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Technical Specification 6.9.1.f.4

October 8, 2002
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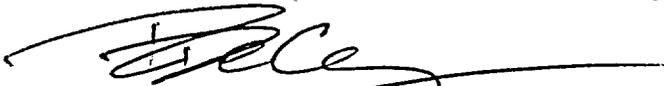
United States Nuclear Regulatory Commission
Document Control Desk
Washington DC 20555

Subject: Oyster Creek Generating Station
Docket 50-219
Core Operating Limits Report, Revision 14

Enclosed with this cover letter is the approved Oyster Creek Generating Station Core Operating Limits Report, Revision 14, for operating cycle 19. This report has been reviewed as required by the Oyster Creek Technical Specifications.

If you should require any further information, please contact Mr. John Rogers, of my staff, at 609.971.4893

Very truly yours,



Ron J. DeGregorio, Vice President
Oyster Creek Generating Station

RJD/JJR

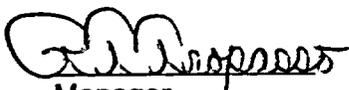
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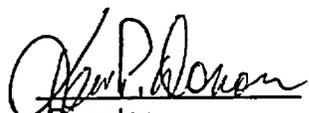
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Oyster Creek Cycle 19
Core Operating Limits Report
Topical Report - 066
Rev. 14

September 2002

Author: G. C. Storey

Approved:  9/16/02
Manager Date
Nuclear Design – BWR Branch

Approved:  9/16/2002
Director Date
Nuclear Fuel Management

TITLE Oyster Creek Core Operating Limits Report

REV	SUMMARY OF CHANGE	DATE
1	Technical Specification references were added to each Figure	
2	<p>Correction to several typographical errors were made</p> <p>References to the Figures were provided in the thermal margins discussion in the introduction.</p> <p>Dates and revision numbers of various references were provided.</p>	
3	Revise document to reflect the Cycle 13 design and safety analysis results. APLHGR limits (Figure 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- 299ZA 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 1.47 to a 1.51 based on a re-evaluation of the EOC 14 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.	
7	Revise document to reflect the cycle 16 design and safety analysis results. Removed APLHGR limit for GE-P8DQB321 fuel. Revised K_T curve and changed MCPR limit from 1.50 to 1.53	
8	Revise document to reflect the cycle 17 design and safety analysis results. Changed MCPR limit from 1.53 to 1.52.	
9	Added approval for Engineering Support Director.	
10	Revised for cycle 17 increased MCPR from 1.52 to 1.56	
11	Revised document to reflect the cycle 18 core design and safety analysis. Removed limits for GE8 fuel design. Included reference to operation with less then five loops instead of operation with four loops. MCPR limit for cycle 18 same as cycle 17	
12	Revised document to reflect the re-analyzed cycle 18 design and safety analysis results. Changed MCPR limit from 1.56 to 1.58.	
13	Revised document to reflect the re-analyzed cycle 18 design and safety analysis results. A complete re-analysis of Cycle 18 transients was performed to address operation at Increased Core Flow (ICF) conditions up to a maximum core flow rate of 67.5 Mibm/hr. This new operating condition resulted in an increase in the operating MCPR. The MCPR limit increased from 1.58 to 1.61.	
14	Revised to eliminate GPU topical references. Added new references to reflect GNF licensing methods and supporting documents. Revised GE9 MAPLHGR figures and added GE11 MAPLHGR figures. Revised MCPR limits to include mid cycle and end of cycle points (1.53 and 1.55 respectively for five or four recirc loop operation and 1.54 and 1.56 respectively for three recirc loop operation). Added GE11 LLHGR limit.	

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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 Specifications 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 COLR has been prepared in accordance with the requirements of OC Technical Specification 6.9.1.f. The Cycle 19 fuel/core operating limits were generated using the NRC-approved codes and methodologies identified in Reference 9. The information in this report is taken from references 11 through 16.

For each GE fuel design, the APLHGR limits provided in the COLR for operation with less than five recirculation loops are calculated to be the same as the five-loop limits at all exposure levels, provided a non-operating loop is not an ISOLATED RECIRCULATION LOOP. If a non-operating loop is ISOLATED (both the suction and discharge valves are in the closed position as defined in References 6 and 14), then a 0.98 MAPHLGR multiplier must be applied at all exposure levels. Only one ISOLATED non-operating loop is permitted. Requirements for operation with recirculation loops out-of-service are provided in Technical Specification 3.3.F.2.

The LLHGR limits are implemented on a fuel rod exposure dependent basis. Figure 7 shows the maximum value of the LLHGR limit. The exposure dependent LLHGR values are contained reference 13 for the GE9B fuel, and in reference 12 for the GE11 fuel.

