ATTACHMENT 1

Core Operating Limits Report

Revision 2

Quad Cities Unit 2 Cycle 15

SVP-98-195

ISSUANCE OF CHANGES SUMMARY

Affected Section	Affected Pages	Summary of Changes	Date
All	All	Original Issue (Cycle 11).	10/89
All	All	Original Issue (Cycle 12), Reissue.	11/91 2/92
All	All	Original Issue (Cycle 13).	2/93
2	2	Added Section 2.3 on SLO.	3/93
References, 4.2 & 5	iii, 4 & 5	Revised References and Section 4.2 and added Section 5.0 on Analytical Methods.	4/94
All	All	Original Issue (Cycle 14).	6/95
All	All	Latest Date Revised added to each COLR page, Added Special Instructions and boxed in TSUP References for TSUP Implementation. Added Control Rod Withdrawal Block Equation for Single Loop Operation.	5/96
All	All	Original Issue (Cycle 15).	5/97
All	All	1. "Cycle 15" Changed to "Cycle 15 Revision 1" 2. Added references 10, 11 and 12 to support Cycle 15 Revision 1 Core Loading to Reference Section on Page iv 3. Page Dates Changed	10/97
All	All	1. Changed MCPR Operating Limits for ATRIUM-9B and associated wording 2. Changed Revisions of Reload Analysis and Plant Transient Analysis (References 7 and 8) 3. Added Reference 13 to support Cycle 15 Rev 1 CPR and Transient Re-analysis 4. Page Dates Changed	5/98

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SPECIAL INSTRUCTIONS

1. This Core Operating Limits Report (COLR) contains the applicable reactor core limits and operational information mandated by Technical Specifications Section 6.9.A.6. When the COLR is referenced by applicable Technical Specifications or procedures for Technical Specification compliance, a controlled copy of this report shall be used as the official source of the applicable limit or requirement.

REFERENCES

1. Commonwealth Edison Company and Iowa-Illinois Gas and Electric Company Docket No. 50-265, Quad Cities Station, Unit 2 Facility Operating License, License No. DPR-30.

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 Technical Specifications.

3. Quad Cities Nuclear Power Station, Units 1 and 2, SAFER/GESTR - LOCA Loss-of-Coolant Accident Analysis, NEDC-31345P, Revision 2, July 1989 (as amended).

4. Lattice Dependent MAPLHGR Report for Quad Cities Nuclear Power Station, Unit 2, Reload 13 Cycle 14, 24A5161-AA Revision 0, December, 1994.

5. SPC Document, EMF-96-185(P) Rev. 1, "Quad Cities LOCA-ECCS Analysis MAPLHGR Limits for ATRIUM-9B Fuel", March, 1997.

6. SPC Document EMF-96-037(P) Rev. 1 "Quad Cities Extended Operating Domain (EOD) and Equipment Out of Service (EOOS) Safety Analysis for ATRIUM-9B Fuel", September, 1996.

7. SPC Document, EMF-96-177 Rev. 3, NDIT970069, "Quad Cities Unit 2 Cycle 15 Reload Analysis", April, 1998 (COLR Attachment).

8. SPC Document EMF-96-180 Rev. 2 NDIT970068 "Quad Cities Unit 2 Cycle 15 Plant Transient Analysis", April, 1998 (COLR Attachment)

9. SPC Letter JHR:97:203, "Analysis to Support Operation with Reactor Pressure Less than the Design Pressure at Quad Cities", May 27, 1997.

10. SPC Letter DEG 97:156, "Quad Cities Unit 2 Cycle 15 Assessment of Licensing Analyses After Replacement of Failed Fuel Assembly (Revision)", September 30, 1997.

11. NDIT 970159 Revision 0, "Quad Cities 2 Cycle 15A Design Basis Loading Plan (DBLP)", September 29, 1997.

12. BNDQ:97-062, "QC2 C15 Licensing Analysis Application to C15A (Assuming YJ8327 is the Leaker and LYU336 is Reinserted)", September 30, 1997.

13. BNDQ:98-010, "QC2 C15A Neutronics Licensing Reruns with Revised 1998 ATRIUM-9B Additive Constants and MICROBURN uaug97", April 27, 1998.

LIST OF TABLES

LIST OF FIGURES

1.0 CONTROL ROD WITHDRAWAL BLOCK INSTRUMENTATION

1.1. TECHNICAL SPECIFICATION REFERENCE:

Technical Specification: Table 3.2.E-1 [COLR 1.2], 3.6.A.1.c [COLR 1.3]

1.2. DESCRIPTION:

The Rod Withdrawal Block Monitor Upscale Instrumentation Trip Setpoint for Two Recirculation Loop Operation is determined from the following relationship:

$\leq$ (0.65)Wd + 43% **

1.3. DESCRIPTION:

The Rod Withdrawal Block Monitor Upscale Instrumentation Trip Setpoint for Single Recirculation Loop Operation (SLO) is determined from the following relationship.

