

DUKE POWER COMPANY  
OCONEE 2 CYCLE 13  
CORE OPERATING LIMITS REPORT  
REVISION 1  
NOVEMBER 20, 1991

REFERENCE OSC-4404

Prepared by:

Checked by:

Approved by:

QA CONDITION 1

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Oconee Nuclear Station  
Core Operating Limits Report  
Revision 0

**REVISION LOG**

Revision Number	Effective Date	Effected Pages			Total Effective Pages
		Revised	Added	Deleted	
0	17OCT91	-	1-25	-	25
1	20NOV91	15, 18 - 21	-	-	25

## 1.0 CORE OPERATING LIMITS

This Core Operating Limits Report for O2C13 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 O2C13 are documented in References 5 and 6. The Reactor Coolant System design flow used in Reference 4 for O2C13 is 107.5% (of 88,000 gpm per RCP). The core operating limits have been developed with a radial local peaking factor ( $F_{\Delta H}^N$ ) of 1.714 and an axial peaking factor ( $F_z^N$ ) of 1.5.

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

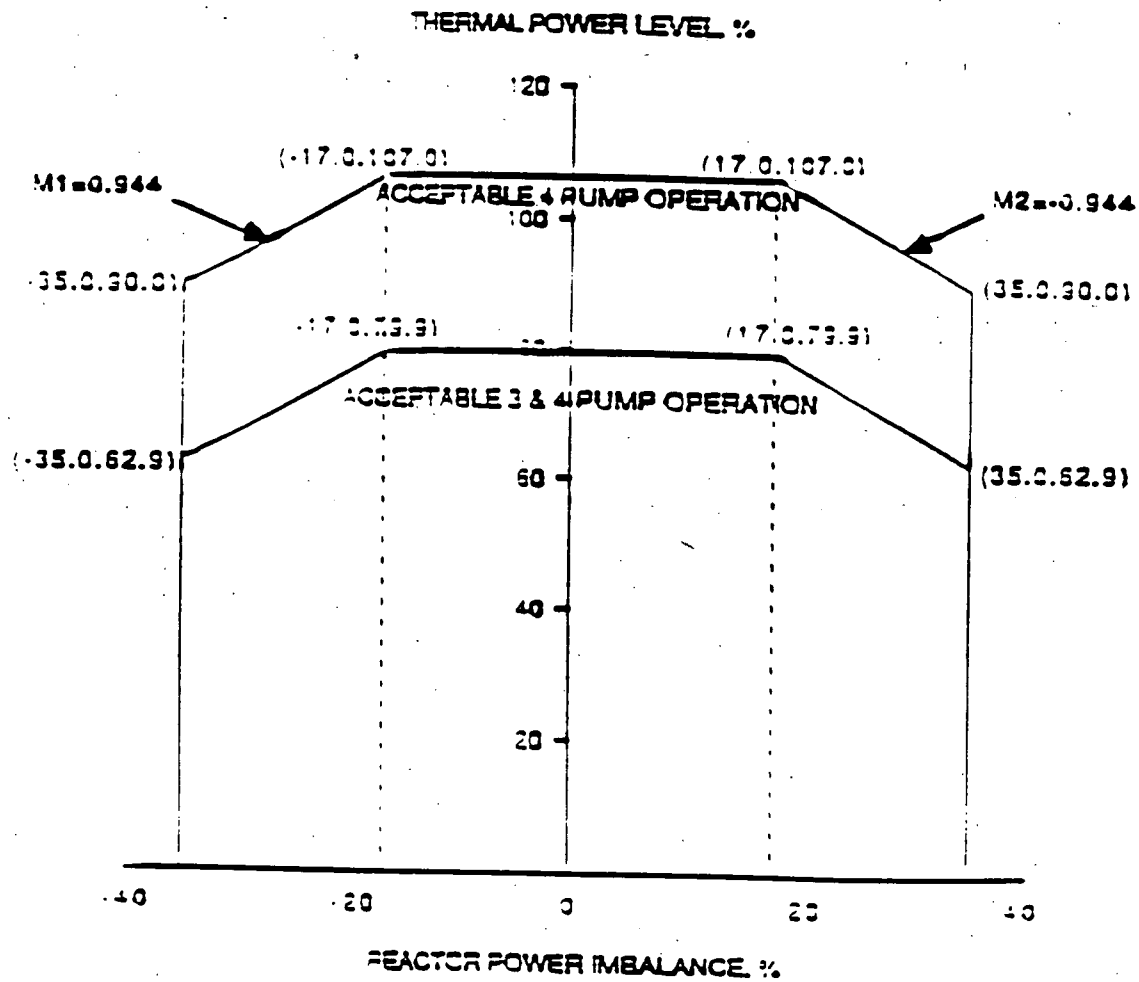
- 1) RPS limiting safety system settings (figure 1.3 and 1.4),
- 2) Quadrant power tilt limits,
- 2) Steady state operating band,
- 3) Operational power-imbalance limits, and
- 4) Operational and shutdown margin-limited control rod position limits.

