Dresden Administrative Technical Requirements

Section 5

Core Operating Limits Report

Dresden Station

Unit 3

Cycle 16

February 1999

ISSUANCE OF CHANGES SUMMARY

Affected Section	Affected Pages	Summary of Changes	Date
All	All	Original Issue Cycle 16	2/99

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REFERENCES

1. Commonwealth Edison Company Docket No. 50-249, Dresden Nuclear Power Station, Unit 2, Facility Operating License DPR-25.

2. Letter, 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. EMF-98-007(P), Dresden LOCA-ECCS Analysis MAPLHGR Limits for ATRIUM-9B and 9x9-2 Fuel, January 1998, NFS NDIT No. 9800072.

4. EMF-2123, Dresden Unit 3 Cycle 16 Plant Transient Analysis, December 1998, NDIT NFM9800261 Seq 0.

5. EMF-2122, Dresden Unit 3 Cycle 16 Reload Analysis, December 1998, NDIT NFM9800260 Seq 0.

6. Dresden Unit 3 Cycle 16 Neutronics Licensing Report (NLR), NDIT NFM9800264 Seq0.

7. SPC document, Dresden Units 2 and 3 Generic Coastdown Analysis with ATRIUM-9B, EMF-92-149 (P) and EMF-92-149(P) Supplement 1, Revision 1 September 1996 NFS NDIT No. 960137.

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1.1 Technical Specification Reference

3.3.M - Rod Block Monitor (RBM)

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Table 4.2.E-1 – Control Rod Block Instrumentation Surveillance Requirements

1.2 Description

The Rod Block Monitor Upscale Instrumentation Setpoints are determined from the relationships shown in Table 1.2-1.

TABLE 1.2-1

CONTROL ROD WITHDRAWAL BLOCK INSTRUMENTATION SETPOINTS

TRIP FUNCTION:	TRIP LEVEL SETTING:
Rod Block Monitor Upscale (Flow Bias)	
Dual Loop Operation	Less than or equal to (0.65 W_d plus 55)*
Single Loop Operation	Less than or equal to (0.65 W_d plus 51)*

*W_d - percent of drive flow required to produce a rated core flow of 98 Mlb/hr.

2.0 AVERAGE PLANAR LINEAR HEAT GENERATION RATE

2.1 Technical Specification References

3.11.A - AVERAGE PLANAR LINEAR HEAT GENERATION RATE

2.2 Description

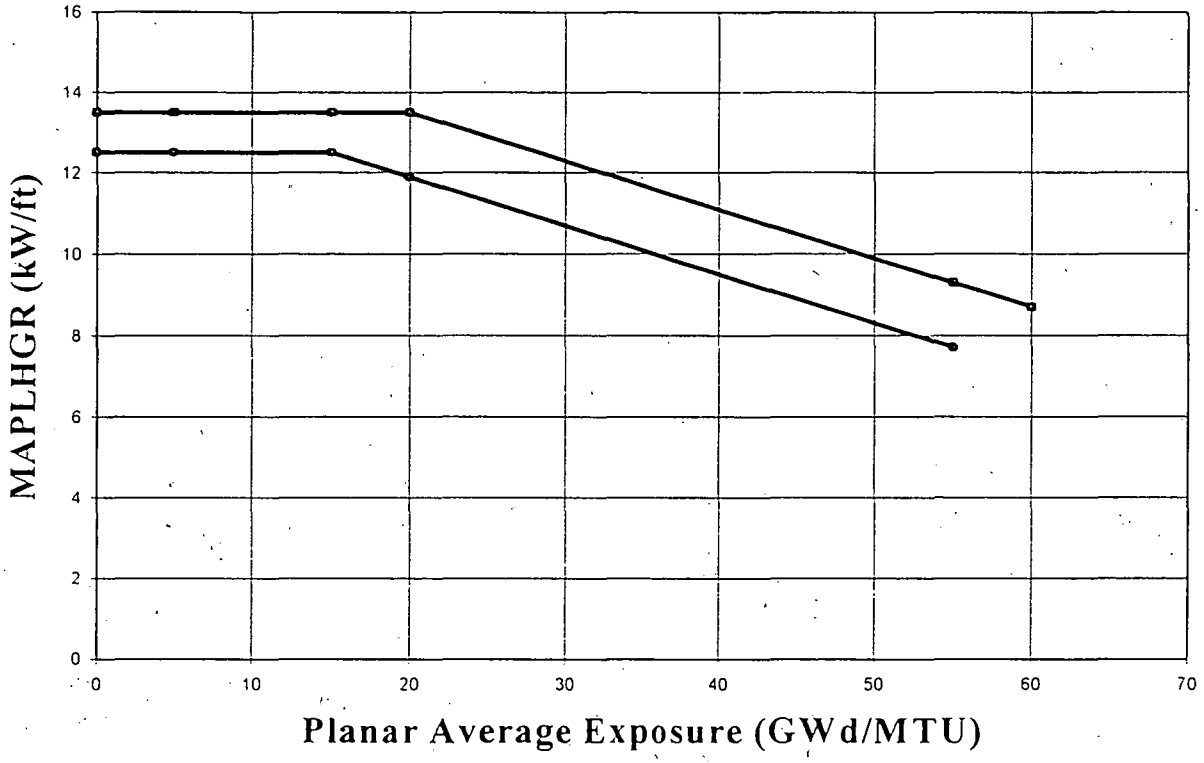
The Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) limit versus Planar Average Exposure for each fuel type is determined from Figure 2.2-1.

