

DUKE POWER COMPANY
OCONEE 2 CYCLE 15
CORE OPERATING LIMITS REPORT
REVISION 0

QA CONDITION 1

REFERENCE OSC-5785

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Oconee Nuclear Station

Unit 2 Cycle 15

Core Operating Limits Report

Insertion Sheet for Revision 0

This revision is not valid until the end of operation for Unit 2 Cycle 14.

Remove these Revision 0 pages

Not applicable

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1-34

Oconee Nuclear Station
Unit 2 Cycle 15
Core Operating Limits Report
Revision Log

Revision	Effective Date	Pages Revised	Pages Added	Pages Deleted	Total Effective Pages
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1.0 CORE OPERATING LIMITS

This Core Operating Limits Report for O2C15 has been prepared in accordance with the requirements of Technical Specification 6.9. The core operating limits within this report have been developed using NRC-approved methodology (References 1, 2, 3, and 4). The RPS protective limits and maximum allowable setpoints are documented in References 6 and 7, and validated in References 5 and 8 for O2C15. Operational limits and requirements are documented in Reference 5. The reactor coolant system design flow used in References 5 and 8 for O2C15 is 107.5 % (of 88,000 gpm per pump). 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. All computations performed in setting these limits used the approved SIMULATE methodology.

- 1) RPS protective limits (Figures 1.1 and 1.2), and RPS maximum allowable setpoints (Figures 1.3 and 1.4),
- 2) Quadrant power tilt operational limits,
- 3) Steady state operating band,
- 4) Power-imbalance operational limits,
- 5) Rod index operational and shutdown margin-restricted limits, and
- 6) BWST, CBAST, and CFT boron requirements.

1.1 REFERENCES

- 1) DPCo, Nuclear Design Methodology Using CASMO-3 / SIMULATE-3P, DPC-NE-1004A, November 1992.
- 2) DPCo, Oconee Nuclear Station, Reload Design Methodology II, DPC-NE-1002A, October 1985.
- 3) DPCo, Oconee Nuclear Station, Reload Design Methodology, NFS-1001A, April 1984.
- 4) DPC-NE-2003A, Oconee Nuclear Station Core Thermal Hydraulic Methodology Using VIPRE-01, July 1989.
- 5) O2C15 Maneuvering Analysis, DPCo calculational file, OSC-5785, September 1994.
- 6) Variable Low Pressure Safety Limit, DPCo calculational file, OSC-4048, Revision 0, July 1990.
- 7) Power-Imbalance Safety Limits and Tech. Spec. Setpoints Using Error-Adjusted Flux-Flow Ratio of 1.094, DPCo calculational file, OSC-5604, Revision 0, November 1993.
- 8) O2C15 Thermal-Hydraulic Evaluation, DPCo calculational file, OSC-5808, Revision 0, August 1994.