## 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 1984.
- 3) DPC-DE-2003A, Oconee Nuclear Station Core Thermal Hydraulic Methodology, Using VIPRE-01, July 1989.
- 4) O2C13 Maneuvering Analysis, Duke Power Company calculational file, OSC-4407, Revision 0, 17OCT91.
- 5) Variable Low Pressure Safety Limit, Duke Power Company calculational file, OSC-4048, Revision 0, 24JUL90.
- 6) O2C13 RPS Setpoints and Safety Review, Duke Power Company calculational file, OSC-4490, Revision 0, 27SEP91.

Figure 1.3

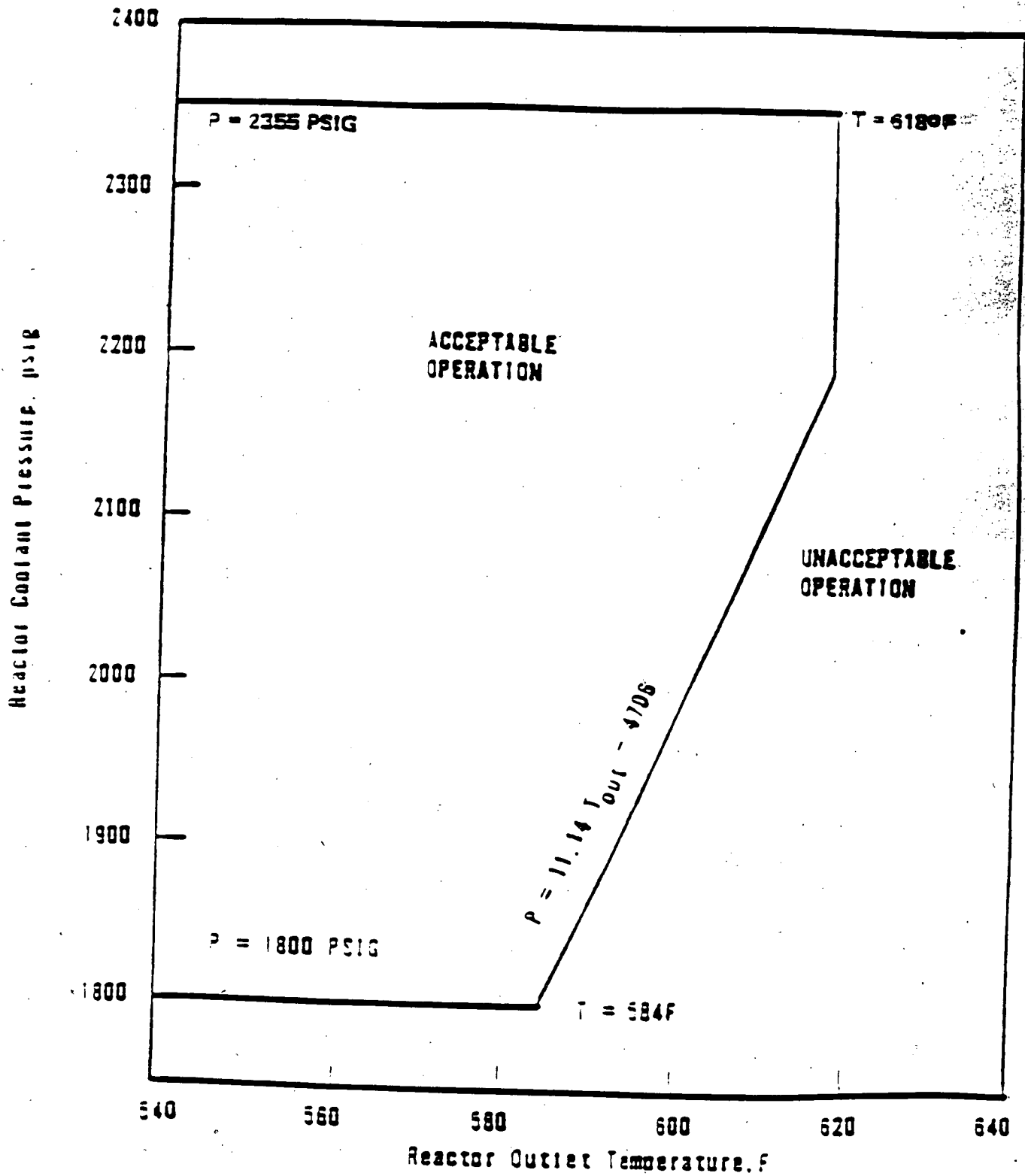
PROTECTIVE SYSTEM MAXIMUM ALLOWABLE SETPOINTS UNIT 2



Referred to by Tech. Spec. 1.3

Figure 1.4

PROTECTIVE SYSTEM MAXIMUM ALLOWABLE SETPOINTS UNIT 2



Oconee 2 Cycle 13

RPS SAFETY LIMIT BREAKPOINTS

	POWER % OF 2568MW	IMBALANCE LIMITS
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 2 Cycle 13

QUADRANT POWER TILT SETPOINTS

STEADY STATE		TRANSIENT		MAXIMUM 0 - 100 % FP
@ Powers: > 30 - 100 % FP	@ Powers: 0 - 30 % FP	@ Powers: > 30 - 100 % FP	@ Powers: 0 - 30 % FP	
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 2 Cycle 13

STEADY STATE OPERATING BAND

RI, %WD		APSR, %WD	
MIN	MAX	MIN	MAX
292	300	30	40



Oconee 2 Cycle 13

OPERATIONAL POWER IMBALANCE  
BREAKPOINTS

	POWER % OF 2568MW	IMBALANCE LIMITS
4 PUMP	0.0	-46.83
	80.0	-46.83
	90.0	-41.54
	102.0	-27.63
	102.0	+33.73
	90.0	+34.77
	80.0	+34.88
	0.0	+34.88
3 PUMP	0.0	-46.83
	77.0	-46.83
	77.0	+34.88
	0.0	+34.88

Referred to by Tech. Spec. 3.5.2.6

Oconee 2 Cycle 13

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 2 Cycle 13

ROD INDEX SHUTDOWN MARGIN LIMITS

0 EFPD to EOC

	POWER % OF 2568MW	MIN	RI, %WD 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 O2C13 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) O2C13 Maneuvering Analysis, Duke Power Company calculational file, OSC-4404, 17OCT91.