2.3 MAPLHGR Multipliers

The appropriate multiplicative factor, during power operation with equipment out of service, to apply to the base MAPLHGR limits specified in Section 2.2 is shown in Table 2.3-1.

FIGURE 2.2-1

MAPLHGR LIMIT VS PLANAR AVERAGE EXPOSURE



Planar Average Exposure (GWd/MTU)	MAPLHGR Limit 9x9-2 (kW/ft)
0	12.5
5	12.5
15	12.5
20	11.9
55	7.7

Planar Average Exposure (GWd/MTU)	MAPLHGR Limit ATRIUM-9B (offset and non-offset) (kW/ft)
0	13.5
5	13.5
15	13.5
20	13.5
55	9.3
60	8.7

TABLE 2.3-1

EQUIPMENT OUT OF SERVICE MAPLHGR LIMIT MULTIPLIERS

Technical Specification	Title of Technical Specification	Scenario	Multiplicative Factors, 9x9-2	Multiplicative Factors, ATRIUM-9B (offset and non-offset)
3.11.A & 3.6.A Action "1.d"	Average Planar LHGR Recirculation Loops	Single Loop Operation (SLO)	0.90	0.90

3.0 STEADY STATE LHGR

3.1 Technical Specification Reference

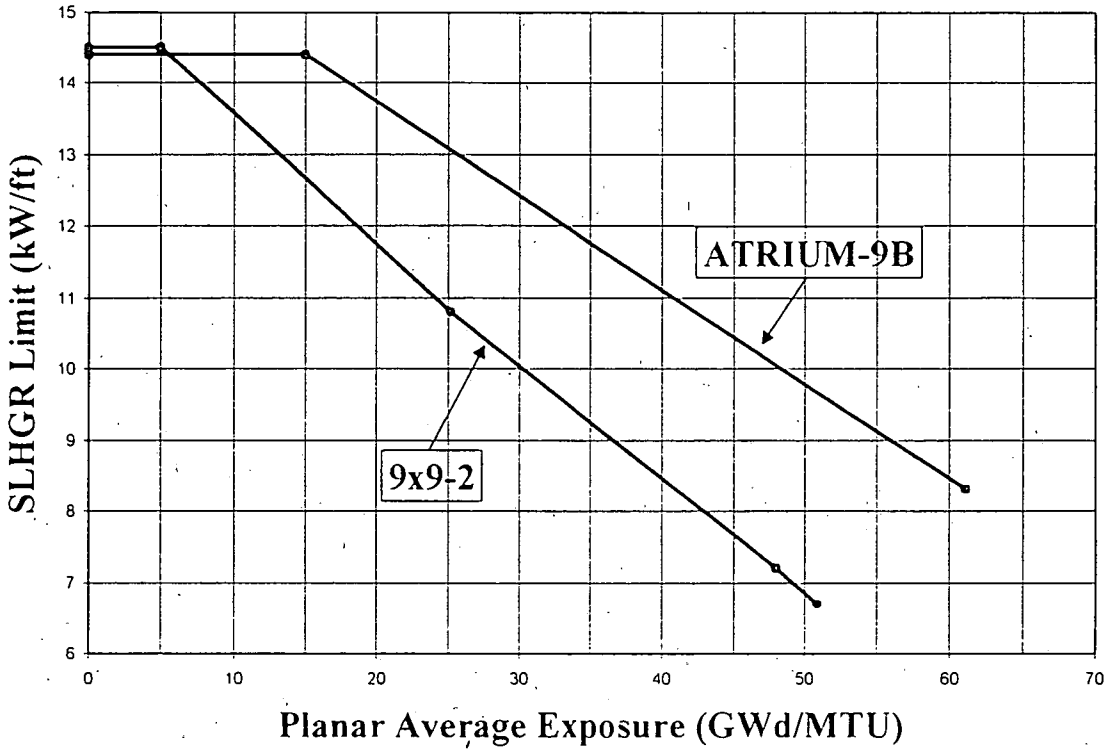
3.11.D - STEADY STATE LINEAR HEAT GENERATION RATE

3.2 Description

The Steady State LHGR (SLHGR) limit versus Planar Average Exposure for each fuel type is determined from Figure 3.2-1.

