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CLASS I
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POOR ORIGINAL

SUPPLEMENTAL RELOAD LICENSING SUBMITTAL FOR MONTICELLO NUCLEAR GENERATING PLANT RELOAD 7

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GENERAL ELECTRIC

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SUPPLEMENTAL RELOAD LICENSING SUBMITTAL
FOR
MONTICELLO NUCLEAR GENERATING PLANT
RELOAD 7

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1470 116

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SAN JOSE, CALIFORNIA 95125

GENERAL ELECTRIC

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CONTENTS OF THIS REPORT
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1. PLANT-UNIQUE ITEMS (1.0)*

Plant parameter changes	-	see Appendix A
GETAB initial conditions	-	see Appendix A
Loading Error LHGR	-	see Appendix A

2. RELOAD FUEL BUNDLES (1.0, 2.0, 3.3.1 AND 4.0)

	Fuel Type	Number	Number Drilled
Irradiated	8DB262	192	None
Irradiated	8DB250	28	None
Irradiated	8DB219L	52	None
Irradiated	8DRB265L	52	52
Irradiated	8DRB282	60	60
New	P8DRB282	56	56
New	P8DRB265L	44	44
Total		484	212

3. REFERENCE CORE LOADING PATTERN (3.3.1)

Nominal previous cycle core exposure: 15.65 GWd/t. Nominal core average exposure at end of cycle 17.29 GWd/t including coastdown. Core loading pattern: Figure 1.

4. CALCULATED CORE EFFECTIVE MULTIPLICATION AND CONTROL SYSTEM WORTH - NO VOIDS, 20°C (3.3.2.1.1 AND 3.3.2.1.2)

BOC k_{eff}	
Uncontrolled	1.114
Fully Controlled	0.955
Strongest Control Rod Out	0.988
R, Maximum Increase in Cold Core Reactivity with Exposure Into Cycle, Δk	0.000

*( ) refers to areas of discussion in Generic Reload Fuel Application," NEDE-24011-P-A-1, August 1979.

1470 118

5. STANDBY LIQUID CONTROL SYSTEM SHUTDOWN CAPABILITY (3.3.2.1.3)

ppm	Shutdown (Margin (Δk) (20°C, Xenon Free)
900	0.092

6. RELOAD-UNIQUE TRANSIENT ANALYSIS INPUTS (3.3.2.1.5 AND 5.2)

	EOC 8
Void Coefficient N/A* (¢/% Rg)	-6.98/-8.73
Void Fraction (%)	37.37
Doppler Coefficient N/A (¢/°F)	-0.228/-0.216
Average Fuel Temperature (°F)	1157
Scram Worth N/A ($)	-38.0/-30.4
Scram Reactivity versus Time	Figure 2

7. RELOAD-UNIQUE GETAB TRANSIENT ANALYSIS INITIAL CONDITION PARAMETERS (5.2)

		EOC 8	
Exposure	8x8	8x8R	P8x8R
Peaking factor (local, radial, axial)	1.22, 1.53, 1.40	1.20, 1.66, 1.40	1.20, 1.63, 1.40
R-Factor	1.098	1.051	1.051
Bundle Power (MWt)	5.157	5.595	5.499
Bundle Flow (10^3 lb/hr)	105.1	102.7	102.7
Initial MCPR	1.41	1.41	1.44

8. SELECTED MARGIN IMPROVEMENT OPTIONS (5.2.2)

None

*N = Nuclear Input Data
A = Used in Transient Analysis

1470 119

9. CORE-WIDE TRANSIENT ANALYSIS RESULTS (5.2.1)

Transient	Exposure	Power (%)	Core Flow (%)	ϕ (% NBR)	Q/A (% NBR)	P_{SL} (psig)	P_v (psig)	ΔCPR 8x8/8x8R/P8x8R	Plant Response
Turbine Trip without Bypass	EOC 8	100	100	411.9	119.7	1177	1215	0.34/0.34/0.37	Figure 3
Loss of 100°F Feedwater Heater	--	100	100	117.7	117.0	1022	1067	0.16/0.16/0.17	Figure 4
Feedwater Controller Failure	EOC 8	100	100	301.4	118.8	1154	1195	0.30/0.30/0.32	Figure 5

