

8/10/78

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DOCDATE: 08/02/78
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DOCTYPE: LETTER NOTARIZED: NO
SUBJECT:
FORWARDING FIGURES CONSISTING OF INFO RE FLUX MAPS TAKEN DURING THE STARTUP
OF CYCLE 8.

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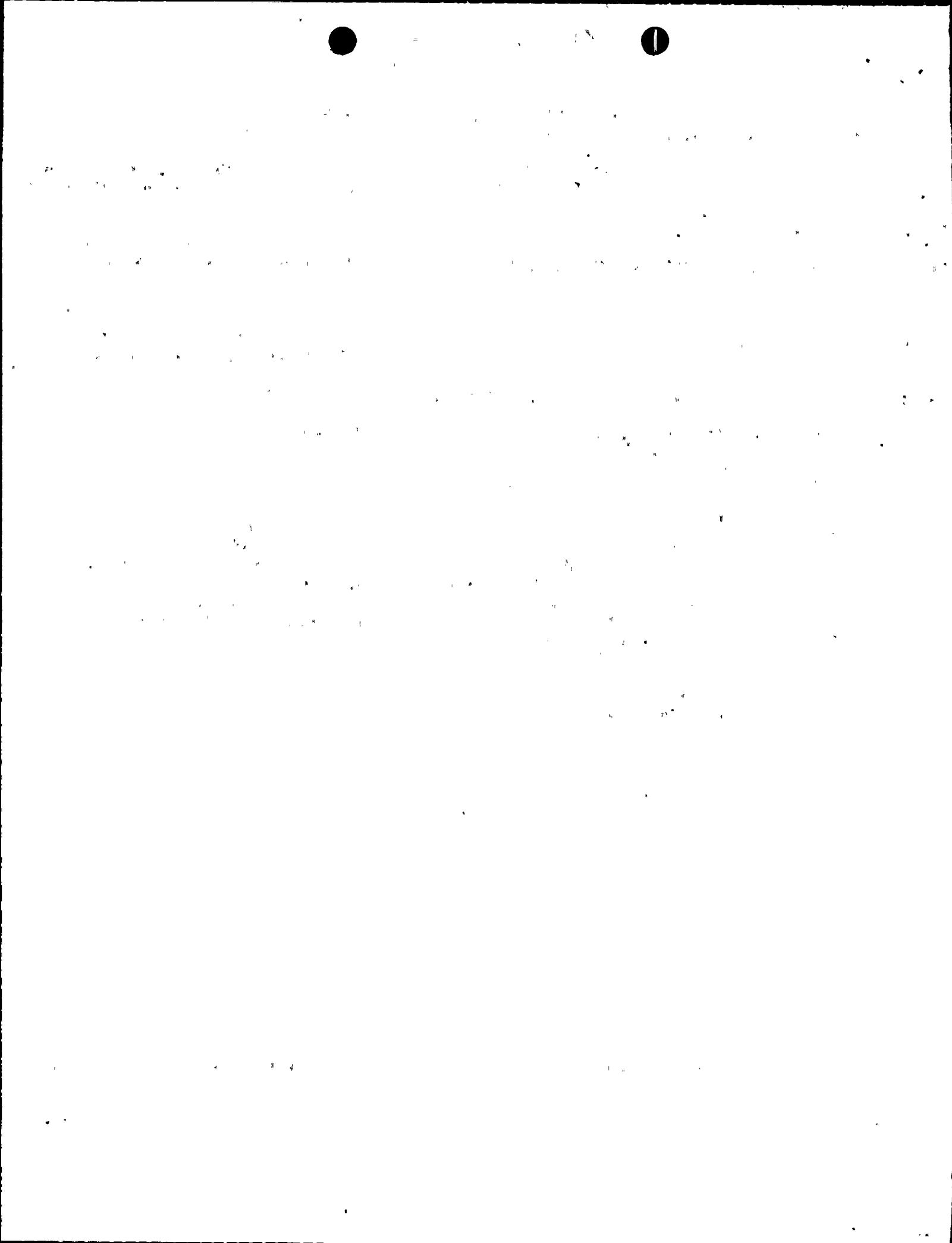
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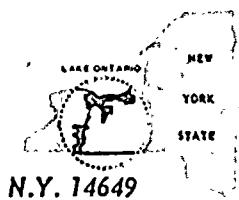




ROCHESTER GAS AND ELECTRIC CORPORATION • 89 EAST AVENUE, ROCHESTER, N.Y. 14649

LEON D. WHITE, JR.
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5378 AUG 9 AM 11 15

August 2, 1978

Director of Nuclear Reactor Regulation
Attention: Mr. D. L. Ziemann, Chief
Operating Reactors Branch No. 2
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Ziemann:

During conversations with members of the NRC staff, a request was made for additional detail on the flux maps taken during the startup of Cycle 8. Attached are five figures which illustrate measured assembly powers and a comparison between measured assembly power and the predicted assembly power for the following conditions:

- a. Hot Zero Power, All Rods Out (Figure 1)
- b. Hot Zero Power, D bank in (Figure 2)
- c. 25% Power (Figure 3)
- d. 50% Power (Figure 4)
- e. 80% Power (Figure 5)