$\leq$ (0.65)Wd + 39% **

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

Wd is the percent of drive flow required to produce a rated core flow of 98 million lb/hr. Trip level setting is in percent of rated power (2511 MWth).

2.0 AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)

2.1 TECHNICAL SPECIFICATION REFERENCE:

Technical Specification 3.11.A

2.2 DESCRIPTION:

MAPLHGR versus Average Planar Exposure for GE9B-P8DWB310-9GZ-80M-145-T is determined from Table 2-1.

MAPLHGR versus Average Planar Exposure for GE9B-P8DWB299-11GZ-80M-145-T is determined from Table 2-2.

MAPLHGR versus Average Planar Exposure for GE9B-P8DWB286-7G3.0-80M-145-T is determined from Table 2-3.

MAPLHGR versus Average Planar Exposure for GE9B-P8DWB286-9GZ-80M-145-T is determined from Table 2-4.

MAPLHGR versus Average Planar Exposure for GE9B-P8DWB310-7G3.0-80M-145-T is determined from Table 2-5.

MAPLHGR versus Average Planar Exposure for GE9B-P8DWB308-10GZ1-80M-145-T is determined from Table 2-6.

MAPLHGR versus Average Planar Exposure for GE10-P8HXB316-8GZ-100M-145-T is determined from Table 2-7.

MAPLHGR versus Average Planar Exposure for GE10-P8HXB312-7GZ-100M-145-T is determined from Table 2-8.

MAPLHGR versus Average Planar Exposure for SPCA9-372B-11GZH-ADV is determined from Table 2-9.

MAPLHGR versus Average Planar Exposure for SPCA9-358B-11GZL-ADV is determined from Table 2-10.

2.3 SINGLE LOOP OPERATION MULTIPLIER:

The tabulated values are multiplied by 0.85 for GE fuel and 0.90 for SPC fuel whenever Quad Cities enters Single Loop Operation.

TABLE 2-1

MAPLHGR vs. AVERAGE PLANAR EXPOSURE
FOR BUNDLE TYPE : GE9B-P8DWB310-9GZ-80M-145-T

LATTICE 731 : P8DWL071-NOG-80M-T
LATTICE 847 : P8DWL334-7G3.0-80M-T
LATTICE 848 : P8DWL350-7G3.0-80M-T
LATTICE 849 : P8DWL350-2G4.0/7G3.0-80M-T
LATTICE 846 : P8DWL071-9GE1-80M-T

AVERAGE PLANAR EXPOSURE (GWd/ST)	MAPLHGR LIMITS (KW/FT)				
	731	847	848	849	846
0.00	11.64	12.25	11.78	11.31	11.64
0.20	11.57	12.32	11.85	11.39	11.57
1.00	11.38	12.46	11.99	11.55	11.38
2.00	11.36	12.62	12.19	11.78	11.36
3.00	11.41	12.79	12.36	12.02	11.41
4.00	11.49	12.96	12.52	12.22	11.49
5.00	11.56	13.14	12.69	12.44	11.56
6.00	11.63	13.23	12.81	12.60	11.63
7.00	11.69	13.30	12.93	12.77	11.69
8.00	11.74	13.38	13.04	12.93	11.74
9.00	11.78	13.43	13.14	13.08	11.78
10.00	11.81	13.46	13.21	13.20	11.81
12.50	11.54	13.41	13.21	13.21	11.54
15.00	11.16	13.02	12.94	12.93	11.16
20.00	10.37	12.28	12.30	12.29	10.37
25.00	9.58	11.57	11.61	11.60	9.58
35.00	8.01	10.27	10.29	10.27	8.01
43.70	4.71	-	-	-	4.71
45.00	-	9.02	8.98	8.92	-
51.10	-	-	-	5.90	-
51.20	-	5.96	5.90	-	-

TABLE 2-2

MAPLHGR vs. AVERAGE PLANAR EXPOSURE
FOR BUNDLE TYPE : GE9B-P8DWB299-11GZ-80M-145-T

LATTICE 731 : P8DWL071-NOG-80M-T
LATTICE 850 : P8DWL322-9G3.0-80M-T
LATTICE 851 : P8DWL337-9G3.0-80M-T
LATTICE 852 : P8DWL337-2G4.0/9G3.0-80M-T
LATTICE 853 : P8DWL071-11GE-80M-T

