

DUKE POWER COMPANY
OCONEE 1 CYCLE 14
CORE OPERATING LIMITS REPORT
REVISION 4
NOVEMBER 28, 1991

QA CONDITION 1

REFERENCE OSC-4137

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Oconee Nuclear Station
Core Operating Limits Report
Revision 4

REVISION LOG

Revision Number	Effective Date	Effected Pages			Total Effective Pages
		Revised	Added	Deleted	
0	13MAR91	-	1-22	-	22
1	06MAY91	1	4a - 4d	4	25
2	22AUG91	1 - 22	1-27	1-22	27
3	16SEP91	7 & 13	-	-	27
4	26NOV91	15 & 18-21			27

1.0 CORE OPERATING LIMITS

This Core Operating Limits Report for 01C14 has been prepared in accordance with the requirements of Technical Specification 6.9. The core operating limits have been developed using NRC-approved methodology (Reference 1, 2 and 3) and are documented in Reference 4. The setpoints for 01C14 are documented in Reference 5 and 6. The Reactor Coolant System design flow used in Reference 4 for 01C14 is 109.5% (of 88,000 gpm per RCP). The core operating limits have been developed with radial local peaking factor ($F_{\Delta N}^N$) of 1.714 and an axial peaking factor (F_2^N) of 1.5.

The following cycle-specific core operating limits are included in this report:

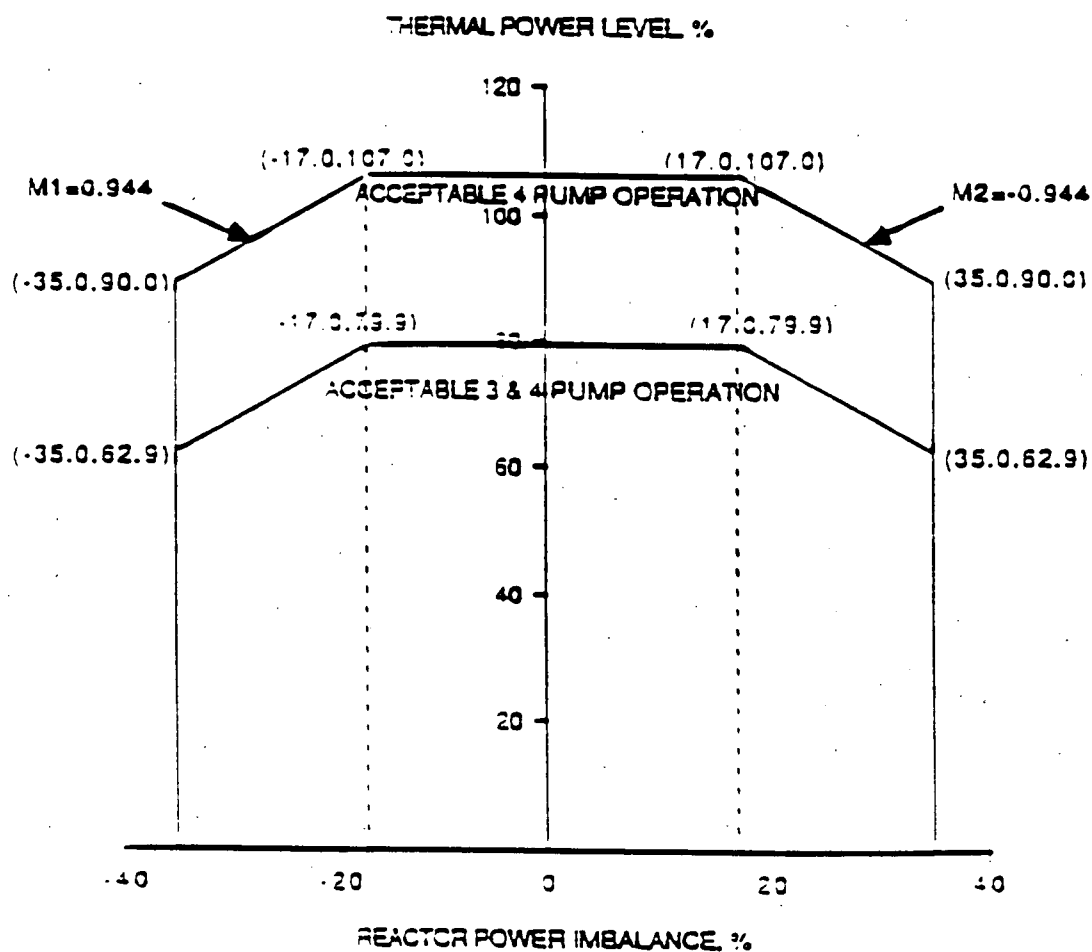
- 1) RPS limiting safety system settings (figure 1.3 and 1.4).
- 2) Quadrant power tilt limits,
- 3) Steady state operating band,
- 4) Operational power-imbalance limits, and
- 5) Operational and shutdown margin-limited control rod position limits.

1.1 REFERENCES

1. Duke Power Company, Oconee Nuclear Station, Reload Design Methodology II, DPC-NE-1002A, October 1985.
2. NFS-1001A, Reload Design Methodology, April 1985.
3. DPC-DE-2003A, Oconee Nuclear Station Core Thermal Hydraulic Methodology Using VIPRE-01, July 1989.
4. 01C14 Maneuvering Analysis, Duke Power Company calculational file, OSC-4137, Rev 0, 13MAR91.
5. Variable Low Pressure Safety Limit, Duke Power Company calculational file, OSC-4048, Rev 0, 24JUL90.
6. 01C14 RPS Setpoints and Safety Review, Duke Power Company calculational, file, OSC-4275, Rev 0, 25MAR91.