The CPR limits in Figure 5 are differentiated based on the number of recirculation loops in service; one set of limits applies to the condition of five or four loops in service, while the other set applies to the condition of three loops in service. Cycle exposure dependent limits are provided for each condition. The limits cover operation at any point in the cycle with increased core flow up to 67.5 Mlb/hr, feedwater temperature reduction of up to 100 °F, and operation in the extended load line limit analysis (ELLLA) region. The MCPR limits are adjusted for reduced core flow using the Kf curve in Figure 6, which is taken from reference 15.

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, 2, 3 and 4), LLHGR (Figure 7) or CPR (Figure 5) 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. Deleted
2. Deleted
3. Deleted
4. Deleted
5. Deleted
6. "Oyster Creek NGS SAFER/CORECOOL/GESTR-LOCA Loss-of-Coolant Accident Analysis," NEDE-31462P August 1987
7. Deleted
8. Deleted
9. "General Electric Standard Application for Reactor Fuel," NEDE-24011-P-A-14 June 2000
10. Deleted
11. 000000055032-SRLR, "Supplemental Reload Licensing Report for Oyster Creek Reload 18 Cycle 19", Revision 0, September 2002.
12. 000000055032-FBIR, "Fuel Bundle Information Report for Oyster Creek Reload 18 Cycle 19", Revision 0, September 2002.
13. GNF-e0000-0007-5877, "Improved LHGR Limits for GE9B Fuel in Oyster Creek", September 2002.
14. GE-NE-0000-0001-7486-01P, "Oyster Creek Generating Station Loss of Coolant Accident Evaluation for GE11", July 2002.
15. NEDE-31152P, "General Electric Fuel Bundle Designs", Revision 7, June 2000.
16. SE-311004-001 Rev 1, "Rated Power Operation at Reduced Feedwater Temperature", January 1999.

FIGURE 1

GE9B-P8DWB348-12GZ-80M-145-T
 MAPLHGR LIMITS

Technical Specification 3.10.A

DATA POINTS

ALL LATTICES

Exposure	
GWD/MT	KW/FT
0.20	10.88
1.10	10.98
5.50	11.30
8.80	11.28
11.00	11.19
13.80	11.11
16.50	10.79
19.30	9.99
22.00	9.89
27.60	9.86
38.60	9.63
49.60	9.69
60.60	9.59
71.70	9.61