10. LOCAL ROD WITHDRAWAL ERROR (WITH LIMITING INSTRUMENT FAILURE) TRANSIENT SUMMARY (5.2.1)

Rod Block Reading	Rod Position (Feet Withdrawn)	ΔCPR 8x8/8x8R and P8x8R	LHGR 8x8/8x8R and P8x8R	Limiting Rod Pattern
104	3.5	0.09/0.20	11.8/13.7	
105	3.5	0.09/0.20	11.8/13.7	Figure 6
106	4.0	0.11/0.21	11.9/14.4	
107	4.5	0.12/0.23	11.9/14.6	
108*	6.0	0.18/0.27	12.4/15.4	
109	7.0	0.20/0.29	12.7/15.8	

11. OPERATING MCPR LIMIT (5.2, Appendix C)

8x8	8x8R	P8x8R
1.42	1.46	1.46

12. OVERPRESSURIZATION ANALYSIS SUMMARY (5.3)

Transient	Power (%)	Core Flow (%)	P_{sl} (psig)	P_v (psig)	Plant Response
MSIV Closure (Flux Scram)	100	100	1235	1254	Figure 7

*Indicates setpoint selected.

1470 120

13. STABILITY ANALYSIS RESULTS (5.4)

Decay Ratio: Figure 8

Reactor Core Stability:

Decay Ratio, x_2/x_o (Natural Circulation-100% Rod Line)	0.550

Channel Hydrodynamic Performance

	Decay Ratio (Natural Circulation-100% Rod Line)
8x8 Channel	0.10
8x8R Channel	0.06
P8x8R Channel	0.06

14. LOSS-OF-COOLANT ACCIDENT RESULTS (5.5.2)

Fuel types 8DRB265L and 8DRB282 were introduced in Reload-6. The Reload-6 MAPLHGR, PCT and Local Oxidation Fraction are applicable to P8DRB265L and P8DRB282, respectively, for Reload-7.