Figure 1.3

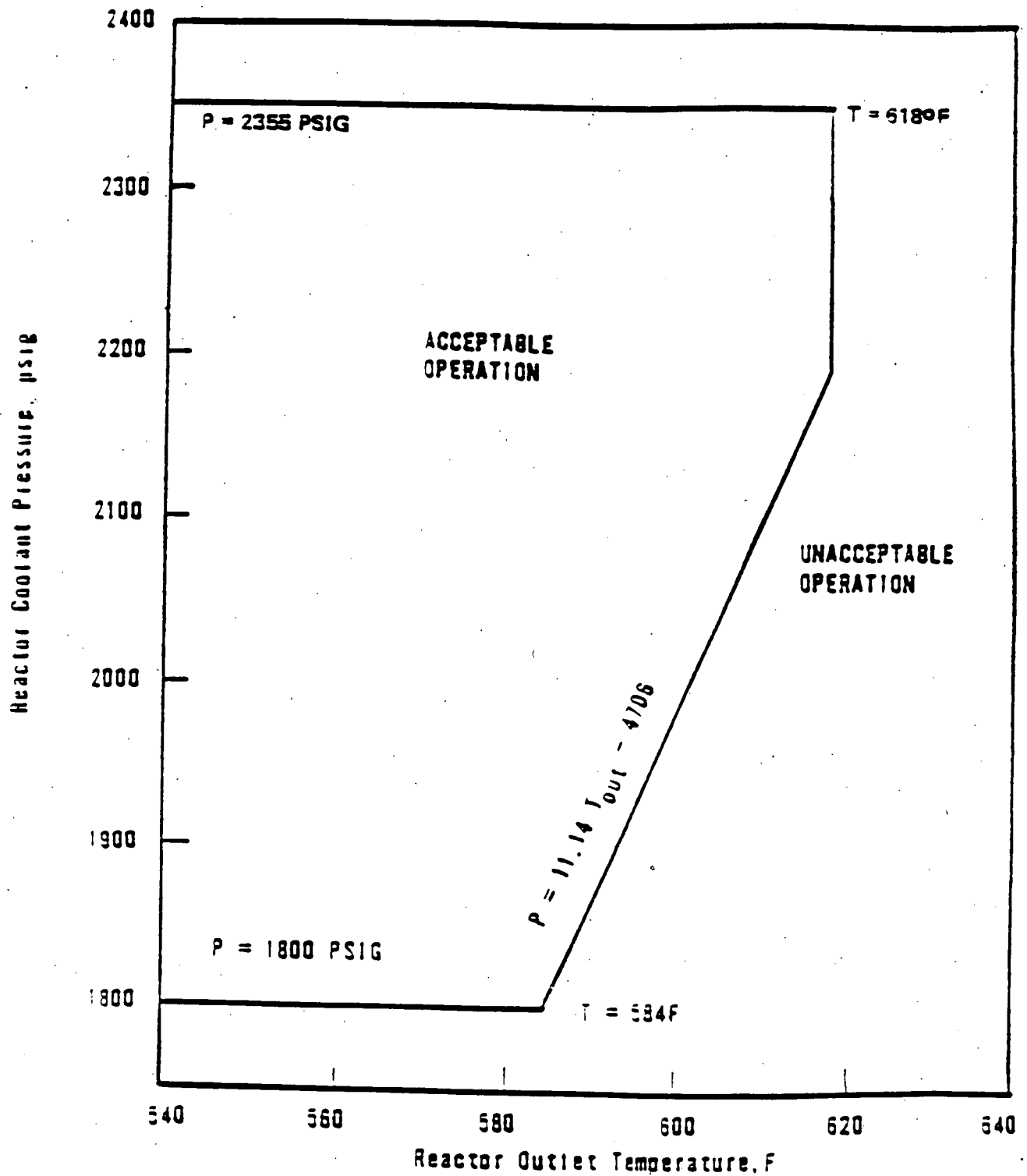
PROTECTIVE SYSTEM MAXIMUM ALLOWABLE SETPOINTS UNIT 1



Referred to by Tech. Spec. 2.3

Figure 1.4

PROTECTIVE SYSTEM MAXIMUM ALLOWABLE SETPOINTS UNIT 1



Referred to by Tech. Spec. 2.3

Oconee 1 Cycle 14

RPS SAFETY LIMIT BREAKPOINTS

	POWER <u>% OF 2568MW</u>	IMBALANCE <u>LIMITS</u>
4 PUMP	0.0	-48.00
	100.0	-48.00
	112.0	-31.10
	112.0	31.10
	100.0	48.00
	0.0	48.00
3 PUMP	0.0	-48.00
	72.9	-48.00
	84.9	-31.10
	84.9	31.10
	72.9	48.00
	0.0	48.00

Oconee 1 Cycle 14
QUADRANT POWER TILT LIMITS

STEADY STATE LIMITS		TRANSIENT LIMITS		MAXIMUM LIMITS
<u>>30 - 100%FP</u>	<u>0 - 30%FP</u>	<u>>30 - 100%FP</u>	<u>0 - 30%FP</u>	<u>0 - 100%FP</u>
5.00	10.00	9.44	12.00	20.00

Referred to by Tech. Spec:

3.5.2.4.a
3.5.2.4.b
3.5.2.4.d
3.5.2.4.e
3.5.2.4.f

Oconee 1 Cycle 14

STEADY STATE OPERATING BAND

RI, %WD		APSR, %WD	
<u>MIN</u>	<u>MAX</u>	<u>MIN</u>	<u>MAX</u>
292	300	30	40

Oconee 1 Cycle 14

OPERATIONAL POWER IMBALANCE BREAKPOINTS

	POWER % OF 2568MW	IMBALANCE LIMITS
4 PUMP	0.0	-40.67
	80.0	-40.67
	90.0	-38.09
	102.0	-25.57
	102.0	20.46
	90.0	24.50
	80.0	26.10
	0.0	26.10
3 PUMP	0.0	-40.67
	77.0	-40.67
	77.0	26.10
	0.0	26.10

Referred to by Tech. Spec. 3.5.2.6

Oconee 1 Cycle 14
ROD INDEX OPERATIONAL LIMITS
0 EFPD to EOC

	POWER % OF 2568MW	RI, %WD	
		MIN	MAX
4 PUMP	102	260.0	300.0
	90	260.0	300.0
	80	240.0	300.0
	50	200.0	300.0
	15	90.0	300.0
	5	0.0	300.0
3 PUMP	77	236.0	300.0
	50	200.0	300.0
	15	90.0	300.0
	5	0.0	300.0

Referred to by Tech. Spec.