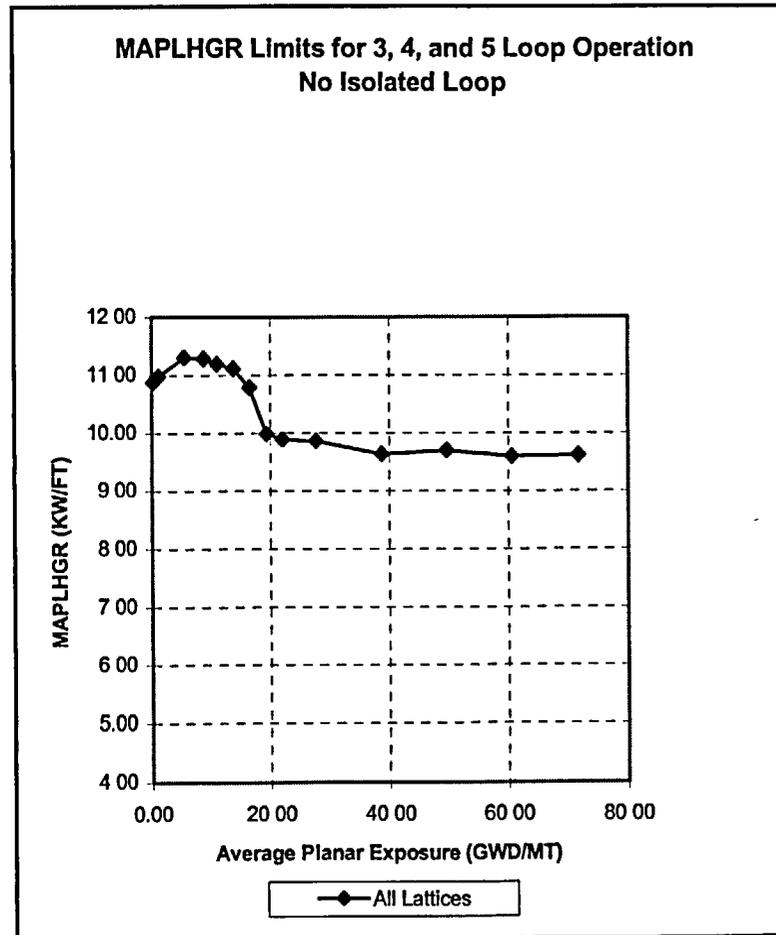


FIGURE 2

GE9B-P8DWB338-11GZ-80M-145-T
 MAPLHGR LIMITS

Technical Specification 3.10.A

DATA POINTS

ALL LATTICES

Exposure	
GWD/MT	KW/FT
0.20	10.93
1.10	11.03
5.50	11.37
8.80	11.29
11.00	11.11
13.80	11.11
16.50	10.68
19.30	9.96
22.00	9.86
27.60	9.83
38.60	9.63
49.60	9.68
60.60	9.60
71.70	9.67

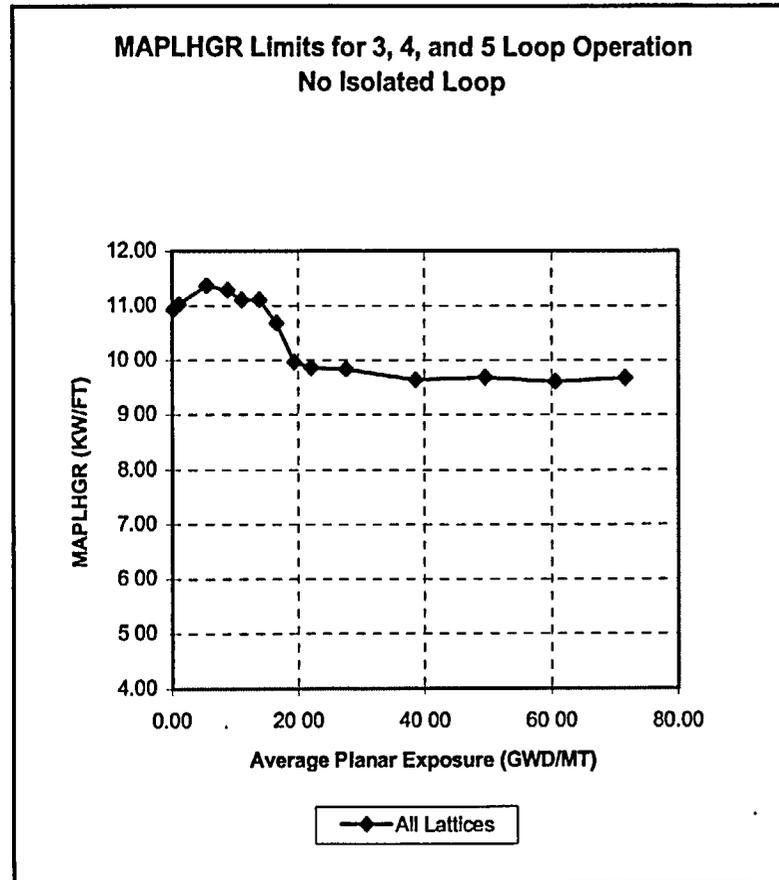


FIGURE 3

GE11B-P9HUB374-13GZ-100T-145-T6-2559
 MAPLHGR LIMITS

Technical Specification 3.10.A

DATA POINTS

ALL LATTICES

Exposure	
GWD/MT	KW/FT
0.20	9.78
1.10	9.73
5.50	9.62
11.00	9.52
16.50	9.45
22.00	9.22
27.60	8.43
38.60	8.16
49.60	8.19
60.60	8.02
71.70	7.54