15. LOADING ERROR RESULTS (5.5.4)

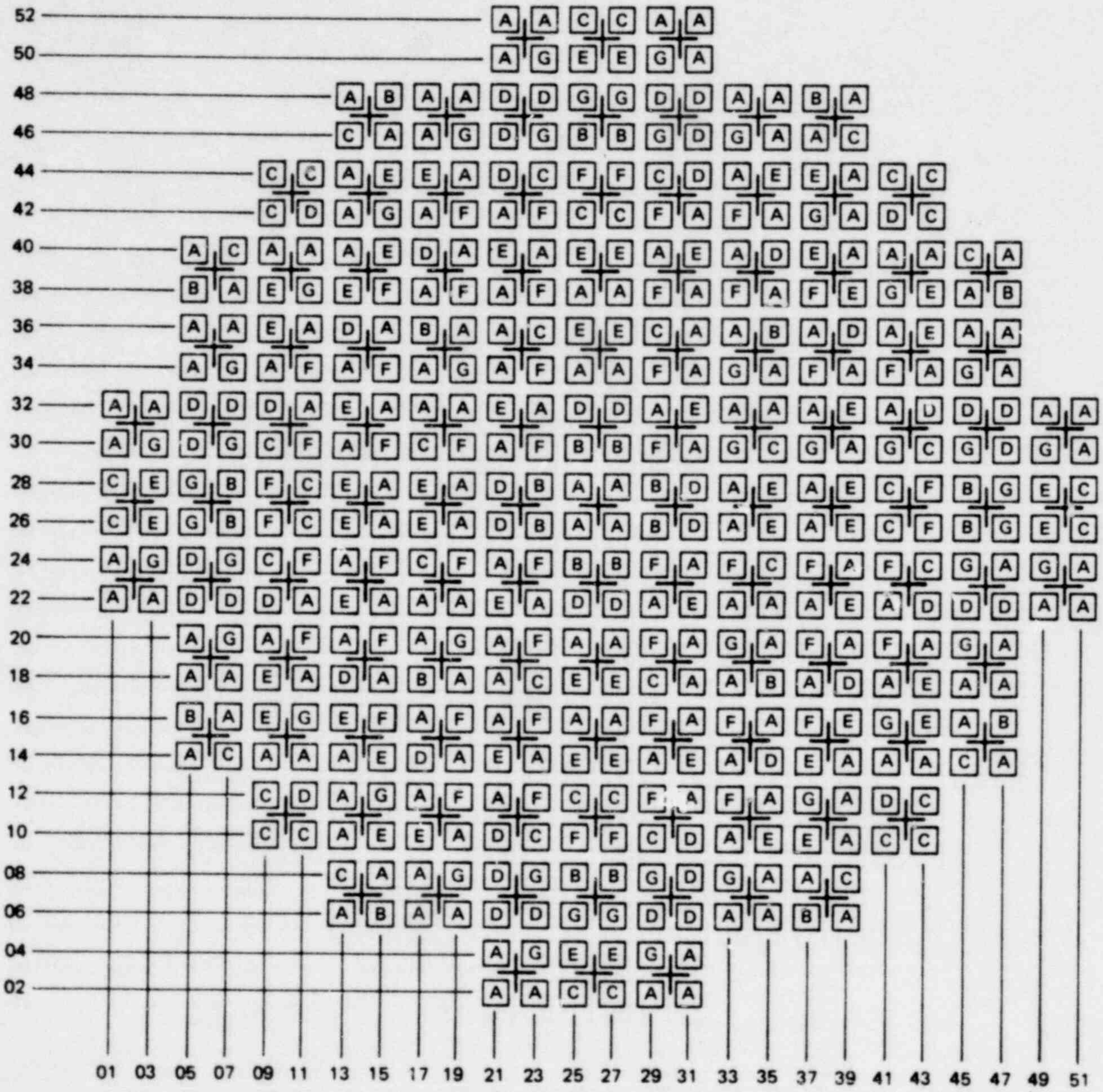
Limiting event: Mislocated Bundle

	MCPR
8x8R Monitored 8x8 Mislocated	1.07

16. CONTROL ROD DROP ANALYSIS RESULTS (5.5.1)

Maximum incremental control rod worth: 0.97% Δk

