

**DUKE POWER COMPANY**  
**OCONEE 2 CYCLE 14**  
**CORE OPERATING LIMITS REPORT**  
**REVISION 0**

REFERENCE OSC-4999

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Date: 22 DEC 92

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Date: 22 DEC 92

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Date: 22 DEC 92

Oconee Nuclear Station  
Unit 2 Cycle 14  
Core Operating Limits Report  
Revision Log

Revision	Effective Date	Pages Revised	Pages Added	Pages Deleted	Total Effective Pages
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0	11-Dec-92	-	1-29	-	29
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Oconee Nuclear Station

Unit 2 Cycle 14

Core Operating Limits Report

Insertion Sheet for Revision 0

**Remove these Revision 0 pages**

Not applicable

**Insert these Revision 0 pages**

Not applicable

## 1.0 CORE OPERATING LIMITS

This Core Operating Limits Report for O2C14 has been prepared in accordance with the requirements of Technical Specification 6.9. The core operating limits have been developed using NRC-approved methodology (References 1, 2 and 3) and are documented in Reference 4. The setpoints for O2C14 are documented in References 5 and 6. The Reactor Coolant System design flow used in Reference 4 for O2C14 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) Axial power imbalance and variable low pressure protective limits (Figures 1.1 and 1.2),
- 2) RPS limiting safety system settings (Figures 1.3 and 1.4),
- 3) Quadrant power tilt limits,
- 4) Steady state operating band,
- 5) Operational power-imbalance breakpoints,
- 6) Operational and shutdown margin-limited control rod position limits, and
- 7) BWST, CBAST, and CFT boron requirements.

## 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) O2C14 Maneuvering Analysis, Duke Power Company calculational file, OSC-4999, Revision 0, December 1992.
- 5) Variable Low Pressure Safety Limit, Duke Power Company calculational file, OSC-4048, Revision 0, 24JUL90.
- 6) O2C14 RPS Setpoints and Safety Review, Duke Power Company calculational file, OSC-5124, Revision 0, January 1993.

