

Oyster Creek Cycle 15  
Core Operating Limits Report  
Topical Report - 061  
Rev. 6

BA Number 335400

Date: 8/23/94

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TITLE Oyster Creek Cycle 15 Core Operating Limits Report

REV	SUMMARY OF CHANGE	APPROVAL	DATE
1	Technical Specification references were added to each Figure.		7/11/90
2	Correction to several typographical errors were made.  References to the Figures were provided in the thermal margins discussion in the introduction.  Dates and revision numbers of various references were provided.		11/14/90
3	Revise document to reflect the Cycle 13 design and safety analysis results. APLHGR limits (Figures 8 and 9) for two new fuel designs were added. Also the MCPR limit (Figure 10) changed from 1.51 to 1.48.		
4	Revise document to reflect the Cycle 14 design and safety analysis results. MAPLHGR limits for ENCVB, GE-239, GE-265H and GE-2992A fuel designs were removed. MCPR limit changed from 1.48 to 1.47. LLHGR limit for ENCVB fuel was removed.		
5	Mid-Cycle 14 revision to the MCPR operating limit. The limit changed from a 1.47 to a 1.51 based on a re-analysis of EOC14 conditions.		
6	Revise document to reflect the Cycle 15 design and safety analysis results. APLHGR and LLHGR limits for two new GE9 fuel designs were added. Also, the MCPR limit changed from 1.51 to 1.50.	<i>RVJuria</i>	10/5/94

N0036 (03-90)

TABLE OF CONTENTS

	<u>Page</u>
Introduction . . . . .	2
References . . . . .	3
Figure 1 GE9-348B Fuel MAPLHGR Limits . . . . .	4
Figure 2 GE9-338B Fuel MAPLHGR Limits . . . . .	5
Figure 3 GE-321B Fuel MAPLHGR Limits . . . . .	6
Figure 4 GE-338-12GZ Fuel MAPLHGR Limits . . . . .	7
Figure 5 GE-338-11GZ Fuel MAPLHGR Limits . . . . .	8
Figure 6 MCPR Limits . . . . .	9
Figure 7 $K_f$ Flow Factor . . . . .	10
Figure 8 LLHGR Limits . . . . .	11

## INTRODUCTION

Generic Letter 88-16 provides guidance for Technical Specification changes concerning cycle-specific limits. The generic letter provides a vehicle for the removal of cycle specific parameters from the Technical Specification and the maintenance of these values within a Core Operating Limits Report (COLR). The Technical Specification modification also establishes reporting requirements and includes definitions supporting the proposed changes. The COLR, including mid-cycle revisions, will be provided for each reload cycle.

This Core Operating Limits Report (COLR) has been prepared in accordance with the requirements of OC Technical Specification 6.9.1f. The information in this report was reviewed and approved for use at Oyster Creek by means of the Cycle 15 Reload Information and Safety Analysis Report (TR-97-rev 0) dated August 1994. The Cycle 15 fuel/core operating limits were generated using the NRC approved codes and methodologies identified in References 1 through 8.

For each GE fuel design the APLHGR limits provided in the COLR for four-loop operation are calculated to be the same as the five-loop limits at all exposure levels provided the idle loop is unisolated. If the idle loop has both its suction and discharge valves closed the loop is isolated as defined in Reference 6 and a 0.98 MAPLHGR multiplier must be applied at all exposure levels. Requirements for operation with an idle loop are provided in Technical Specification 3.3.F.

During power operation thermal margins should be maintained within the specified limits. If at any time during power operation it is determined by normal surveillance that the limiting value for APLHGR (Figures 1-5), LLHGR (Figure 8) or CPR (Figures 6 and 7) is being exceeded action shall be initiated to restore operation to within the prescribed limits as specified in Technical Specification Section 3.10.