1470 121



FUEL TYPE	
A = 8DB262	E = 8DRB282
B = 8DB250	F = P8DRB282
C = 8DB219L	G = P8DRB265L
D = 8DRB265L	

Figure 1. Reference Core Loading Pattern

1470 122

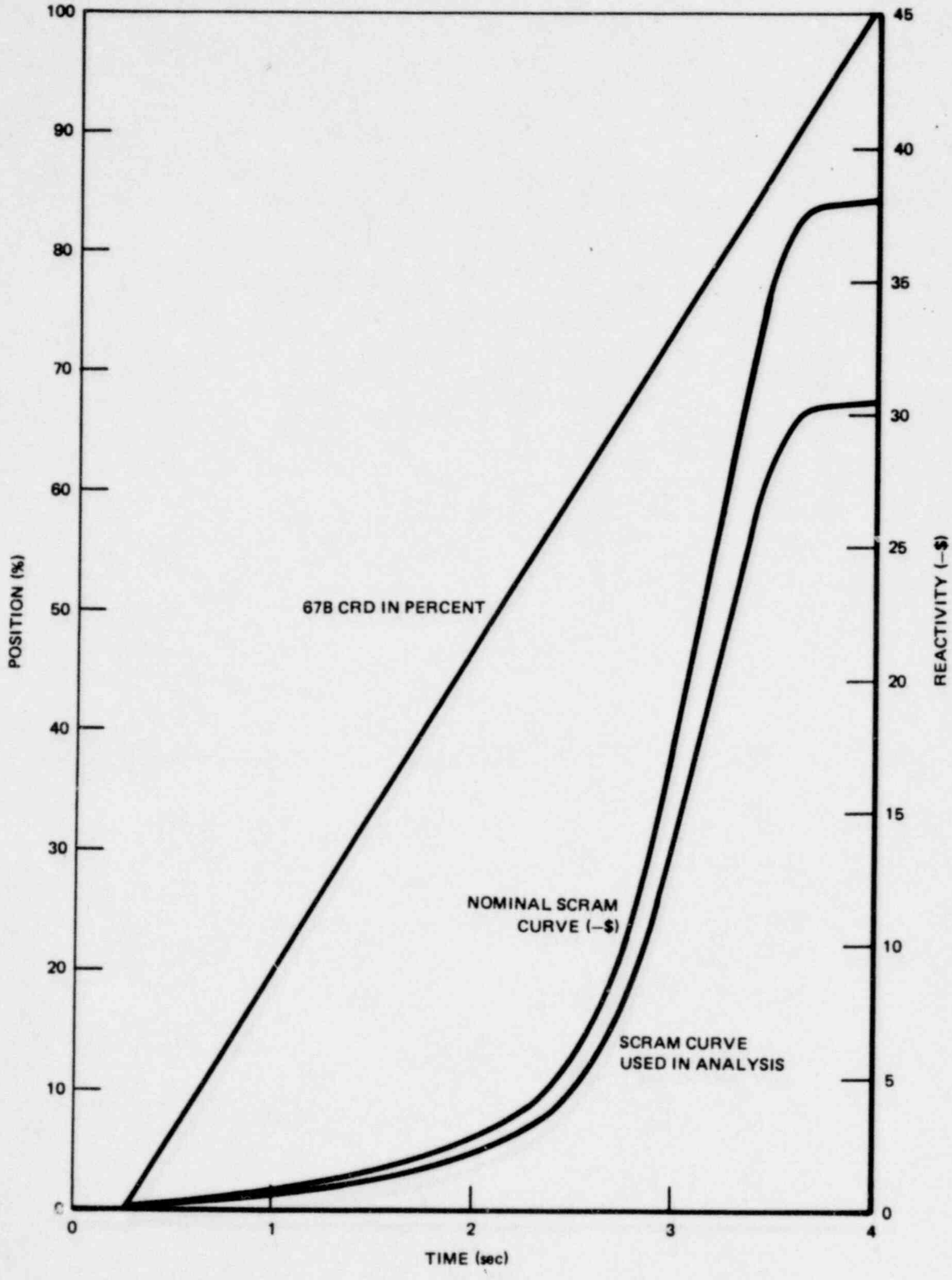


Figure 2. Scram Reactivity and Control Rod Drive Specifications