Figure 1.1. Axial Power Imbalance Protective Limits

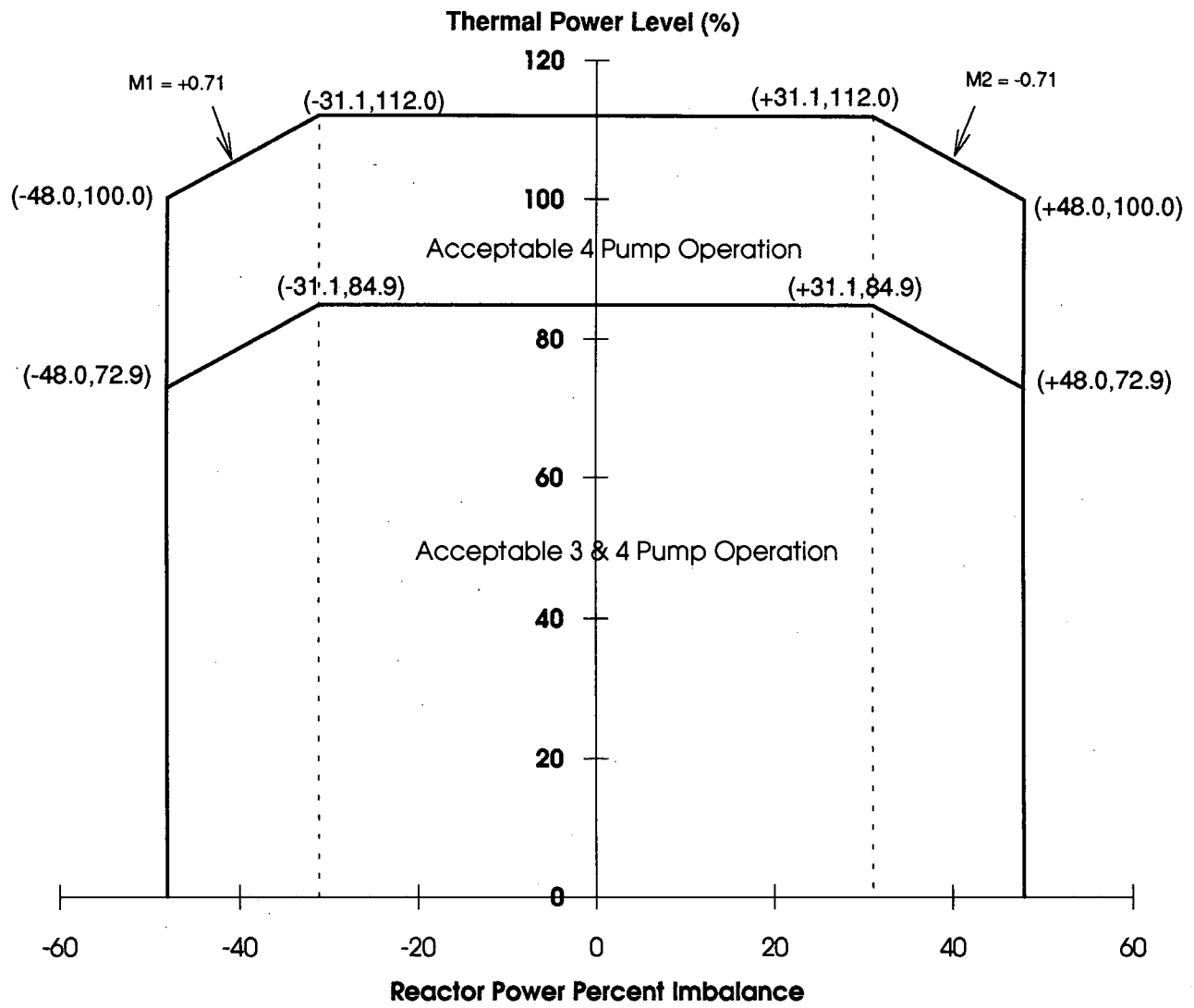


Figure 1.2. Variable