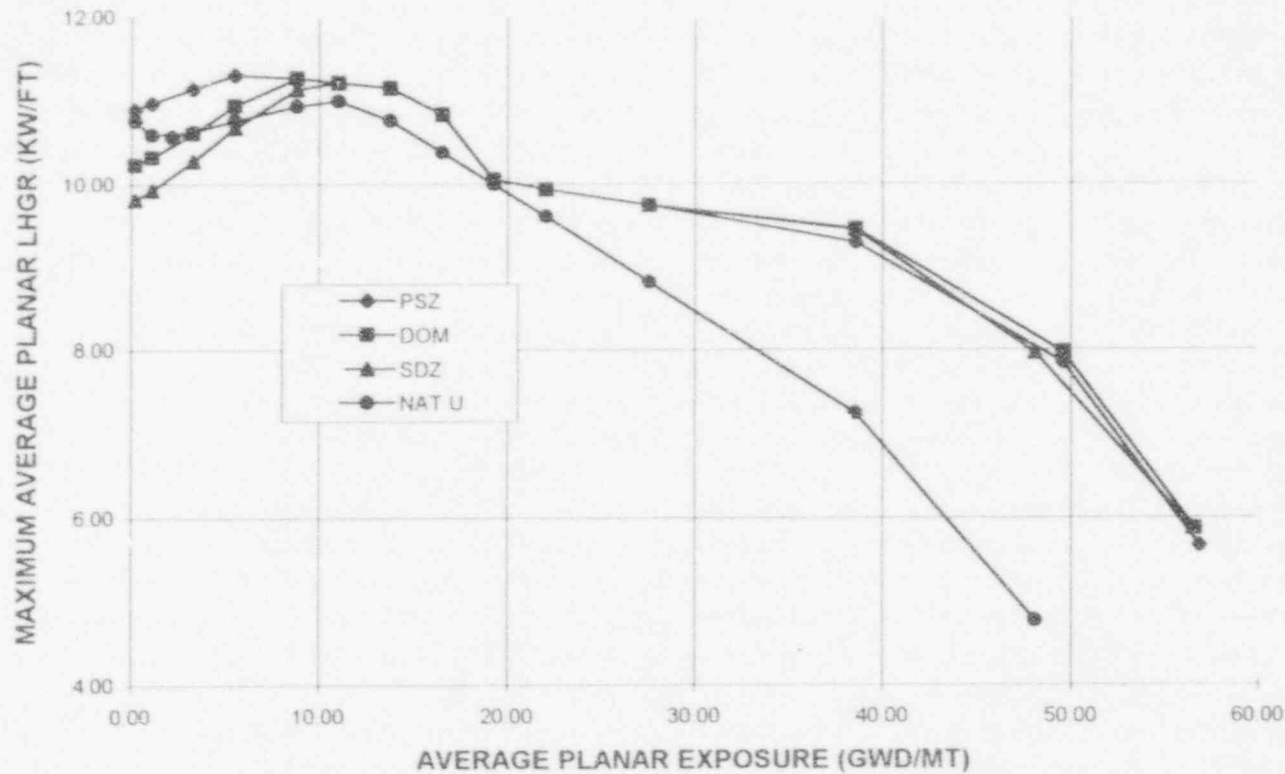
#### REFERENCES

1. Letter from J. N. Donahew, Jr. (NRC) to P. B. Fiedler (GPUN) dated November 14, 1986, "Reload Topical Report TR 020, Revision 0 (TAC 60339)."
2. Letter from A. W. Dromerick (NRC) to P. B. Fiedler (GPUN) dated September 27, 1987, GPU Nuclear Corp. (GPUN) Topical Report TR 021, Revision 0, "Methods for the Analysis of Boiling Water Reactors Steady State Physics."
3. Letter from A. W. Dromerick (NRC) to P. B. Fiedler (GPUN) dated March 21, 1988, GPU Nuclear Corp (GPUN) Topical Report TR-033, Revision 0, "Methods for the Generation of Core Kinetics Data for RETRAN-02 (TAC No. 65138)"
4. Letter from A. W. Dromerick (NRC) to P. B. Fiedler (GPUN) dated March 21, 1988, GPU Nuclear Corp (GPUN) Topical Report TR-040, Revision 0 "Steady State and Quasi-Steady State Methods for Analyzing Accidents and Transients" (TAC No. 65139).
