APPENDIX D

CYCLE 11
RELOAD LICENSE SUBMITTAL

REVISION 1

D.1 REFERENCE CORE LOADING PATTERN (1.0, 2.7, 3.3.1 AND 4.0)*

	Fuel Type	Group	Number
Irradiated	Exxon Type VB	A	176
	Exxon Type VB	B	24
	P8DRB239	C	112
	P8DRB265H	D	60
New	P8DRB265H	E	4
	P8DRB299ZA	F	48
	P8DRB299Z	G	136
Total			560

Nominal previous cycle core average exposure at end of cycle: 14,898 MWd/t

Minimum previous cycle core average exposure at end of cycle from cold shutdown considerations: 14,898 MWd/t

Assumed reload cycle core average exposure at end of cycle: 15,769 MWd/t

Core loading pattern: Figure D-1

Sources of non-GE bundle characteristics:

Bundle Type	Nuclear Libraries	Local Peaking Factor	R-Factor	Thermal-Hydraulic Model (Fuel and Channels)
Exxon Type VB	Developed via GE lattice methods		See App. B NEDO-24195	See App. B NEDO-24195

*( ) Refers to areas of discussion in "General Electric Reload Fuel Application for Oyster Creek", NEDO-24195, August 1979.

D.2 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	1.103
Fully Controlled	0.945
Strongest Control Rod Out	0.975
R, Maximum Increased in Cold Core Reactivity with Exposure Into Cycle, Δk	0.002

D.3 STANDBY LIQUID CONTROL SYSTEM SHUTDOWN CAPABILITY (3.3.2.1.3)

ppm	Shutdown Margin (Δk) (20°C, Xenon Free)
600	0.045

D.4 TRANSIENT ANALYSIS INPUTS (3.3.2.1.5 and 5.2)

Void Coefficient N/A* (/% Rgo)	-6.71/-8.39
Void Fraction (%)	36.2
Doppler Coefficient N/A (/°F)	-0.221/-0.210
Average Fuel Temperature (°F)	1138
Scram Worth N/A ($)	-37.64/-30.11
Scram Reactivity vs Time	Figure D-2

D.5 GETAB TRANSIENT ANALYSIS INITIAL CONDITION PARAMETERS (5.2)

	P8x8R	EX8
Peaking Factors (local, radial and axial	1.20 1.683 1.40	1.28 1.609 1.40
R-Factor	1.051	1.098
Bundle Power (MWt)	5.653	5.416
Bundle Flow (10^3 lb/hr)	89.34	91.02
Initial MCPR	1.35	1.32

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

D.6 CORE-WIDE TRANSIENT ANALYSIS RESULTS (5.2.1)

Transient	Exposure (MWd/T)	Φ (% NBR)	Q/A (%)	ΔCPR P8x8R	ΔCPR Ex8	Figure
Turbine Trip without Bypass	EOC	516	122	0.28	0.25	Figure D-3
Loss of 100°F Feedwater Heating	BOC to EOC	115	114	0.13	0.12	Figure D-4
Feedwater Controller Failure	EOC	350	121	0.24	0.22	Figure D-5

D.7 LOCAL ROD WITHDRAWAL ERROR (WITH LIMITING INSTRUMENT FAILURE) TRANSIENT SUMMARY (5.2.1)

Limiting Rod Pattern: Figure D-6

Reactor Power (%)	Rod Position (Feet Withdrawn)	ΔCPR P8x8R	ΔCPR Ex8	MLHGR (kW/ft) P8x8R	MLHGR (kW/ft) Ex8
104	7.0	0.23	0.22	17.0	13.8
105	8.0	0.26	0.25	17.9	14.4
106	8.5	0.27	0.25	17.9	14.4
107	9.0	0.28	0.25	17.9	14.4
108**	9.0	0.28	0.25	17.9	14.4
109	9.5	0.29	0.25	17.9	14.4
110	9.5	0.29	0.25	17.9	14.4