Figure 1.1. Axial Power Imbalance RPS Protective Limits

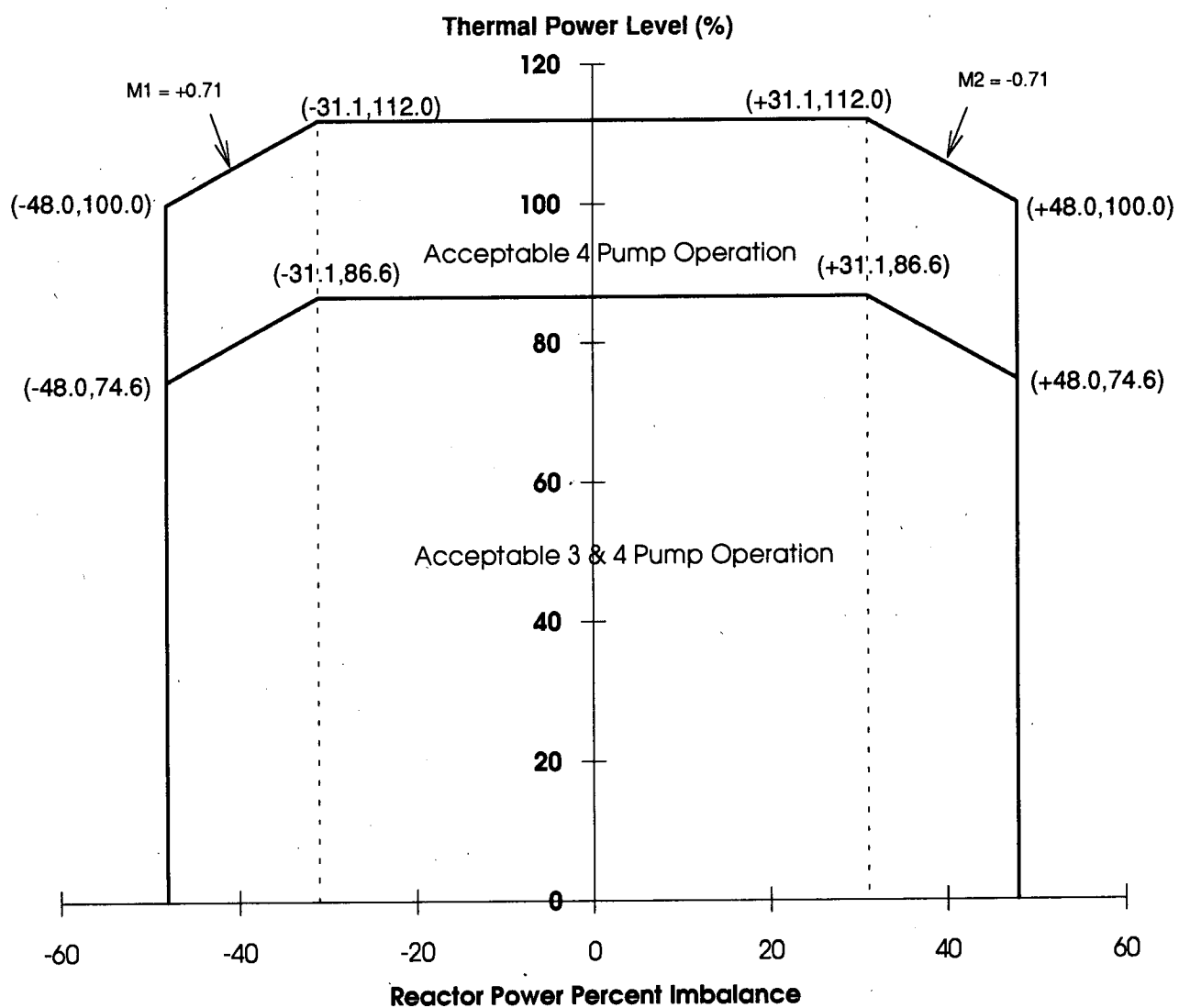


Figure 1.2. Variable Low RCS Pressure RPS Protective Limits

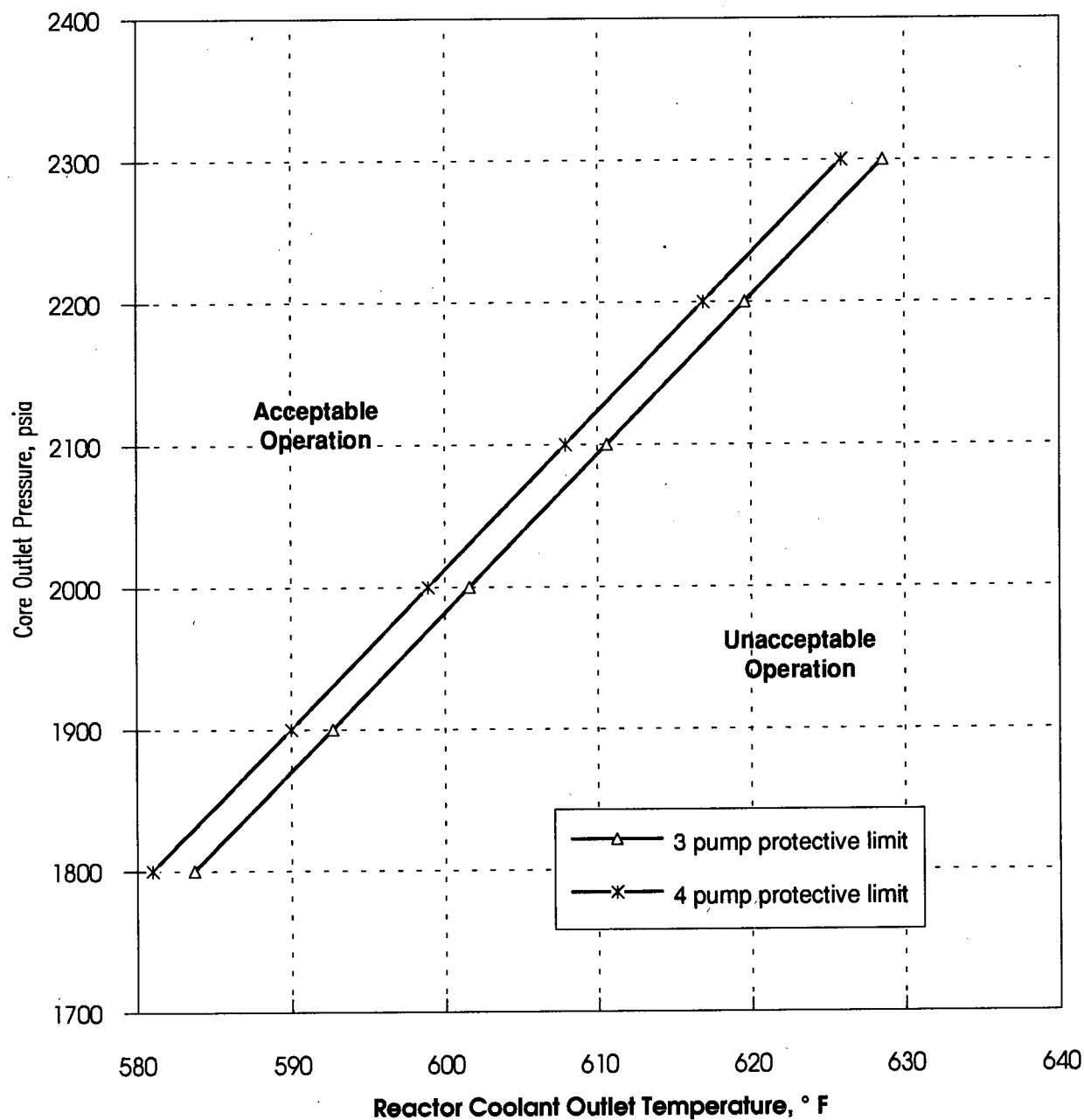


Figure 1.3. Axial Power Imbalance RPS Maximum Allowable Setpoints

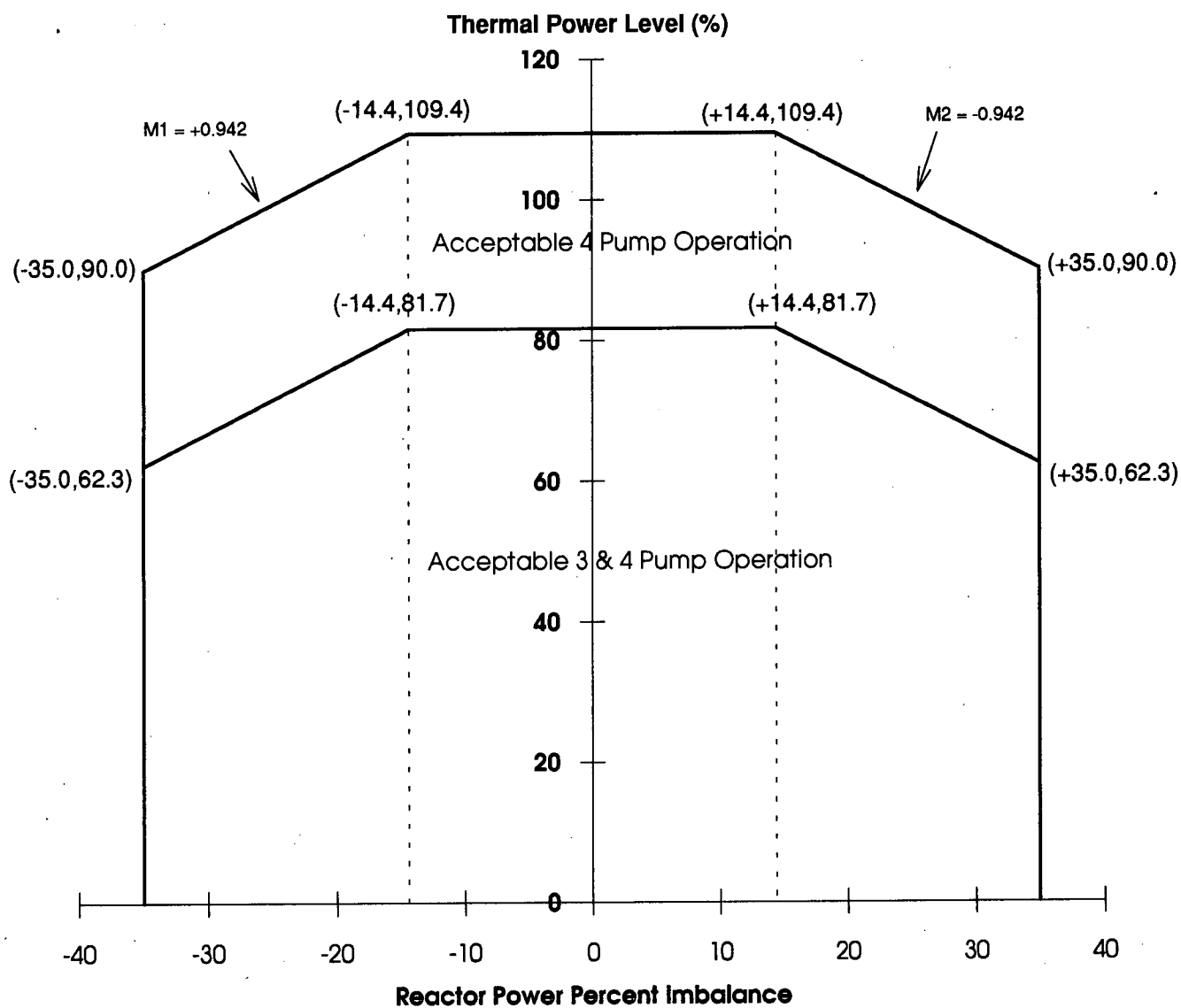
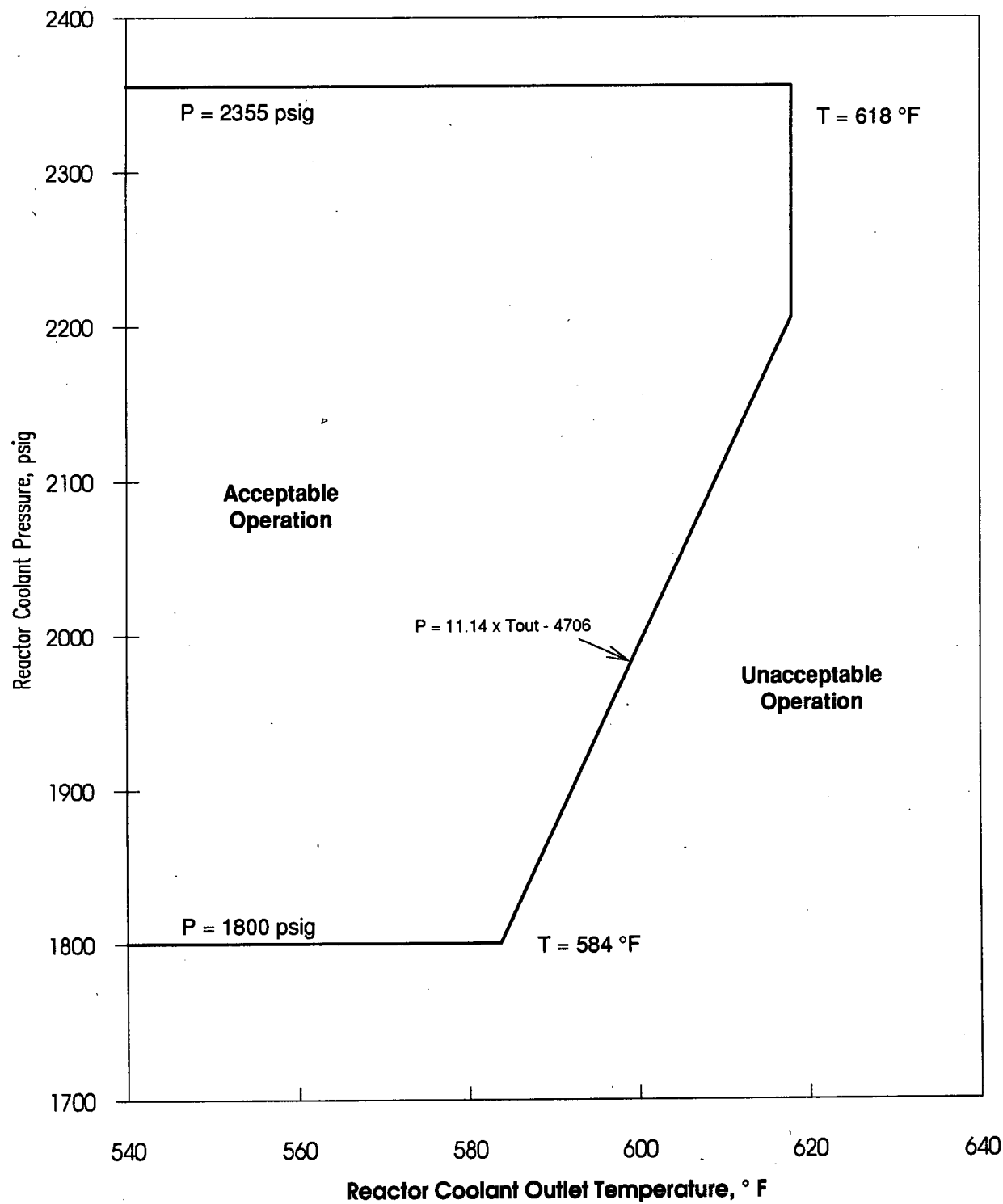


