with plant Technical Specifications at the conclusion of Cycle 4.

INDIAN POINT 3
COLD LEG DEFECTS ≥ 50%
COMPARISON WITH 82 DATA

SG 31 COLD LEG:

Tube	Reevaluated 82 Data	84 Data	Signal Voltage*
30-13	35	59	1.3 volts
6-21	NDD	56	.66
11-22	51	50	.78
17-22	54	60	.76
12-24	67	65	.33
17-24	27	60	.56
27-30	39	56	.26
28-30	52	51	.66
7-32	55	88	1.18
8-34	37	54	.39
10-34	31	57	.53
7-36	45	74	.53
10-36	<20	58	1.06
8-37	53	64	.69
3-38	39	59	.24
13-41	NDD	55	.43
25-41	56	74	.71
29-41	52	86	.62
27-42	55	62	.62
37-42	82	78	.42
18-44	42	62	.34
31-44	48	61	.87
7-46	48	57	1.58

31 COLD LEG (cont)

Tube	Reevaluated B2 Data	B4 Data	Signal Voltage
5-49	44	51	.79
28-49	42	62	.62
31-49	47	54	.25
17-50	DS	60	.71
29-51	45	52	1.19
10-53	39	56	.38
25-53	21	54	.78
32-53	40	54	.65
36-53	<20	62	.45
18-54	42	52	.77
23-56	53	61	.27
30-56	55	69	.53
27-57	<20	57	.34
28-57	48	60	.33
27-59	55	60	.80
30-59	67	59	.67
30-60	39	59	.51
10-65	39	54	.83
6-73	48	54	.58
10-73	47	57	.67
9-74	40	51	.43
13-74	40	52	.41
9-76	45	62	.26
6-77	<20	52	.27
10-80	47	59	.34

SG 34 COLD LEG:

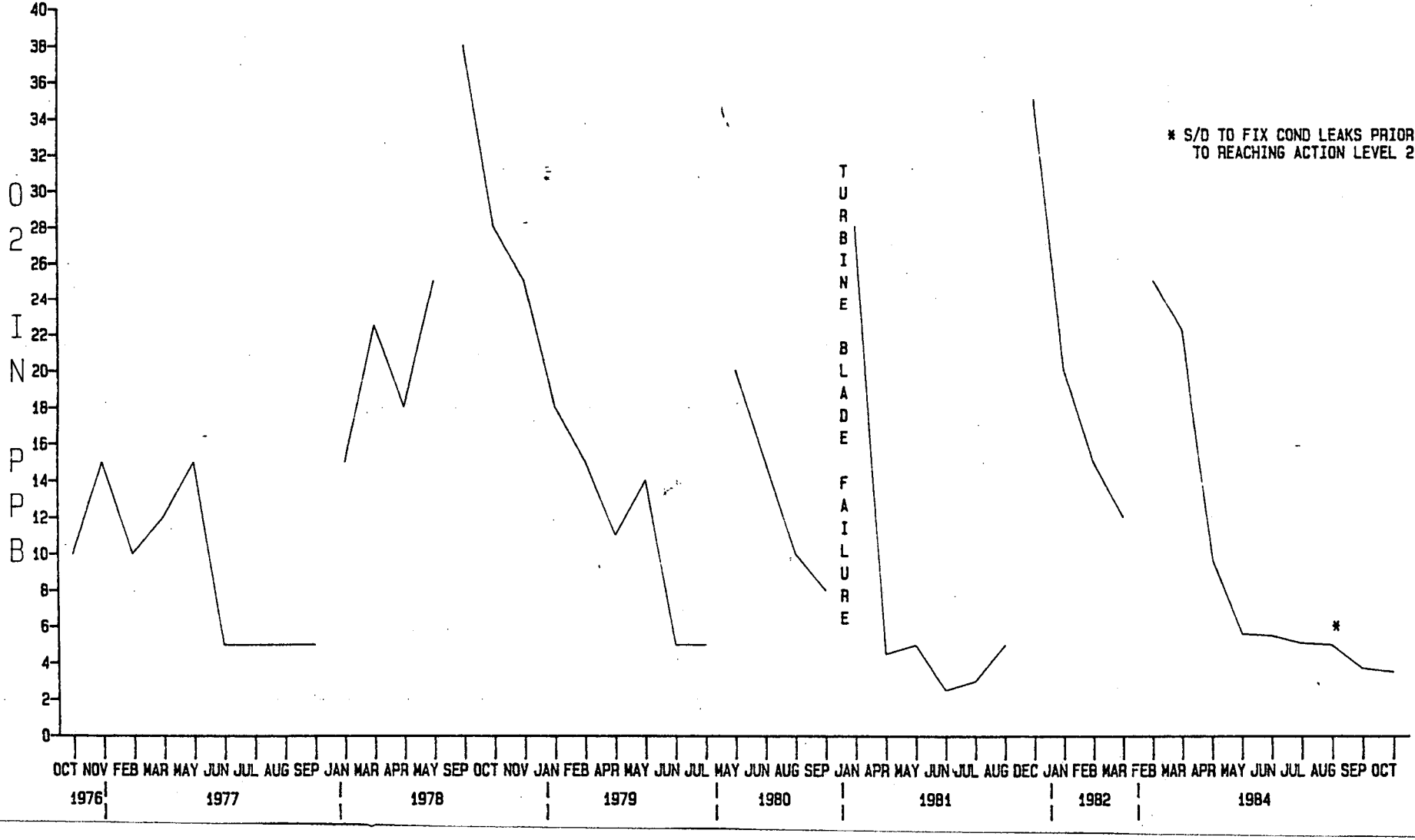
Tube	Reevaluated 82 Data	84 Data	Signal Voltage
7-4	NDD	NDD(.610 R)	0.0
4-19	55	61	.24
5-21	58	62	.36
23-27	46	50	1.25
4-28	48	50	.47
21-31	21	74	.78
26-33	36	55	.29
13-36	74	76	1.07
21-38	39	60	.65
26-40	NA	53	.46
31-40	NA	50	1.74
11-45	40	51	1.13
6-49	NDD	65	.43
20-50	47	54	.87
11-52	47	59	.63
17-60	52	53	1.00
6-67	NDD	67	.79
12-68	31	58	.77
3-70	45	53	.58
10-91	41	42	.73

