

ATTACHMENT B

Core Operating Limits Report

for

LaSalle County Station

Unit 2, Reload 5 (Cycle 6)

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SYSENG3

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CORE OPERATING LIMITS REPORT

ISSUANCE OF CHANGES SUMMARY

<u>Affected Section</u>	<u>Affected Pages</u>	<u>Summary of Changes</u>	<u>Date</u>
All	All	Original Issue (Cycle 4)	4/90
All	All	Original Issue (Cycle 5)	3/92
2.0	2-2	Revised MCPR Power Distribution Limits (all fuel types) for New TCV Analysis Slow Closure Event	6/93
2.0	2-4	MCPR Power Distribution Limits (all fuel types) for Coastdown Analysis	6/93
All	All	Original Issue (Cycle 6)	9/93

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REFERENCES

1. Commonwealth Edison Company Docket No. 50-373, LaSalle County Station, Unit 2 Facility Operating License, License No. NPF-18.
2. Letter from D. M. Crutchfield to All Power Reactor Licensees and Applicants, Generic Letter 88-16; Concerning the Removal of Cycle-Specific Parameter Limits from Tech Specs, dated October 4, 1988.
3. Supplemental Reload License Submittal for LaSalle County Station, Unit 2, Reload 5 (Cycle 6), 23A7209, Rev. 0, June, 1993.
4. LaSalle County Station, Units 1 and 2, SAFER/GESTR LOCA Loss-of-Coolant-Accident Analysis, NEDE, 3151OP (latest approved version).
5. General Electric Standard Application for Reactor Fuel (GESTAR), NEDE-24011-P-A (latest approved version).
6. Extended Operating Domain and Equipment Out-of-Service for LaSalle County Station Units 1 and 2, NEDE-31455, (latest approved version).
7. Equipment Out-of-Service In The Increased Core Flow Domain For LaSalle County Station Units 1 and 2, GE-NE-187-62-1191 (latest approved version).
8. Evaluation of a Postulated Slow Turbine Control Valve Closure Event for LaSalle County Station, Unit 1 and 2, GE-NE-187-13-0792, February, 1993.
9. Analysis of EFPC Coastdown With Load Following for LaSalle 1 and 2. GENE-637-016-0693, June, 1993.

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1.0 AVERAGE PLANAR LINEAR HEAT GENERATION RATE (3/4.2.1)

1.1 Tech Spec REFERENCE:

Tech Spec 3.2.1.

1.2

TABLE for
Maximum Average
Planar Heat
Generation Rates
(MAPLHGR)

Fuel Type

1.2-1	BC320C
1.2-2	BC300D
1.2-3	P8CWB303-9GZ
1.2-4	P8CWB303-10GZ
1.2-5	P8CWB302-9GZ
1.2-6	P8CWB300-9GZ
1.2-7	P8CWB313-9GZ
1.2-8	P8CWB316-9GZ

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MAXIMUM AVERAGE PLANAR LINEAR HEAT GENERATION RATE (MAPLEGR)
 vs. AVERAGE PLANAR EXPOSURE FOR FUEL TYPE BC320C (GE8B-P8CQB320-7GE)

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TABLE 1.2-1

CMC BUNDLE TYPE 7

<u>Exposure (MWd/ST)</u>	<u>LATTICE SPECIFIC MAPLHGR (kw/ft)</u>			
	<u>P8CQ071</u> <u>NOG</u>	<u>P8CQL340</u> <u>7G4.0</u>	<u>P8CQL340</u> <u>7G3.0</u>	<u>P8CQL071</u> <u>7GE</u>
0.0	12.44	11.57	11.63	12.44
200	12.26	-	-	12.36
1000	12.15	-	-	12.15
2000	12.08	-	-	12.08
3000	12.08	-	12.21	12.08
4000	12.10	12.23	12.41	12.10
6000	-	12.57	12.83	-
8000	-	12.94	13.06	-
10000	12.25	13.12	-	12.25
12500	-	13.03	13.04	-
15000	-	12.71	12.72	-
25000	10.11	-	-	10.11
35000	8.53	10.15	10.16	8.53
45000	-	8.50	8.55	-
45600	5.09	-	-	5.09
50000	-	6.08	6.12	-
CMC LATTICE TYPE	10	13	14	15