5. Letter from A. W. Dromerick (NRC) to E. E. Fitzpatrick (GPUN) dated October 12, 1988, GPU Nuclear Corp. (GPUN) Topical Report TR-045, Revision 0 "BWR-2 Transient Analysis Model using the RETRAN Code" (TAC No. 66358).
6. NEDE-31462P; "Oyster Creek NGS SAFETY/CORECOOL/GESTR-J.OCA LOSS of coolant Accident Analysis," August 1987.
7. GPUN TR-097 Rev. 0, "Reload Information and Safety Analysis Report for Oyster Creek Cycle 15 Reload," dated December 1992.
8. Letter from A. W., Dromerick (NRC) to E. E. Fitzpatrick (GPUN), dated October 31, 1988, "Issuance of Amendment No. 129" (TAC No. 67743).
9. NEDE-24011 Revision 9, General Electric Standard Application for Reactor Fuel.
10. Letter WHO: 91-002, W.H. Hetzel (GE) to R.V. Furia (GPUN) dated January 14, 1991, "Oyster Creek Reload 12 MAPLHGR Calculation".
11. Letter WHO: 94-036, W.H. Hetzel (GE) to R.V. Furia (GPUN) dated July 29, 1994, "MAPLHGR Report for Oyster Creek Reload 14 Fuel Bundles".