D.8 CYCLE MCPR VALUES*** (5.2)

Non-pressurization Events

Exposure Range: BOC to EOC

	P8x8R	Ex8
Loss of Feedwater Heater	1.20	1.19
Fuel Loading Error	1.21	N/A
Rod Withdrawal Error	1.35	1.32

** Indicates APRM rod block setpoint selected.
*** Minimum MCPR required by ECCS is 1.30.

Pressurization Events

Exposure Range: BOC to EOC

	Option A		Option B	
	P8x8R	Ex8	P8x8R	Ex8
Turbine Trip w/o Bypass	1.41	1.38	1.36	1.33
Feedwater Controller Failure	1.37	1.34	1.28	1.26

D.9 OVERPRESSURIZATION ANALYSIS SUMMARY (5.3)

Transient	P_{sl} (psig)	P_v (psig)	Plant Response
MSIV Closure	1264	1302	Figure D-7

D.10 STABILITY ANALYSIS RESULTS (5.4)

Not required by reference.

D.11 LOADING ERROR RESULTS (5.5.4)

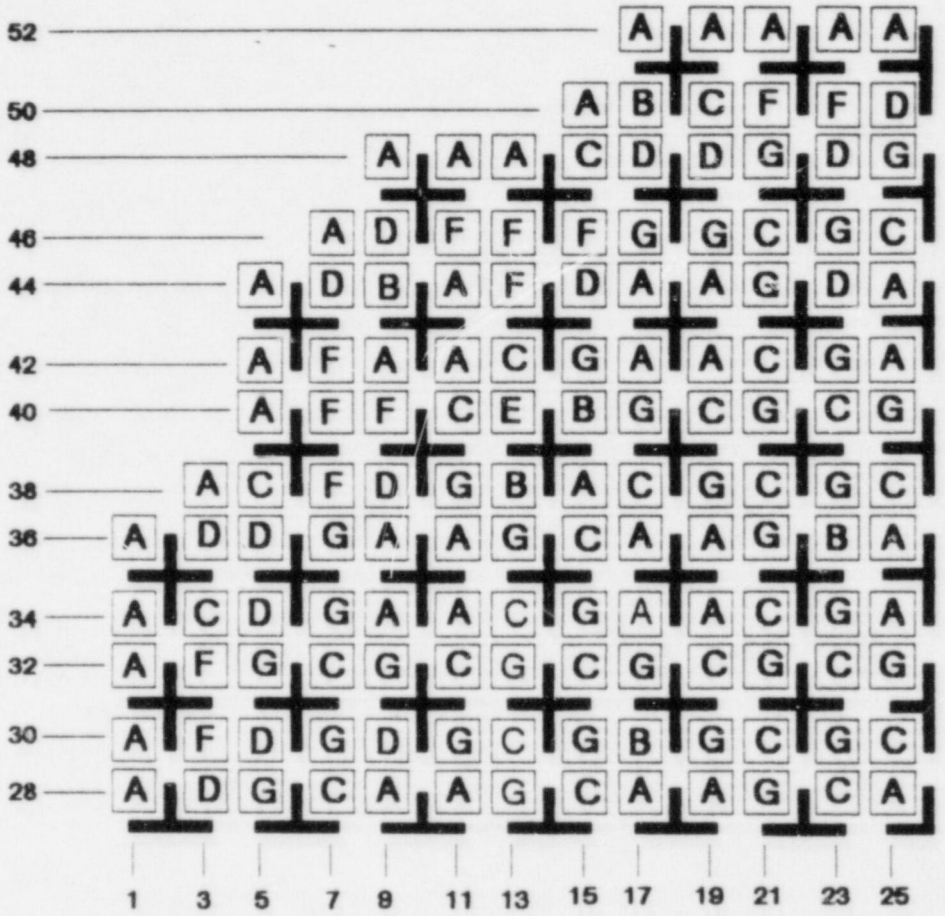
Rotated Bundle: P8x8R

ICPR: 1.21 (before rotating)

MCPR: 1.09 (after rotating)

ΔCPR: 0.14*

*Includes 0.02 ΔCPR penalty.