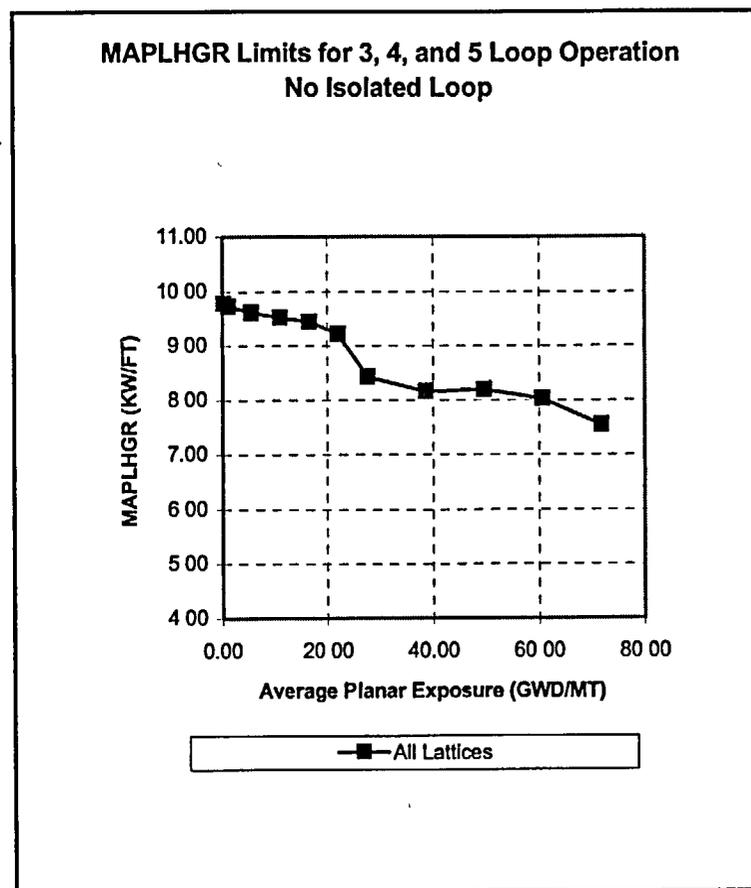


FIGURE 4

GE11B-P9HUB369-12GZ-100T-145-T6-2560
 MAPLHGR LIMITS

Technical Specification 3.10.A

DATA POINTS

ALL LATTICES

Exposure	
GWD/MT	KW/FT
0.20	10.10
1.10	10.04
5.50	9.88
11.00	9.72
16.50	9.64
22.00	9.25
27.60	8.56
38.60	8.25
49.60	8.35
60.60	7.98
71.70	7.51

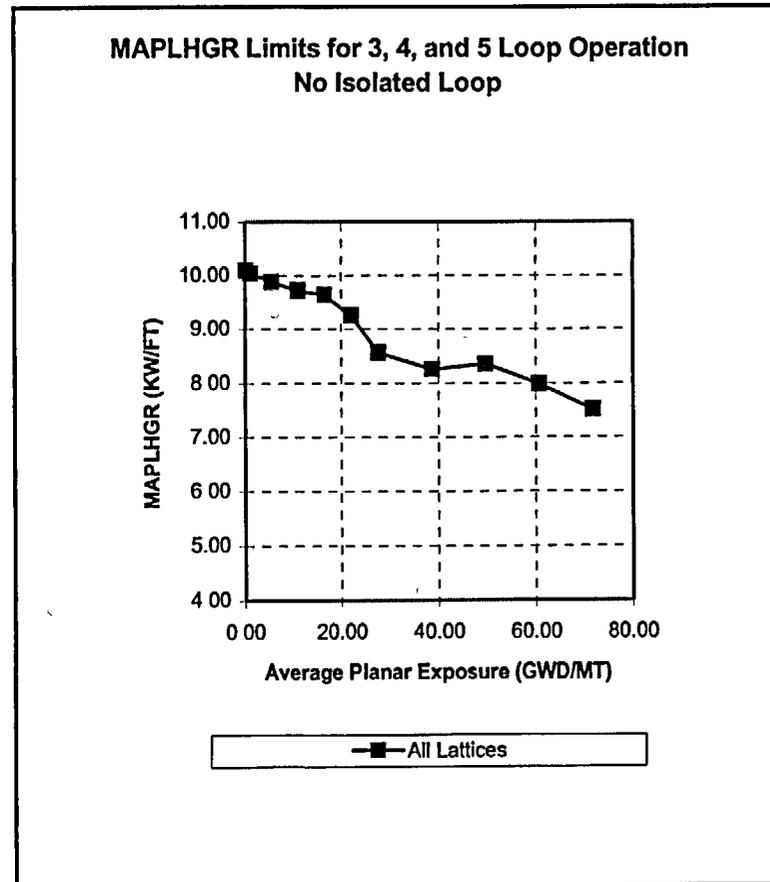


FIGURE 5**MINIMUM CRITICAL POWER RATIO (MCPR) - Tech Spec 3.10.C****MCPR Limits for Five or Four Recirculation Loops in Service**

APRM STATUS	BOC to EOR-2000 MWD/ST ⁽¹⁾	EOR-2000 MWD/ST to EEOC ⁽²⁾
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)	1.53	1.55
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).	1.53	1.55
3. All B, C, and D LPRM inputs to the APRM system are operating and no APRM channels are inoperable or bypassed.	1.53	1.55

MCPR Limits for Three Recirculation Loops in Service

APRM STATUS	BOC to EOR-2000 MWD/ST ⁽¹⁾	EOR-2000 MWD/ST to EEOC ⁽²⁾
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)	1.54	1.56
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).	1.54	1.56
3. All B, C, and D LPRM inputs to the APRM system are operating and no APRM channels are inoperable or bypassed.	1.54	1.56

Notes:

- (1) Limit applies in the cycle exposure range from beginning of cycle (BOC) until 2000 MWD/ST prior to end of rated (EOR). EOR is defined as the cycle exposure point where all rods out at rated power and flow with all feedwater heaters in service.
- (2) Limit applies in the cycle exposure range from 2000 MWD/ST prior to EOR to extended end of cycle (EEOC). EEOC includes all cycle extension options used beyond EOR (increased core flow, feedwater temperature reduction, and coastdown).