3.1.3.5

3.1.11

3.5.2.1.b

3.5.2.2.d.2.c

3.5.2.3

3.5.2.5.c

Oconee 1 Cycle 14

ROD INDEX SHUTDOWN MARGIN LIMITS

0 EFPD to EOC

	POWER % OF 2568MW	RI. %WD	
		MIN	MAX
4 PUMP	102	220.0	300.0
	50	160.0	300.0
	15	90.0	300.0
	5	0.0	300.0
3 PUMP	77	210.0	300.0
	50	160.0	300.0
	15	90.0	300.0
	5	0.0	300.0

Referred to by Tech. Spec.:

3.1.3.5
3.1.11
3.5.2.1.b
3.5.2.2.d.2.c
3.5.2.3
3.5.2.5.c

2.0 ERROR-ADJUSTED OPERATING LIMITS

The error-adjusted operating limits for O1C14 have been determined including all necessary uncertainties and margins. The calculations which support these limits are documented in Reference 1.

The following cycle-specific error-adjusted limits are included in this report:

- 1) Quadrant tilt setpoints.
- 2) RPS Imbalance Trip Setpoints.
- 3) Operational Imbalance Alarm Setpoints, and
- 4) Operational and shutdown margin-limited control rod position limits.

2.1 REFERENCES

1. O1C14 Maneuvering Analysis. Duke Power Company calculational file. OSC-4137 13MAR91.

Oconee 1 Cycle 14

QUADRANT TILT SETPOINTS

	STEADY STATE		TRANSIENT		MAXIMUM 0-100%FP
	<u>>30-100%FP</u>	<u>0-30%FP</u>	<u>>30-100%FP</u>	<u>0-30%FP</u>	
FULL INCORE (*):	3.02	7.49	6.99	9.27	16.43
EXCORE:	2.03	6.09	5.63	7.72	14.22
BACKUP INCORE:	1.92	3.94	3.64	5.03	9.58

(*) BASED UPON $q = 0.61$

Oconee 1 Cycle 14

ERROR ADJUSTED RPS IMBALANCE TRIP SETPOINTS

	POWER <u>% OF 2568MW</u>	<u>IMBALANCE</u> <u>SETPOINT</u>
4 PUMP	0.0	-33.00
	90.4	-33.00
	105.5	-17.00
	105.5	17.00
	90.4	33.00
	0.0	33.00
3 PUMP	0.00	-33.00
	63.71	-33.00
	78.81	-17.00
	78.81	17.00
	63.71	33.00
	0.00	33.00

Oconee 1 Cycle 14

ERROR ADJUSTED OPERATIONAL IMBALANCE LIMITS

0 EFPD to EOC

	<u>POWER % OF 2568 MW</u>	<u>IMBALANCE LIMITS</u>	<u>FULL INCORE</u>	<u>ALARM SETPOINTS BACKUP INCORE</u>	<u>OUT-OF-CORE</u>
4 PUMP	0	-38.46	-31.50	-26.66	-27.14
	80	-38.46	-31.50	-26.66	-27.14
	90	-35.37	-29.70	-23.71	-24.06
	102	-23.39	-17.00	-13.23	-13.57
	102	+20.46	+17.00	+10.76	+11.17
	90	+24.50	+22.35	+14.58	+15.14
	80	+26.10	+24.04	+16.27	+17.01
	0	+26.10	+24.04	+16.27	+17.01
3 PUMP	0.00	-38.46	-31.50	-26.66	-27.14
	63.31	-	-31.50	-	-
	67.43	-	-	-	-27.14
	67.88	-	-	-26.66	-
	77.00	-38.46	-17.00	-17.00	-17.00
	77.00	+26.10	+17.00	+16.27	+17.00
	63.31	-	+24.04	-	-
	0.00	+26.10	+24.04	+16.27	+17.00

Oconee 1 Cycle 14

ERROR ADJUSTED ROD INDEX

0 EFPD to EOC

	POWER % OF 2568MW	RI. %WD MIN	MAX
4 PUMP	102	261.5	300.0
	88	261.5	300.0
	78	241.5	300.0
	48	201.5	300.0
	13	91.5	300.0
	2.8	0.0	300.0
3 PUMP	77	240.5	300.0
	75	237.5	300.0
	48	201.5	300.0
	13	91.5	300.0
	2.8	0.0	300.0