Figure 1.4. Variable Low RCS Pressure RPS Maximum Allowable Setpoints



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RPS POWER-IMBALANCE PROTECTIVE LIMITS*

	POWER % OF 2568 MW	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
	74.6	-48.00
	86.6	-31.10
	86.6	31.10
	74.6	48.00
	0.0	48.00

* -- These limits have not been error-adjusted. Refer to Section 2 of this Report for the error-adjusted setpoints.

Referred to by Tech. Spec. 2.1

Oconee 2 Cycle 15

QUADRANT POWER TILT OPERATIONAL LIMITS*

STEADY STATE		TRANSIENT		MAXIMUM
30 - 100 % FP	0 - 30 % FP	30 - 100 % FP	0 - 30 % FP	0 - 100 % FP
5.54	10.00	9.44	12.00	20.00

The Steady State, Transient, and Maximum Limits tabulated above define quadrant tilt ranges that impose different restrictions on power operation, and time intervals within which specific action may be required. Refer to the Technical Specification Sections listed below for more detailed information.

* -- These limits have not been error-adjusted. Refer to Section 2 of this Report for the error-adjusted setpoints.

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 15

STEADY STATE OPERATING BAND

	Rod Index		APSR % withdrawn	
	Min	Max	Min	Max
0 to 450 EFPD	292	300	30	40
450 to 470 EFPD	292	300	100	100

Oconee 2 Cycle 15

**POWER-IMBALANCE OPERATIONAL
LIMITS***

	POWER % OF 2568 MW	IMBALANCE LIMITS
4 PUMP	0.0	-43.4
	80.0	-43.4
	90.0	-36.3
	102.0	-27.5
	102.0	+22.8
	90.0	+27.1
	80.0	+33.8
	0.0	+33.8
3 PUMP	0.0	-43.4
	77.0	-43.4
	77.0	+33.8
	0.0	+33.8

* -- These limits have not been error-adjusted. Refer to Section 2 of this Report for the error-adjusted setpoints.

Referred to by Tech. Spec. 3.5.2.6

Oconee 2 Cycle 15

ROD INDEX OPERATIONAL LIMITS*

0 EFPD to EOC

	POWER % OF 2568 MW	RI, %WD		
		MIN		MAX
		0 INOP ROD	1 INOP ROD	
4 PUMP	102	260.0	280.0	300.0
	90	260.0	266.0	300.0
	80	250.0	255.0	300.0
	50	200.0	220.0	300.0
	15	90.0	160.0	300.0
	5	0.0	90.0	300.0
3 PUMP	77	245.0	280.0	300.0
	50	200.0	220.0	300.0
	15	90.0	160.0	300.0
	5	0.0	90.0	300.0

* -- These limits have not been error-adjusted. Refer to Section 2 of this Report for the error-adjusted setpoints.

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 15

ROD INDEX SHUTDOWN MARGIN LIMITS*

0 EFPD to EOC

	POWER % OF 2568 MW	RI, %WD		
		MIN		MAX
		0 INOP ROD	1 INOP ROD	
4 PUMP	102	220.0	280.0	300.0
	50	160.0	220.0	300.0
	15	90.0	160.0	300.0
	5	0.0	90.0	300.0
3 PUMP	77	210.0	280.0	300.0
	50	160.0	220.0	300.0
	15	90.0	160.0	300.0
	5	0.0	90.0	300.0

* -- These limits have not been error-adjusted. Refer to Section 2 of this Report for the error-adjusted setpoints.

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 15

BWST, CBAST, and CFT BORON REQUIREMENTS

0 EFPD to EOC

- 1) The BWST boron concentration shall be greater than 2210 ppm and less than 3000 ppm (referred to by Tech Spec 3.3.4).
- 2) The equivalent of at least 1100 cubic feet of 11,000 ppm boron shall be maintained in the CBAST (referred to by Tech Spec 3.2.2).
- 3) The boron concentration in each CFT shall be greater than 1835 ppm (referred to by Tech Spec 3.3.3).
- 4) The refueling canal boron concentration shall be greater than 2210 ppm (referred to by the bases to Tech Spec 3.8.4). This concentration is large enough to maintain 1% $\Delta k/k$ shutdown margin with all control rods out of the core at temperatures down to 33 deg F, and with no credit for xenon worth. There is no upper limit on the refueling canal boron concentration.

2.0 ERROR-ADJUSTED CORE OPERATING LIMITS

The error-adjusted core operating limits (i.e., setpoints) have been determined for O2C15, with all necessary uncertainties and margins applied. The calculations that support these setpoints are documented in Reference 1.

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

- 1) Quadrant power tilt operational setpoints,
- 2) RPS power-imbalance trip setpoints,
- 3) Power-imbalance operational setpoints and,
- 4) Rod index operational alarm and shutdown margin-restricted setpoints.