Low Pressure Protective Limits

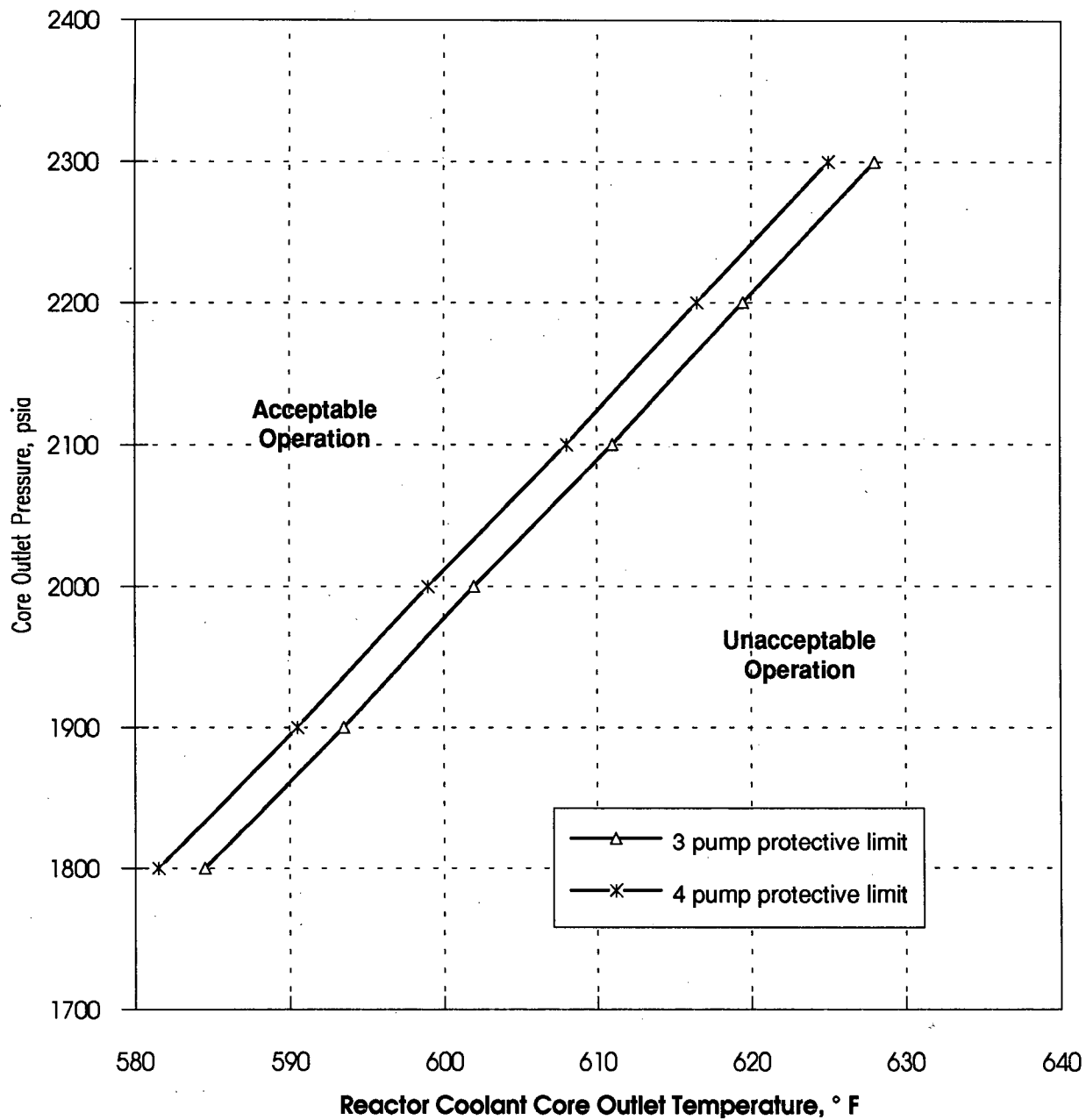


Figure 1.3. Protective System Maximum Allowable Setpoints  
