MONTICELLO NUCLEAR GENERATING PLANT

Core Operating Limits Report

for Cycle 17

Revision 0

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This report provides the values of the limits for Cycle 17 as required by Technical Specification Section 6.7.A.7. These values have been established using NRC approved methodology and are established such that all applicable limits of the plant safety analysis are met.

Rod Block Monitor Operability Requirements

The MCPR limit associated with the Rod Block Monitor operability is:

if thermal power < 90% of rated and MCPR < 1.70 or
if thermal power ≥ 90% of rated and MCPR < 1.55.

Reference Technical Specification Section 3.2.C.2.a

Rod Block Monitor Upscale Trip Setpoints

Low Trip Setpoint (LTSP)	≤	120/125 of full scale
Intermediate Trip Setpoint (ITSP)	≤	115/125 of full scale
High Trip Setpoint (HTSP)	≤	110/125 of full scale

Reference Technical Specification Sections: Table 3.2.3 Item 4.a, Table 3.2.3 Note 8.

Minimum Critical Power Ratio

The Minimum Critical Power Ratio (MCPR) limit shall be determined as follows:

If thermal power > 45%, then the MCPR is the greater of:

1.35 * K_P (K_P from Figure 3) or $MCPR_F$ from Figure 4.

If thermal power ≤ 45%, then the MCPR limit is obtained from Figure 3.

Reference Technical Specification Section: 3.11.C.

Power-Flow Operating Map

The Power-Flow Operating Map based on analysis to support Cycle 17 is shown in Figure 5.

Approved Analytical Methods

NEDE-24011-P-A Rev 11	"General Electric Standard Application for Reactor Fuel"
NSPNAD-8608-A Rev 2	"Reload Safety Evaluation Methods for Application to the Monticello Nuclear Generating Plant"
NSPNAD-8609-A Rev 1	"Qualification of Reactor Physics Methods for Application to Monticello"
ANF-91-048 (P) (A) Rev 0	"Advanced Nuclear Fuels Corporation Methodology for Boiling Water Reactors-EXEM BWR Evaluation Model," Siemens Power Corporation

Maximum Average Linear Heat Generation Rate as a function of exposure

When hand calculations are required, the Maximum Average Linear Heat Generation Rate (MAPLHGR) for each fuel bundle design as a function of average planer exposure shall not exceed the limiting lattice (excluding natural Uranium) provided in Table 1 (based on straight line interpolation between data points) multiplied by the smaller of the two MAPFAC factors determined from Figures 1 and 2.

The MAPLHGR limits in Table 1 are conservative values bounding all fuel lattice types (excluding natural Uranium) in a given fuel bundle design and are intended only for use in hand calculations as described in Technical Specification 3.11.A. No channel bow effects are included in the bounding MAPLHGR values below because there are no reused channels. MAPLHGR limits for each individual fuel lattice design in a bundle design as a function of axial location and average planar exposure, with appropriate channel bow adjustments (no channel bow effects for Cycle 17), are determined based on the approved methodology referenced in Monticello Technical Specification 6.7.A.7.b and loaded in the process computer for use in core monitoring calculations.

The SPC 9x9-IX Qualification Fuel Assemblies (QFAs) will be monitored to the GE10 DXB333-10GZ MAPLHGR and LHGR limits to protect the steady state LHGR limit of the QFAs. When hand calculations are required, the DXB333-10GZ MAPLHGR and LHGR limits can be used to calculate the appropriate limits for the QFAs.

Reference Technical Specification Section 3.11.A.

Table 1

MAPLHGR for each fuel type (kW/ft)							
Exposure MWD/STU	Fuel						
	NBD 312A	NBD 313A	HXB324-10GZ	HXB324-11GZ	HXB324-10GZ1	DXB333-10GZ	DXB324-11GZ
200	11.1	11.3	10.92	10.36	11.19	11.64	10.71
1000	11.2	11.2	11.05	10.47	11.42	11.70	10.82
5000	12.0	12.0	12.01	11.55	12.20	12.30	11.78
10000	13.0	13.0	13.17	12.95	12.65	12.88	13.17
15000	12.9	12.8	12.95	12.97	12.47	12.65	12.88
20000	12.3	12.2	12.21	12.22	11.81	11.97	12.25
25000	11.6	11.5	11.52	11.52	11.21	11.31	11.60
30000	10.9	10.8	10.90	10.90	10.67	10.67	10.95
35000	10.2	10.2	10.29	10.28	10.14	10.02	10.30
40000	9.5	9.5	9.63	9.61	9.55	9.21	9.61
45000	8.8	8.9	8.98	8.94	8.97	8.40	8.92
50000	6.3	6.3	6.50	6.45	6.49	5.93	6.43

Note: For two recirculation loop operation. For single loop operation, multiply these values by 0.85.