AVERAGE PLANAR EXPOSURE (GWd/ST)	MAPLHGR LIMITS (KW/FT)				
	731	850	851	852	853
0.00	11.64	11.49	11.31	10.87	11.64
0.20	11.57	11.52	11.38	10.96	11.57
1.00	11.38	11.62	11.56	11.14	11.38
2.00	11.36	11.87	11.84	11.44	11.36
3.00	11.41	12.19	12.05	11.70	11.41
4.00	11.49	12.57	12.21	11.88	11.49
5.00	11.56	12.94	12.37	12.07	11.56
6.00	11.63	13.04	12.54	12.27	11.63
7.00	11.69	13.14	12.73	12.50	11.69
8.00	11.74	13.21	12.90	12.72	11.74
9.00	11.78	13.26	13.03	12.92	11.78
10.00	11.81	13.28	13.11	13.07	11.81
12.50	11.54	13.21	13.07	13.06	11.54
15.00	11.16	12.82	12.81	12.81	11.16
20.00	10.37	12.07	12.30	12.30	10.37
25.00	9.58	11.36	11.66	11.64	9.58
35.00	8.01	10.07	10.29	10.27	8.01
43.70	4.71	-	-	-	4.71
45.00	-	8.61	8.85	8.82	-
50.60	-	5.89	-	-	-
51.00	-	-	-	5.84	-
51.20	-	-	5.81	-	-

TABLE 2-3

MAPLHGR vs. AVERAGE PLANAR EXPOSURE
FOR BUNDLE TYPE : GE9B-P8DWB286-7G3.0-80M-145-T

LATTICE 731 : P8DWL071-NOG-80M-T
LATTICE 1059 : P8DWL306-7G3.0-80M-T
LATTICE 1060 : P8DWL324-7G3.0-80M-T
LATTICE 1061 : P8DWL071-7GE1-80M-T

AVERAGE PLANAR EXPOSURE (GWd/ST)	MAPLHGR LIMITS (KW/FT)			
	731	1059	1060	1061
0.00	11.64	12.38	11.95	11.64
0.20	11.57	12.45	12.03	11.57
1.00	11.38	12.54	12.11	11.38
2.00	11.36	12.65	12.30	11.36
3.00	11.41	12.75	12.57	11.41
4.00	11.49	12.85	12.88	11.49
5.00	11.56	12.94	12.97	11.56
6.00	11.63	12.95	13.01	11.63
7.00	11.69	12.97	13.09	11.69
8.00	11.74	13.01	13.17	11.74
9.00	11.78	13.05	13.21	11.78
10.00	11.81	13.09	13.23	11.81
12.50	11.54	13.04	13.16	11.54
15.00	11.16	12.71	12.79	11.16
20.00	10.37	12.06	12.06	10.37
25.00	9.58	11.43	11.37	9.58
35.00	8.01	10.04	10.12	8.01
43.66	4.71	-	-	4.71
45.00	-	8.60	8.68	-
50.66	-	5.84	-	-
50.75	-	-	0.91	-

TABLE 2-4

MAPLHGR vs. AVERAGE PLANAR EXPOSURE FOR BUNDLE TYPE GE9B-P8DWB286-9GZ-80M-145-T

LATTICE 731 : P8DWL071-NOG-80M-T
LATTICE 1059 : P8DWL306-7G3.0-80M-T
LATTICE 1060 : P8DWL324-7G3.0-80M-T
LATTICE 1000 : P8DWL324-2G4.0/7G3.0-80M-T
LATTICE 1001 : P8DWL071-9GE-80M-T

AVERAGE PLANAR EXPOSURE (GWd/ST)	MAPLHGR LIMITS (KW/FT)				
	731	1059	1060	1000	1001
0.00	11.64	12.38	11.95	11.42	11.64
0.20	11.57	12.45	12.03	11.51	11.57
1.00	11.38	12.54	12.11	11.59	11.38
2.00	11.36	12.65	12.30	11.82	11.36
3.00	11.41	12.75	12.57	12.13	11.41
4.00	11.49	12.85	12.88	12.51	11.49
5.00	11.56	12.94	12.97	12.69	11.56
6.00	11.63	12.95	13.01	12.80	11.63
7.00	11.69	12.97	13.09	12.92	11.69
8.00	11.74	13.01	13.17	13.04	11.74
9.00	11.78	13.05	13.21	13.14	11.78
10.00	11.81	13.09	13.23	13.20	11.81
12.50	11.54	13.04	13.16	13.14	11.54
15.00	11.16	12.71	12.79	12.77	11.16
20.00	10.37	12.06	12.06	12.04	10.37
25.00	9.58	11.43	11.37	11.36	9.58
35.00	8.01	10.04	10.12	10.11	8.01
43.66	4.71	-	-	-	4.71
45.00	-	8.60	8.68	8.65	-
50.66	-	5.84	-	5.92	-
50.75	-	-	5.91	-	-