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MAXIMUM AVERAGE PLANAR LINEAR HEAT GENERATION RATE (MAPLHGR)
vs. AVERAGE PLANAR EXPOSURE FOR FUEL TYPE BC300D (GEBB-P8CQB300-6G3.0)

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TABLE 1.2-2

CMC BUNDLE TYPE 6

<u>Exposure (Mwd/ST)</u>	<u>LATTICE SPECIFIC MAPLHGR (kw/ft)</u>		
	<u>P8CQL071</u> <u>NOG</u>	<u>P8CQL319</u> <u>6G3.0</u>	<u>P8CQL071</u> <u>6GE</u>
0.0	12.44	11.77	12.44
200	12.36	-	12.36
1000	12.15	-	12.15
2000	12.08	12.33	12.08
3000	12.08	12.61	12.08
4000	12.10	12.91	12.10
5000	-	13.22	-
10000	12.25	13.45	12.25
15000	-	13.17	-
25000	10.11	-	10.11
35000	8.53	10.65	8.53
45000	-	8.73	-
45600	5.09	-	5.09
50000	-	6.62	-
CMC LATTICE TYPE	10	11	12

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MAXIMUM AVERAGE PLANAR LINEAR HEAT GENERATION RATE (MAPLHGR)
vs. AVERAGE PLANAR EXPOSURE FOR FUEL TYPE P8CWB303-9GE

CORE OPERATING LIMITS REPORT

TABLE 1.2-3

CMC BUNDLE TYPE 8

<u>EXPOSURE</u> <u>(MWD/ST)</u>	<u>LATTICE SPECIFIC MAPLHGR (kw/ft)</u>				
	<u>P8CWLO71</u> <u>NOG</u>	<u>P8CWL327</u> <u>9G5.0</u>	<u>P8CWL338</u> <u>4G5.0/5G4.0</u>	<u>P8CWL327</u> <u>4G5.0/5G4.0</u>	<u>P8CWLO71</u> <u>9GE</u>
0.0	12.74	11.98	11.35	12.01	12.74
200	12.67	12.05	11.39	12.08	12.67
1000	12.48	12.17	11.48	12.22	12.48
2000	12.42	12.37	11.67	12.43	12.42
3000	12.41	12.56	11.90	12.61	12.41
4000	12.44	12.69	12.16	12.78	12.44
5000	12.46	12.81	12.38	12.91	12.46
6000	12.49	12.92	12.56	13.03	12.49
7000	12.51	13.04	12.75	13.15	12.51
8000	12.54	13.16	12.94	13.27	12.54
9000	12.55	13.29	13.13	13.37	12.55
10000	12.57	13.41	13.29	13.47	12.57
12500	12.41	13.49	13.33	13.51	12.41
15000	12.04	13.18	13.05	13.20	12.04
20000	11.27	12.54	12.46	12.55	11.27
25000	10.49	11.84	11.87	11.84	10.49
35000	8.95	10.35	10.54	10.36	8.95
45000	6.15	9.02	9.14	9.02	6.15
46900	5.21	-	-	-	5.21
51500	-	-	5.90	-	-
51800	-	5.82	-	5.81	-
CMC LATTICE TYPE 16		17	18	19	20

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MAXIMUM AVERAGE PLANAR LINEAR HEAT GENERATION RATE (MAPLHGR)
vs. AVERAGE PLANAR EXPOSURE FOR FUEL TYPE P8CWB303-10G2

CORE OPERATING LIMITS REPORT

TABLE 1.2-4

CMC BUNDLE TYPE 9

<u>Exposure</u> <u>(Mwd/ST)</u>	<u>LATTICE SPECIFIC MAPLHGR (kw/ft)</u>				
	<u>P8CWL071</u> <u>NOG</u>	<u>P8CWL326</u> <u>6G5.0/4G4.0</u>	<u>P8CWL338</u> <u>10G4.0</u>	<u>P8CWL326</u> <u>10G4.0</u>	<u>P8CWL071</u> <u>10GE</u>
0.0	12.74	12.02	11.69	12.07	12.74
200	12.67	12.08	11.75	12.14	12.67
1000	12.48	12.23	11.91	12.30	12.48
2000	12.42	12.44	12.09	12.55	12.42
3000	12.41	12.68	12.25	12.81	12.41
4000	12.44	12.89	12.40	12.98	12.44
5000	12.46	13.04	12.56	13.15	12.46
6000	12.49	13.18	12.72	13.29	12.49
7000	12.51	13.33	12.88	13.36	12.51
8000	12.54	13.49	13.05	13.44	12.54
9000	12.55	13.57	13.21	13.53	12.55
10000	12.57	13.59	13.33	13.60	12.57
12500	12.41	13.61	13.29	13.63	12.41
15000	12.04	13.29	12.97	13.31	12.04
20000	11.27	12.63	12.33	12.64	11.27
25000	10.49	11.84	11.70	11.85	10.49
35000	8.95	10.35	10.40	10.36	8.95
45000	6.15	9.00	8.97	9.01	6.15
46900	5.21	-	-	-	5.21
51100	-	-	5.90	-	-
51900	-	5.78	-	-	-
52000	-	-	-	5.79	-
CMC LATTICE TYPE 16		4	5	6	7