Linear Heat Generation Rate

Table 2

LHGR for Each Fuel Type (kW/ft)						
NBD 312A	NBD 313A	HXB324-10GZ	HXB324-11GZ	HXB324-10GZ1	DXB333-10GZ	DXB324-11GZ
14.4	14.4	14.4	14.4	14.4	14.4	14.4

Reference Technical Specification Section: 3.11.B.

Figure 1

Monticello Cycle 17
Power Dependent MAPLHGR Limits

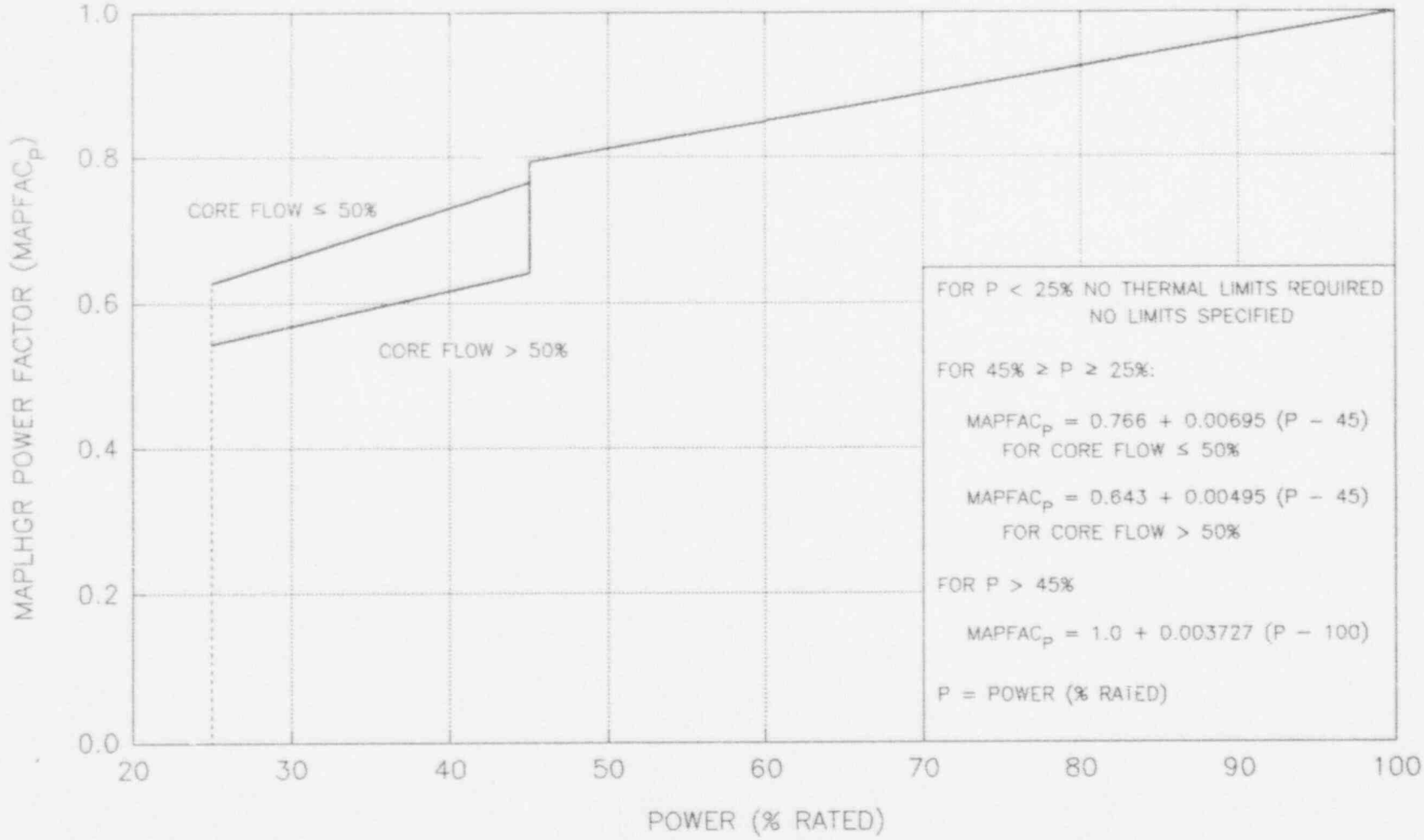

Figure 2

Monticello Cycle 17