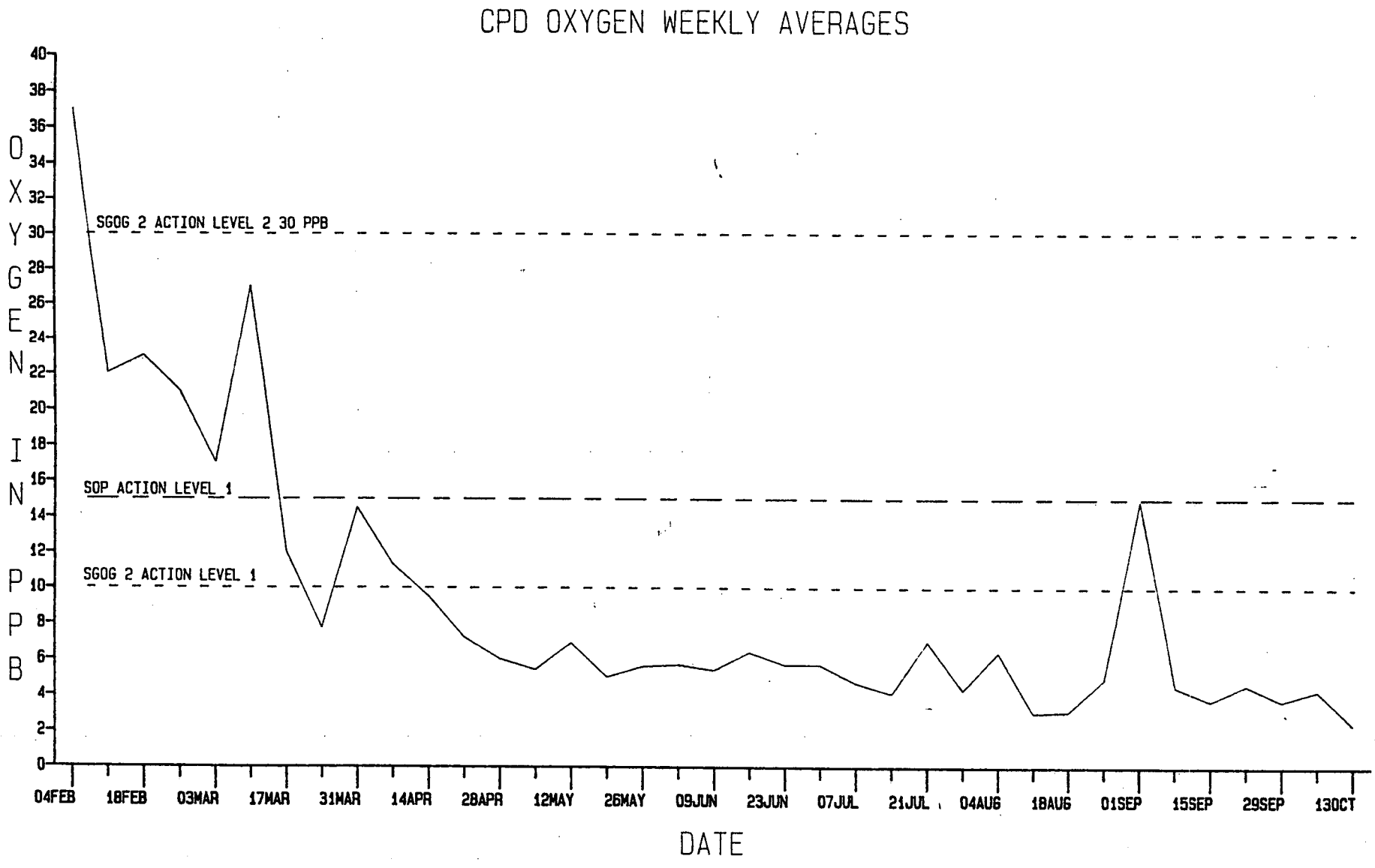
NOTES:

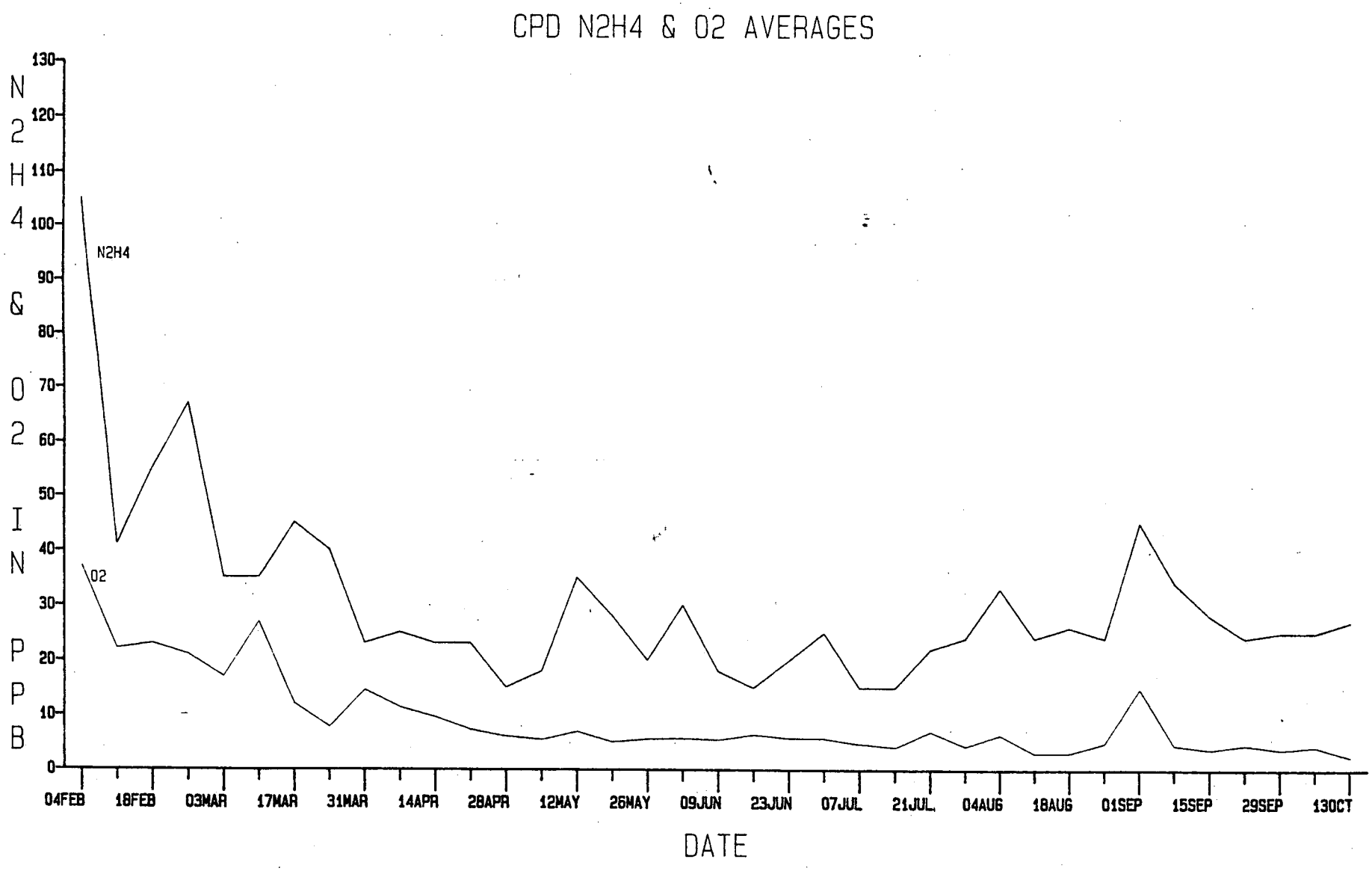
NDD = No detectable degradation
DS = Distorted signal
R = Restriction
NA = Data not available

* For comparison purposes, note that the ASME calibration standard defects produce signal voltages of 4 - 6 volts.