FIGURE 1

# GE9B-P8DWB348-12GZ FUEL

MAXIMUM ALLOWABLE AVERAGE PLANAR  
LINEAR HEAT GENERATION RATE  
(FOUR AND FIVE LOOP OPERATION)

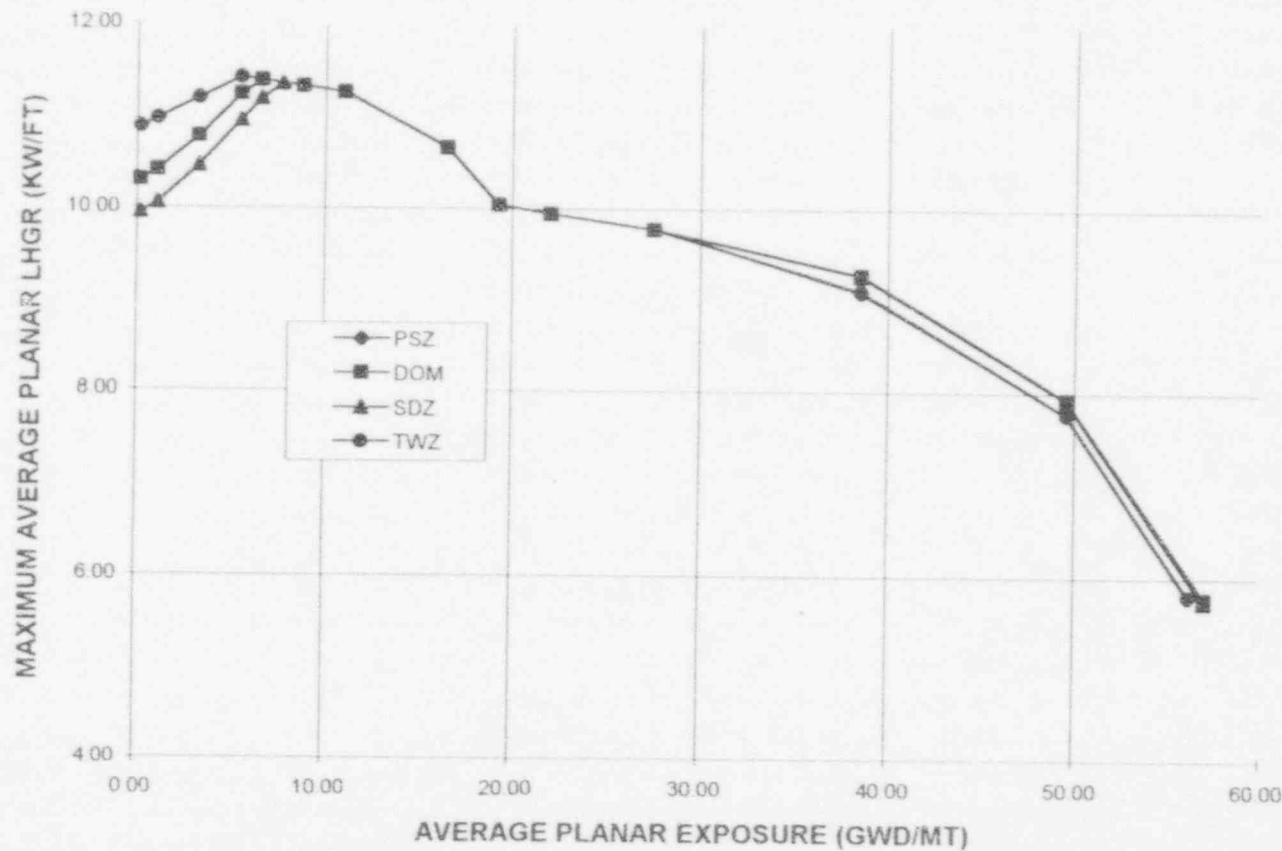


EXPOSURE (GWD/MT)	Lattice 1861 (PSZ)	Lattice 1862 (DOM)	Lattice 1863 (SDZ)	(Nat-U)
0.22	10.89	10.23	9.81	10.76
1.10	10.97	10.32	9.92	10.59
3.31	11.14	10.61	10.28	10.62
5.51	11.30	10.94	10.68	10.76
8.82	11.26	11.26	11.13	10.93
11.02	11.21	11.21	11.21	10.99
13.78	11.15	11.15	11.15	10.76
16.53	10.53	10.83	10.83	10.38
19.29	10.05	10.05	10.05	9.99
22.05	9.93	9.93	9.93	9.60
27.56	9.74	9.74	9.74	8.81
38.58	9.28	9.45	9.43	7.24
48.12				4.78
49.60	7.85	7.97	7.96	
56.49			5.88	
56.62		5.87		
56.87	5.67			

FIGURE 2