FUEL TYPE		
A = EXXON - VB	D = P8DRB265H	G = P8DRB299Z
B = EXXON - VB	E = P8DRB265H	
C = P8DRB239	F = P8DRB299ZA	

Figure D-1. Reference Core Loading Pattern for Cycle 11

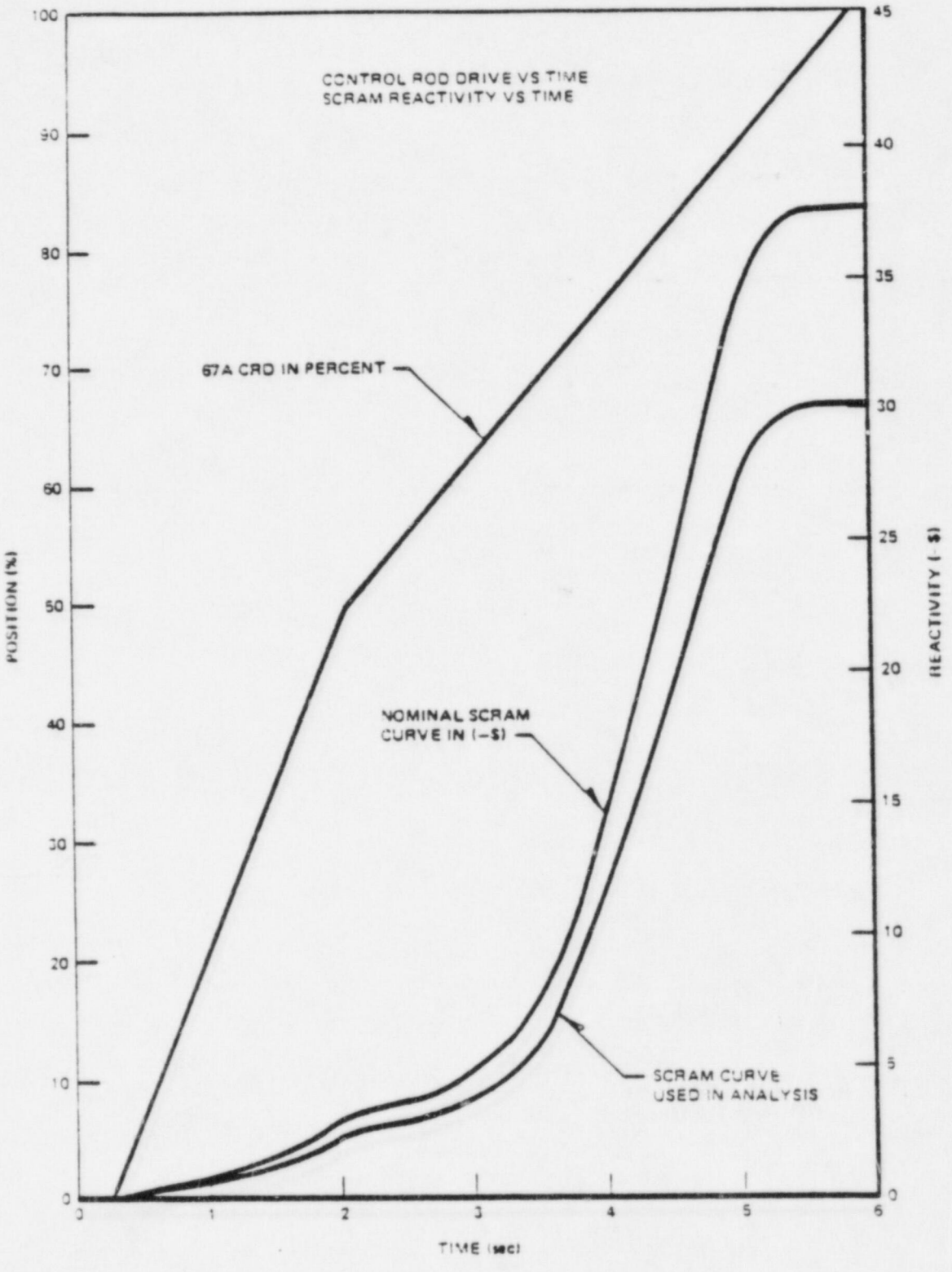


Figure D-2. EOC Scram Reactivity