Flow Dependent MAPLHGR Limits

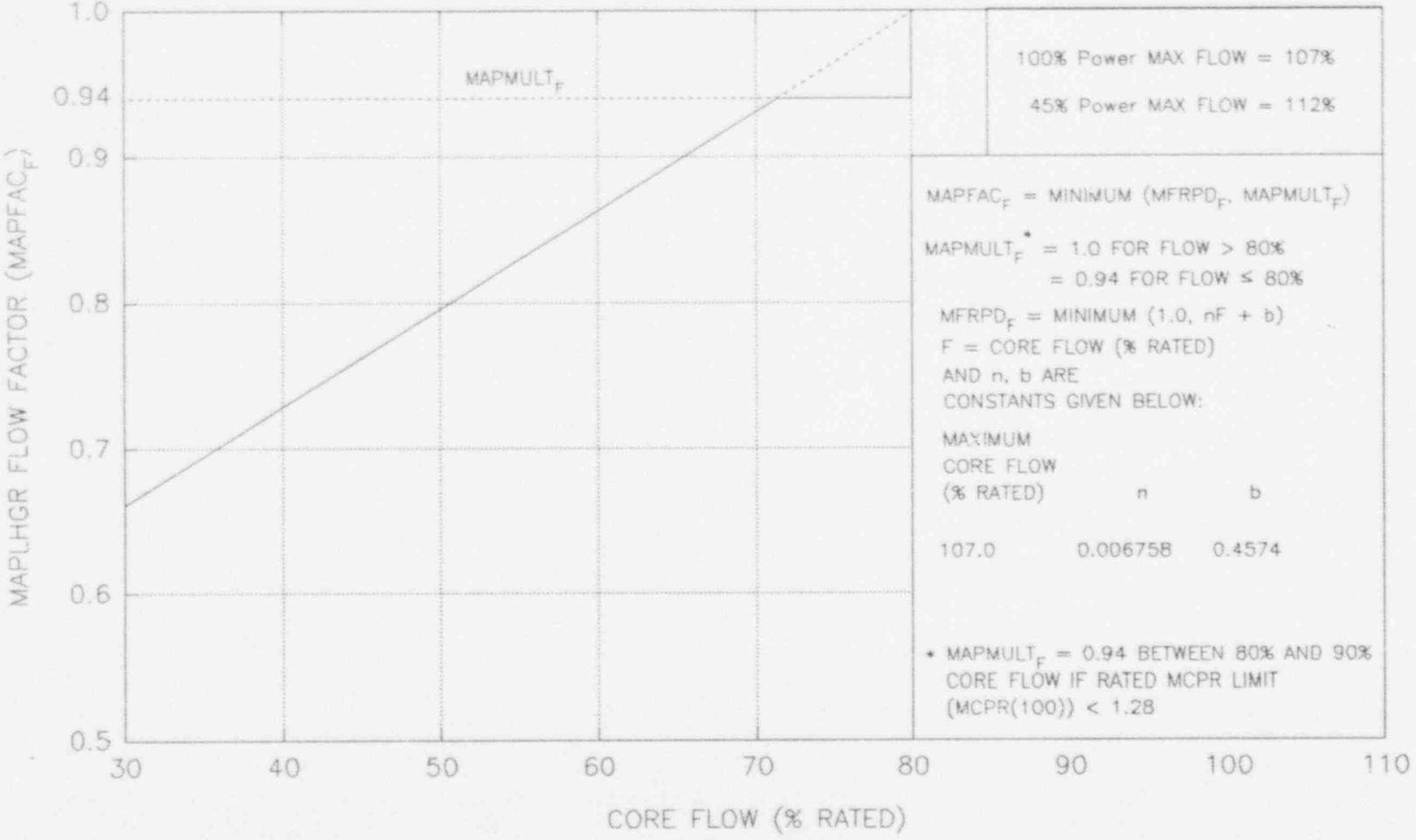

Figure 3

Monticello Cycle 17
Power Dependent MCPR Limits

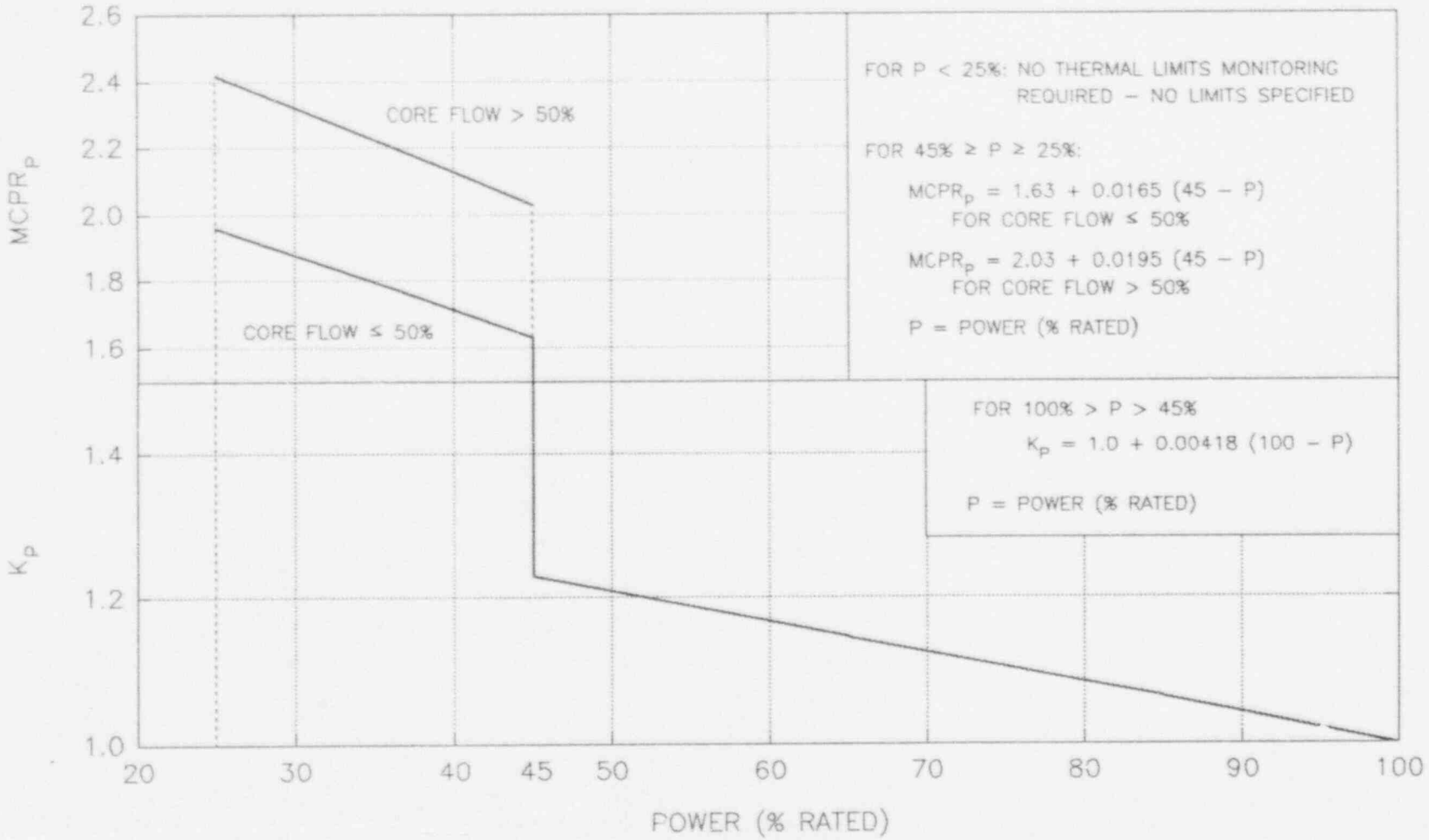