Oconee 1 Cycle 14

ERROR ADJUSTED SHUTDOWN MARGIN LIMITS

0 EFPD to EOC

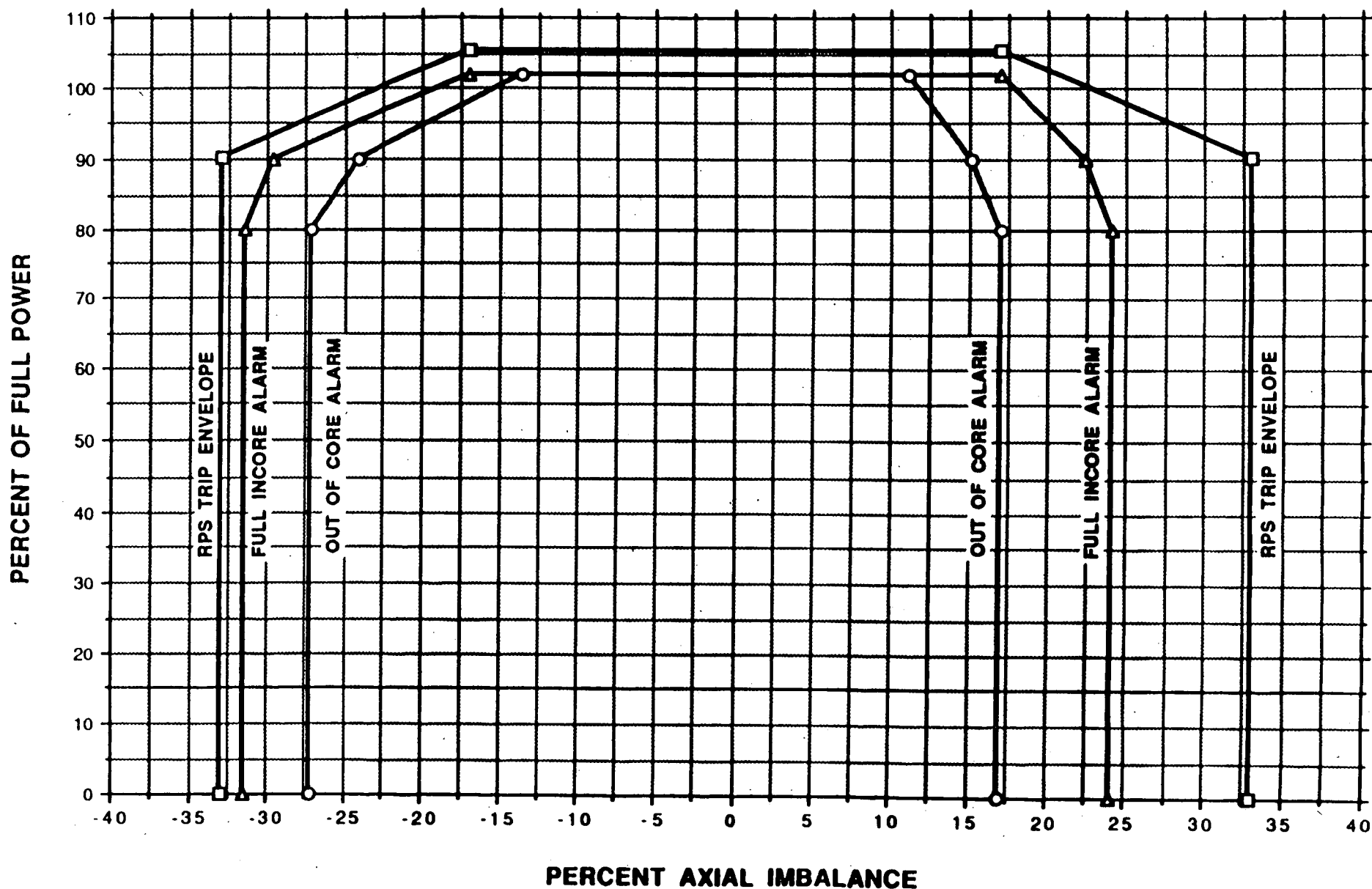
	POWER % OF 2568MW	RI. XWD	
		MIN	MAX
4 PUMP	102	223.8	300.0
	100	221.5	300.0
	48	161.5	300.0
	13	91.5	300.0
	2.8	0.0	300.0
3 PUMP	77	215.5	300.0
	75	211.5	300.0
	48	161.5	300.0
	13	91.5	300.0
	2.8	0.0	300.0

OCONEE 1 CYCLE 14 IMBALANCE SETPOINTS

4 PUMP OPERATION BOC TO EOC

PERCENT OF FULL POWER	R P S	TRIP	FULL INCORE ALARM		OUT OF CORE ALARM	
105.5	-17.00	17.00				
105	-17.53	17.53				
104	-18.59	18.59				
103	-19.65	19.65				
102	-20.71	20.71	-17.00	17.00	-13.57	11.17
101	-21.77	21.77	-18.06	17.45	-14.44	11.50
100	-22.83	22.83	-19.12	17.89	-15.32	11.83
99	-23.89	23.89	-20.18	18.34	-16.19	12.16
98	-24.95	24.95	-21.23	18.78	-17.07	12.49
97	-26.01	26.01	-22.29	19.23	-17.94	12.82
96	-27.07	27.07	-23.35	19.68	-18.82	13.16
95	-28.13	28.13	-24.41	20.12	-19.69	13.49
94	-29.19	29.19	-25.47	20.57	-20.56	13.82
93	-30.25	30.25	-26.53	21.01	-21.44	14.15
92	-31.30	31.30	-27.58	21.46	-22.31	14.48
91	-32.36	32.36	-28.64	21.90	-23.19	14.81
90.4	-33.00	33.00	-29.28	22.17	-23.71	15.01
90	-33.00	33.00	-29.70	22.35	-24.06	15.14
89	-33.00	33.00	-29.88	22.52	-24.37	15.33
88	-33.00	33.00	-30.06	22.69	-24.68	15.51
87	-33.00	33.00	-30.24	22.86	-24.98	15.70
86	-33.00	33.00	-30.42	23.03	-25.29	15.89
85	-33.00	33.00	-30.60	23.20	-25.60	16.08
84	-33.00	33.00	-30.78	23.36	-25.91	16.26
83	-33.00	33.00	-30.96	23.53	-26.22	16.45
82	-33.00	33.00	-31.14	23.70	-26.52	16.64
81	-33.00	33.00	-31.32	23.87	-26.83	16.82
80	-33.00	33.00	-31.50	24.04	-27.14	17.01
79	-33.00	33.00	-31.50	24.04	-27.14	17.01
78	-33.00	33.00	-31.50	24.04	-27.14	17.01
77	-33.00	33.00	-31.50	24.04	-27.14	17.01
76	-33.00	33.00	-31.50	24.04	-27.14	17.01
75	-33.00	33.00	-31.50	24.04	-27.14	17.01
0	-33.00	33.00	-31.50	24.04	-27.14	17.01
PERCENT OF FULL POWER	R P S	TRIP	FULL INCORE ALARM		OUT OF CORE ALARM	