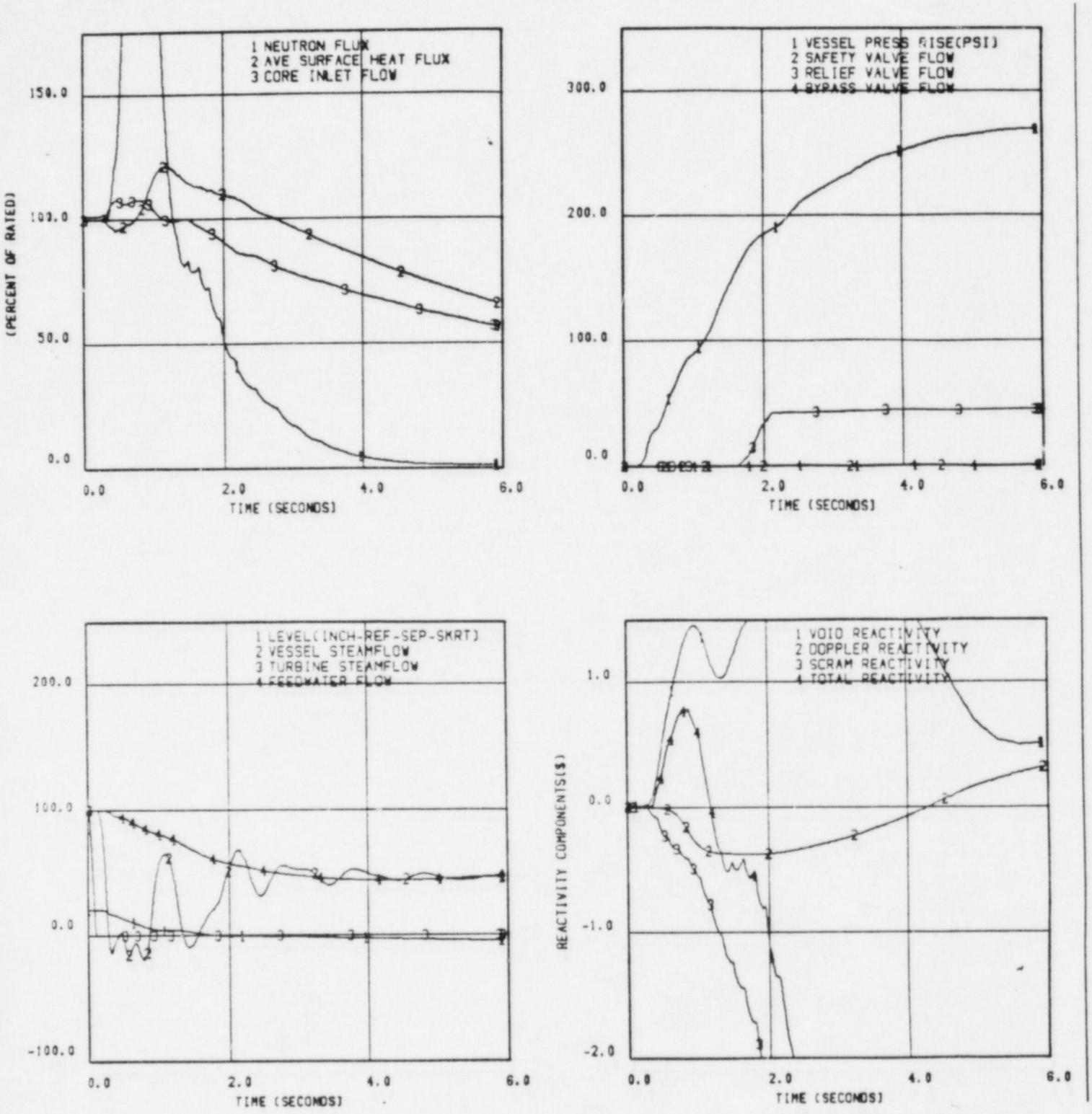


Figure D-3. Plant Response to Turbine Trip Without Bypass

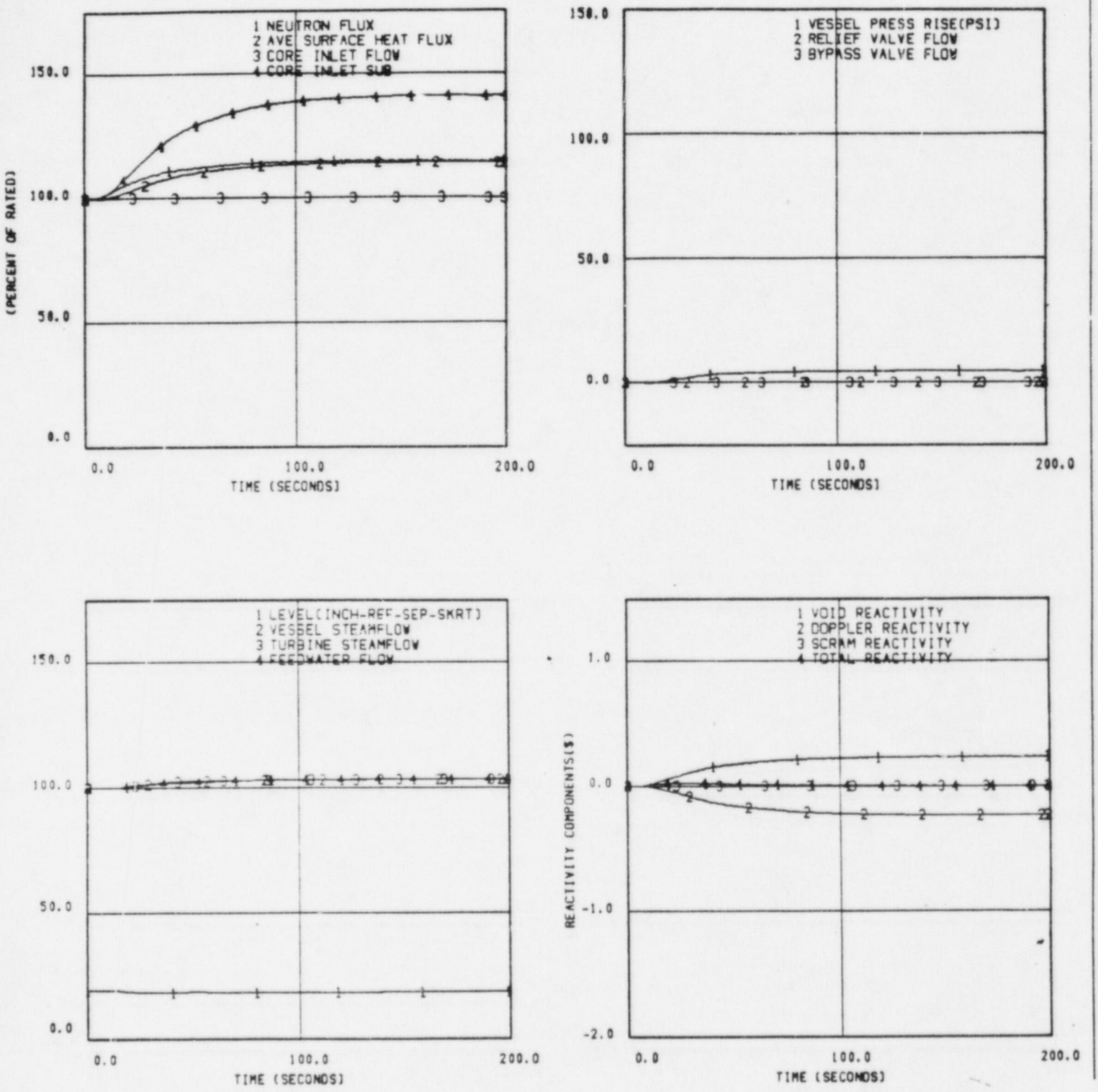


Figure D-4. Plant Response to Loss of 100°F Feedwater Heating

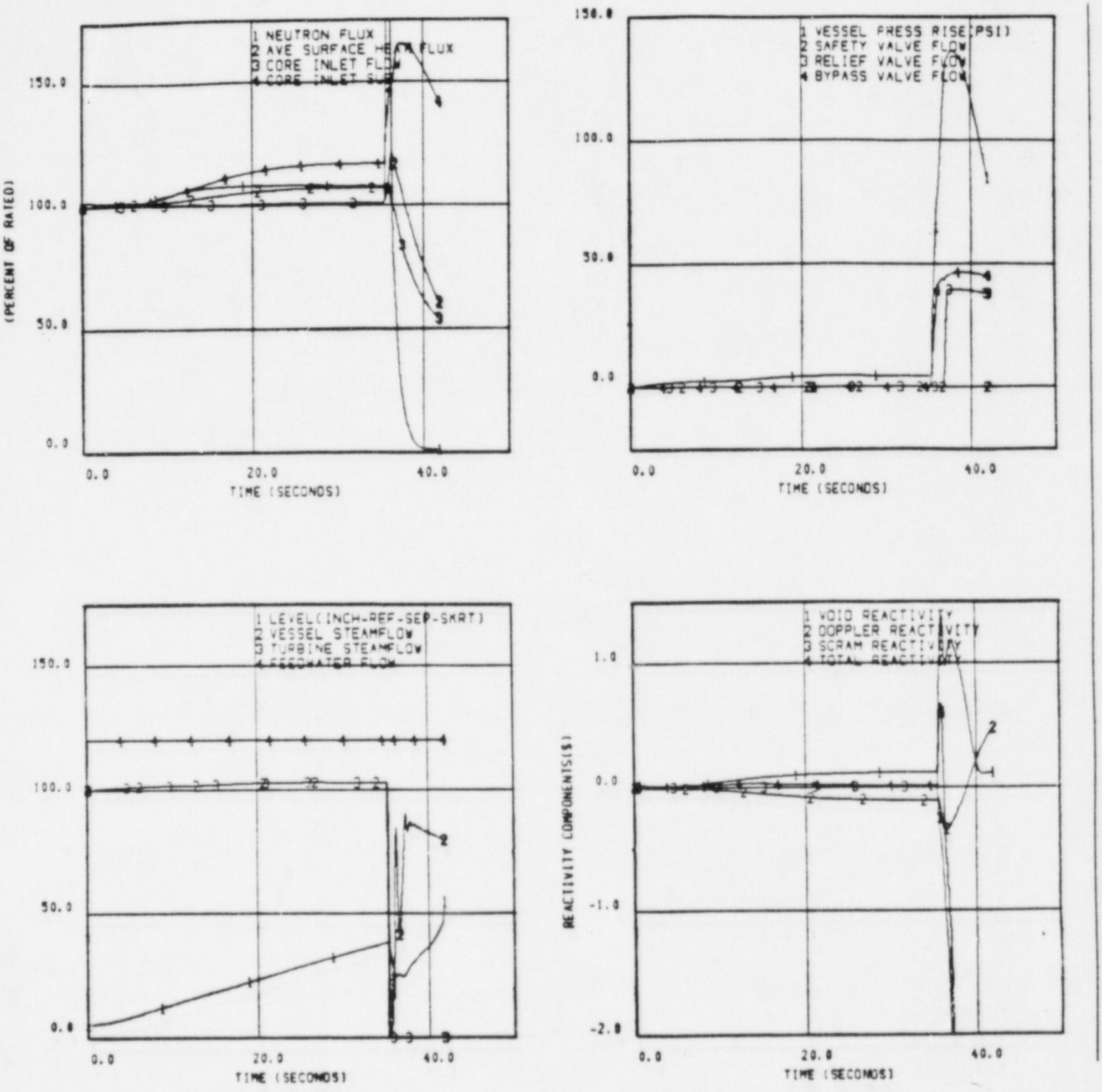


Figure D-5. Plant Response to Feedwater Controller Failure

	2	6	10	14	18	22	26	30	34	38	42	46	50
51					48		48		48				
47				06		06		06		06			
43			06		40		48		40		06		
39		06		06		34		34		06		06	
35	48		40		48		38		48		40		48
31		06		34		0		0		34		06	
27	48		48		38		48		38		48		48
23		06		34		0		0		34		06	
19	48		40		48		38		48		40		48
15		06		06		34		34		06		06	
11			06		40		48		40		06		
7				06		06		06		06			
3					48		48		48				

NOTES: 1. Rod pattern is full core.