for Oconee Unit 2

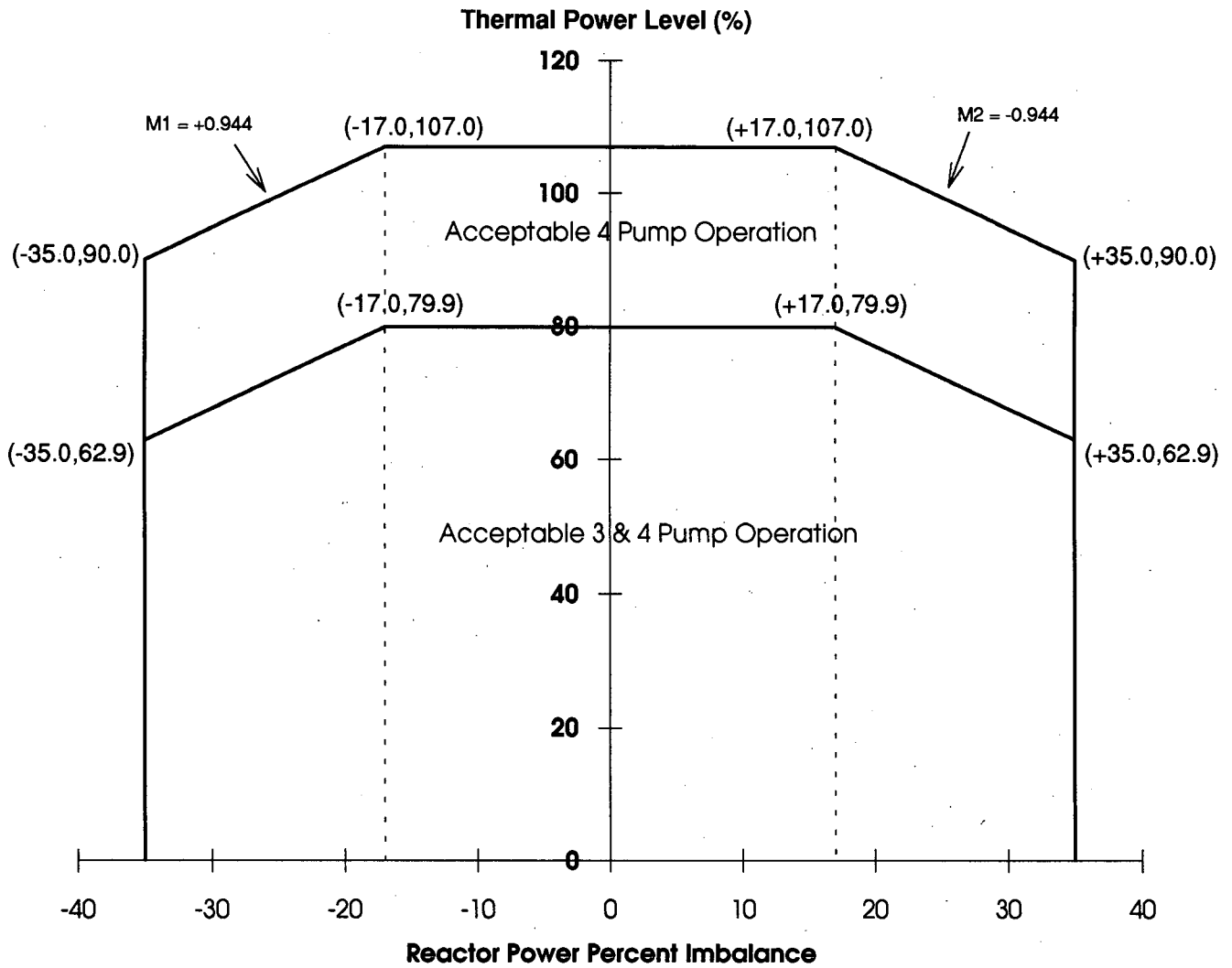
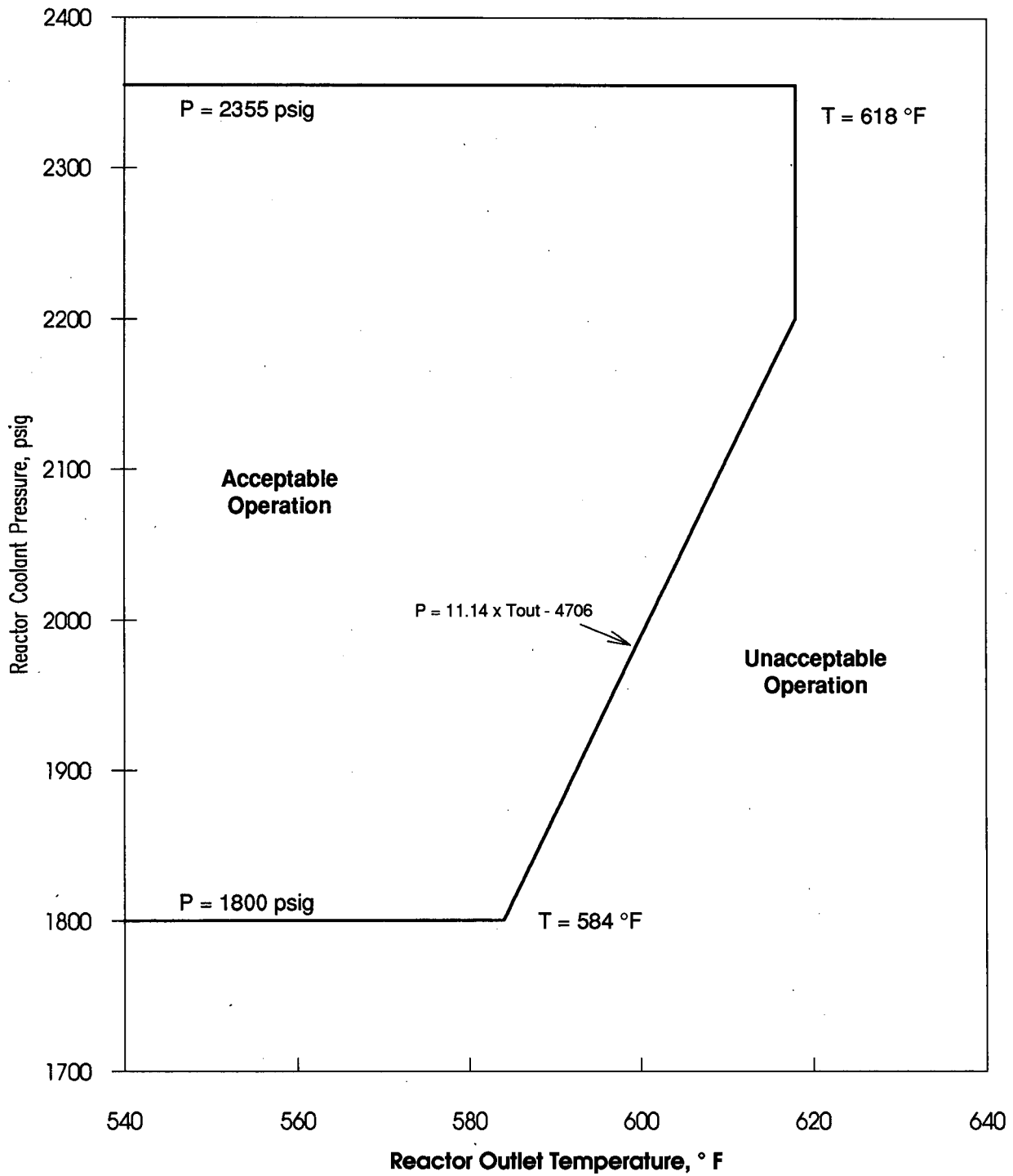