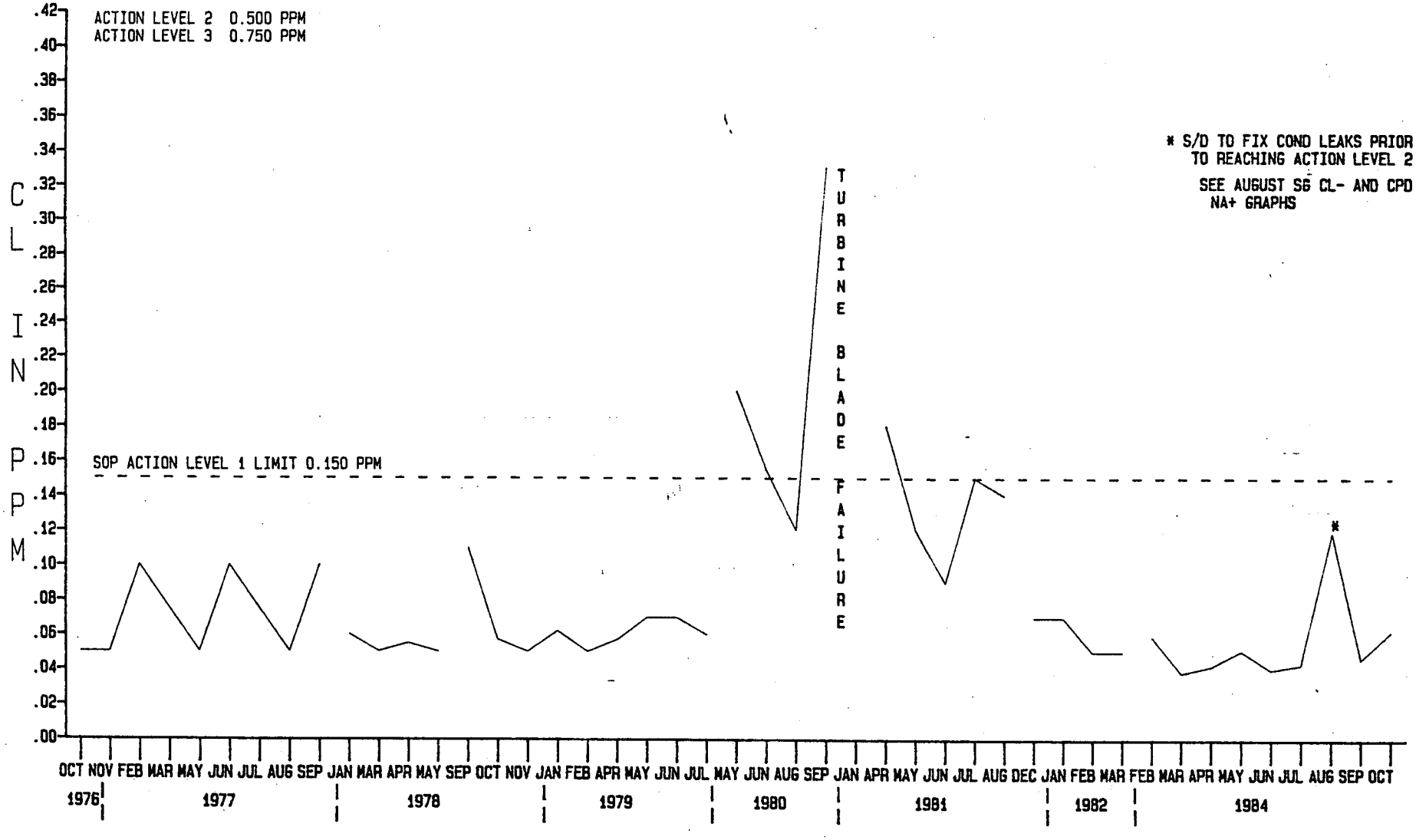
CPD O2 VS OPERATING MONTHS

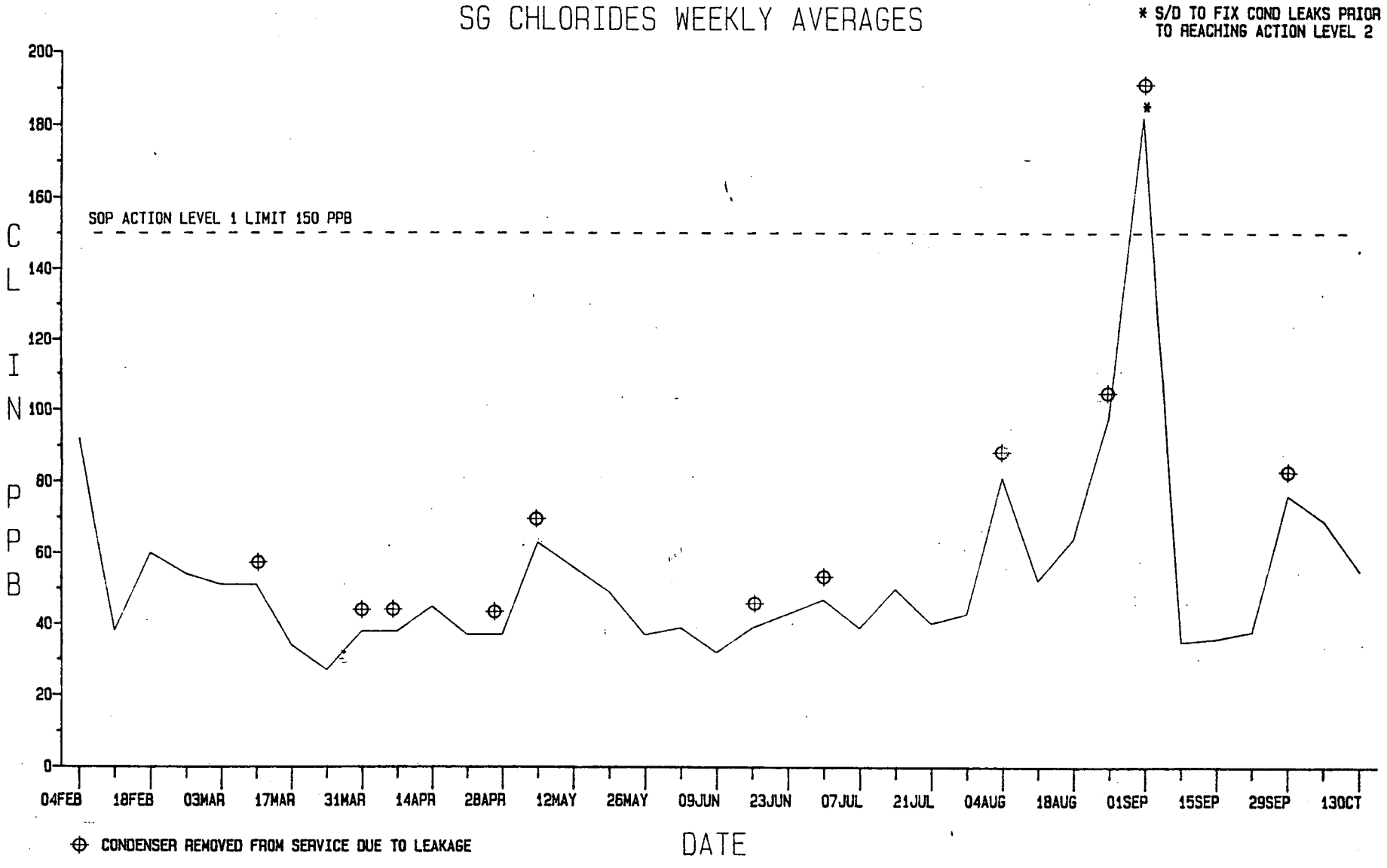


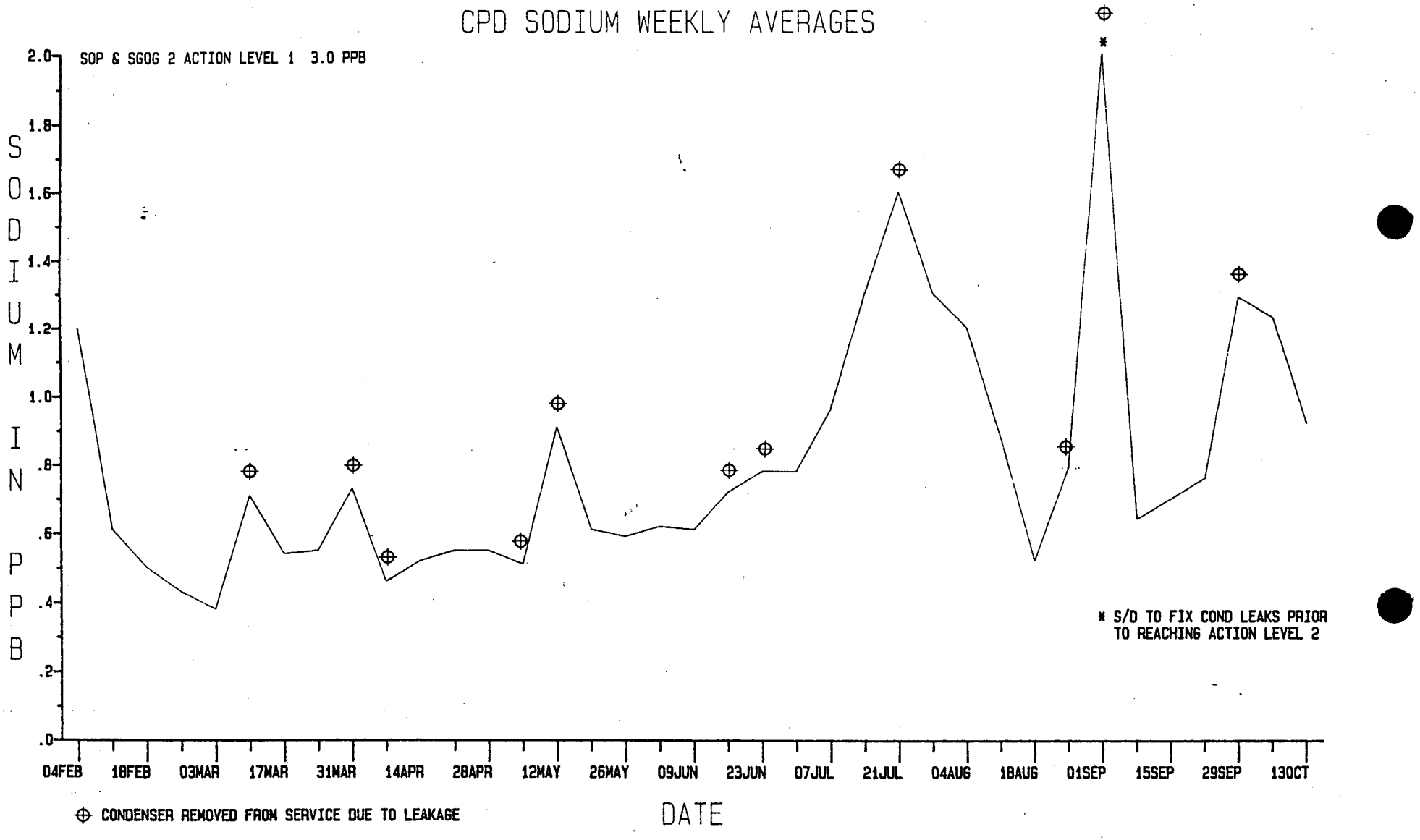

CPD OXYGEN WEEKLY AVERAGES
OXYGEN IN PPB
40
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
SGOG 2 ACTION LEVEL 2 30 PPB
SOP ACTION LEVEL 1
SGOG 2 ACTION LEVEL 1
04FEB
18FEB
03MAR
17MAR
31MAR
14APR
28APR
12MAY
26MAY
09JUN
23JUN
07JUL
21JUL
04AUG
18AUG
01SEP
15SEP
29SEP
13OCT
DATE


CPD N2H4 & 02 AVERAGES