Figure 4

Monticello Cycle 17
Flow Dependent $MCPR_F$ Limits

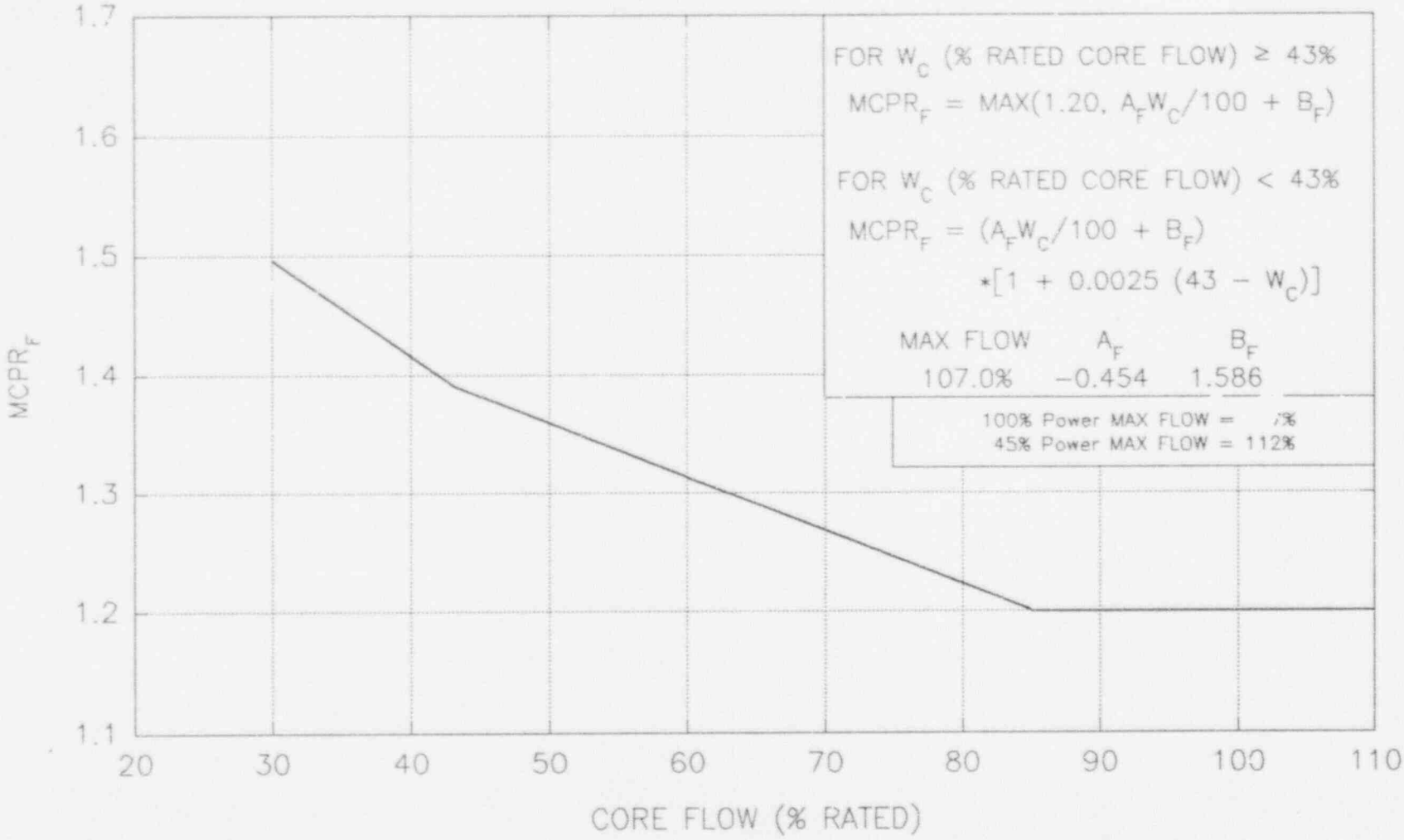

Figure 5
Monticello Nuclear Generating Plant
Power–Flow Operating Map for Cycle 17