Oconee 2 Cycle 13

QUADRANT TILT LIMITS

	STEADY STATE		TRANSIENT		MAXIMUM 0 - 100 % FP
	@ Powers: > 30 - 100 % FP	@ Powers: 0 - 30 % FP	@ Powers: > 30 - 100 % FP	@ Powers: 0 - 30 % FP	
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 2 Cycle 13

ERROR ADJUSTED RPS IMBALANCE TRIP SETPOINTS

	POWER % OF 2568MW	IMBALANCE SETPOINT
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 2 Cycle 13

ERROR ADJUSTED OPERATIONAL IMBALANCE LIMITS

0 EFPD to EOC

	POWER % OF 2568 MW	IMBALANCE LIMITS	FULL INCORE	ALARM SETPOINTS BACKUP INCORE	OUT-OF-CORE
4 PUMP	0	-42.02	-31.50	-29.45	-30.06
	80	-42.02	-31.50	-29.45	-30.06
	90	-39.29	-29.70	-26.80	-27.27
	102	-25.48	-17.00	-14.78	-15.28
	102	+33.73	+17.00	+17.00	+17.00
	90	+34.77	+29.70	+23.01	+23.56
	80	+34.88	+31.50	+23.45	+24.20
	0	+34.88	+31.50	+23.45	+24.20
3 PUMP	0.00	-42.02	-31.50	-29.45	-30.06
	63.31	-	-31.50	-	-
	64.67	-	-	-	-30.06
	65.25	-	-	-29.45	-
	77.00	-42.02	-17.00	-17.00	-17.00
	77.00	+34.88	+17.00	+17.00	+17.00
	70.91	-	-	+23.45	-
	70.21	-	-	-	+24.20
	63.31	-	+31.50	-	-
	0.00	+34.88	+31.50	+23.45	+24.20

Oconee 2 Cycle 13

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 2 Cycle 13

ERROR ADJUSTED SHUTDOWN MARGIN LIMITS

0 EFPD to EOC

	POWER % OF 2568MW	RI, %WD	
		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