TABLE 2-5

MAPLHGR vs. AVERAGE PLANAR EXPOSURE
FOR BUNDLE TYPE : GE9B-P8DWB310-7G3.0-80M-145-T

LATTICE 731 : P8DWL071-NOG-80M-T
LATTICE 1644 : P8DWL334-7G3.0-80M-T
LATTICE 1645 : P8DWL350-7G3.0-80M-T
LATTICE 1004 : P8DWL071-7GE-80M-T

AVERAGE PLANAR EXPOSURE (GWd/ST)	MAPLHGR LIMITS (KW/FT)			
	731	1644	1645	1004
0.00	11.64	12.25	11.78	11.64
0.20	11.57	12.32	11.85	11.57
1.00	11.38	12.46	11.99	11.38
2.00	11.36	12.62	12.19	11.36
3.00	11.41	12.79	12.36	11.41
4.00	11.49	12.96	12.52	11.49
5.00	11.56	13.14	12.69	11.56
6.00	11.63	13.23	12.81	11.63
7.00	11.69	13.30	12.93	11.69
8.00	11.74	13.38	13.04	11.74
9.00	11.78	13.43	13.14	11.78
10.00	11.81	13.46	13.21	11.81
12.50	11.54	13.41	13.22	11.54
15.00	11.16	13.03	12.95	11.16
20.00	10.37	12.29	12.31	10.37
25.00	9.58	11.58	11.62	9.58
35.00	8.01	10.28	10.31	8.01
43.66	4.71	-	-	4.71
45.00	-	9.04	9.01	-
51.41	-	-	5.88	-
51.43	-	5.94	-	-

TABLE 2-6

MAPLHGR vs. AVERAGE PLANAR EXPOSURE
FOR BUNDLE TYPE : GE9B-P8DWB308-10GZ1-80M-145-T

LATTICE 731 : P8DWL071-NOG-80M-T
LATTICE 1642 : P8DWL332-8G4.0/2G3.0-80M-T
LATTICE 1669 : P8DWL348-8G4.0/2G3.0-80M-T
LATTICE 1188 : P8DWL071-10GE-80M-T

AVERAGE PLANAR EXPOSURE (GWd/ST)	MAPLHGR LIMITS (KW/FT)			
	731	1642	1669	1188
0.00	11.64	11.63	11.24	11.64
0.20	11.57	11.69	11.31	11.57
1.00	11.38	11.83	11.44	11.38
2.00	11.36	12.04	11.62	11.36
3.00	11.41	12.25	11.82	11.41
4.00	11.49	12.48	12.02	11.49
5.00	11.56	12.58	12.24	11.56
6.00	11.63	12.69	12.44	11.63
7.00	11.69	12.86	12.62	11.69
8.00	11.74	13.04	12.75	11.74
9.00	11.78	13.19	12.90	11.78
10.00	11.81	13.31	13.05	11.81
12.50	11.54	13.32	13.14	11.54
15.00	11.16	12.96	12.92	11.16
20.00	10.37	12.22	12.25	10.37
25.00	9.58	11.53	11.57	9.58
35.00	8.01	10.24	10.26	8.01
43.66	4.71	-	-	4.71
45.00	-	8.93	8.93	-
51.09	-	5.96	-	-
51.15	-	-	5.90	-

TABLE 2-7

MAPLHGR vs. AVERAGE PLANAR EXPOSURE
FOR BUNDLE TYPE : GE10-P8HXB316-8GZ-100M-145-T

LATTICE 7400 : P8HXL071-NOG-100M
LATTICE 7467 : P8HXL341-6G4.0/2G3.0-100M
LATTICE 7469 : P8HXL357-6G4.0/2G3.0-100M
LATTICE 7468 : P8HXL341-8G3.0-100M
LATTICE 7404 : P8HXL071-8GE-100M

AVERAGE PLANAR EXPOSURE (GWd/ST)	MAPLHGR LIMITS (KW/FT)				
	7400	7467	7469	7468	7404
0.00	11.85	12.00	11.11	12.08	11.85
0.20	11.78	12.06	11.14	12.15	11.78
1.00	11.59	12.18	11.24	12.30	11.59
2.00	11.57	12.36	11.44	12.53	11.57
3.00	11.61	12.50	11.70	12.68	11.61
4.00	11.68	12.60	11.99	12.82	11.68
5.00	11.75	12.71	12.26	12.96	11.75
6.00	11.81	12.84	12.37	13.12	11.81
7.00	11.86	13.01	12.51	13.29	11.86
8.00	11.91	13.20	12.68	13.44	11.91
9.00	11.94	13.39	12.86	13.53	11.94
10.00	11.97	13.52	13.01	13.55	11.97
12.50	11.75	13.44	13.09	13.44	11.75
15.00	11.38	13.06	12.84	13.07	11.38
20.00	10.59	12.32	12.21	12.33	10.59
25.00	9.81	11.60	11.54	11.61	9.81
35.00	8.26	10.21	10.25	10.22	8.26
44.89	4.93	-	-	-	4.93
45.00	-	8.72	8.82	8.72	-
50.76	-	-	-	5.87	-
50.78	-	5.86	-	-	-
50.88	-	-	5.90	-	-