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MAXIMUM AVERAGE PLANAR LINEAR HEAT GENERATION RATE (MAPLHGR)
VS. AVERAGE PLANAR EXPOSURE FOR FUEL TYPE P8CWB302-9G1

CORE OPERATING LIMITS REPORT

TABLE 1.2-5

CMC BUNDLE TYPE 10

LATTICE SPECIFIC MAPLHGR (KW/FT)

<u>EXPOSURE</u> <u>(MWD/ST)</u>	<u>P8CWL071</u> <u>9G1</u>	<u>P8CWL326</u> <u>5G5.0/4G4.0</u>	<u>P8CWL337</u> <u>9G4.0</u>	<u>P8CWL326</u> <u>9G4.0</u>	<u>P8CWL071</u> <u>NOG</u>
0	12.74	11.99	11.38	12.04	12.74
200	12.67	12.07	11.42	12.11	12.67
1000	12.48	12.21	11.53	12.27	12.48
2000	12.42	12.41	11.74	12.48	12.42
3000	12.41	12.58	11.99	12.63	12.41
4000	12.44	12.72	12.26	12.76	12.44
5000	12.46	12.85	12.46	12.89	12.46
6000	12.49	12.97	12.65	13.03	12.49
7000	12.51	13.08	12.86	13.17	12.51
8000	12.54	13.19	13.07	13.31	12.54
9000	12.55	13.31	13.20	13.43	12.55
10000	12.57	13.41	13.31	13.51	12.57
12500	12.41	13.49	13.34	13.51	12.41
15000	12.04	13.19	13.05	13.19	12.04
20000	11.27	12.55	12.47	12.55	11.27
25000	10.49	11.85	11.88	11.85	10.49
35000	8.95	10.38	10.56	10.38	8.95
45000	6.15	9.05	9.18	9.06	6.15
46850	5.21	-	-	-	5.21
51790	-	-	5.86	-	-
52120	-	5.80	-	-	-
52130	-	-	-	5.80	-
CMC LATTICE TYPE	25	22	23	24	21
LATTICE No.	887	879	880	882	733
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MAXIMUM AVERAGE PLANAR LINEAR HEAT GENERATION RATE (MAPLHGR)
VS. AVERAGE PLANAR EXPOSURE FOR FUEL TYPE P8CWB300-9G1

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TABLE 1.2-6

CMC BUNDLE TYPE 11

LATTICE SPECIFIC MAPLHGR (KW/FT)

EXPOSURE (MWD/ST)	P8CWL071 9G1	P8CWL320	P8CWL338 7G3.0	P8CWL338	P8CWL320	P8CWL071 NOG
		4G4.0/ 3G3.0		2G4.0/ 7G3.0	7G3.0	
0	12.74	12.41	11.89	11.39	12.48	12.74
200	12.67	12.47	11.96	11.47	12.49	12.67
1000	12.48	12.60	12.12	11.65	12.55	12.48
2000	12.42	12.71	12.29	11.90	12.64	12.42
3000	12.41	12.82	12.43	12.17	12.73	12.41
4000	12.44	12.92	12.51	12.43	12.82	12.44
5000	12.46	13.03	12.58	12.54	12.90	12.46
6000	12.49	13.13	12.65	12.63	12.98	12.49
7000	12.51	13.17	12.71	12.69	13.04	12.51
8000	12.54	13.16	12.75	12.73	13.08	12.54
9000	12.55	13.14	12.78	12.76	13.11	12.55
10000	12.57	13.13	12.80	12.80	13.14	12.57
12500	12.41	13.10	12.72	12.71	13.11	12.41
15000	12.04	12.80	12.41	12.41	12.81	12.04
20000	11.27	12.21	11.82	11.81	12.22	11.27
25000	10.49	11.63	11.23	11.22	11.64	10.49
35000	8.95	10.29	10.04	10.03	10.29	8.95
45000	6.15	8.99	8.31	8.30	9.00	6.15
46850	5.21	-	-	-	-	5.21
49960	-	-	5.84	5.83	-	-
51240	-	-	-	-	5.88	-
51290	-	5.86	-	-	-	-
CMC LATTICE TYPE	30	26	27	28	29	21
LATTICE No.	1204	1200	1201	1202	1203	733