OCONEE 1 CYCLE 14 IMBALANCE SETPOINTS 4 PUMP OPERATION BOC TO EOC



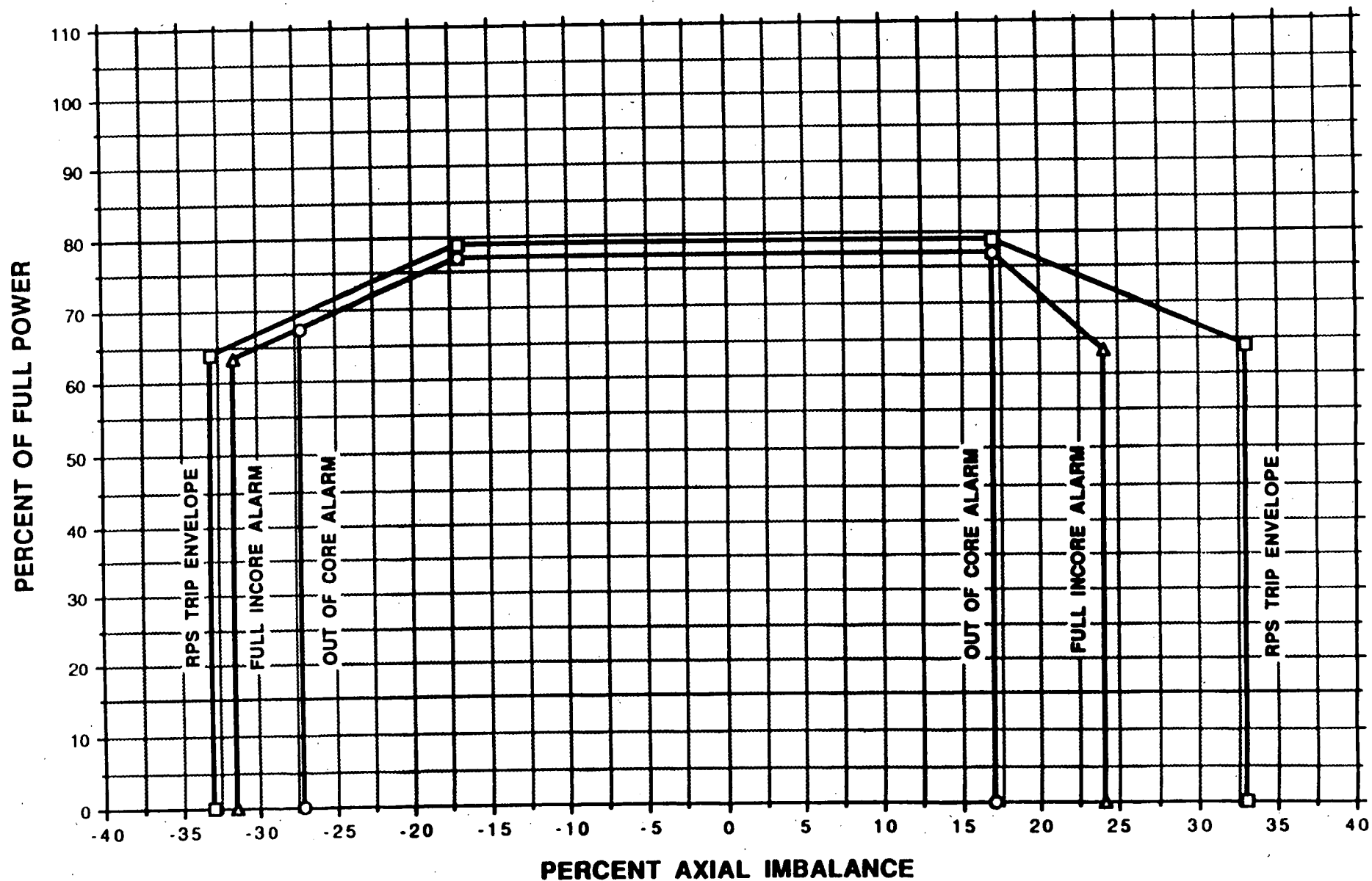
OCONEE 1 CYCLE 14 IMBALANCE SETPOINTS

3 PUMP OPERATION

BOC TO EOC

PERCENT OF FULL POWER	R P S	TRIP	FULL INCORE ALARM		OUT OF CORE ALARM	
78.8	-17.00	17.00				
78	-17.85	17.85				
77	-18.91	18.91	-17.00	17.00	-17.00	17.00
76	-19.97	19.97	-18.04	17.50	-17.74	17.00
75	-21.03	21.03	-19.07	18.01	-18.48	17.00
74	-22.09	22.09	-20.11	18.51	-19.22	17.00
73	-23.15	23.15	-21.14	19.01	-19.96	17.00
72	-24.21	24.21	-22.18	19.51	-20.70	17.00
71	-25.26	25.26	-23.21	20.02	-21.44	17.00
70	-26.32	26.32	-24.25	20.52	-22.18	17.00
69	-27.38	27.38	-25.29	21.02	-22.92	17.00
68	-28.44	28.44	-26.32	21.53	-23.66	17.00
67.43	-29.05	29.05	-26.91	21.81	-27.14	17.00
67	-29.50	29.50	-27.36	22.03	-27.14	17.00
66	-30.56	30.56	-28.39	22.53	-27.14	17.00
65	-31.62	31.62	-29.43	23.03	-27.14	17.00
64	-32.68	32.68	-30.46	23.54	-27.14	17.00
63.7	-33.00	33.00	-30.78	23.69	-27.14	17.00
63.3	-33.00	33.00	-31.50	24.04	-27.14	17.00
63	-33.00	33.00	-31.50	24.04	-27.14	17.00
62	-33.00	33.00	-31.50	24.04	-27.14	17.00
61	-33.00	33.00	-31.50	24.04	-27.14	17.00
60	-33.00	33.00	-31.50	24.04	-27.14	17.00
0	-33.00	33.00	-31.50	24.04	-27.14	17.00
PERCENT OF FULL POWER	R P S	TRIP	FULL INCORE ALARM		OUT OF CORE ALARM	