TABLE 2-8

MAPLHGR vs. AVERAGE PLANAR EXPOSURE
FOR BUNDLE TYPE : GE10-P8HXB312-7GZ-100M-145-T

LATTICE 7400 : P8HXL071-NOG-100M
LATTICE 7405 : P8HXL336-3G4.0/4G3.0-100M
LATTICE 7406 : P8HXL354-1G4.0/6G3.0-100M
LATTICE 7407 : P8HXL336-7G3.0-100M
LATTICE 7408 : P8HXL071-7GE-100M

AVERAGE PLANAR EXPOSURE (GWd/ST)	MAPLHGR LIMITS (KW/FT)				
	7400	7405	7406	7407	7408
0.00	11.85	12.01	11.27	12.04	11.85
0.20	11.78	12.08	11.31	12.11	11.78
1.00	11.59	12.23	11.42	12.27	11.59
2.00	11.57	12.43	11.65	12.49	11.57
3.00	11.61	12.65	11.93	12.72	11.61
4.00	11.68	12.88	12.24	12.96	11.68
5.00	11.75	13.09	12.58	13.15	11.75
6.00	11.81	13.22	12.94	13.30	11.81
7.00	11.86	13.32	13.15	13.41	11.86
8.00	11.91	13.40	13.32	13.46	11.91
9.00	11.94	13.45	13.43	13.47	11.94
10.00	11.97	13.47	13.50	13.45	11.97
12.50	11.75	13.35	13.45	13.35	11.75
15.00	11.38	12.97	13.10	12.97	11.38
20.00	10.59	12.23	12.41	12.24	10.59
25.00	9.81	11.51	11.74	11.52	9.81
35.00	8.26	10.14	10.41	10.15	8.26
44.89	4.93	-	-	-	4.93
45.00	-	8.61	9.01	8.60	-
50.55	-	-	-	5.85	-
50.59	-	5.85	-	-	-
51.56	-	-	5.86	-	-

TABLE 2-9

MAPLHGR vs. AVERAGE PLANAR EXPOSURE FOR BUNDLE TYPE : SPCA9-372B-11GZH-ADV

Average Planar Exposure (GWd/MTU)	ATRIUM-9B MAPLHGR (kW/ft)
0.0	13.5
20.0	13.5
60.0	8.7

TABLE 2-10

MAPLHGR vs. AVERAGE PLANAR EXPOSURE FOR BUNDLE TYPE : SPCA9-358B-11GZL-ADV

Average Planar Exposure (GWd/MTU)	ATRIUM-9B MAPLHGR (kW/ft)
0.0	13.5
20.0	13.5
60.0	8.7