FIGURE 3.2-1

STEADY STATE LHGR (SLHGR) LIMIT VS. PLANAR AVERAGE EXPOSURE



Planar Average Exposure (GWd/MTU)	SLHGR Limit 9x9-2 (kW/ft)
0	14.5
5.0	14.5
25.2	10.8
48.0	7.2
50.9	6.7

Planar Average Exposure (GWd/MTU)	ATRIUM-9B (offset and non-offset) (kW/ft)
0	14.4
15.0	14.4
61.1	8.32

4.0 TRANSIENT LHGR

4.1 Technical Specification Reference

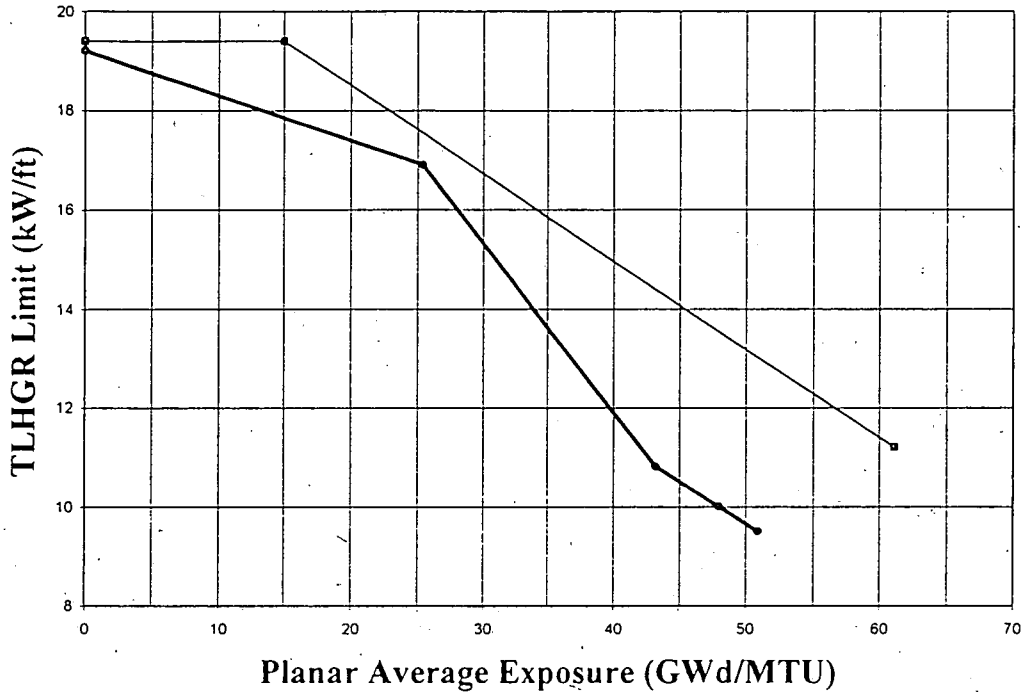
3.11.B - TRANSIENT LINEAR HEAT GENERATION RATE

4.2 Description

The Transient LHGR (TLHGR) limit versus Planar Average Exposure for each fuel type is determined from Figure 4.2-1.

FIGURE 4.2-1

TRANSIENT LHGR (TLHGR) LIMIT VS. PLANAR AVERAGE EXPOSURE



Planar Average Exposure (GWd/MTU)	TLHGR Limit 9x9-2 (kW/ft)
0	19.2
25.4	16.9
43.2	10.8
48.0	10.0
50.9	9.5

Planar Average Exposure (GWd/MTU)	TLHGR Limit ATRIUM-9B (offset and non-offset) (kWft)
0	19.4
15.0	19.4
61.1	11.2

5.0 MINIMUM CRITICAL POWER RATIO

5.1 Technical Specification References

3.11.C - MINIMUM CRITICAL POWER RATIO

5.2 Description

a. The Operating Limit MCPRs for D3C16 are listed in Table 5.2-1 for 9x9-2 and ATRIUM-9B. The OLMCPRs calculated for D3C16 are based on Technical Specification Scram Insertion Speeds (Technical Specification 3.3.E). When necessary the Operating Limit MCPR from Table 5.2-1 is supplemented by Figure 5.2-2 as appropriate.

b. During Manual Flow Control, the Operating Limit MCPR for each fuel type at reduced core flow conditions can be determined from (i) or (ii), whichever is greater:

   i. Figure 5.2-1 using the appropriate flow rate, or

   ii. The Operating Limit MCPR determined from Table 5.2-1 as appropriate and supplemented by Figure 5.2-2 as appropriate.

c. Automatic Flow Control is not supported for D3C16

d. If the turbine bypass valves opening time is degraded, MCPR Operating Limit penalties are provided in Figure 5.2-2 for ranges of bypass valve delay times.