# GE9B-P8DWB338-11GZ FUEL

MAXIMUM ALLOWABLE AVERAGE PLANAR  
LINEAR HEAT GENERATION RATE  
(FOUR AND FIVE LOOP OPERATION)



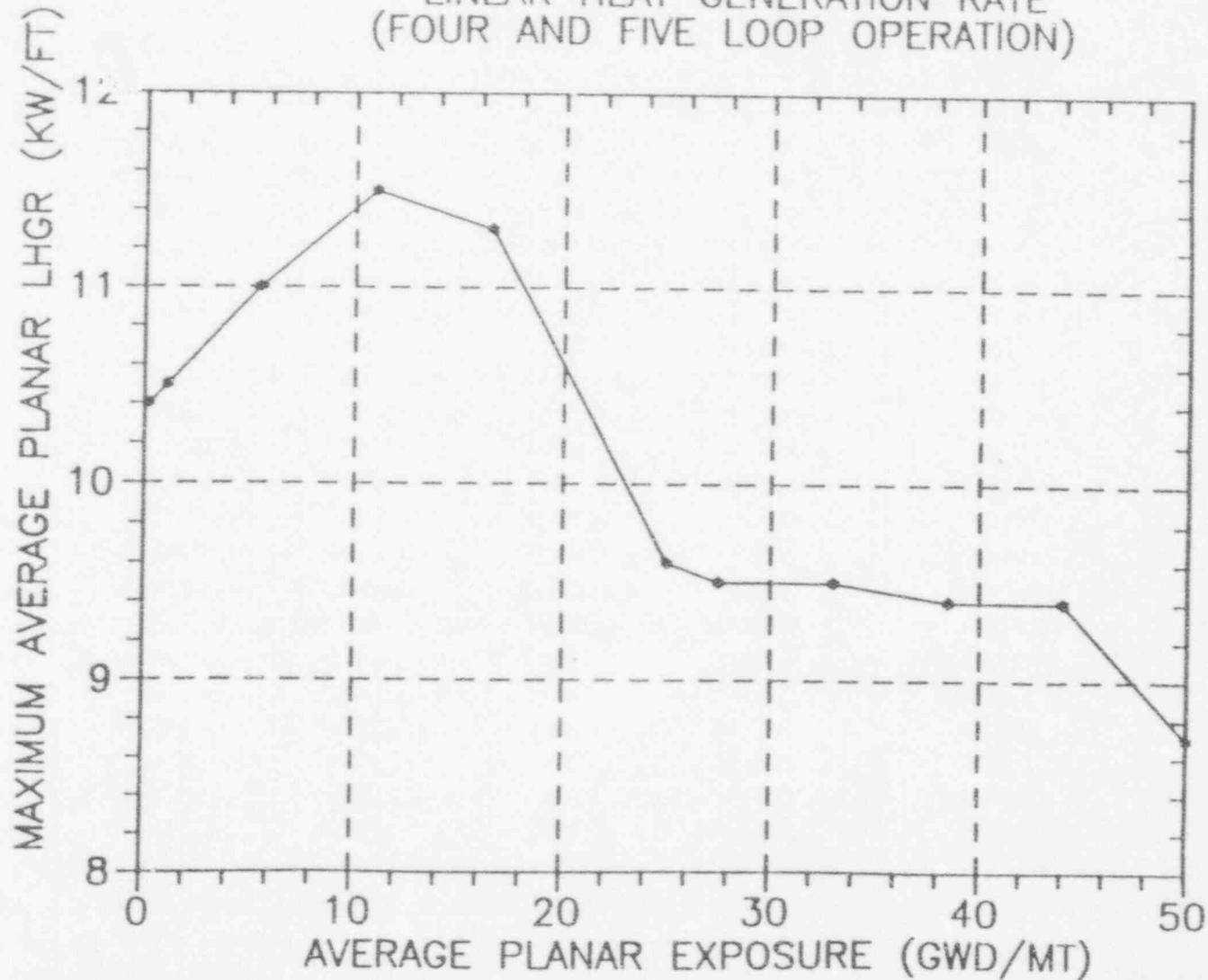
EXPOSURE	Lattice 1831	Lattice 1832	Lattice 1833	Lattice 1834
(GWD/MT)	(PSZ)	(DOM)	(SDZ)	(TWZ)
0.22	10.87	10.30	9.95	10.87
1.10	10.96	10.40	10.05	10.96
3.31	11.19	10.77	10.45	11.19
5.51	11.41	11.23	10.94	11.41
6.61	11.38	11.38	11.18	11.38
7.72			11.34	
8.82	11.31	11.31		11.31
11.02	11.25	11.25	11.25	11.25
16.53	10.65	10.65	10.65	10.65
19.29	10.04	10.04	10.04	10.04
22.05	9.94	9.94	9.94	9.94
27.56	9.77	9.77	9.77	9.77
38.58	9.08	9.27	9.26	9.09
49.60	7.77	7.93	7.92	7.77
56.17				5.80
56.20	5.79			
57.01			5.74	
57.06		5.77		