OCONEE 1 CYCLE 14 IMBALANCE SETPOINTS 3 PUMP OPERATION BOC TO EOC



OCONEE 1 CYCLE 14 CONTROL ROD SETPOINTS

4 PUMP OPERATION BOC TO EOC
RI = 300 IS WITHDRAWAL LIMIT AT ALL POWER LEVELS

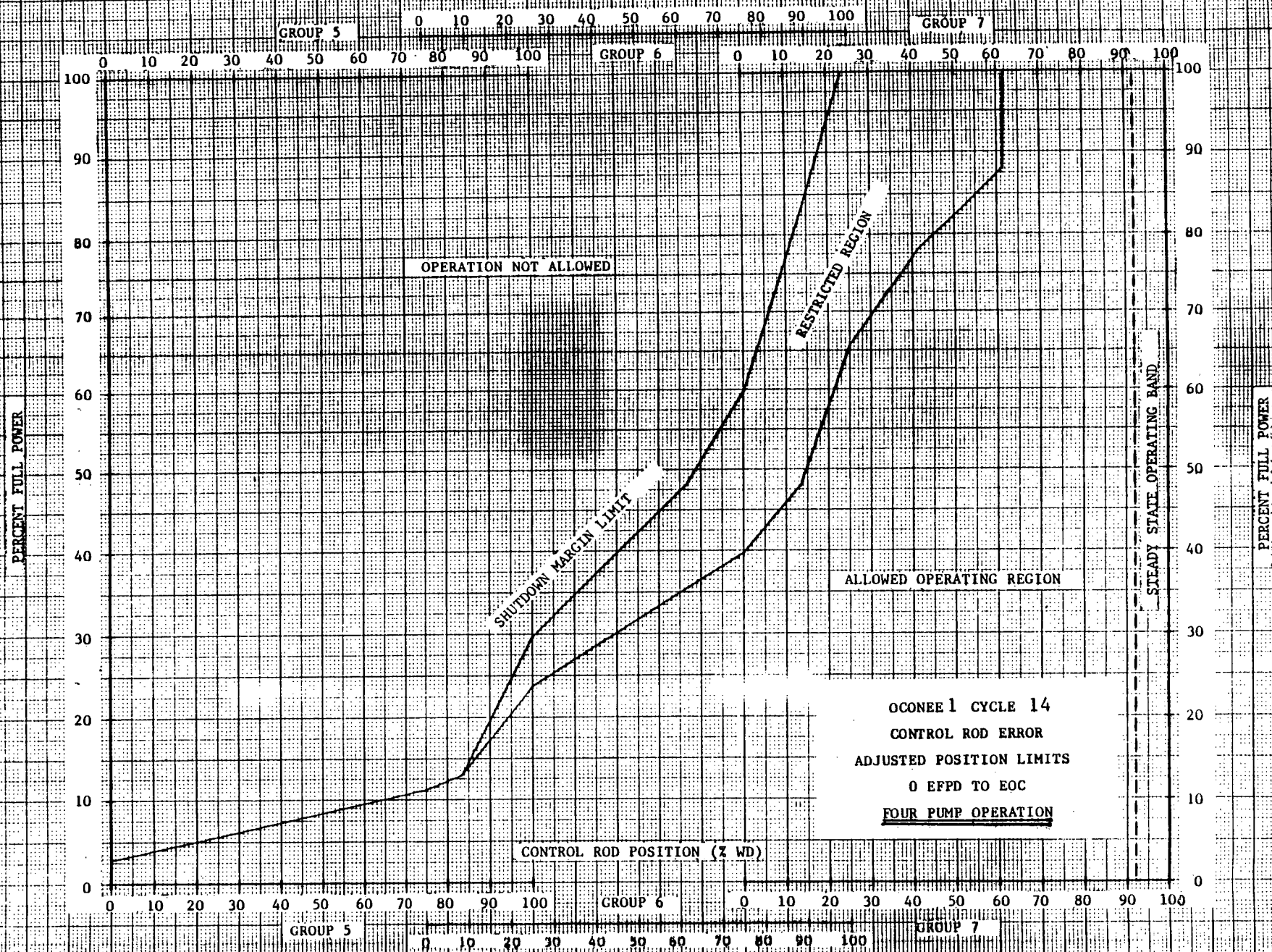
PERCENT OF FULL POWER	SHUTDOWN MARGIN INSERTION SETPOINT			CONTROL ROD ALARM INSERTION SETPOINT		
	CRGP 5	CRGP 6	CRGP 7	CRGP 5	CRGP 6	CRGP 7
102	100.0	99.4	24.4	100.0	100.0	61.5
101	100.0	98.8	23.8	100.0	100.0	61.5
100	100.0	98.2	23.2	100.0	100.0	61.5
99	100.0	97.7	22.7	100.0	100.0	61.5
98	100.0	97.1	22.1	100.0	100.0	61.5
97	100.0	96.5	21.5	100.0	100.0	61.5
96	100.0	95.9	20.9	100.0	100.0	61.5
95	100.0	95.4	20.4	100.0	100.0	61.5
94	100.0	94.8	19.8	100.0	100.0	61.5
93	100.0	94.2	19.2	100.0	100.0	61.5
92	100.0	93.6	18.6	100.0	100.0	61.5
91	100.0	93.1	18.1	100.0	100.0	61.5
90	100.0	92.5	17.5	100.0	100.0	61.5
89	100.0	91.9	16.9	100.0	100.0	61.5
88	100.0	91.3	16.3	100.0	100.0	61.5
87	100.0	90.7	15.7	100.0	100.0	59.5
86	100.0	90.2	15.2	100.0	100.0	57.5
85	100.0	89.6	14.6	100.0	100.0	55.5
84	100.0	89.0	14.0	100.0	100.0	53.5
83	100.0	88.4	13.4	100.0	100.0	51.5
82	100.0	87.9	12.9	100.0	100.0	49.5
81	100.0	87.3	12.3	100.0	100.0	47.5
80	100.0	86.7	11.7	100.0	100.0	45.5
79	100.0	86.1	11.1	100.0	100.0	43.5
78	100.0	85.6	10.6	100.0	100.0	41.5
77	100.0	85.0	10.0	100.0	100.0	40.2
76	100.0	84.4	9.4	100.0	100.0	38.8
75	100.0	83.8	8.8	100.0	100.0	37.5
74	100.0	83.2	8.2	100.0	100.0	36.2
73	100.0	82.7	7.7	100.0	100.0	34.9
72	100.0	82.1	7.1	100.0	100.0	33.5
71	100.0	81.5	6.5	100.0	100.0	32.2
70	100.0	80.9	5.9	100.0	100.0	30.9
69	100.0	80.4	5.4	100.0	100.0	29.5
68	100.0	79.8	4.8	100.0	100.0	28.2
67	100.0	79.2	4.2	100.0	100.0	26.9
66	100.0	78.6	3.6	100.0	100.0	25.5
65.6	100.0	78.4	3.4	100.0	100.0	25.0
65	100.0	78.1	3.1	100.0	99.6	24.6
64	100.0	77.5	2.5	100.0	98.9	23.9
63	100.0	76.9	1.9	100.0	98.3	23.3
62	100.0	76.3	1.3	100.0	97.6	22.6
61	100.0	75.7	0.7	100.0	96.9	21.9
60	100.0	75.2	0.2	100.0	96.3	21.3
59.7	100.0	75.0	0.0	100.0	96.1	21.1
59	100.0	74.2	0.0	100.0	95.6	20.6
58	100.0	73.0	0.0	100.0	95.0	20.0
57	100.0	71.9	0.0	100.0	94.3	19.3
56	100.0	70.7	0.0	100.0	93.6	18.6
55	100.0	69.6	0.0	100.0	93.0	18.0
54	100.0	68.4	0.0	100.0	92.3	17.3
53	100.0	67.3	0.0	100.0	91.6	16.6
52	100.0	66.1	0.0	100.0	91.0	16.0
51	100.0	65.0	0.0	100.0	90.3	15.3
PERCENT OF FULL POWER	CRGP 5	CRGP 6	CRGP 7	CRGP 5	CRGP 6	CRGP 7
	SHUTDOWN MARGIN INSERTION SETPOINT			CONTROL ROD ALARM INSERTION SETPOINT		