TABLE 5.2-1

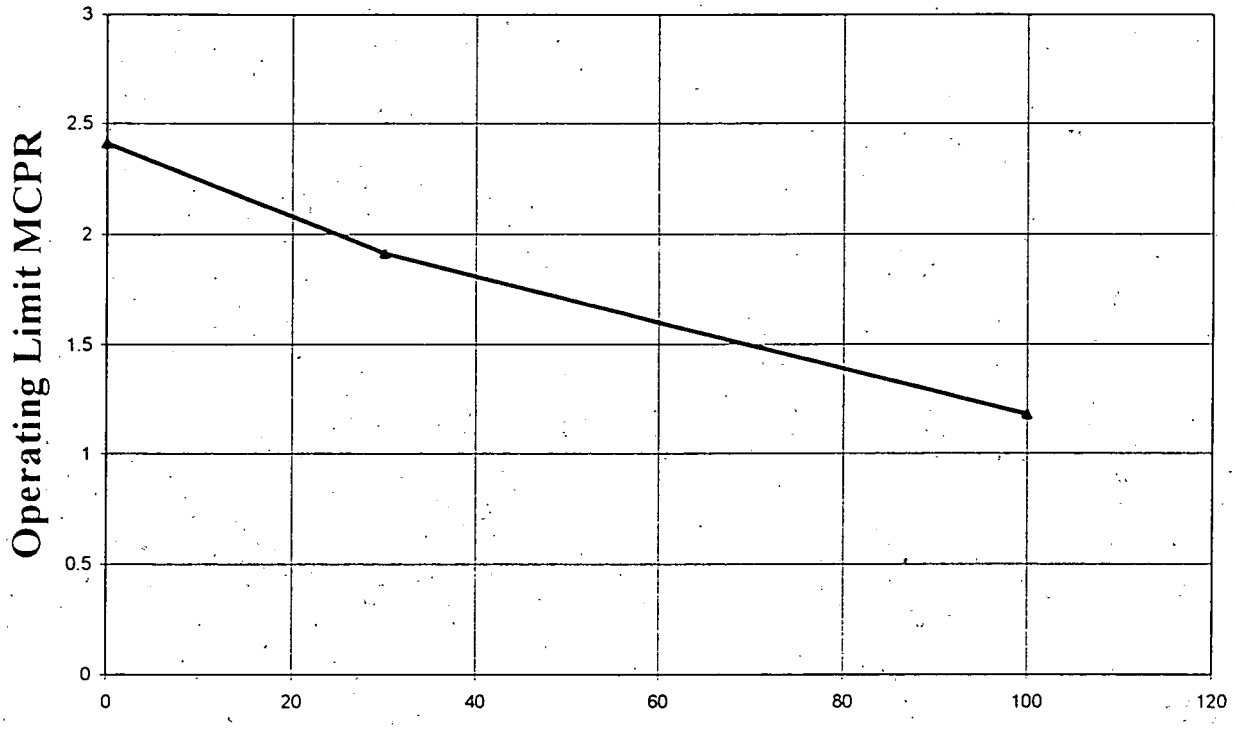
OPERATING LIMIT MCPR

Operating Scenario	9x9-2 Fuel Operating Limit MCPR	ATRIUM-9B[1] Operating Limit MCPR
Normal Operation[2]	1.45	1.43
Single Loop Operation	1.46	1.44
Coastdown[3]	1.49	1.47
Coastdown and SLO Operation	1.50	1.48

[1] Results presented are for both the offset and non-offset design
[2] Normal Operation results include operation with Feedwater Heaters Out of Service.
[3] The 0.04 MCPR penalty adder during coastdown operation includes the effects of feedwater heaters out of service