Figure 1.4. Protective System Maximum Allowable Setpoints  
for Oconee Unit 2



Referred to by Tech Spec 2.3



Oconee 2 Cycle 14

RPS SAFETY LIMIT BREAKPOINTS

	POWER % OF 2568 MW	IMBALANCE LIMITS
<b>4 PUMP</b>	0.0	-48.00
	100.0	-48.00
	112.0	-31.10
	112.0	31.10
	100.0	48.00
	0.0	48.00
<b>3 PUMP</b>	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 14

QUADRANT POWER TILT SETPOINTS

STEADY STATE		TRANSIENT		MAXIMUM
30 - 100 % FP	0 - 30 % FP	30 - 100 % FP	0 - 30 % FP	0 - 100 % 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 14

**STEADY STATE OPERATING BAND**

	<b>Rod Index</b>		<b>APSR % withdrawn</b>	
	<b>Min</b>	<b>Max</b>	<b>Min</b>	<b>Max</b>
0 to 375 EFPD	292	300	30	40
375 to 440 EFPD	292	300	100	100

Oconee 2 Cycle 14

**OPERATIONAL POWER IMBALANCE  
BREAKPOINTS**

	<b>POWER % OF 2568 MW</b>	<b>IMBALANCE LIMITS</b>
<b>4 PUMP</b>	0.0	-47.33
	80.0	-47.33
	90.0	-47.73
	102.0	-34.66
	102.0	+20.57
	90.0	+28.19
	80.0	+34.93
	0.0	+34.93
<b>3 PUMP</b>	0.0	-47.33
	77.0	-47.33
	77.0	+34.93
	0.0	+34.93

Referred to by Tech. Spec. 3.5.2.6

Oconee 2 Cycle 14

**ROD INDEX OPERATIONAL LIMITS**

**0 EFPD to EOC**

	POWER % OF 2568 MW	RI, %WD	
		MIN	MAX
<b>4 PUMP</b>	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
<b>3 PUMP</b>	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 14

ROD INDEX SHUTDOWN MARGIN LIMITS

0 EFPD to EOC

	POWER % OF 2568 MW	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

Oconee 2 Cycle 14

BWST, CBAST, and CFT Boron Requirements

0 EFPD to EOC

- 1) The BWST boron concentration shall be greater than 2210 ppm and less than 2400 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).

## **2.0 ERROR-ADJUSTED OPERATING LIMITS**

The error-adjusted operating limits have been determined for O2C14, with all necessary uncertainties and margins applied. The calculations that 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
- 4) Operational and shutdown margin-limited control rod position limits

## **2.1 REFERENCE**

- 1) O2C14 Maneuvering Analysis, Duke Power Company calculational file, OSC-4999, Revision 0, December 1992.



Oconee 2 Cycle 14

QUADRANT TILT LIMITS

	STEADY STATE		TRANSIENT		MAXIMUM
	30 - 100 % FP	0 - 30 % FP	30 - 100 % FP	0 - 30 % FP	0 - 100 % 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 (fraction of incore detector initial charge consumed) = 0.61

Oconee 2 Cycle 14

**ERROR ADJUSTED RPS IMBALANCE TRIP SETPOINTS**

	<b>POWER % OF 2568MW</b>	<b>IMBALANCE SETPOINT</b>
<b>4 PUMP</b>	0.0	-33.00
	90.4	-33.00
	105.5	-17.00
	105.5	17.00
	90.4	33.00
	0.0	33.00
<b>3 PUMP</b>	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 14

**ERROR ADJUSTED OPERATIONAL IMBALANCE LIMITS**

0 EFPD to EOC

	<b>POWER % OF 2568 MW</b>	<b>IMBALANCE LIMIT</b>	<b>FULL INCORE</b>	<b>ALARM SETPOINT BACKUP INCORE</b>	<b>OUT-OF-CORE</b>
<b>4 PUMP</b>	0	-47.33	-31.50	-31.50	-31.50
	80	-47.33	-31.50	-31.50	-31.50
	90	-47.73	-29.70	-29.70	-29.70
	102	-34.66	-17.00	-17.00	-17.00
	102	+20.57	+17.00	+10.86	+11.26
	90	+28.19	+25.91	+17.68	+18.17
	80	+34.93	+31.50	+23.69	+24.24
	0	+34.93	+31.50	+23.69	+24.24
<b>3 PUMP</b>	0.00	-47.33	-31.50	-31.50	-31.50
	63.31	-	-31.50	-31.50	-31.50
	77.00	-47.33	-17.00	-17.00	-17.00
	77.00	+34.93	+17.00	+17.00	+17.00
	70.69	-	-	+23.69	-
	70.17	-	-	-	+24.24
	63.31	-	+31.50	-	-
	0.00	+34.93	+31.50	+23.69	+24.24