(cont)

OCONEE 1 CYCLE 14 CONTROL ROD SETPOINTS

4 PUMP OPERATION BOC TO EOC
RI = 300 IS WITHDRAWAL LIMIT AT ALL POWER LEVELS

PERCENT OF FULL POWER	SHUTDOWN MARGIN INSERTION SETPOINT			CONTROL ROD ALARM INSERTION SETPOINT		
	CRGP 5	CRGP 6	CRGP 7	CRGP 5	CRGP 6	CRGP 7
50	100.0	63.8	0.0	100.0	88.6	14.6
49	100.0	62.7	0.0	100.0	89.0	14.0
48	100.0	61.5	0.0	100.0	88.3	13.3
47	100.0	59.5	0.0	100.0	86.7	11.7
46	100.0	57.5	0.0	100.0	85.2	10.2
45	100.0	55.5	0.0	100.0	83.6	8.6
44	100.0	53.5	0.0	100.0	82.0	7.0
43	100.0	51.5	0.0	100.0	80.4	5.4
42	100.0	49.5	0.0	100.0	78.9	3.9
41	100.0	47.5	0.0	100.0	77.3	2.3
40	100.0	45.5	0.0	100.0	75.7	0.7
39.5	100.0	44.6	0.0	100.0	75.0	0.0
39	100.0	43.5	0.0	100.0	73.3	0.0
38	100.0	41.5	0.0	100.0	70.2	0.0
37	100.0	39.5	0.0	100.0	67.0	0.0
36	100.0	37.5	0.0	100.0	63.9	0.0
35	100.0	35.5	0.0	100.0	60.7	0.0
34	100.0	33.5	0.0	100.0	57.6	0.0
33	100.0	31.5	0.0	100.0	54.5	0.0
32	100.0	29.5	0.0	100.0	51.3	0.0
31	100.0	27.5	0.0	100.0	48.2	0.0
30	100.0	25.6	0.0	100.0	45.0	0.0
29.7	100.0	25.0	0.0	100.0	44.2	0.0
29	99.3	24.3	0.0	100.0	41.9	0.0
28	98.3	23.3	0.0	100.0	38.7	0.0
27	97.3	22.3	0.0	100.0	35.6	0.0
26	96.3	21.3	0.0	100.0	32.5	0.0
25	95.3	20.3	0.0	100.0	29.3	0.0
24	94.3	19.3	0.0	100.0	26.2	0.0
23.6	93.9	18.9	0.0	100.0	25.0	0.0
23	93.3	18.3	0.0	99.0	24.0	0.0
22	92.3	17.3	0.0	97.4	22.4	0.0
21	91.3	16.3	0.0	95.9	20.9	0.0
20	89.3	15.3	0.0	94.3	19.3	0.0
19	89.3	14.3	0.0	92.7	17.7	0.0
18	88.3	13.3	0.0	91.2	16.2	0.0
17	87.3	12.3	0.0	89.6	14.6	0.0
16	86.3	11.3	0.0	88.0	13.0	0.0
15	85.3	10.3	0.0	86.4	11.4	0.0
14	84.3	9.3	0.0	84.9	9.9	0.0
13	83.3	8.3	0.0	83.3	8.3	0.0
12	78.8	3.8	0.0	78.8	3.8	0.0
11.2	75.0	0.0	0.0	75.0	0.0	0.0
11	73.6	0.0	0.0	73.6	0.0	0.0
10	64.7	0.0	0.0	64.7	0.0	0.0
9	55.7	0.0	0.0	55.7	0.0	0.0
8	46.7	0.0	0.0	46.7	0.0	0.0
7	37.7	0.0	0.0	37.7	0.0	0.0
6	28.7	0.0	0.0	28.7	0.0	0.0
5	19.8	0.0	0.0	19.8	0.0	0.0
4	10.8	0.0	0.0	10.8	0.0	0.0
3	1.8	0.0	0.0	1.8	0.0	0.0
2.8	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0
1	0.0	0.0	0.0	0.0	0.0	0.0
PERCENT OF FULL POWER	CRGP 5	CRGP 6	CRGP 7	CRGP 5	CRGP 6	CRGP 7
	SHUTDOWN MARGIN INSERTION SETPOINT			CONTROL ROD ALARM INSERTION SETPOINT		