2.1 REFERENCE

- 1) O2C15 Maneuvering Analysis, DPCo calculational file, OSC-5785, September 1994.

Oconee 2 Cycle 15

ERROR-ADJUSTED QUADRANT POWER TILT OPERATIONAL SETPOINTS

	STEADY STATE		TRANSIENT		MAXIMUM
	30 - 100 % FP	0 - 30 % FP	30 - 100 % FP	0 - 30 % FP	0 - 100 % FP
Full Incore Alarm *	3.50	7.49	6.99	9.27	16.43
Outcore Alarm	2.46	6.09	5.63	7.72	14.22
Backup Incore	2.14	3.94	3.64	5.03	9.58

* BASED UPON q (fraction of incore detector initial charge consumed) = 0.61

The Steady State, Transient, and Maximum Limits tabulated above define quadrant tilt ranges that impose different restrictions on power operation, and time intervals within which specific action may be required. Refer to the Technical Specification Sections listed below for more detailed information.

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 15

ERROR ADJUSTED RPS POWER-IMBALANCE TRIP SETPOINTS

	POWER % OF 2568MW	IMBALANCE SETPOINT
4 PUMP	0.0	-33.00
	90.4	-33.00
	107.9	-14.40
	107.9	14.40
	90.4	33.00
	0.0	33.00
3 PUMP	0.00	-33.00
	63.1	-33.00
	80.6	-14.40
	80.6	14.40
	63.1	33.00
	0.00	33.00

Oconee 2 Cycle 15

ERROR ADJUSTED POWER-IMBALANCE OPERATIONAL SETPOINTS

0 EFPD to EOC

	POWER % OF 2568 MW	P-I OPERATIONAL LIMIT	FULL INCORE ALARM SETPOINT	BACKUP INCORE SETPOINT	OUTCORE ALARM SETPOINT
4 PUMP	0	-43.4	-31.5	-30.8	-31.1
	80	-43.4	-31.5	-30.8	-31.1
	90	-36.3	-29.7	-24.4	-24.8
	102	-27.5	-17.0	-16.6	-16.9
	102	+22.8	+17.0	+12.7	+13.2
	90	+27.1	+24.8	+16.7	+17.3
	80	+33.8	+31.5	+22.7	+23.4
	0	+33.8	+31.5	+22.7	+23.4
3 PUMP	0.0	-43.4	-31.5	-30.8	-31.1
	63.3	-43.4	-31.5	-	-
	63.7	-	-	-	-31.1
	64.0	-	-	-30.8	-
	77.0	-43.4	-17.0	-17.0	-17.0
	77.0	+33.8	+17.0	+17.0	+17.0
	71.6	-	-	+22.7	-
	71.0	-	-	-	+23.4
	63.3	+33.8	+31.5	-	-
	0.0	+33.8	+31.5	+22.7	+23.4

Oconee 2 Cycle 15

ERROR ADJUSTED ROD INDEX OPERATIONAL ALARM SETPOINTS

0 EFPD to EOC

	POWER % OF 2568 MW	RI, %WD		
		MIN		MAX
		0 INOP ROD	1 INOP ROD	
4 PUMP	102	261.5	283.8	300.0
	88	261.5	267.5	300.0
	78	251.5	256.5	300.0
	48	201.5	221.5	300.0
	13	91.5	161.5	300.0
	3.0	-	91.5	300.0
	2.8	0.0	-	300.0
	0.0	0.0	70.5	300.0
3 PUMP	77	249.8	285.9	300.0
	75	246.5	281.5	300.0
	48	201.5	221.5	300.0
	13	91.5	161.5	300.0
	3.0	-	91.5	300.0
	2.8	0.0	-	300.0
	0.0	0.0	70.5	300.0

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ERROR ADJUSTED ROD INDEX SHUTDOWN MARGIN SETPOINTS

0 EFPD to EOC

	POWER % OF 2568 MW	RI, % WD		
		MIN		MAX
		0 INOP ROD	1 INOP ROD	
4 PUMP	102	223.8	283.8	300.0
	100	221.5	281.5	300.0
	48	161.5	221.5	300.0
	13	91.5	161.5	300.0
	3.0	-	91.5	300.0
	2.8	0.0	-	300.0
	0.0	0.0	70.5	300.0
3 PUMP	77	215.5	285.9	300.0
	75	211.5	281.5	300.0
	48	161.5	221.5	300.0
	13	91.5	161.5	300.0
	3.0	-	91.5	300.0
	2.8	0.0	-	300.0
	0.0	0.0	70.5	300.0