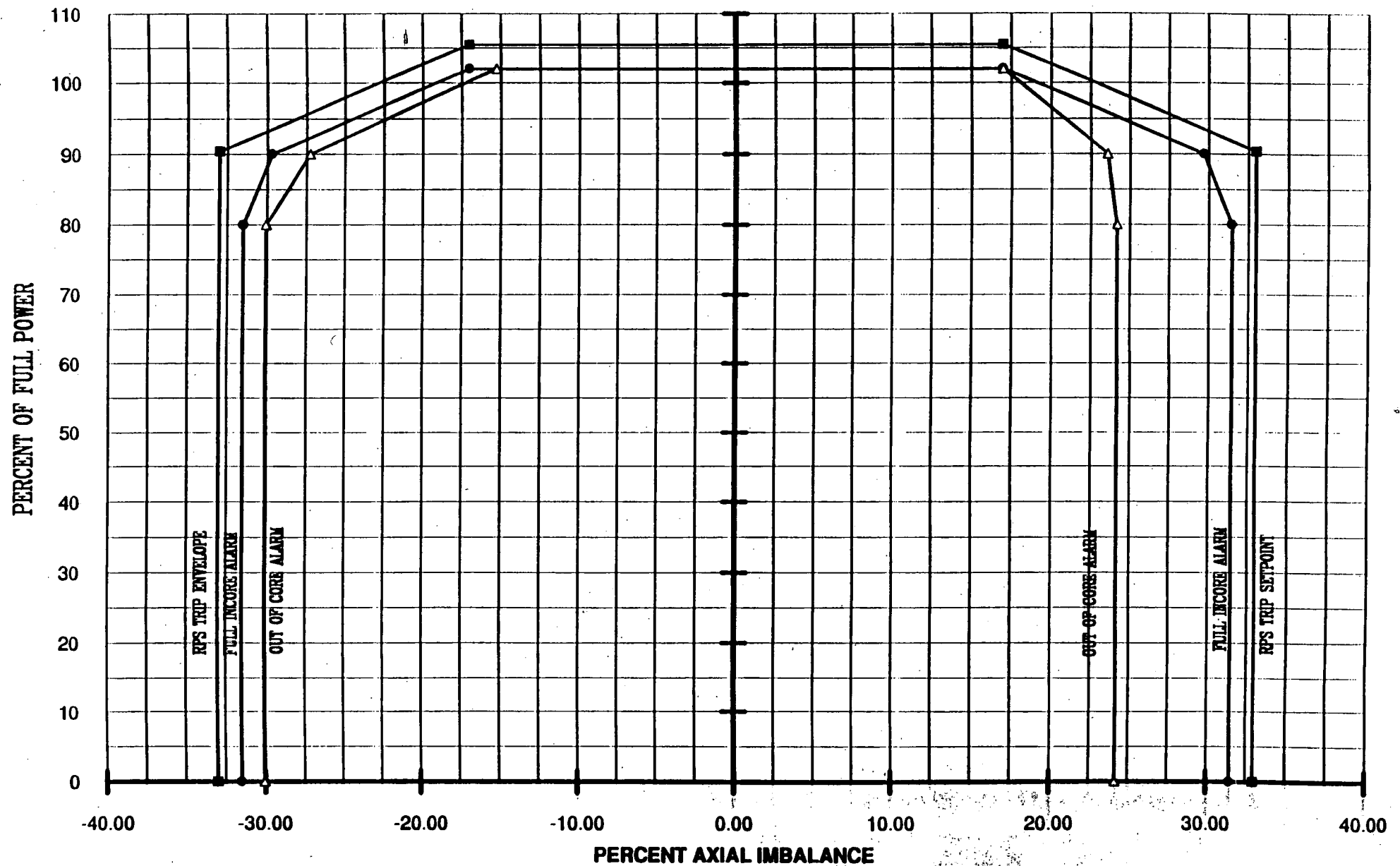
# OCONEE 2 CYCLE 13 IMBALANCE SETPOINTS

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	-15.28	17.00
101	-21.77	21.77	-18.06	18.06	-16.28	17.55
100	-22.83	22.83	-19.12	19.12	-17.28	18.09
99	-23.89	23.89	-20.18	20.18	-18.28	18.64
98	-24.95	24.95	-21.23	21.23	-19.28	19.19
97	-26.01	26.01	-22.29	22.29	-20.28	19.73
96	-27.07	27.07	-23.35	23.35	-21.28	20.28
95	-28.13	28.13	-24.41	24.41	-22.27	20.83
94	-29.19	29.19	-25.47	25.47	-23.27	21.37
93	-30.25	30.25	-26.53	26.53	-24.27	21.92
92	-31.30	31.30	-27.58	27.58	-25.27	22.47
91	-32.36	32.36	-28.64	28.64	-26.27	23.01
90.4	-33.00	33.00	-29.28	29.28	-26.87	23.34
90	-33.00	33.00	-29.70	29.70	-27.27	23.56
89	-33.00	33.00	-29.88	29.88	-27.55	23.62
88	-33.00	33.00	-30.06	30.06	-27.83	23.69
87	-33.00	33.00	-30.24	30.24	-28.11	23.75
86	-33.00	33.00	-30.42	30.42	-28.39	23.82
85	-33.00	33.00	-30.60	30.60	-28.67	23.88
84	-33.00	33.00	-30.78	30.78	-28.94	23.94
83	-33.00	33.00	-30.96	30.96	-29.22	24.01
82	-33.00	33.00	-31.14	31.14	-29.50	24.07
81	-33.00	33.00	-31.32	31.32	-29.78	24.14
80	-33.00	33.00	-31.50	31.50	-30.06	24.20
79	-33.00	33.00	-31.50	31.50	-30.06	24.20
78	-33.00	33.00	-31.50	31.50	-30.06	24.20
77	-33.00	33.00	-31.50	31.50	-30.06	24.20
76	-33.00	33.00	-31.50	31.50	-30.06	24.20
75	-33.00	33.00	-31.50	31.50	-30.06	24.20
0	-33.00	33.00	-31.50	31.50	-30.06	24.20
PERCENT OF FULL POWER	R P S	TRIP	FULL INCORE ALARM		OUT OF CORE ALARM	