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MAXIMUM AVERAGE PLANAR LINEAR HEAT GENERATION RATE (MAPLHGR)
VS. AVERAGE PLANAR EXPOSURE FOR FUEL TYPE P8CWB313-9GE

CORE OPERATING LIMITS REPORT

TABLE 1.2-7

CMC BUNDLE TYPE 12

LATTICE SPECIFIC MAPLHGR (KW/FT)

<u>EXPOSURE</u> <u>(MWD/ST)</u>	<u>P8CWL071</u> <u>9GE</u>	<u>P8CWL339</u> <u>7G4.0</u>	<u>P8CWL350</u> <u>2G4.0/5G3.0</u>	<u>P8CWL350</u> <u>4G4.0/5G3.0</u>	<u>P8CWL339</u> <u>2G4.0/5G3.0</u>	<u>P8CWL071</u> <u>NOG</u>
0	12.74	12.34	11.79	11.32	12.35	12.74
200	12.67	12.39	11.84	11.40	12.40	12.67
1000	12.48	12.49	11.96	11.55	12.52	12.48
2000	12.42	12.63	12.12	11.73	12.68	12.42
3000	12.41	12.74	12.28	11.92	12.83	12.41
4000	12.44	12.85	12.40	12.11	12.96	12.44
5000	12.46	12.97	12.49	12.27	13.10	12.46
6000	12.49	13.10	12.58	12.39	13.19	12.49
7000	12.51	13.22	12.67	12.52	13.29	12.51
8000	12.54	13.34	12.76	12.65	13.37	12.54
9000	12.55	13.38	12.84	12.78	13.45	12.55
10000	12.57	13.38	12.91	12.89	13.41	12.57
12500	12.41	13.36	12.85	12.85	13.36	12.41
15000	12.04	13.01	12.56	12.56	13.01	12.04
20000	11.27	12.34	11.98	11.97	12.33	11.27
25000	10.49	11.69	11.38	11.37	11.69	10.49
35000	8.95	10.46	10.12	10.11	10.46	8.95
45000	6.15	9.12	8.53	8.50	9.13	6.15
46850	5.21	-	-	-	-	5.21
50360	-	-	-	5.84	-	-
50390	-	-	5.85	-	-	-
51860	-	5.84	-	-	-	-
51880	-	-	-	-	5.84	-
CMC						
LATTICE TYPE	9	1	2	3	8	31
LATTICE No.	1581	1577	1578	1579	1580	733

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MAXIMUM AVERAGE PLANAR LINEAR HEAT GENERATION RATE (MAPLHGR)
 VS. AVERAGE PLANAR EXPOSURE FOR FUEL TYPE P8CWB316-9GE

CORE OPERATING LIMITS REPORT

TABLE 1.2-8

CMC BUNDLE TYPE 13

LATTICE SPECIFIC MAPLHGR (KW/FT)