3.0 LINEAR HEAT GENERATION RATE (LHGR)

3.1 TECHNICAL SPECIFICATION REFERENCE:

Technical Specification 3.11.D

3.2 DESCRIPTION:

A. The LHGR limit is 14.4 Kw/ft for all GE fuel types:

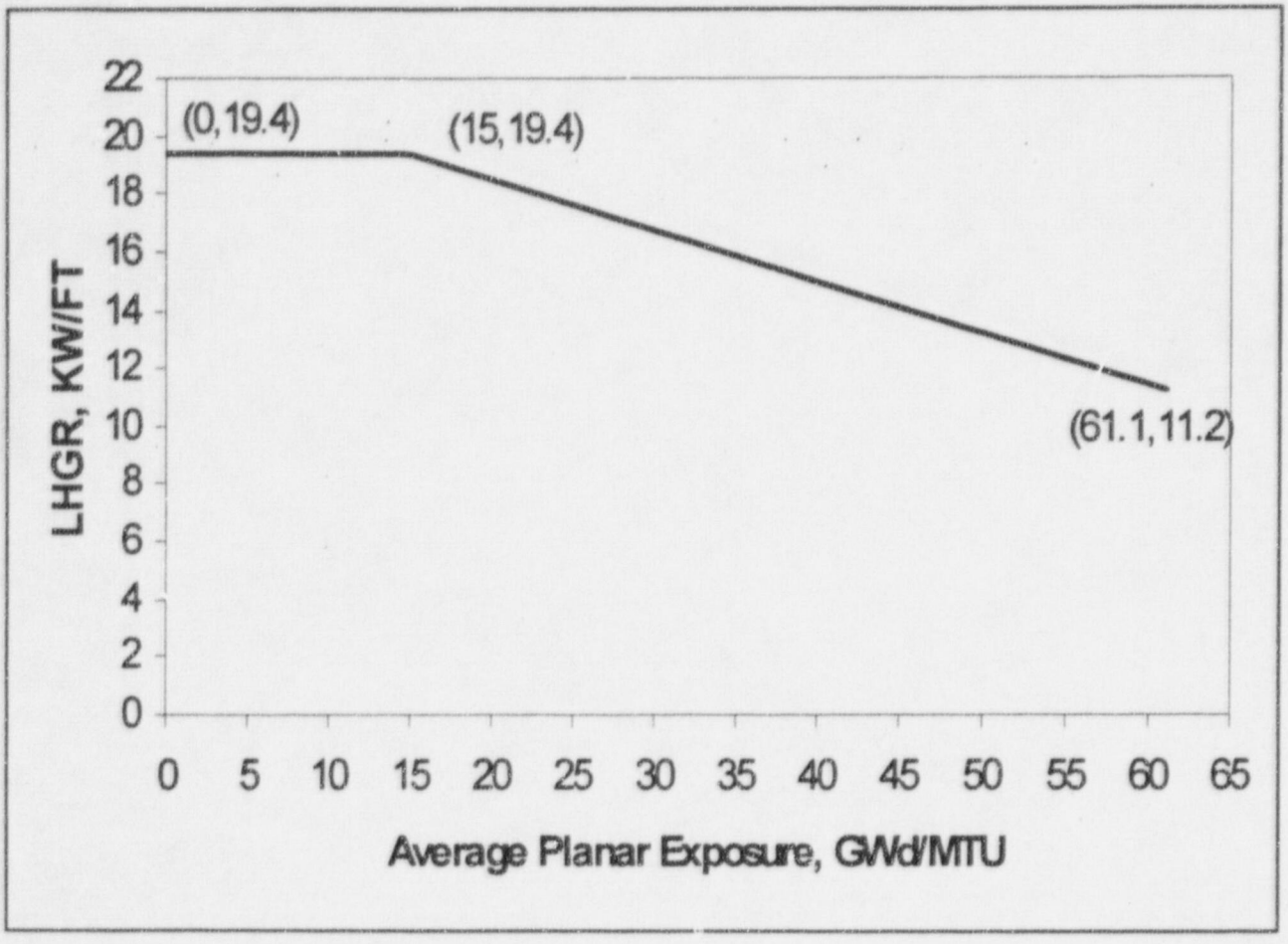
1. GE9B-P8DWB310-9GZ-80M-145-T
2. GE9B-P8DWB299-11GZ-80M-145-T
3. GE9B-P8DWB286-7G3.0-80M-145-T
4. GE9B-P8DWB286-9GZ-80M-145-T
5. GE9B-P8DWB310-7G3.0-80M-145-T
6. GE9B-P8DWB308-10GZ1-80M-145-T
7. GE10-P8HXB316-8GZ-100M-145-T
8. GE10-P8HXB312-7GZ-100M-145-T

B. The LHGR limits are provided in the table below for all of the SPC fuel types:

1. SPCA9-372B-11GZH-ADV
2. SPCA9-358B-11GZL-ADV

Average Planar Exposure (GWd/MTU)	ATRIUM-9B LHGR (kW/ft)
0.0	14.4
15.0	14.4
61.1	8.32

The Protection Against Power Transient LHGR Limit for ATRIUM-9B Offset fuel is provided in Figure 3-1.



QUAD CITIES UNIT 2 CYCLE 15 REVISION 1
PROTECTION AGAINST POWER TRANSIENT LHGR LIMIT FOR ATRIUM-9B OFFSET
FIGURE 3-1

4.0 MINIMUM CRITICAL POWER RATIO (MCPR)

4.1 TECHNICAL SPECIFICATION REFERENCE:

Technical Specification 3.11.C

4.2 DESCRIPTION:

During steady-state operation at rated core flow, the Operating Limit MCPR (OLMCPR) shall be greater than or equal to:

-1.58 fc GE9B fuel
-1.53 for GE10 fuel
-1.47 for ATRIUM-9B fuel for:

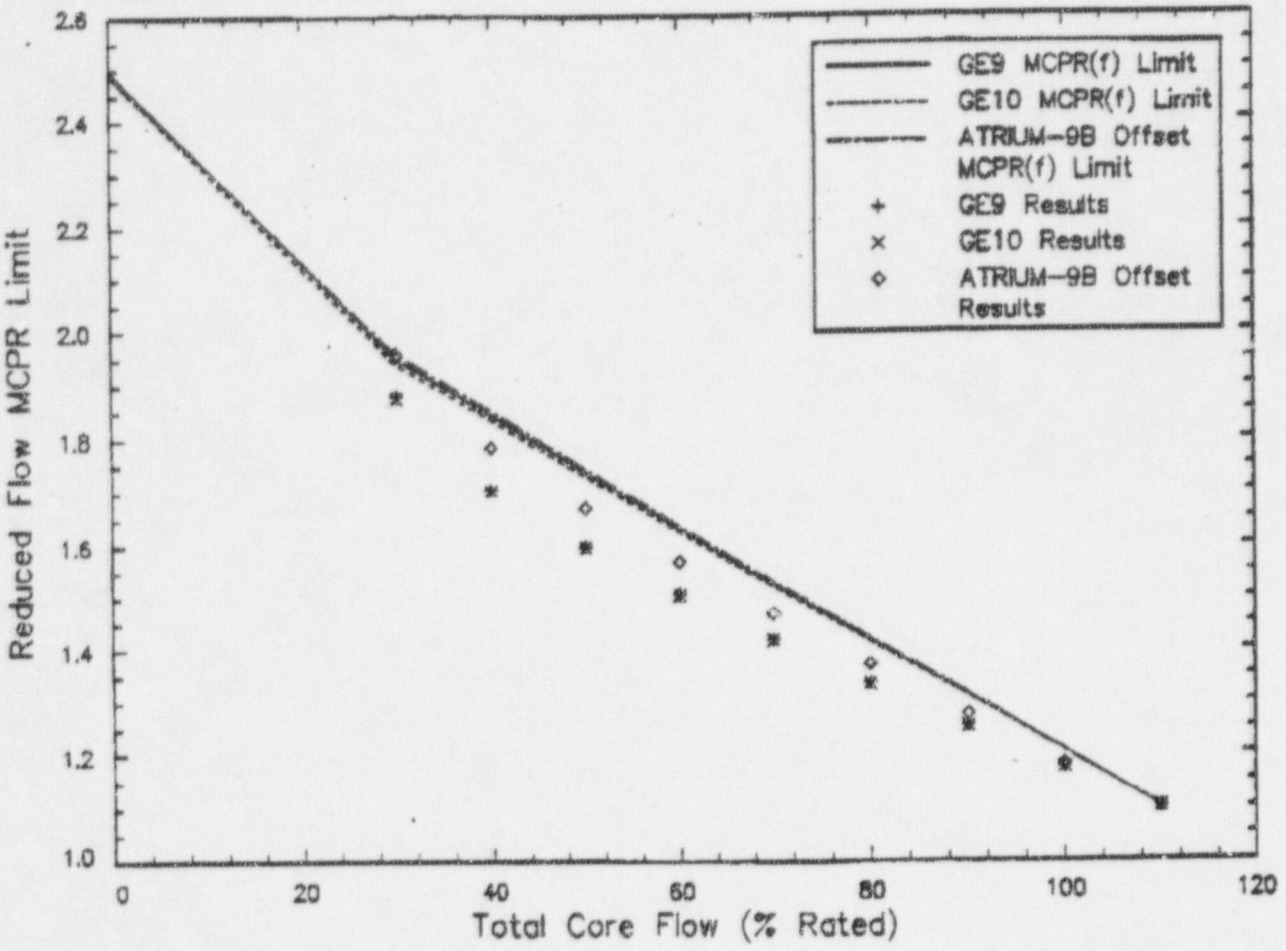
5% insertion $t_{ave} \leq$ 0.375 seconds
20% insertion $t_{ave} \leq$ 0.90 seconds
50% insertion $t_{ave} \leq$ 2.00 seconds
90% insertion $t_{ave} \leq$ 3.50 seconds

where t_{ave} = Technical Specification scram insertion times for all surveillance data from Technical Specification 3/4.3.E which has been generated in the current cycle. Where t_{ave} is less than or equal to the Technical Specification Scram Speed.

For core flows less than rated, reduced flow $MCPR_f$ curves for Manual Flow Control are provided in Figure 4-1. $MCPR_f$ values for Automatic Flow Control are provided in Table 4-1.