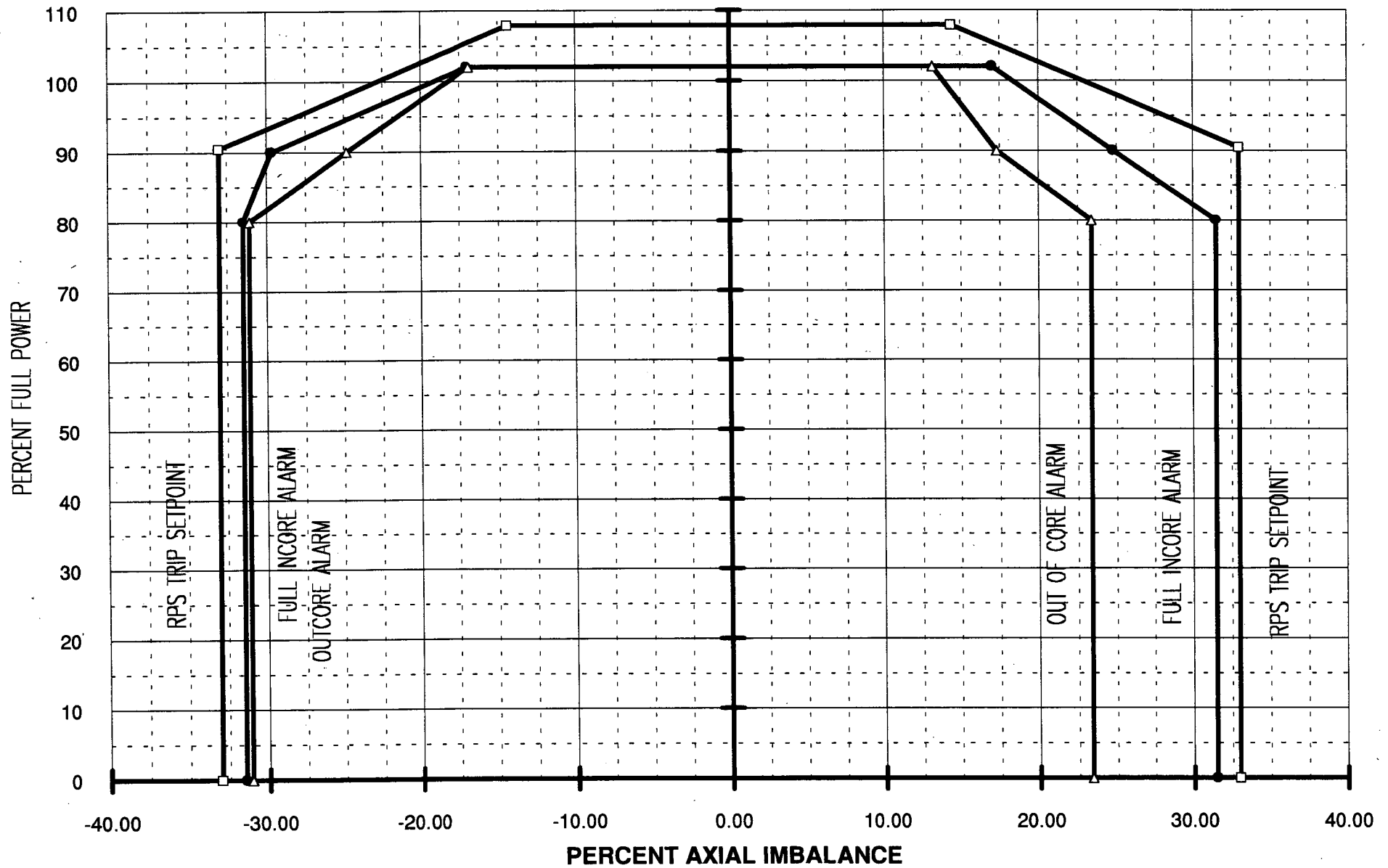
OCONEE 2 CYCLE 15 IMBALANCE SETPOINTS

4 PUMP OPERATION BOC TO EOC

PERCENT OF FULL POWER	R P S	TRIP	FULL INCORE ALARM		OUTCORE ALARM	
107.9	-14.40	14.40				
107	-15.36	15.36				
106	-16.42	16.42				
105	-17.48	17.48				
104	-18.55	18.55				
103	-19.61	19.61				
102	-20.67	20.67	-17.00	17.00	-16.90	13.20
101	-21.73	21.73	-18.06	17.65	-17.56	13.54
100	-22.80	22.80	-19.12	18.30	-18.22	13.88
99	-23.86	23.86	-20.18	18.95	-18.88	14.23
98	-24.92	24.92	-21.23	19.60	-19.53	14.57
97	-25.99	25.99	-22.29	20.25	-20.19	14.91
96	-27.05	27.05	-23.35	20.90	-20.85	15.25
95	-28.11	28.11	-24.41	21.55	-21.51	15.59
94	-29.17	29.17	-25.47	22.20	-22.17	15.93
93	-30.24	30.24	-26.53	22.85	-22.83	16.28
92	-31.30	31.30	-27.58	23.50	-23.48	16.62
91	-32.36	32.36	-28.64	24.15	-24.14	16.96
90.4	-33.00	33.00	-29.28	24.54	-24.54	17.16
90.0	-33.00	33.00	-29.70	24.80	-24.80	17.30
89	-33.00	33.00	-29.88	25.47	-25.43	17.91
88	-33.00	33.00	-30.06	26.14	-26.06	18.52
87	-33.00	33.00	-30.24	26.81	-26.69	19.13
86	-33.00	33.00	-30.42	27.48	-27.32	19.74
85	-33.00	33.00	-30.60	28.15	-27.95	20.35
84	-33.00	33.00	-30.78	28.82	-28.58	20.96
83	-33.00	33.00	-30.96	29.49	-29.21	21.57
82	-33.00	33.00	-31.14	30.16	-29.84	22.18
81	-33.00	33.00	-31.32	30.83	-30.47	22.79
80	-33.00	33.00	-31.50	31.50	-31.10	23.40
79	-33.00	33.00	-31.50	31.50	-31.10	23.40
78	-33.00	33.00	-31.50	31.50	-31.10	23.40
77	-33.00	33.00	-31.50	31.50	-31.10	23.40
76	-33.00	33.00	-31.50	31.50	-31.10	23.40
75	-33.00	33.00	-31.50	31.50	-31.10	23.40
0	-33.00	33.00	-31.50	31.50	-31.10	23.40
PERCENT OF FULL POWER	R P S	TRIP	FULL INCORE ALARM		OUTCORE ALARM	

OCONEE 2 CYCLE 15 IMBALANCE SETPOINTS 4 PUMP OPERATION -- BOC TO EOC

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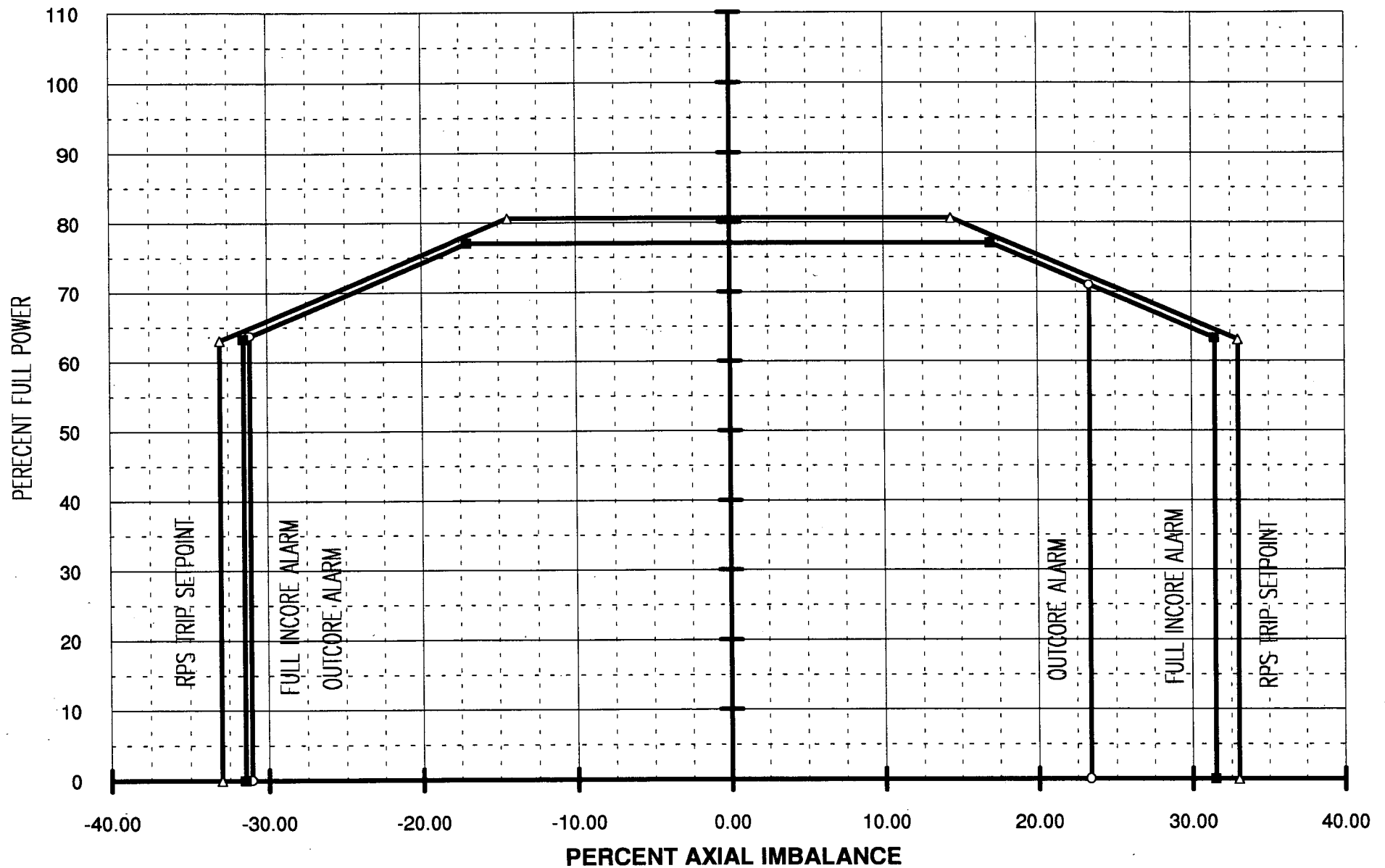
OCONEE 2 CYCLE 15 IMBALANCE SETPOINTS