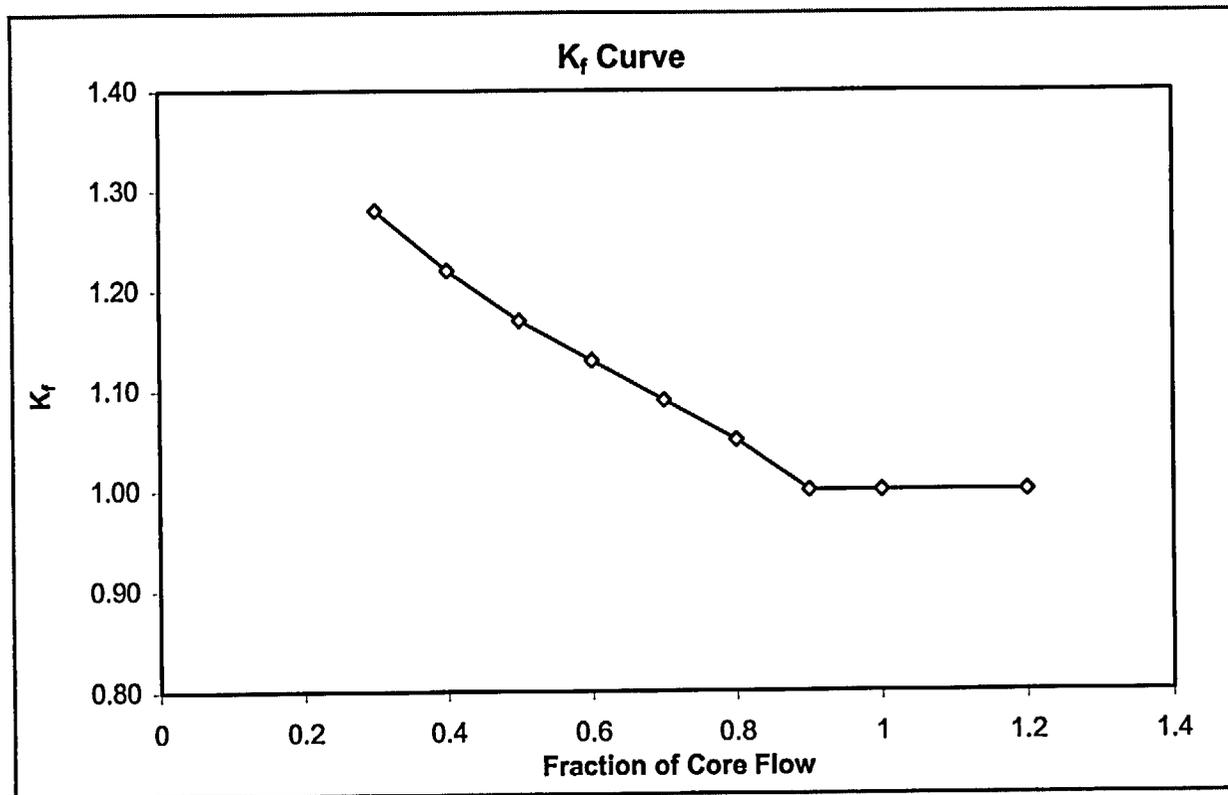
FIGURE 6

Technical Specification 3.10.C

DATA POINTS

FLOW	K_f
0.3	1.28
0.4	1.22
0.5	1.17
0.6	1.13
0.7	1.09
0.8	1.05
0.9	1.00
1	1.00
1.2	1.00

Flowmax =117%



NOTE: For Fraction of Core Flow (FCF) less than 0.40 the following adjustment factor must be applied to the curve: $1.0 + (0.32)(1.22)(0.40-FCF)$

FIGURE 7**LOCAL LINEAR HEAT GENERATION RATE (LLHGR) - Tech Spec 3.10.B**

<u>FUEL TYPE</u>	<u>LLHGR Limit</u>
GE8x8NB	≤ 13.4 kw/ft
GE11	≤ 11.0 kw/ft