Oconee 2 Cycle 14

ERROR ADJUSTED ROD INDEX

0 EFPD to EOC

	POWER % OF 2568 MW	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 14

**ERROR ADJUSTED SHUTDOWN MARGIN LIMITS**

**0 EFPD to EOC**

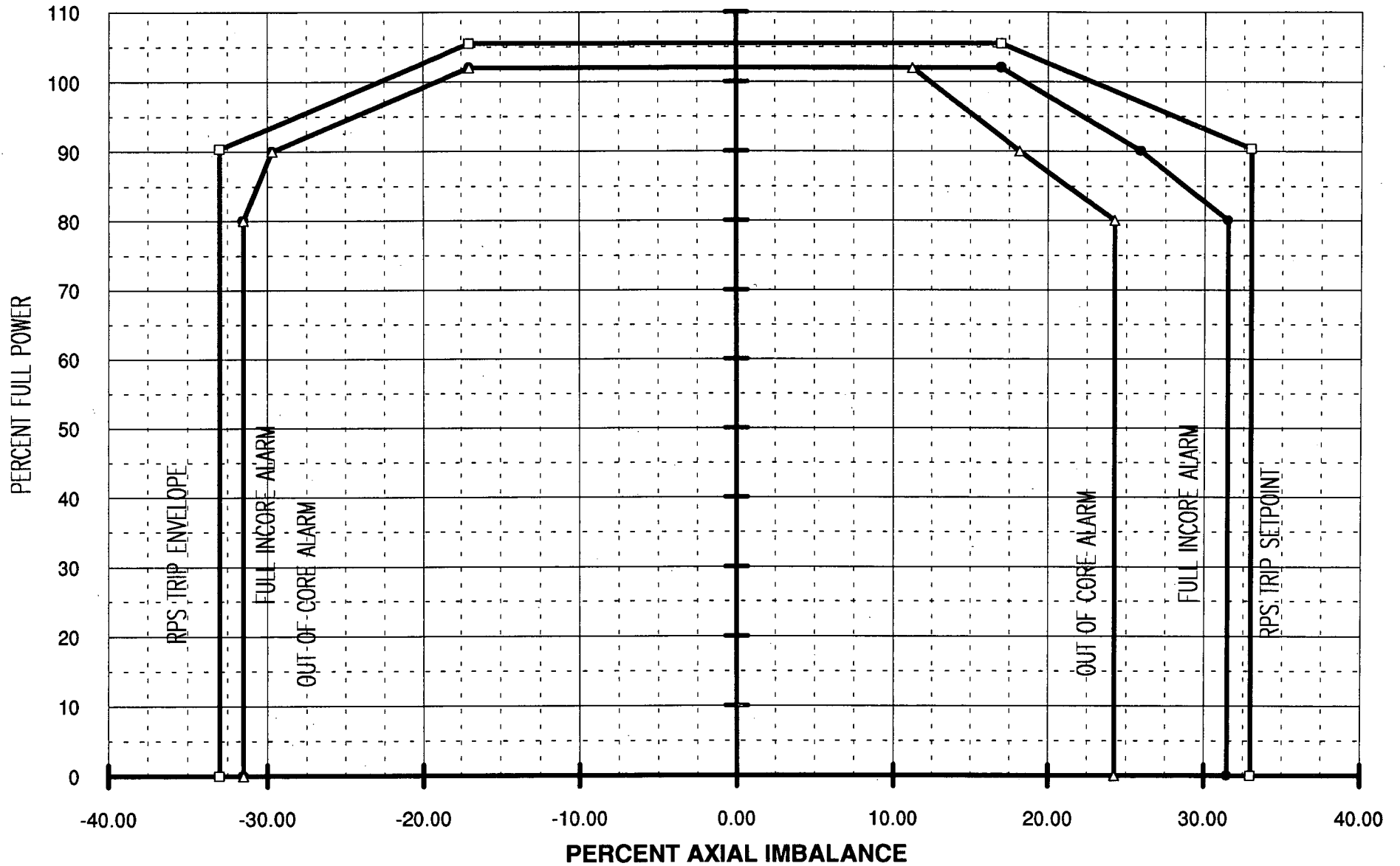
	POWER % OF 2568 MW	RI, %WD	
		MIN	MAX
<b>4 PUMP</b>	102	223.8	300.0
	100	221.5	300.0
	48	161.5	300.0
	13	91.5	300.0
	2.8	0.0	300.0
<b>3 PUMP</b>	77	215.5	300.0
	75	211.5	300.0
	48	161.5	300.0
	13	91.5	300.0
	2.8	0.0	300.0

## OCONEE 2 CYCLE 14 IMBALANCE SETPOINTS

### 4 PUMP OPERATION      BOC TO EOC<sup>5</sup>

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	-17.00	11.26
101	-21.77	21.77	-18.06	17.74	-18.06	11.84
100	-22.83	22.83	-19.12	18.49	-19.12	12.41
99	-23.89	23.89	-20.18	19.23	-20.18	12.99
98	-24.95	24.95	-21.23	19.97	-21.23	13.56
97	-26.01	26.01	-22.29	20.71	-22.29	14.14
96	-27.07	27.07	-23.35	21.46	-23.35	14.72
95	-28.13	28.13	-24.41	22.20	-24.41	15.29
94	-29.19	29.19	-25.47	22.94	-25.47	15.87
93	-30.25	30.25	-26.53	23.68	-26.53	16.44
92	-31.30	31.30	-27.58	24.43	-27.58	17.02
91	-32.36	32.36	-28.64	25.17	-28.64	17.59
90.4	-33.00	33.00	-29.28	25.61	-29.28	17.94
90	-33.00	33.00	-29.70	25.91	-29.70	18.17
89	-33.00	33.00	-29.88	26.47	-29.88	18.78
88	-33.00	33.00	-30.06	27.03	-30.06	19.38
87	-33.00	33.00	-30.24	27.59	-30.24	19.99
86	-33.00	33.00	-30.42	28.15	-30.42	20.60
85	-33.00	33.00	-30.60	28.71	-30.60	21.21
84	-33.00	33.00	-30.78	29.26	-30.78	21.81
83	-33.00	33.00	-30.96	29.82	-30.96	22.42
82	-33.00	33.00	-31.14	30.38	-31.14	23.03
81	-33.00	33.00	-31.32	30.94	-31.32	23.63
80	-33.00	33.00	-31.50	31.50	-31.50	24.24
79	-33.00	33.00	-31.50	31.50	-31.50	24.24
78	-33.00	33.00	-31.50	31.50	-31.50	24.24
77	-33.00	33.00	-31.50	31.50	-31.50	24.24
76	-33.00	33.00	-31.50	31.50	-31.50	24.24
75	-33.00	33.00	-31.50	31.50	-31.50	24.24
0	-33.00	33.00	-31.50	31.50	-31.50	24.24
PERCENT OF FULL POWER	R P S	TRIP	FULL INCORE ALARM		OUT OF CORE ALARM	