<u>EXPOSURE</u> <u>(MWD/ST)</u>	<u>P8CWL071</u> <u>9GE</u>	<u>P8CWL339</u> <u>7G4.0</u>	<u>P8CWL355</u> <u>4G4.0/3G3.0</u>	<u>P8CWL355</u> <u>5G4.0/3G3.0</u>	<u>P8CWL339</u> <u>4G4.0/3G3.0</u>	<u>P8CWL071</u> <u>NOG</u>
0	12.74	12.34	11.87	11.34	12.36	12.74
200	12.67	12.39	11.94	11.43	12.41	12.67
1000	12.48	12.49	12.10	11.61	12.53	12.48
2000	12.42	12.63	12.27	11.86	12.65	12.42
3000	12.41	12.74	12.41	12.05	12.77	12.41
4000	12.44	12.85	12.53	12.23	12.89	12.44
5000	12.46	12.97	12.61	12.38	13.02	12.46
6000	12.49	13.10	12.69	12.50	13.14	12.49
7000	12.51	13.22	12.77	12.62	13.23	12.51
8000	12.54	13.34	12.87	12.75	13.34	12.54
9000	12.55	13.38	12.96	12.90	13.43	12.55
10000	12.57	13.38	13.04	13.02	13.39	12.57
12500	12.41	13.36	13.01	13.00	13.36	12.41
15000	12.04	13.01	12.70	12.70	13.01	12.04
20000	11.27	12.34	12.10	12.10	12.33	11.27
25000	10.49	11.69	11.49	11.47	11.69	10.49
35000	8.95	10.46	10.19	10.18	10.46	8.95
45000	6.15	9.12	8.70	8.67	9.13	6.15
46850	5.21	-	-	-	-	5.21
50690	-	-	-	5.85	-	-
50720	-	-	5.85	-	-	-
51860	-	5.84	-	-	5.84	-
CMC						
LATTICE TYPE	36	32	33	34	35	31
LATTICE No.	1581	1700	1701	1702	1703	733

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2.0 MINIMUM CRITICAL POWER RATIO (3/4.2.3)

2.1 Tech Spec REFERENCE:

Tech Spec 3.2.3.

2.2 DESCRIPTION:

a. Single Recirculation Loop Operation

The MCPR limit when in Single Recirculation Loop Operation is determined from Figure 2.2-1* plus 0.01, times the Kf factor determined from Figure 2.2-2.

b. Two Recirculation Loop Operation

The MCPR limit when in Dual Recirculation Loop Operation is determined from Figure 2.2-1* times the Kf factor determined from Figure 2.2-2.

c. Two Recirculation Loop Operation with Main Turbine Bypass Inoperable

The MCPR limit when in Dual Recirculation Loop Operation with the Main Turbine Bypass Inoperable (per Tech Spec 3.7.10) is determined from Figure 2.2-1* times the Kf factor determined from Figure 2.2-2.

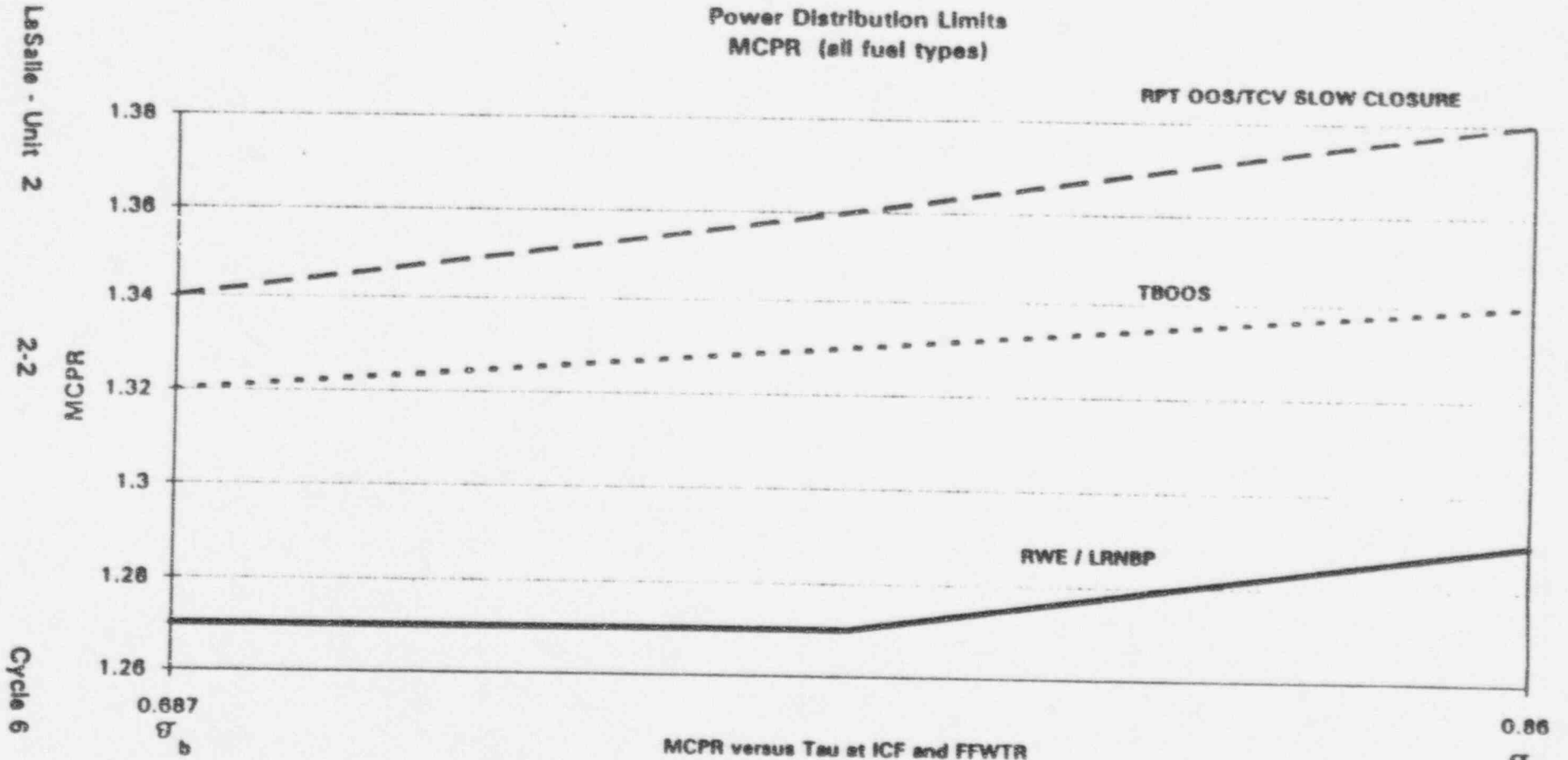
d. Two Recirculation Loop Operation with End-of-Cycle Recirculation Pump Trip System Inoperable and/or a Postulated Slow Turbine Control Valve Closure Event