N2H4 & 02 IN PPB
130
120
110
100
90
80
70
60
50
40
30
20
10
0
N2H4
02
04FEB
18FEB
03MAR
17MAR
31MAR
14APR
28APR
12MAY
26MAY
09JUN
23JUN
07JUL
21JUL
04AUG
18AUG
01SEP
15SEP
29SEP
13OCT
DATE

SG CL- VS OPERATING MONTHS




SG CHLORIDES WEEKLY AVERAGES
* S/D TO FIX COND LEAKS PRIOR TO REACHING ACTION LEVEL 2
SOP ACTION LEVEL 1 LIMIT 150 PPB
CL IN PPB
200
180
160
140
120
100
80
60
40
20
0
04FEB
18FEB
03MAR
17MAR
31MAR
14APR
28APR
12MAY
26MAY
09JUN
23JUN
07JUL
21JUL
04AUG
18AUG
01SEP
15SEP
29SEP
13OCT
DATE
CONDENSER REMOVED FROM SERVICE DUE TO LEAKAGE


CPD SODIUM WEEKLY AVERAGES
SOP & SGOG 2 ACTION LEVEL 1 3.0 PPB
SODIUM IN PPB
2.0
1.8
1.6
1.4
1.2
1.0
.8
.6
.4
.2
.0
04FEB
18FEB
03MAR
17MAR
31MAR
14APR
28APR
12MAY
26MAY
09JUN
23JUN
07JUL
21JUL
04AUG
18AUG
01SEP
15SEP
29SEP
13OCT
DATE
* S/D TO FIX COND LEAKS PRIOR TO REACHING ACTION LEVEL 2
⊕ CONDENSER REMOVED FROM SERVICE DUE TO LEAKAGE

SG CATION CONDUCTIVITY