FIGURE 3

Tech Spec 3.10.A

# GE-P8DQB321 FUEL

MAXIMUM ALLOWABLE AVERAGE PLANAR  
LINEAR HEAT GENERATION RATE  
(FOUR AND FIVE LOOP OPERATION)



## DATA POINTS

EXPOSURE (GWD/MT)	MAPLHGR (KW/FT)
0.22	10.4
1.10	10.5
5.50	11.0
11.00	11.5
18.50	11.3
25.00	9.6
27.50	9.5
33.00	9.5
38.50	9.4
44.00	9.4
50.00	8.7

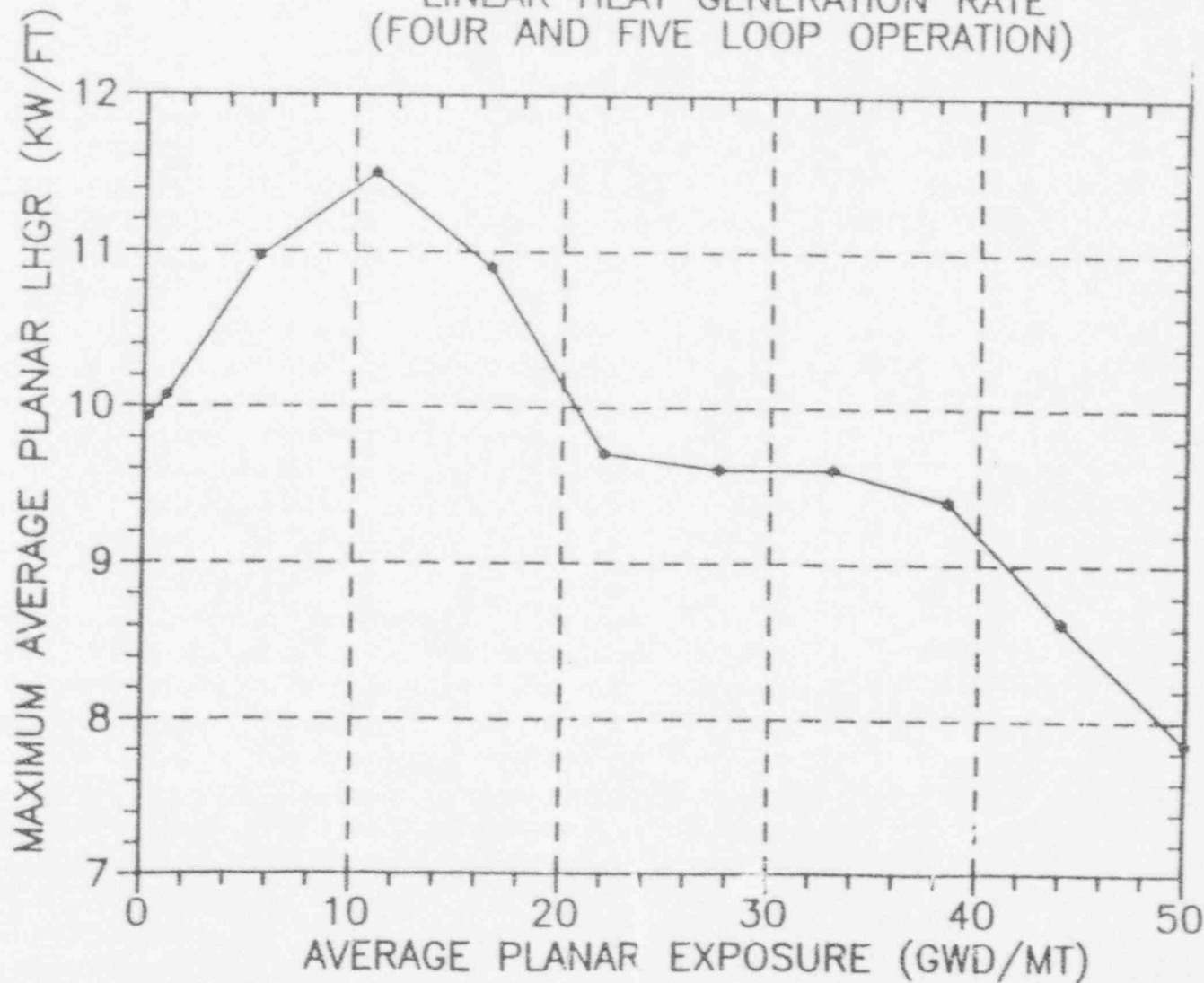


FIGURE 4

Tech Spec 3.10.A

# GE-P8DQB338-12GZ FUEL

MAXIMUM ALLOWABLE AVERAGE PLANAR  
LINEAR HEAT GENERATION RATE  
(FOUR AND FIVE LOOP OPERATION)