**OCONEE 2 CYCLE 13 IMBALANCE SETPOINTS  
4 PUMP OPERATION; BOC TO EOC**

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# OCONEE 2 CYCLE 13 IMBALANCE SETPOINTS

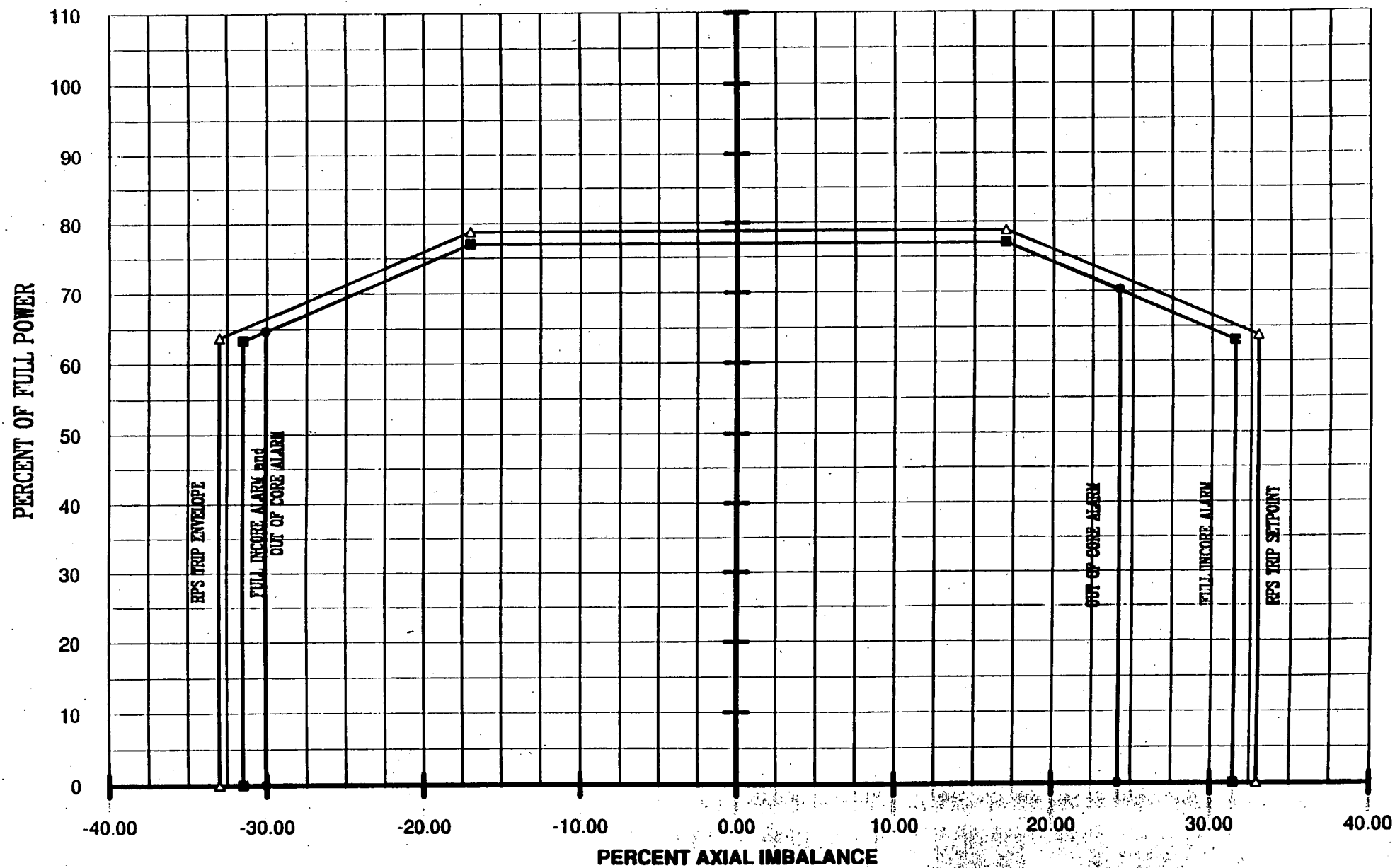
3 PUMP OPERATION

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	-17.00 17.00	-17.00 17.00
76	-19.97 19.97	-18.06 18.06	-18.06 18.06	-18.06 18.06	-18.06 18.06
75	-21.03 21.03	-19.12 19.12	-19.12 19.12	-19.12 19.12	-19.12 19.12
74	-22.09 22.09	-20.18 20.18	-20.18 20.18	-20.18 20.18	-20.18 20.18
73	-23.15 23.15	-21.23 21.23	-21.23 21.23	-21.24 21.24	-21.24 21.24
72	-24.21 24.21	-22.29 22.29	-22.29 22.29	-22.30 22.29	-22.30 22.29
71	-25.26 25.26	-23.35 23.35	-23.35 23.35	-23.36 23.35	-23.36 23.35
70.2	-26.11 26.11	-24.20 24.20	-24.20 24.20	-24.20 24.20	-24.20 24.20
70	-26.32 26.32	-24.41 24.41	-24.41 24.41	-24.41 24.20	-24.41 24.20
69	-27.38 27.38	-25.47 25.47	-25.47 25.47	-25.47 24.20	-25.47 24.20
68	-28.44 28.44	-26.53 26.53	-26.53 26.53	-26.53 24.20	-26.53 24.20
67	-29.50 29.50	-27.58 27.58	-27.58 27.58	-27.59 24.20	-27.59 24.20
66	-30.56 30.56	-28.64 28.64	-28.64 28.64	-28.65 24.20	-28.65 24.20
65	-31.62 31.62	-29.70 29.70	-29.70 29.70	-29.71 24.20	-29.71 24.20
64.67	-31.97 31.97	-30.05 30.05	-30.05 30.05	-30.06 24.20	-30.06 24.20
64	-32.68 32.68	-30.76 30.76	-30.76 30.76	-30.06 24.20	-30.06 24.20
63.7	-33.00 33.00	-31.08 31.08	-31.08 31.08	-30.06 24.20	-30.06 24.20
63.3	-33.00 33.00	-31.50 31.50	-31.50 31.50	-30.06 24.20	-30.06 24.20