1470 123

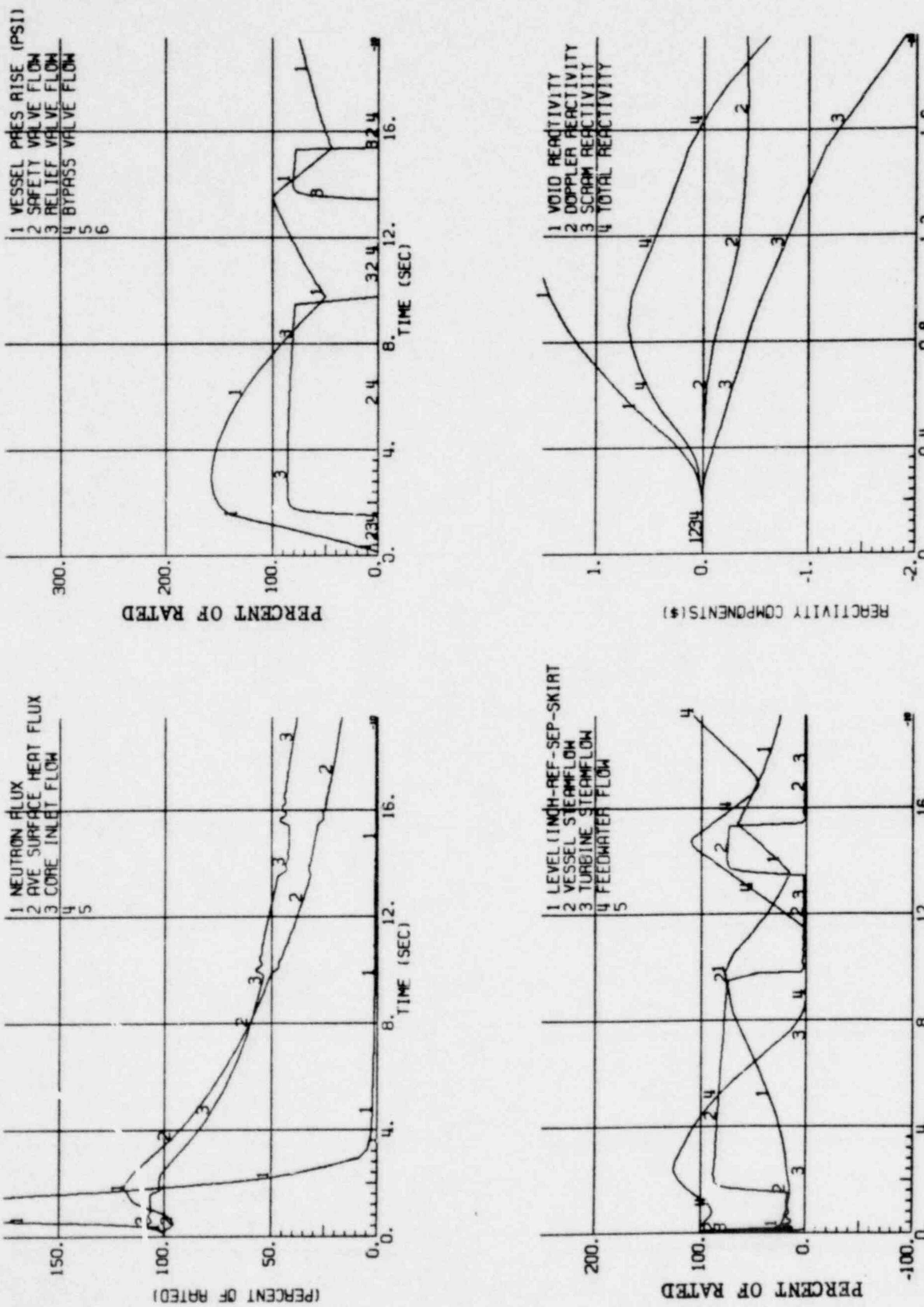


Figure 3. Plant Response to Turbine Trip Without Bypass

1470 124

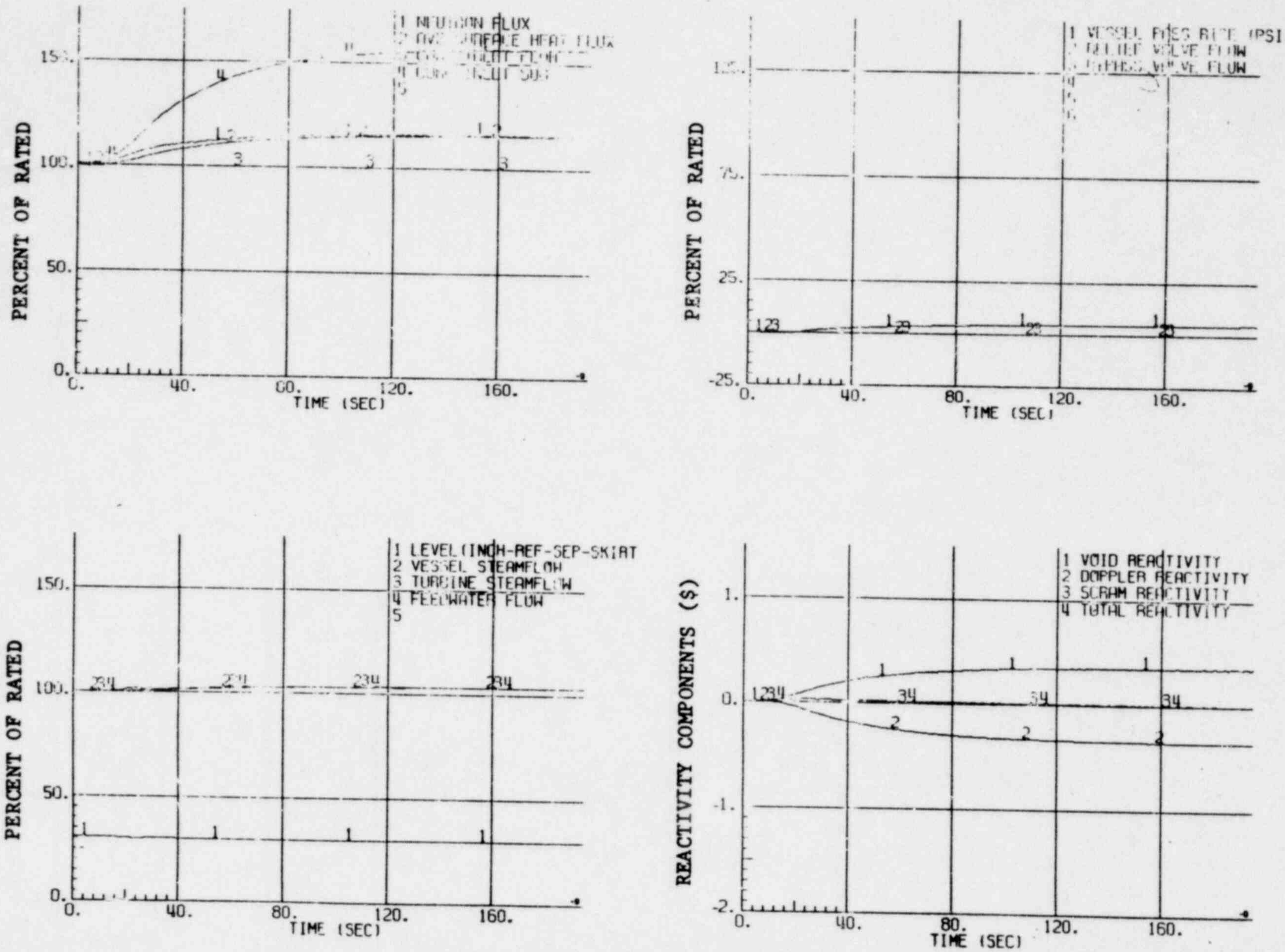


Figure 4. Plant Response to Loss of 100°F Feedwater Heating