FIGURE 5.2-1

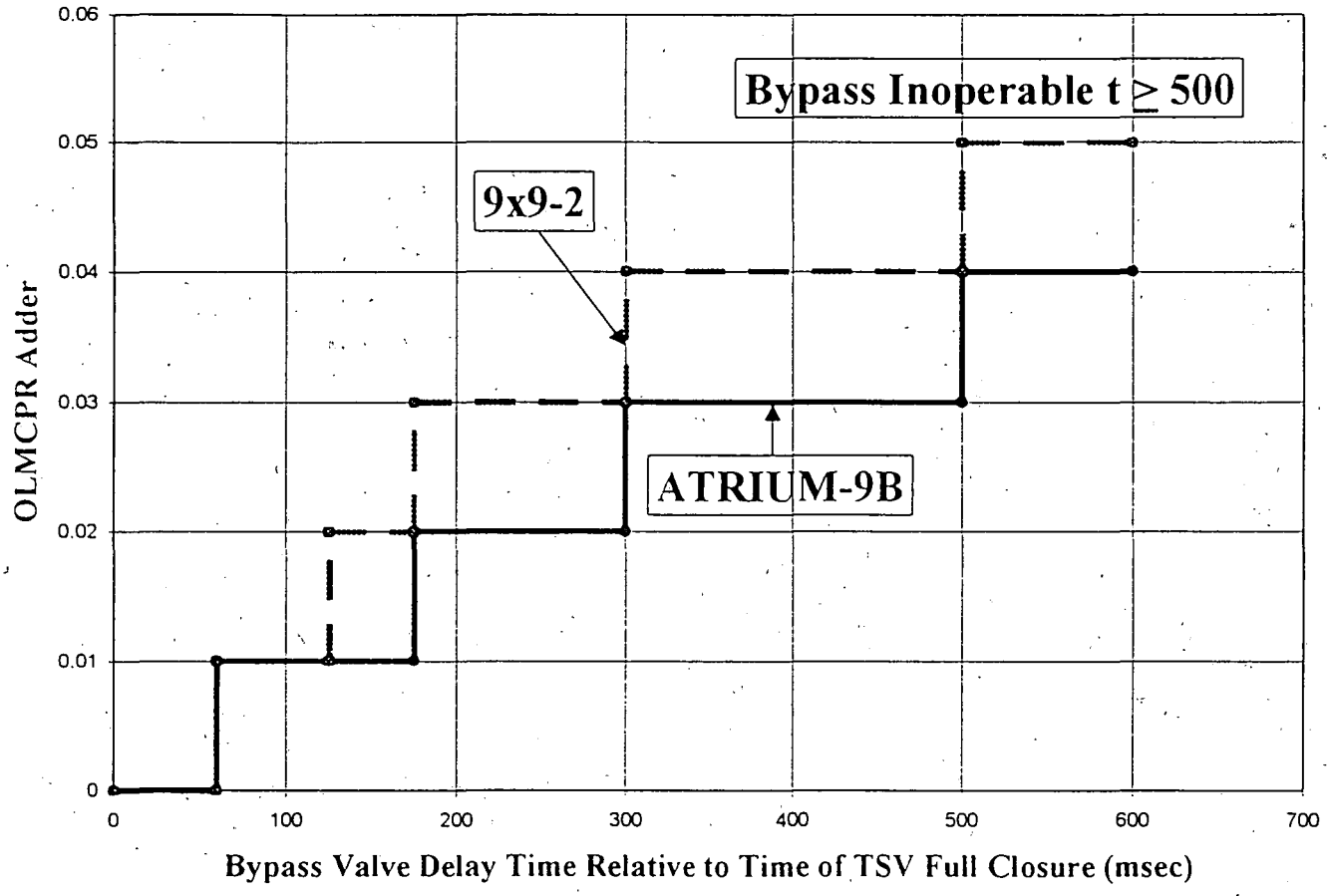
OPERATING LIMIT MCPR FOR MANUAL FLOW CONTROL



Total Core Flow (% Rated)	Operating Limit MCPR for ATRIUM-9B (offset and non-offset) and 9x9-2 Fuel
100	1.18
30	1.91
0	2.41

FIGURE 5.2-2

BYPASS VALVE DEGRADATION OLMCPR ADDERS



Bypass Valve Delay Time (msec)	9x9-2 OLMCPR Adder (ΔCPR)	ATRIUM-9B (offset and non-offset) OLMCPR Adder (ΔCPR)
$0 \leq t \leq 60$	0	0
$60 < t \leq 125$	0.01	0.01
$125 < t \leq 175$	0.02	0.01
$175 < t \leq 300$	0.03	0.02
$300 < t \leq 500$	0.04	0.03
$t > 500$	0.05	0.04

6.0 METHODOLOGY

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. These Methodologies are listed in Technical Specification 6.9.A.6.b.