The OLMCPR limits stated above are valid for all planned Operational modes, including Increased Core Flow (ICF) and Final Feedwater Temperature Reduction (FFTR). The value corresponds to the cycle specific determination of the bounding event. For Unit 2 Cycle 15 Revision 1 this event is the Feedwater Controller Failure (FWCF) Event for GE9 and 10 fuel and the FWCF Event and the Load Rejection with No Bypass Event for Atrium-9B fuel with the above Operational modes incorporated. This value was determined to be 1.47 for the ATRIUM-9B bundles, 1.53 for the GE10 bundles, and 1.58 for the GE9B bundles, for the Technical Specification Scram Speeds. This limit is increased by 0.04 for any and all combinations of Quad Cities Equipment Out-Of-Service / Extended Operating Domain analysis (Reference 6) excluding Single Loop Operation (SLO). For SLO, the OLMCPR is increased by 0.01. The above OLMCPR values include a 0.01 adder to permit operation with reactor steam dome pressure up to 15 psi below rated pressure from 90% to 100% CTP. Below 90% CTP, the 15 psi band requirement is not required (Reference 9). Unit Two has been approved for operating up to 15% (Reference 6) above

equilibrium coastdown power level with allowance for multiple control rods inserted. At End of Full Power Capability (EFPC) the generic EOOS/EOD MCPR operating limit MCPR penalty of 0.04 must be added to the operating limit MCPR in order to exceed equilibrium xenon coastdown power.



Recirculation Flow (% of rated	GE 9 MCPR, Limit	GE 10 MCPR, Limit	ATRIUM-9B Offset MCPR, Limit
110	1.10	1.10	1.10
30	1.95	1.94	1.96
0	2.50	2.49	2.49

QUAD CITIES UNIT 2 CYCLE 15 REVISION 1

MCPR, CURVE FOR MANUAL FLOW CONTROL

FIGURE 4-1

Automatic Flow Control $MCPR_f$ Results

	Base Case OLMCPR			EOD/EOOS OLMCPR		
Core Flow (% rated)	GE9	GE10	ATRIUM-9B	GE9	GE10	ATRIUM-9B
108	1.58	1.53	1.47	1.62	1.57	1.51
30	2.95	2.85	2.77	3.02	2.92	2.85
0	3.85	3.72	3.59	3.95	3.82	3.72

5.0 Analytical Methods

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 Quad Cities Unit 2, the topical reports are:

(1) GE Document, NEDE-24011-P-A "General Electric Standard Application for Reactor Fuel," (latest approved revision).

(2) Commonwealth Edison Topical Report NFSR-0091, "Benchmark of BWR Nuclear Design Methods," (latest approved revision).

(3) Commonwealth Edison Topical Report NFSR-0091 Supplement 1, "Benchmark of CASMO/MICROBURN BWR Nuclear Design Methods", (As Supplemented)

(4) SPC document, "Application of the ANFB Critical Power Correlation to Coresident GE Fuel for Quad Cities Unit 2 Cycle 15", EMF-96-051(P), May, 1996.

6.0 Attachments

Attachment 1. Quad Cities Unit 2 Cycle 15 Reload Analysis

Attachment 2. Quad Cities Unit 2 Cycle 15 Plant Transient Analysis

NUCLEAR FUEL SERVICES DEPARTMENT
NUCLEAR DESIGN INFORMATION TRANSMITTAL

☒ SAFETY RELATED ☐ NON-SAFETY RELATED ☐ REGULATORY RELATED	Originating Organization ☒ Nuclear Fuel Services ☐ Other (specify) _____	NDIT No. 970069 Rev. No. Seq 01 Page 1 of 1

Station Quad Cities Unit 2 Cycle 15A Generic _____

To: Mike Ford

Subject: Quad Cities Unit 2 Cycle 16 Reload Analysis, EMF-96-177, Revision 3

Nancy J. Buck Preparer	Preparer's Signature	5/6/98 Date
John M. Freeman Reviewer	Reviewer's Signature	5/8/98 Date
Edward A. McVey NFS Supervisor	NFS Supervisor's Signature	5-8-98 Date

Status of Information:

☒ Verified
☐ Unverified
☐ Engineering Judgement

Method and Schedule of Verification for Unverified NDITs: _____

Description of Information: EMF-96-177 Rev. 2 was provided as part of the Q2C15 Reload Licensing Documents per SPC letter JHR:97:160 EMF-96-177, Rev. 2 supports Q2C15 operation. This NDIT revises EMF-96-177 Rev. 1, NDIT97009 due to a change to the MCPRSL. NDIT97009 shoud be labeled as "SUPERSEDED"

EMF-96-177 Rev. 3 was provided due to modifications associated with changes to the ATRIUM-9B additive constants and changes for operation with reactor pressures less than the design pressures. This NDIT supercedes NDIT970069 Seq 00.

Purpose of Information: Support QC2 C15rev1 startup.

Source of Information: Siemens Power Coporation, Richland WA

Supplemental Distribution:

QC Central File
R. A. Canalas/Mike Ford w/o attachment
N. J. Buck w/o attachment
J. K. Wheeler w/o attachment
DG Central File