## DATA POINTS

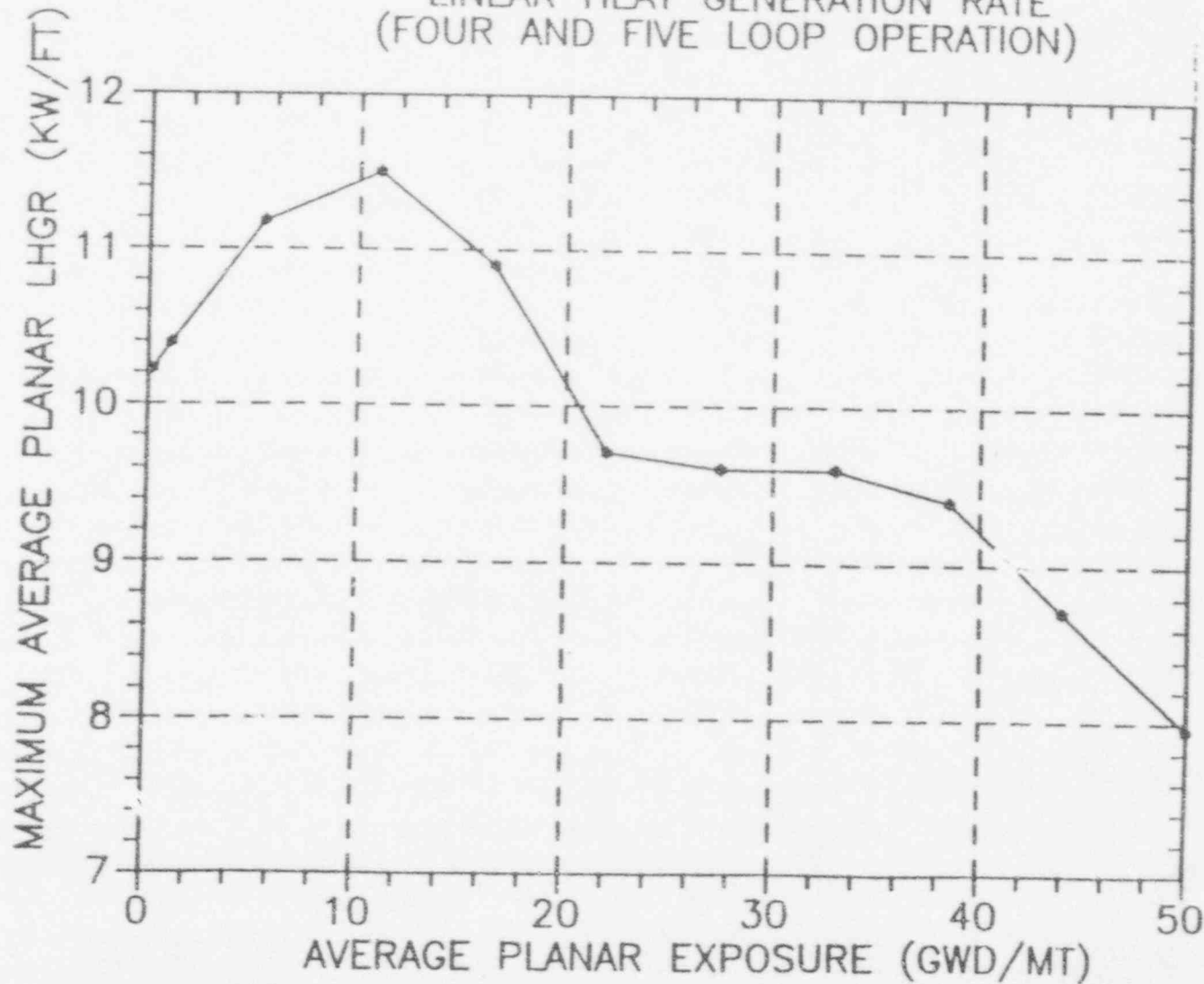
EXPOSURE (GWD/MT)	MAPLHGR (KW/FT)
0.22	9.93
1.10	10.07
5.50	10.97
11.00	11.50
16.50	10.90
22.00	9.70
27.50	9.60
33.00	9.60
38.50	9.40
44.00	8.83
50.00	7.85

FIGURE 5

Tech Spec 3.10.A

# GE-P8DQB338-11GZ FUEL

MAXIMUM ALLOWABLE AVERAGE PLANAR  
LINEAR HEAT GENERATION RATE  
(FOUR AND FIVE LOOP OPERATION)



## DATA POINTS

EXPOSURE (GWD/MT)	MAPLHGR (KW/FT)
0.22	10.22
1.10	10.39
5.50	11.18
11.00	11.50
16.50	10.90
22.00	9.70
27.50	9.60
33.00	9.60
38.50	9.40
44.00	8.70
50.00	7.95