2. No. Indicates number of notches withdrawn out of 48. Blank is a withdrawn rod.

3. Error rod is (22,31).

Figure D-6 Limiting RWE Rod Pattern

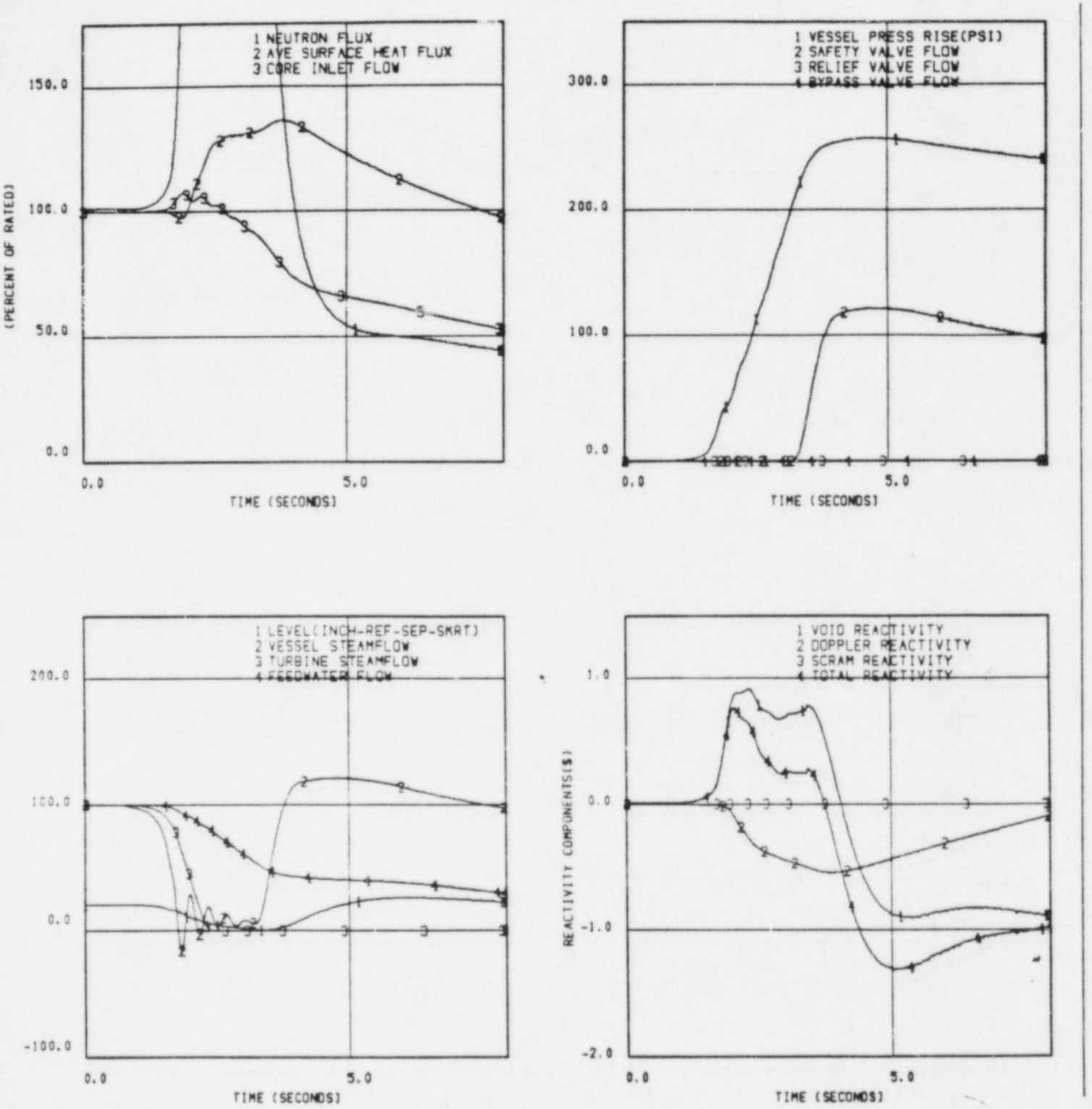


Figure D-7. Plant Response to MSIV Closure, No Scram

Table 5-14a

MAPLHGR VERSUS AVERAGE PLANAR EXPOSURE

Plant: Oyster Creek

Fuel Type: P8DRB239

Average Planar Exposure (MWd/t)	MAPLHGR (kW/ft)	PCT (°F)	Oxidation Fraction
200	9.5	2198	0.095
1000	9.5	2198	0.095
5000	9.5	2194	0.085
10,000	9.5	2193	0.085
15,000	9.5	2194	0.085
20,000	9.0	2092	0.169
25,000	8.9	2048	0.169
30,000	8.9	2049	0.170
35,000	8.7	2050	0.170
40,000	8.3	2049	0.170

Table 5-14b

MAPLHGR VERSUS AVERAGE PLANAR EXPOSURE

Plant: Oyster Creek

Fuel Type: P8DRB265H

Average Planar Exposure (MWd/t)	MAPLHGR (kW/ft)	PCT (°F)	Oxidation Fraction
200	9.5	2198	0.095
1000	9.5	2198	0.095
5000	9.5	2198	0.086
10,000	9.5	2198	0.086
15,000	9.5	2198	0.086
20,000	8.9	2078	0.170
25,000	8.8	2050	0.170
30,000	8.8	2044	0.166
35,000	8.6	2049	0.170
40,000	8.3	2050	0.170

Table 5-14c

MAPLHGR VERSUS AVERAGE PLANAR EXPOSURE

Plant: Oyster Creek

Fuel Type: P8DRB299

Average Planar Exposure (MWd/t)	MAPLHGR (kW/ft)	PCT (°F)	Oxidation Fraction
200	9.3	2198	0.092
1000	9.4	2198	0.091
5000	9.5	2199	0.085
10,000	9.5	2197	0.085
15,000	9.5	2198	0.086
20,000	8.8	2047	0.169
25,000	8.7	2046	0.168
30,000	8.7	2042	0.166
35,000	8.5	2047	0.169
40,000	8.2	2048	0.170
45,000	7.7	2046	0.167