3 PUMP OPERATION BOC TO EOC

PERCENT OF FULL POWER	R P S	TRIP	FULL INCORE ALARM		OUTCORE ALARM	
80.6	-14.40	14.40				
80	-15.04	15.04				
79	-16.10	16.10				
78	-17.16	17.16				
77.0	-18.23	18.23	-17.00	17.00	-17.00	17.00
76	-19.29	19.29	-18.06	18.06	-18.06	18.06
75	-20.35	20.35	-19.12	19.12	-19.12	19.12
74	-21.41	21.41	-20.18	20.18	-20.18	20.18
73	-22.48	22.48	-21.23	21.23	-21.23	21.23
72	-23.54	23.54	-22.29	22.29	-22.29	22.29
71.0	-24.65	24.65	-23.40	23.40	-23.40	23.40
70	-25.67	25.67	-24.41	24.41	-24.41	23.40
69	-26.73	26.73	-25.47	25.47	-25.47	23.40
68	-27.79	27.79	-26.53	26.53	-26.53	23.40
67	-28.85	28.85	-27.58	27.58	-27.58	23.40
66	-29.92	29.92	-28.64	28.64	-28.64	23.40
65	-30.98	30.98	-29.70	29.70	-29.70	23.40
64	-32.04	32.04	-30.76	30.76	-30.76	23.40
63.7	-32.39	32.39	-31.10	31.10	-31.10	23.40
63.3	-32.79	32.79	-31.50	31.50	-31.10	23.40
63.1	-33.00	33.00	-31.50	31.50	-31.10	23.40
63	-33.00	33.00	-31.50	31.50	-31.10	23.40
62	-33.00	33.00	-31.50	31.50	-31.10	23.40
61	-33.00	33.00	-31.50	31.50	-31.10	23.40
60	-33.00	33.00	-31.50	31.50	-31.10	23.40
0	-33.00	33.00	-31.50	31.50	-31.10	23.40
PERCENT OF FULL POWER	R P S	TRIP	FULL INCORE ALARM		OUTCORE ALARM	

OCONEE 2 CYCLE 15 IMBALANCE SETPOINTS 3 PUMP OPERATION -- BOC TO EOC

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OCONEE 2 CYCLE 15 ERROR ADJUSTED ROD INDEX SETPOINTS

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

PERCENT OF FULL POWER	SHUTDOWN MARGIN INSERTION SETPOINT			OPERATIONAL 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	90.8	15.8	100.0	100.0	60.5
86	100.0	90.2	15.2	100.0	100.0	59.5
85	100.0	89.6	14.6	100.0	100.0	58.5
84	100.0	89.0	14.0	100.0	100.0	57.5
83	100.0	88.4	13.4	100.0	100.0	56.5
82	100.0	87.9	12.9	100.0	100.0	55.5
81	100.0	87.3	12.3	100.0	100.0	54.5
80	100.0	86.7	11.7	100.0	100.0	53.5
79	100.0	86.1	11.1	100.0	100.0	52.5
78	100.0	85.6	10.6	100.0	100.0	51.5
77	100.0	85.0	10.0	100.0	100.0	49.8
76	100.0	84.4	9.4	100.0	100.0	48.2
75	100.0	83.8	8.8	100.0	100.0	46.5
74	100.0	83.2	8.2	100.0	100.0	44.8
73	100.0	82.7	7.7	100.0	100.0	43.2
72	100.0	82.1	7.1	100.0	100.0	41.5
71	100.0	81.5	6.5	100.0	100.0	39.8
70	100.0	80.9	5.9	100.0	100.0	38.2
69	100.0	80.4	5.4	100.0	100.0	36.5
68	100.0	79.8	4.8	100.0	100.0	34.8
67	100.0	79.2	4.2	100.0	100.0	33.2
66	100.0	78.6	3.6	100.0	100.0	31.5
65	100.0	78.1	3.1	100.0	100.0	29.8
64	100.0	77.5	2.5	100.0	100.0	28.2
63	100.0	76.9	1.9	100.0	100.0	26.5
62.1	100.0	76.4	1.4	100.0	100.0	25.0
62	100.0	76.3	1.3	100.0	99.9	24.9
61	100.0	75.8	0.8	100.0	99.1	24.1
60	100.0	75.2	0.2	100.0	98.2	23.2
59.7	100.0	75.0	0.0	100.0	98.0	23.0
59	100.0	74.2	0.0	100.0	97.4	22.4
58	100.0	73.0	0.0	100.0	96.6	21.6
57	100.0	71.9	0.0	100.0	95.8	20.8
56	100.0	70.7	0.0	100.0	94.9	19.9
55	100.0	69.6	0.0	100.0	94.1	19.1
54	100.0	68.4	0.0	100.0	93.2	18.2
53	100.0	67.3	0.0	100.0	92.4	17.4
52	100.0	66.1	0.0	100.0	91.6	16.6
51	100.0	65.0	0.0	100.0	90.8	15.8
50	100.0	63.8	0.0	100.0	89.9	14.9
PERCENT OF FULL POWER	CRGP 5	CRGP 6	CRGP 7	CRGP 5	CRGP 6	CRGP 7
	SHUTDOWN MARGIN INSERTION SETPOINT			OPERATIONAL ALARM INSERTION SETPOINT		

(continued)

OCONEE 2 CYCLE 15 ERROR ADJUSTED ROD INDEX SETPOINTS

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

PERCENT OF FULL POWER	SHUTDOWN MARGIN INSERTION SETPOINT			OPERATIONAL ALARM INSERTION SETPOINT		
	CRGP 5	CRGP 6	CRGP 7	CRGP 5	CRGP 6	CRGP 7
49	100.0	62.7	0.0	100.0	89.1	14.1
48	100.0	61.5	0.0	100.0	88.2	13.2
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	77.2	2.2
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	66.9	0.0
36	100.0	37.5	0.0	100.0	63.8	0.0
35	100.0	35.5	0.0	100.0	60.6	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	51.2	0.0
31	100.0	27.5	0.0	100.0	48.1	0.0
30	100.0	25.5	0.0	100.0	44.9	0.0
29.8	100.0	25.0	0.0	100.0	44.1	0.0
29	99.2	24.2	0.0	100.0	41.8	0.0
28	98.2	23.2	0.0	100.0	38.6	0.0
27	97.2	22.2	0.0	100.0	35.5	0.0
26	96.2	21.2	0.0	100.0	32.4	0.0
25	95.2	20.2	0.0	100.0	29.2	0.0
24	94.2	19.2	0.0	100.0	26.1	0.0
23.7	93.9	18.9	0.0	100.0	25.0	0.0
23	93.2	18.2	0.0	99.0	24.0	0.0
22	92.2	17.2	0.0	97.4	22.4	0.0
21	91.2	16.2	0.0	95.8	20.8	0.0
20	90.2	15.2	0.0	94.2	19.2	0.0
19	89.2	14.2	0.0	92.7	17.7	0.0
18	88.2	13.2	0.0	91.1	16.1	0.0
17	87.2	12.2	0.0	89.5	14.5	0.0
16	86.2	11.2	0.0	88.0	13.0	0.0
15	85.2	10.2	0.0	86.4	11.4	0.0
14	84.2	9.2	0.0	84.8	9.8	0.0
13	83.2	8.2	0.0	83.2	8.2	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	64.6	0.0	0.0	64.6	0.0	0.0
9	55.6	0.0	0.0	55.6	0.0	0.0
8	46.6	0.0	0.0	46.6	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	19.7	0.0	0.0	19.7	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
0	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			OPERATIONAL ALARM INSERTION SETPOINT		