OCONEE 1 CYCLE 14 CONTROL ROD SETPOINTS

3 PUMP OPERATION BOC TO EOC
RI = 300 IS WITHDRAWAL LIMIT AT ALL POWER LEVELS

PERCENT OF FULL POWER	SHUTDOWN MARGIN INSERTION SETPOINT			CONTROL ROD ALARM INSERTION SETPOINT		
	CRGP 5	CRGP 6	CRGP 7	CRGP 5	CRGP 6	CRGP 7
77	100.0	95.3	20.1	100.0	100.0	40.5
76	100.0	94.3	19.2	100.0	100.0	39.0
75	100.0	93.3	18.3	100.0	100.0	37.5
74	100.0	92.3	17.3	100.0	100.0	36.2
73	100.0	91.4	16.4	100.0	100.0	34.8
72	100.0	90.5	15.5	100.0	100.0	33.5
71	100.0	89.5	14.5	100.0	100.0	32.2
70	100.0	88.6	13.6	100.0	100.0	30.8
69	100.0	87.7	12.7	100.0	100.0	29.5
68	100.0	86.8	11.8	100.0	100.0	28.2
67	100.0	85.8	10.8	100.0	100.0	26.8
66	100.0	84.9	9.9	100.0	100.0	25.5
65.6	100.0	84.6	9.6	100.0	100.0	25.0
65	100.0	84.0	9.0	100.0	99.6	24.6
64	100.0	83.1	8.1	100.0	98.9	23.9
63	100.0	82.1	7.1	100.0	98.3	23.3
62	100.0	81.2	6.2	100.0	97.6	22.6
61	100.0	80.3	5.3	100.0	96.9	21.9
60	100.0	79.4	4.4	100.0	96.3	21.3
59	100.0	78.4	3.4	100.0	95.6	20.6
58	100.0	77.5	2.5	100.0	94.9	19.9
57	100.0	76.6	1.6	100.0	94.3	19.3
56	100.0	75.7	0.7	100.0	93.6	18.6
55.3	100.0	75.0	0.0	100.0	93.1	18.1
55	100.0	74.5	0.0	100.0	92.9	17.9
54	100.0	72.6	0.0	100.0	92.3	17.3
53	100.0	70.8	0.0	100.0	91.6	16.6
52	100.0	68.9	0.0	100.0	90.9	15.9
51	100.0	67.1	0.0	100.0	90.3	15.3
50	100.0	65.2	0.0	100.0	89.6	14.6
49	100.0	63.4	0.0	100.0	88.9	13.9
48	100.0	61.5	0.0	100.0	88.3	13.3
47	100.0	59.5	0.0	100.0	86.7	11.7
46	100.0	57.5	0.0	100.0	85.1	10.1
45	100.0	55.5	0.0	100.0	83.5	8.5
44	100.0	53.5	0.0	100.0	82.0	7.0
43	100.0	51.5	0.0	100.0	80.4	5.4
42	100.0	49.5	0.0	100.0	78.8	3.8
41	100.0	47.5	0.0	100.0	77.3	2.3
40	100.0	45.5	0.0	100.0	75.7	0.7
39.6	100.0	44.6	0.0	100.0	75.0	0.0
39	100.0	43.5	0.0	100.0	73.2	0.0
38	100.0	41.5	0.0	100.0	70.1	0.0
37	100.0	39.5	0.0	100.0	67.0	0.0
36	100.0	37.5	0.0	100.0	63.8	0.0
35	100.0	35.5	0.0	100.0	60.7	0.0
34	100.0	33.5	0.0	100.0	57.5	0.0
33	100.0	31.5	0.0	100.0	54.4	0.0
32	100.0	29.5	0.0	100.0	51.3	0.0
31	100.0	27.5	0.0	100.0	48.1	0.0
30	100.0	25.6	0.0	100.0	45.0	0.0
29.7	100.0	25.0	0.0	100.0	44.1	0.0
FULL POWER	CRGP 5	CRGP 6	CRGP 7	CRGP 5	CRGP 6	CRGP 7
PERCENT OF	SHUTDOWN MARGIN INSERTION SETPOINT			CONTROL ROD ALARM INSERTION SETPOINT		

(cont)

OCONEE 1 CYCLE 14 CONTROL ROD SETPOINTS

3 PUMP OPERATION BOC TO EOC
RI = 300 IS WITHDRAWAL LIMIT AT ALL POWER LEVELS

PERCENT OF FULL POWER	SHUTDOWN MARGIN INSERTION SETPOINT			CONTROL ROD ALARM INSERTION SETPOINT		
	CRGP 5	CRGP 6	CRGP 7	CRGP 5	CRGP 6	CRGP 7
29	99.3	24.3	0.0	100.0	41.8	0.0
28	98.3	23.3	0.0	100.0	38.7	0.0
27	97.3	22.3	0.0	100.0	35.6	0.0
26	96.3	21.3	0.0	100.0	32.4	0.0
25	95.3	20.3	0.0	100.0	29.3	0.0
24	94.3	19.3	0.0	100.0	26.1	0.0
23.6	93.9	18.9	0.0	100.0	25.0	0.0
23	93.3	18.3	0.0	99.0	24.0	0.0
22	92.3	17.3	0.0	97.4	22.4	0.0
21	91.3	16.3	0.0	95.9	20.9	0.0
20	90.3	15.3	0.0	94.3	19.3	0.0
19	89.3	14.3	0.0	92.7	17.7	0.0
18	88.3	13.3	0.0	91.2	16.2	0.0
17	87.3	12.3	0.0	89.6	14.6	0.0
16	86.3	11.3	0.0	88.0	13.0	0.0
15	85.3	10.3	0.0	86.4	11.4	0.0
14	84.3	9.3	0.0	84.9	9.9	0.0
13	83.3	8.3	0.0	83.3	8.3	0.0
12	78.8	3.8	0.0	78.8	3.8	0.0
11.2	75.0	0.0	0.0	75.0	0.0	0.0
11	73.6	0.0	0.0	73.6	0.0	0.0
10	64.7	0.0	0.0	64.7	0.0	0.0
9	55.7	0.0	0.0	55.7	0.0	0.0
8	46.7	0.0	0.0	46.7	0.0	0.0
7	37.7	0.0	0.0	37.7	0.0	0.0
6	28.7	0.0	0.0	28.7	0.0	0.0
5	19.8	0.0	0.0	19.8	0.0	0.0
4	10.8	0.0	0.0	10.8	0.0	0.0
3	1.8	0.0	0.0	1.8	0.0	0.0
2.8	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0
1	0.0	0.0	0.0	0.0	0.0	0.0
FULL POWER	CRGP 5	CRGP 6	CRGP 7	CRGP 5	CRGP 6	CRGP 7
PERCENT OF	SHUTDOWN MARGIN INSERTION SETPOINT			CONTROL ROD ALARM INSERTION SETPOINT		