1470 125

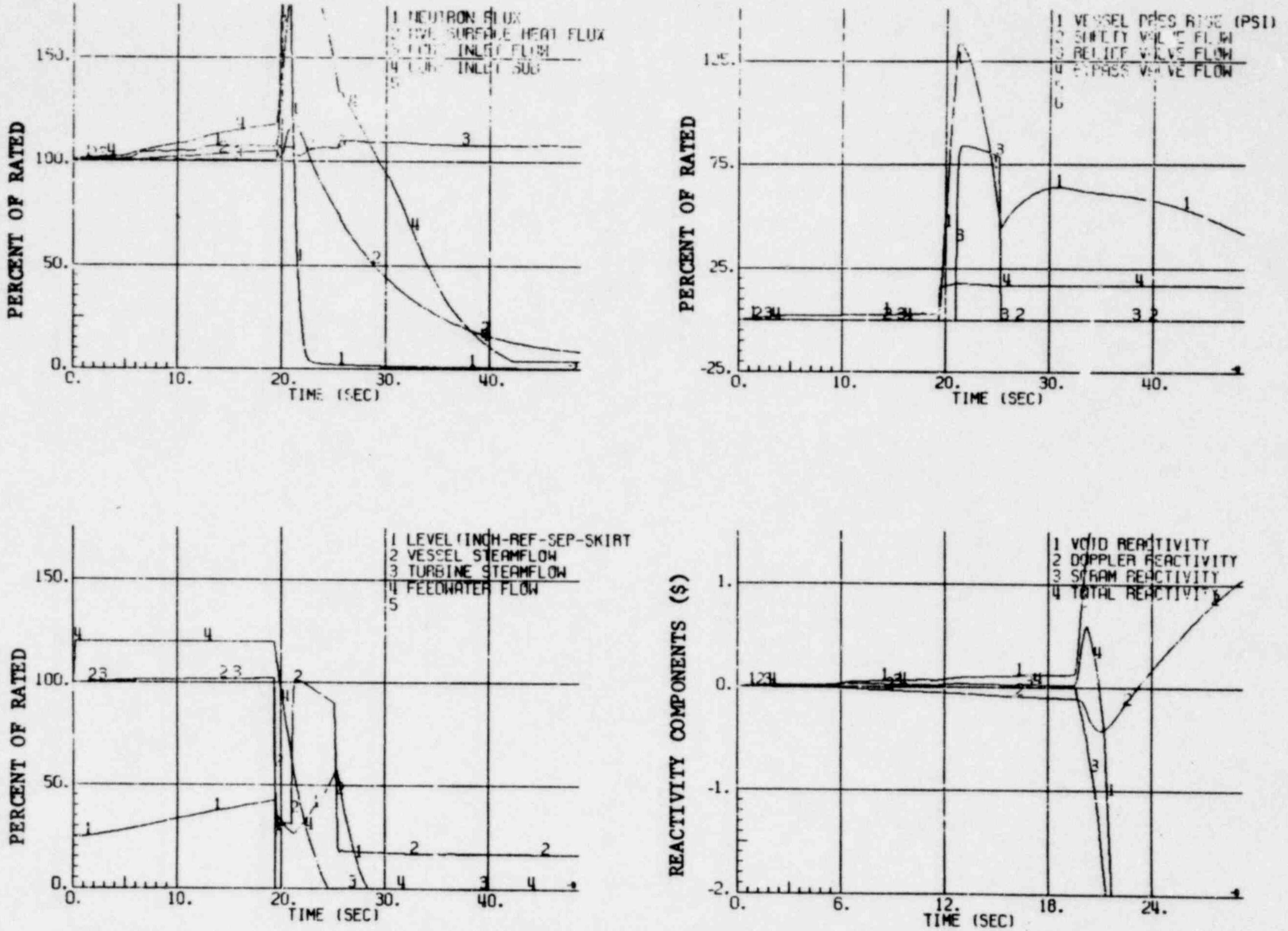


Figure 5. Plant Response to Feedwater Controller Failure

	02	06	10	14	18	22	26	30
51						14		
47							24	
43				10		6		
39			22		36		36	
35		8		8		8		
31	30		36		36		36	
27		8		40		0		