# OCONEE 2 CYCLE 14 IMBALANCE SETPOINTS 4 PUMP OPERATION -- BOC TO EOC



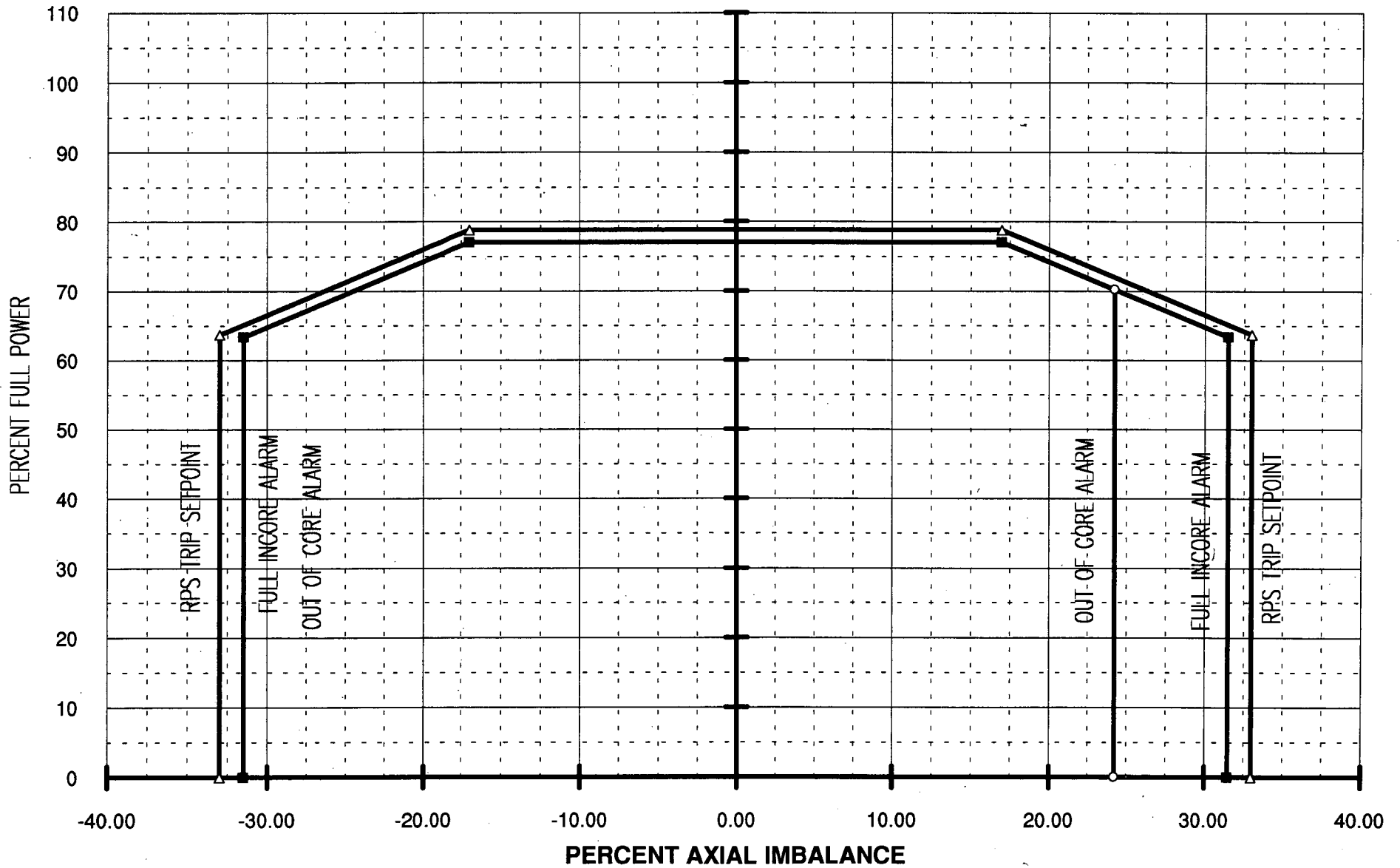
## OCONEE 2 CYCLE 14 IMBALANCE SETPOINTS