OCONEE 2 CYCLE 15 ERROR ADJUSTED ROD INDEX SETPOINTS

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

PERCENT OF FULL POWER	SHUTDOWN MARGIN INSERTION SETPOINT			OPERATIONAL ALARM INSERTION SETPOINT		
	CRGP 5	CRGP 6	CRGP 7	CRGP 5	CRGP 6	CRGP 7
77	100.0	95.2	20.2	100.0	100.0	49.8
76	100.0	94.2	19.2	100.0	100.0	48.1
75	100.0	93.2	18.2	100.0	100.0	46.5
74	100.0	92.3	17.3	100.0	100.0	44.8
73	100.0	91.4	16.4	100.0	100.0	43.2
72	100.0	90.5	15.5	100.0	100.0	41.5
71	100.0	89.5	14.5	100.0	100.0	39.8
70	100.0	88.6	13.6	100.0	100.0	38.2
69	100.0	87.7	12.7	100.0	100.0	36.5
68	100.0	86.8	11.8	100.0	100.0	34.8
67	100.0	85.8	10.8	100.0	100.0	33.2
66	100.0	84.9	9.9	100.0	100.0	31.5
65	100.0	84.0	9.0	100.0	100.0	29.8
64	100.0	83.1	8.1	100.0	100.0	28.2
63	100.0	82.1	7.1	100.0	100.0	26.5
62.1	100.0	81.3	6.3	100.0	100.0	25.0
62	100.0	81.2	6.2	100.0	99.9	24.9
61	100.0	80.3	5.3	100.0	99.1	24.1
60	100.0	79.4	4.4	100.0	98.2	23.2
59	100.0	78.4	3.4	100.0	97.4	22.4
58	100.0	77.5	2.5	100.0	96.6	21.6
57	100.0	76.6	1.6	100.0	95.8	20.8
56	100.0	75.7	0.7	100.0	94.9	19.9
55.3	100.0	75.0	0.0	100.0	94.3	19.3
55	100.0	74.5	0.0	100.0	94.1	19.1
54	100.0	72.6	0.0	100.0	93.2	18.2
53	100.0	70.8	0.0	100.0	92.4	17.4
52	100.0	68.9	0.0	100.0	91.6	16.6
51	100.0	67.1	0.0	100.0	90.8	15.8
50	100.0	65.2	0.0	100.0	89.9	14.9
49	100.0	63.4	0.0	100.0	89.1	14.1
48	100.0	61.5	0.0	100.0	88.2	13.2
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	77.2	2.2
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	66.9	0.0
36	100.0	37.5	0.0	100.0	63.8	0.0
35	100.0	35.5	0.0	100.0	60.6	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	51.2	0.0
31	100.0	27.5	0.0	100.0	48.1	0.0
30	100.0	25.5	0.0	100.0	44.9	0.0
29.8	100.0	25.0	0.0	100.0	44.1	0.0
29	99.2	24.2	0.0	100.0	41.8	0.0
28	98.2	23.2	0.0	100.0	38.6	0.0
27	97.2	22.2	0.0	100.0	35.5	0.0
PERCENT OF FULL POWER	CRGP 5	CRGP 6	CRGP 7	CRGP 5	CRGP 6	CRGP 7
	SHUTDOWN MARGIN INSERTION SETPOINT			OPERATIONAL ALARM INSERTION SETPOINT		

(continued)

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OCONEE 2 CYCLE 15 ERROR ADJUSTED ROD INDEX SETPOINTS

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

PERCENT OF FULL POWER	SHUTDOWN MARGIN INSERTION SETPOINT			OPERATIONAL ALARM INSERTION SETPOINT		
	CRGP 5	CRGP 6	CRGP 7	CRGP 5	CRGP 6	CRGP 7
102	100.0	100.0	83.8	100.0	100.0	83.8
101	100.0	100.0	82.6	100.0	100.0	82.6
100	100.0	100.0	81.5	100.0	100.0	81.5
99	100.0	100.0	80.3	100.0	100.0	80.3
98	100.0	100.0	79.2	100.0	100.0	79.1
97	100.0	100.0	78.0	100.0	100.0	78.0
96	100.0	100.0	76.9	100.0	100.0	76.8
95	100.0	100.0	75.7	100.0	100.0	75.6
94	100.0	100.0	74.6	100.0	100.0	74.5
93	100.0	100.0	73.4	100.0	100.0	73.3
92	100.0	100.0	72.3	100.0	100.0	72.2
91	100.0	100.0	71.1	100.0	100.0	71.0
90	100.0	100.0	70.0	100.0	100.0	69.8
89	100.0	100.0	68.8	100.0	100.0	68.7
88	100.0	100.0	67.7	100.0	100.0	67.5
87	100.0	100.0	66.5	100.0	100.0	66.4
86	100.0	100.0	65.3	100.0	100.0	65.3
85	100.0	100.0	64.2	100.0	100.0	64.2
84	100.0	100.0	63.0	100.0	100.0	63.1
83	100.0	100.0	61.9	100.0	100.0	62.0
82	100.0	100.0	60.7	100.0	100.0	60.9
81	100.0	100.0	59.6	100.0	100.0	59.8
80	100.0	100.0	58.4	100.0	100.0	58.7
79	100.0	100.0	57.3	100.0	100.0	57.6
78	100.0	100.0	56.1	100.0	100.0	56.5
77	100.0	100.0	55.0	100.0	100.0	55.3
76	100.0	100.0	53.8	100.0	100.0	54.2
75	100.0	100.0	52.7	100.0	100.0	53.0
74	100.0	100.0	51.5	100.0	100.0	51.8
73	100.0	100.0	50.3	100.0	100.0	50.7
72	100.0	100.0	49.2	100.0	100.0	49.5
71	100.0	100.0	48.0	100.0	100.0	48.3
70	100.0	100.0	46.9	100.0	100.0	47.2
69	100.0	100.0	45.7	100.0	100.0	46.0
68	100.0	100.0	44.6	100.0	100.0	44.8
67	100.0	100.0	43.4	100.0	100.0	43.7
66	100.0	100.0	42.3	100.0	100.0	42.5
65	100.0	100.0	41.1	100.0	100.0	41.3
64	100.0	100.0	40.0	100.0	100.0	40.2
63	100.0	100.0	38.8	100.0	100.0	39.0
62	100.0	100.0	37.7	100.0	100.0	37.8
61	100.0	100.0	36.5	100.0	100.0	36.7
60	100.0	100.0	35.3	100.0	100.0	35.5
59	100.0	100.0	34.2	100.0	100.0	34.3
58	100.0	100.0	33.0	100.0	100.0	33.2
57	100.0	100.0	31.9	100.0	100.0	32.0
56	100.0	100.0	30.7	100.0	100.0	30.8
55	100.0	100.0	29.6	100.0	100.0	29.7
54	100.0	100.0	28.4	100.0	100.0	28.5
53	100.0	100.0	27.3	100.0	100.0	27.3
52	100.0	100.0	26.1	100.0	100.0	26.2
51	100.0	100.0	25.0	100.0	100.0	25.0
50	100.0	99.4	24.4	100.0	99.4	24.4
49	100.0	98.8	23.8	100.0	98.8	23.8
48	100.0	98.2	23.2	100.0	98.2	23.2
PERCENT OF FULL POWER	CRGP 5	CRGP 6	CRGP 7	CRGP 5	CRGP 6	CRGP 7
	SHUTDOWN MARGIN INSERTION SETPOINT			OPERATIONAL ALARM INSERTION SETPOINT		

(continued)