63	-33.00 33.00	-31.50 31.50	-31.50 31.50	-30.06 24.20	-30.06 24.20
62	-33.00 33.00	-31.50 31.50	-31.50 31.50	-30.06 24.20	-30.06 24.20
61	-33.00 33.00	-31.50 31.50	-31.50 31.50	-30.06 24.20	-30.06 24.20
60	-33.00 33.00	-31.50 31.50	-31.50 31.50	-30.06 24.20	-30.06 24.20
0	-33.00 33.00	-31.50 31.50	-31.50 31.50	-30.06 24.20	-30.06 24.20
PERCENT OF FULL POWER	R P S TRIP	FULL INCORE ALARM		OUT OF CORE ALARM	

**OCONEE 2 CYCLE 13 IMBALANCE SETPOINTS  
3 PUMP OPERATION; BOC TO EOC**

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# OCONEE 2 CYCLE 13 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	24.5
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		

# OCONEE 2 CYCLE 13 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	89.6	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	25.5	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	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
PERCENT OF FULL POWER	CRGP 5	CRGP 6	CRGP 7	CRGP 5	CRGP 6	CRGP 7

## OCONEE 2 CYCLE 13 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	84.3	9.3	100.0	99.6	24.5
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	96.2	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	92.6	17.6
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	25.5	0.0	100.0	45.0	0.0
29.7	100.0	25.0	0.0	100.0	44.1	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		

(cont)



# OCONEE 2 CYCLE 13 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
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		