### 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	-18.06	18.06	-18.06	18.06
75	-21.03	21.03	-19.12	19.12	-19.12	19.12
74	-22.09	22.09	-20.18	20.18	-20.18	20.18
73	-23.15	23.15	-21.23	21.23	-21.23	21.24
72	-24.21	24.21	-22.29	22.29	-22.29	22.30
71	-25.26	25.26	-23.35	23.35	-23.35	23.36
70.17	-26.14	26.14	-24.23	24.23	-24.23	24.24
70	-26.32	26.32	-24.41	24.41	-24.41	24.24
69	-27.38	27.38	-25.47	25.47	-25.47	24.24
68	-28.44	28.44	-26.53	26.53	-26.53	24.24
67	-29.50	29.50	-27.58	27.58	-27.58	24.24
66	-30.56	30.56	-28.64	28.64	-28.64	24.24
65	-31.62	31.62	-29.70	29.70	-29.70	24.24
64	-32.68	32.68	-30.76	30.76	-30.76	24.24
63.7	-33.00	33.00	-31.08	31.08	-31.08	24.24
63.3	-33.00	33.00	-31.50	31.50	-31.50	24.24
63	-33.00	33.00	-31.50	31.50	-31.50	24.24
62	-33.00	33.00	-31.50	31.50	-31.50	24.24
61	-33.00	33.00	-31.50	31.50	-31.50	24.24
60	-33.00	33.00	-31.50	31.50	-31.50	24.24
0	-33.00	33.00	-31.50	31.50	-31.50	24.24
PERCENT OF FULL POWER	R P S	TRIP	FULL INCORE ALARM		OUT OF CORE ALARM	



# OCONEE 2 CYCLE 14 IMBALANCE SETPOINTS 3 PUMP OPERATION -- BOC TO EOC



## OCONEE 2 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
<b>100</b>	<b>100.0</b>	<b>98.2</b>	<b>23.2</b>	<b>100.0</b>	<b>100.0</b>	<b>61.5</b>
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
<b>95</b>	<b>100.0</b>	<b>95.4</b>	<b>20.4</b>	<b>100.0</b>	<b>100.0</b>	<b>61.5</b>
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
<b>90</b>	<b>100.0</b>	<b>92.5</b>	<b>17.5</b>	<b>100.0</b>	<b>100.0</b>	<b>61.5</b>
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
<b>85</b>	<b>100.0</b>	<b>89.6</b>	<b>14.6</b>	<b>100.0</b>	<b>100.0</b>	<b>55.5</b>
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
<b>80</b>	<b>100.0</b>	<b>86.7</b>	<b>11.7</b>	<b>100.0</b>	<b>100.0</b>	<b>45.5</b>
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
<b>75</b>	<b>100.0</b>	<b>83.8</b>	<b>8.8</b>	<b>100.0</b>	<b>100.0</b>	<b>37.5</b>
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
<b>70</b>	<b>100.0</b>	<b>80.9</b>	<b>5.9</b>	<b>100.0</b>	<b>100.0</b>	<b>30.9</b>
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
<b>65</b>	<b>100.0</b>	<b>78.1</b>	<b>3.1</b>	<b>100.0</b>	<b>99.6</b>	<b>24.6</b>
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
<b>60</b>	<b>100.0</b>	<b>75.2</b>	<b>0.2</b>	<b>100.0</b>	<b>96.3</b>	<b>21.3</b>
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
<b>55</b>	<b>100.0</b>	<b>69.6</b>	<b>0.0</b>	<b>100.0</b>	<b>93.0</b>	<b>18.0</b>
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		

(continued)

## OCONEE 2 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	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	25.6	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	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		

## OCONEE 2 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
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		

(continued)

## OCONEE 2 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
<b>25</b>	<b>95.3</b>	<b>20.3</b>	<b>0.0</b>	<b>100.0</b>	<b>29.3</b>	<b>0.0</b>
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
<b>20</b>	<b>90.3</b>	<b>15.3</b>	<b>0.0</b>	<b>94.3</b>	<b>19.3</b>	<b>0.0</b>
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
<b>15</b>	<b>85.3</b>	<b>10.3</b>	<b>0.0</b>	<b>86.4</b>	<b>11.4</b>	<b>0.0</b>
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
<b>10</b>	<b>64.7</b>	<b>0.0</b>	<b>0.0</b>	<b>64.7</b>	<b>0.0</b>	<b>0.0</b>
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
<b>5</b>	<b>19.8</b>	<b>0.0</b>	<b>0.0</b>	<b>19.8</b>	<b>0.0</b>	<b>0.0</b>
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		