OCONEE 2 CYCLE 15 ERROR ADJUSTED ROD INDEX SETPOINTS

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

PERCENT OF FULL POWER	SHUTDOWN MARGIN INSERTION SETPOINT			OPERATIONAL ALARM INSERTION SETPOINT		
	CRGP 5	CRGP 6	CRGP 7	CRGP 5	CRGP 6	CRGP 7
47	100.0	97.4	22.4	100.0	97.4	22.4
46	100.0	96.5	21.5	100.0	96.5	21.5
45	100.0	95.7	20.7	100.0	95.7	20.7
44	100.0	94.8	19.8	100.0	94.8	19.8
43	100.0	94.0	19.0	100.0	94.0	19.0
42	100.0	93.1	18.1	100.0	93.1	18.1
41	100.0	92.2	17.2	100.0	92.2	17.2
40	100.0	91.4	16.4	100.0	91.4	16.4
39	100.0	90.5	15.5	100.0	90.5	15.5
38	100.0	89.7	14.7	100.0	89.7	14.7
37	100.0	88.8	13.8	100.0	88.8	13.8
36	100.0	88.0	13.0	100.0	88.0	13.0
35	100.0	87.1	12.1	100.0	87.1	12.1
34	100.0	86.2	11.2	100.0	86.2	11.2
33	100.0	85.4	10.4	100.0	85.4	10.4
32	100.0	84.5	9.5	100.0	84.5	9.5
31	100.0	83.7	8.7	100.0	83.7	8.7
30	100.0	82.8	7.8	100.0	82.8	7.8
29	100.0	82.0	7.0	100.0	82.0	7.0
28	100.0	81.1	6.1	100.0	81.1	6.1
27	100.0	80.2	5.2	100.0	80.2	5.2
26	100.0	79.4	4.4	100.0	79.4	4.4
25	100.0	78.5	3.5	100.0	78.5	3.5
24	100.0	77.7	2.7	100.0	77.7	2.7
23	100.0	76.8	1.8	100.0	76.8	1.8
22	100.0	76.0	1.0	100.0	76.0	1.0
21	100.0	75.1	0.1	100.0	75.1	0.1
20.9	100.0	75.0	0.0	100.0	75.0	0.0
20	100.0	73.5	0.0	100.0	73.5	0.0
19	100.0	71.8	0.0	100.0	71.8	0.0
18	100.0	70.1	0.0	100.0	70.1	0.0
17	100.0	68.4	0.0	100.0	68.4	0.0
16	100.0	66.6	0.0	100.0	66.6	0.0
15	100.0	64.9	0.0	100.0	64.9	0.0
14	100.0	63.2	0.0	100.0	63.2	0.0
13	100.0	61.5	0.0	100.0	61.5	0.0
12	100.0	54.5	0.0	100.0	54.5	0.0
11	100.0	47.5	0.0	100.0	47.5	0.0
10	100.0	40.5	0.0	100.0	40.5	0.0
9	100.0	33.5	0.0	100.0	33.5	0.0
8	100.0	26.5	0.0	100.0	26.5	0.0
7.8	100.0	25.0	0.0	100.0	25.0	0.0
7	97.2	22.2	0.0	97.2	22.2	0.0
6	93.8	18.8	0.0	93.8	18.8	0.0
5	90.2	15.2	0.0	90.2	15.2	0.0
4	86.8	11.8	0.0	86.8	11.8	0.0
3	83.2	8.2	0.0	83.2	8.2	0.0
2	79.8	4.8	0.0	79.8	4.8	0.0
1	76.2	1.2	0.0	76.2	1.2	0.0
0.6	75.0	0.0	0.0	75.0	0.0	0.0
0	70.5	0.0	0.0	70.5	0.0	0.0
PERCENT OF FULL POWER	CRGP 5	CRGP 6	CRGP 7	CRGP 5	CRGP 6	CRGP 7
	SHUTDOWN MARGIN INSERTION SETPOINT			OPERATIONAL ALARM INSERTION SETPOINT		

OCONEE 2 CYCLE 15 ERROR ADJUSTED ROD INDEX SETPOINTS

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

PERCENT OF FULL POWER	SHUTDOWN MARGIN INSERTION SETPOINT			OPERATIONAL ALARM INSERTION SETPOINT		
	CRGP 5	CRGP 6	CRGP 7	CRGP 5	CRGP 6	CRGP 7
77	100.0	100.0	85.9	100.0	100.0	85.9
76	100.0	100.0	83.7	100.0	100.0	83.7
75	100.0	100.0	81.5	100.0	100.0	81.5
74	100.0	100.0	79.3	100.0	100.0	79.3
73	100.0	100.0	77.1	100.0	100.0	77.1
72	100.0	100.0	74.8	100.0	100.0	74.8
71	100.0	100.0	72.6	100.0	100.0	72.6
70	100.0	100.0	70.4	100.0	100.0	70.4
69	100.0	100.0	68.2	100.0	100.0	68.2
68	100.0	100.0	65.9	100.0	100.0	65.9
67	100.0	100.0	63.7	100.0	100.0	63.7
66	100.0	100.0	61.5	100.0	100.0	61.5
65	100.0	100.0	59.3	100.0	100.0	59.3
64	100.0	100.0	57.1	100.0	100.0	57.1
63	100.0	100.0	54.8	100.0	100.0	54.8
62	100.0	100.0	52.6	100.0	100.0	52.6
61	100.0	100.0	50.4	100.0	100.0	50.4
60	100.0	100.0	48.2	100.0	100.0	48.2
59	100.0	100.0	45.9	100.0	100.0	45.9
58	100.0	100.0	43.7	100.0	100.0	43.7
57	100.0	100.0	41.5	100.0	100.0	41.5
56	100.0	100.0	39.3	100.0	100.0	39.3
55	100.0	100.0	37.1	100.0	100.0	37.1
54	100.0	100.0	34.8	100.0	100.0	34.8
53	100.0	100.0	32.6	100.0	100.0	32.6
52	100.0	100.0	30.4	100.0	100.0	30.4
51	100.0	100.0	28.2	100.0	100.0	28.2
50	100.0	100.0	25.9	100.0	100.0	25.9
49.6	100.0	100.0	25.0	100.0	100.0	25.0
49	100.0	99.4	24.4	100.0	99.4	24.4
48	100.0	98.2	23.2	100.0	98.2	23.2
47	100.0	97.4	22.4	100.0	97.4	22.4
46	100.0	96.5	21.5	100.0	96.5	21.5
45	100.0	95.7	20.7	100.0	95.7	20.7
44	100.0	94.8	19.8	100.0	94.8	19.8
43	100.0	94.0	19.0	100.0	94.0	19.0
42	100.0	93.1	18.1	100.0	93.1	18.1
41	100.0	92.2	17.2	100.0	92.2	17.2
40	100.0	91.4	16.4	100.0	91.4	16.4
39	100.0	90.5	15.5	100.0	90.5	15.5
38	100.0	89.7	14.7	100.0	89.7	14.7
37	100.0	88.8	13.8	100.0	88.8	13.8
36	100.0	88.0	13.0	100.0	88.0	13.0
35	100.0	87.1	12.1	100.0	87.1	12.1
34	100.0	86.2	11.2	100.0	86.2	11.2
33	100.0	85.4	10.4	100.0	85.4	10.4
32	100.0	84.5	9.5	100.0	84.5	9.5
31	100.0	83.7	8.7	100.0	83.7	8.7
30	100.0	82.8	7.8	100.0	82.8	7.8
29	100.0	82.0	7.0	100.0	82.0	7.0
28	100.0	81.1	6.1	100.0	81.1	6.1
27	100.0	80.2	5.2	100.0	80.2	5.2
26	100.0	79.4	4.4	100.0	79.4	4.4
25	100.0	78.5	3.5	100.0	78.5	3.5
24	100.0	77.7	2.7	100.0	77.7	2.7
PERCENT OF FULL POWER	CRGP 5	CRGP 6	CRGP 7	CRGP 5	CRGP 6	CRGP 7
	SHUTDOWN MARGIN INSERTION SETPOINT			OPERATIONAL ALARM INSERTION SETPOINT		

(continued)

[illegible]