NOTES:
1. ROD PATTERN IS 1/4 CORE MIRROR SYMMETRIC, UPPER LEFT QUADRANT SHOWN ON MAP
2. NUMBER INDICATES NUMBER OF NOTCHES WITHDRAWN OUT OF 48. BLANK IS A WITHDRAWN ROD
3. ERROR ROD AT 22,27

Figure 6. Limiting RWE Rod Pattern

1470 127

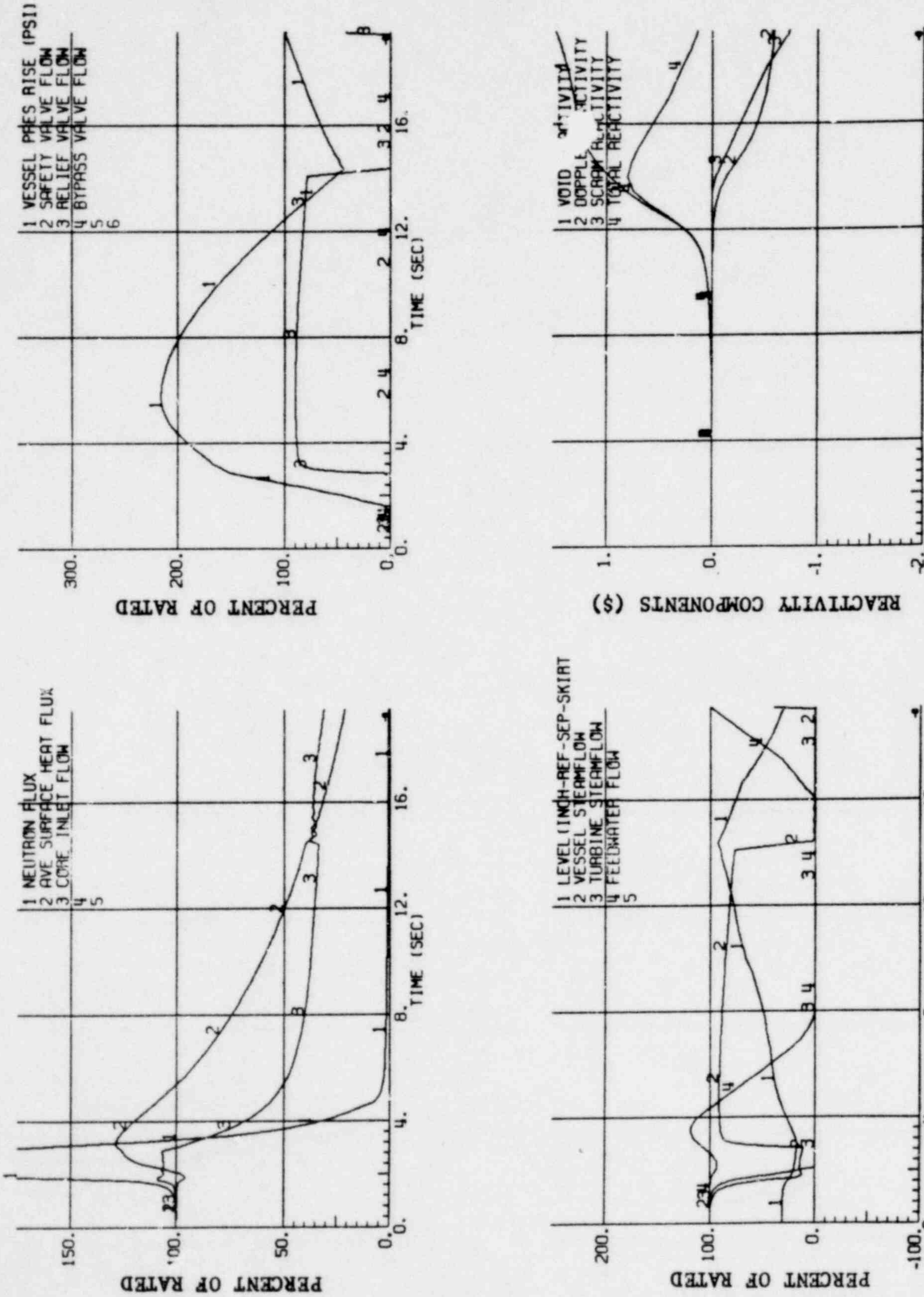


Figure 7. Plant Response to MSIV Closure

1470 128

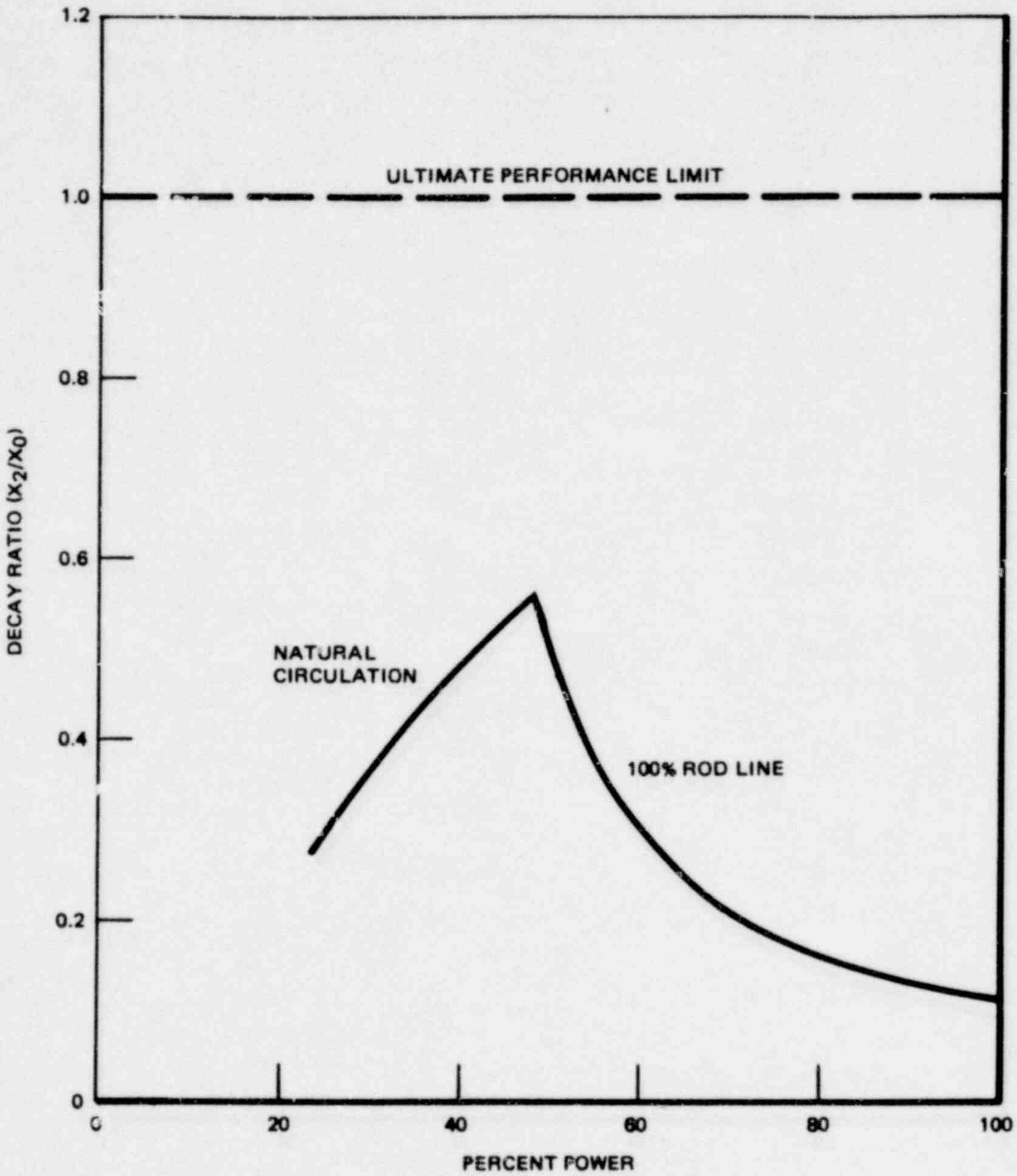


Figure 8. Decay Ratio

1470 129

APPENDIX A

PLANT PARAMETER CHANGES

Safety/Relief Valve - (Table 5.4, page 5-62, Operating Plants Pressure Relief Systems) 8 S/R valves installed

7 S/R valves assum i in analysis capacity at setpoint 82.6%

Lowest setpoint = 1108 + 1% psig

GETAB Initial Conditions (Table 5-8, page 5-66)

Reactor Core Pressure	1038 psia
Inlet Enthalpy	524.3 Btu/lb

Loading Error Results (5.5.4, Table 5-8, page 5-66)

Limiting Event for LHGR:

8x8 Monitored	
8x8 Mislocated	18.67 kW/ft

1470 130