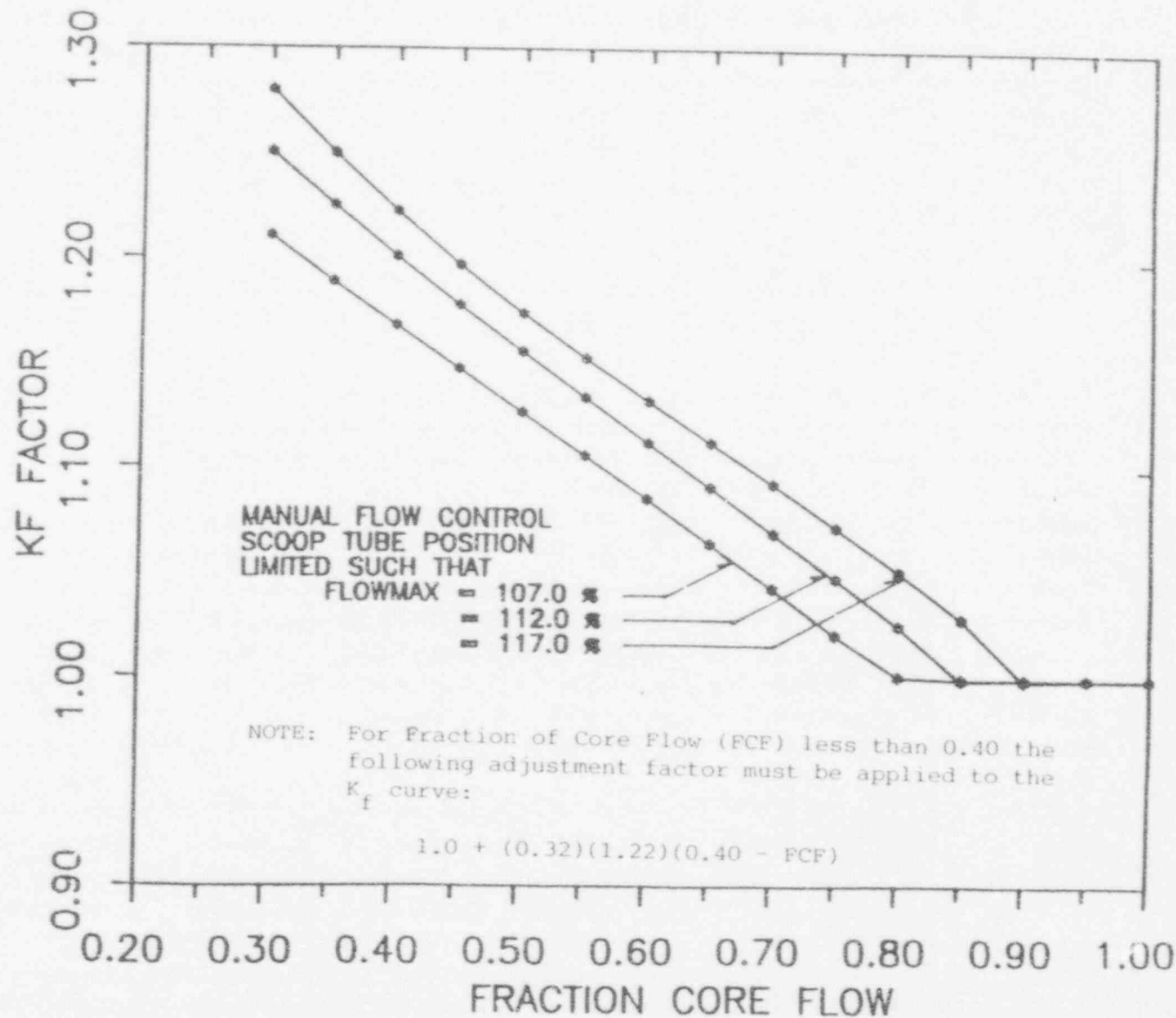
FIGURE 6

MINIMUM CRITICAL POWER RATIO (MCPR) - Tech Spec 3.10.C

APRM STATUS	MCPR Limit
1. If any two (2) LPRM assemblies which are input to the APRM system and are separated in distance by less than three (3) times the control rod pitch contain a combination of three (3) out of four (4) detectors located in either the A and B or C and D levels which are failed or bypassed (i.e., APRM channel or LPRM input bypassed or inoperable.)	1.50
2. If any LPRM input to the APRM system at the B, C, or D level is failed or bypassed or any APRM channel is inoperable (or bypassed).	1.50
3. All B, C, and D LPRM inputs to the APRM system are operating and no APRM channels are inoperable or bypassed.	1.50

FIGURE 7

Tech Spec 3.10.C

FLOW FACTOR,  $K_f$ 

## DATA POINTS

FLOW	FLOWMAX (%)		
	107	112	117
0.3	1.21	1.25	1.28
0.4	1.17	1.20	1.22
0.5	1.13	1.16	1.17
0.6	1.08	1.11	1.13
0.7	1.04	1.07	1.09
0.8	1.00	1.03	1.05
0.9	1.00	1.00	1.00
1.0	1.00	1.00	1.00

FIGURE 8

LOCAL LINEAR HEAT GENERATION RATE (LLHGR) - Tech Spec 3.10.8

FUEL TYPE	LHGR Limit
1. GE8 x 8NB GE8 x 8EB	LHGR $\leq$ 13.4 kw/ft