The MCPR limit when in Dual Recirculation Loop Operation with the End-of-Cycle Recirculation Pump Trip System (RPT) Inoperable (per Tech Spec 3.3.4.2) and/or one or more Turbine Control Valve Slow Closing is determined from Figure 2.2-1* times the Kf factor determined from Figure 2.2-2.

- * If, during Unit Coastdown, power operation exceeding the equilibrium power level is desired, then Figure 2.2-3 shall be used.

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Power Distribution Limits
MCPR (all fuel types)



MCPR versus Tau at ICF and FFWTR

Figure 2.2-1

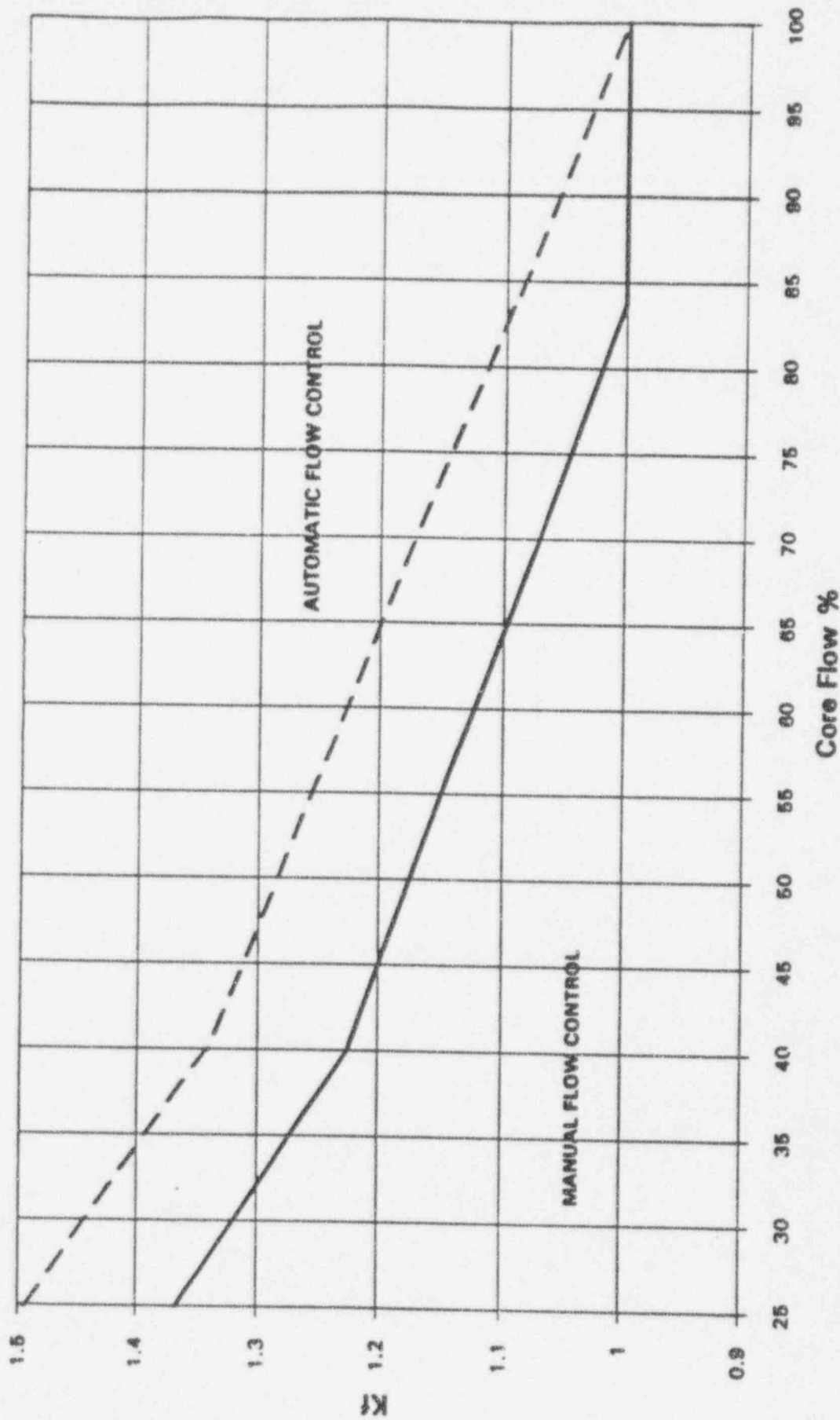
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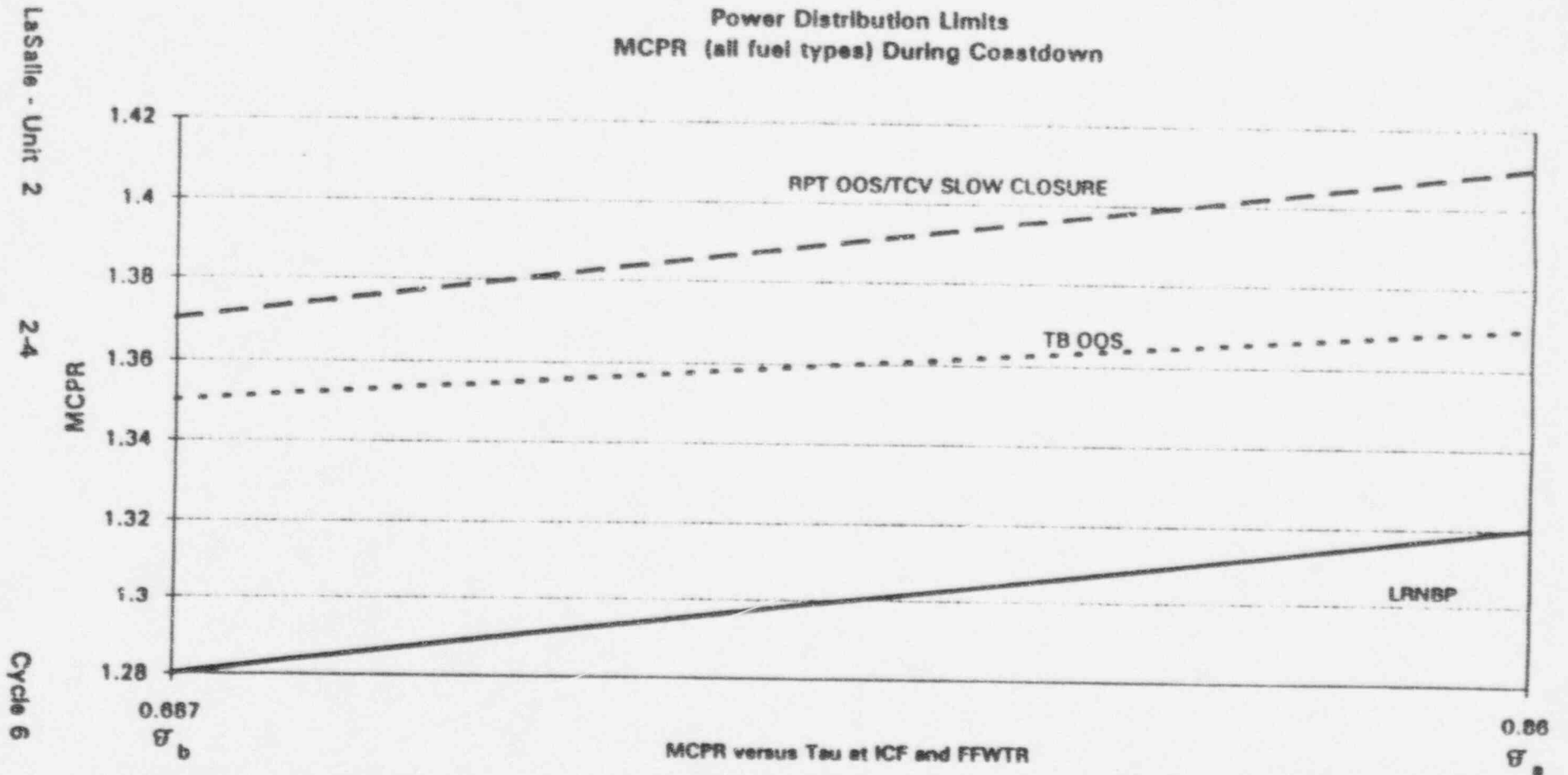
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Kf FACTOR
Figure 2.2-2



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Power Distribution Limits
MCPR (all fuel types) During Coastdown



MCPR versus Tau at ICF and FFWR

Figure 2.2-3

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CORE OPERATING LIMITS REPORT

3.0 LINEAR HEAT GENERATION RATE (3/4.2.4)

3.1 Tech Spec REFERENCE:

Tech Spec 3.2.4.

3.2 DESCRIPTION:

a. The LHGR limit is 14.4 kw/ft for fuel types:

1. BC300D
2. BC320C
3. P8CWB303-9GZ
4. P8CWB303-10GZ
5. P8CWB300-9GZ
6. P8CWB302-9GZ
7. P8CWB313-9GZ
8. P8CWB316-9GZ

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4.0 CONTROL ROD WITHDRAWAL BLOCK INSTRUMENTATION (3/4.3.6)

4.1 Tech Spec REFERENCE:

Tech Spec Table 3.3.6-2.

4.2 DESCRIPTION:

- a. The Rod Block Monitor Upscale Instrumentation Setpoints are determined from the relationships shown in Table 4.2-1.

TABLE 4.2-1

CONTROL ROD WITHDRAWAL BLOCK INSTRUMENTATION SETPOINTS

<u>TRIP FUNCTION</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUE</u>
1.0 <u>ROD BLOCK MONITOR</u>		
A. <u>UPSCALE</u>		
1. Two Recirculation * Loop Operation	$\leq 0.66 W + 45 \%^{**}$	$\leq 0.66 W + 48 \%^{**}$
2. Single Recirculation * Loop Operation	$\leq 0.66 W + 39.7\%^{**}$	$\leq 0.66 W + 42.7\%^{**}$

* Clamped, with an allowable value not to exceed the allowable value for recirculation loop flow (W) of 100%.

** This setpoint may be lower and will still comply with the RWE Analysis.

ATTACHMENT B

CORE OPERATING LIMITS REPORT

5. Analytical Methods

5.1 The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC in the latest approved revision or supplement of the Topical Reports describing the methodology. For LaSalle County Station Unit 2, the Topical Reports are:

- a. NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel", (latest approved revision).
- b. Commonwealth Edison Topical Report NFSR-0085, "Benchmark of BWR Nuclear Design Methods", (latest approved revision).
- c. Commonwealth Edison Topical Report NFSR-0085, Supplement 1, "Benchmark of BWR Nuclear Design Methods - Quad Cities Gamma Scan Comparisons", (latest approved revision).
- d. Commonwealth Edison Topical Report NFSR-0085, Supplement 2, "Benchmark of BWR Nuclear Design Methods - Neutronic Licensing Analyses", (latest approved revision).