Very truly yours,

L. D. White, Jr.
L. D. White, Jr.

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AOI
5/11

Cycle 8 - Flux Map VIII - 1

Hot zero power, D bank @ 209 steps

ROCHESTER GAS AND ELECTRIC CORPORATION

CORE MAP

Measured $F_{\Delta H}^N$

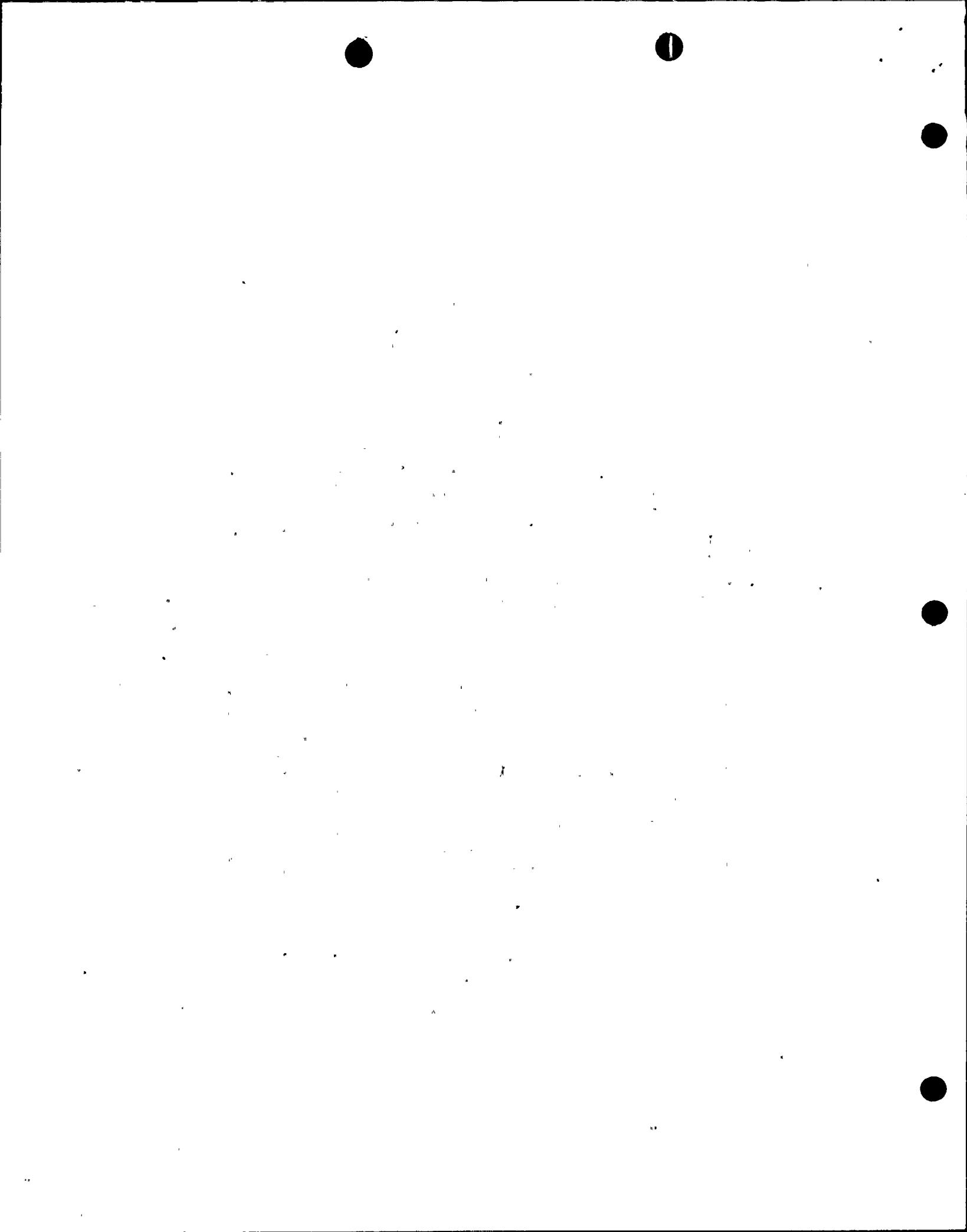
270°

	1	2	3	4	5	6	7	8	9	10	11	12	13					
A						0.652 -1.9	0.811 -1.3	0.658 -0.9										
B						0.632 -1.9	0.935 -1.9	1.150 -1.9	1.067 -1.3	1.172 -0.0	0.959 -0.6	0.649 -0.8						
C						0.723 0.8	1.082 0.8	1.012 -0.3	1.135 -1.3	1.180 -1.8	1.144 -0.5	1.034 1.9	1.081 0.7	0.710 -1.0				
D						0.631 -2.3	1.083 0.8	1.052 0.8	1.220 0.9	1.052 0.1	0.971 -1.8	1.045 -0.5	1.206 0.0	1.035 -0.9	1.055 -1.73	0.639 -0.9		
E						0.932 -2.3	0.992 -2.3	1.219 0.8	1.011 1.3	1.061 1.3	1.072 0.4	1.054 0.6	0.990 -0.8	1.173 -2.9	0.983 -3.2	0.921 -3.5		
F						0.648 -2.3	1.145 -2.3	1.128 -1.8	1.041 -1.2	1.061 1.2	0.985 2.3	1.166 2.3	0.986 2.4	1.057 0.8	1.050 -0.3	1.132 -1.5	1.136 -3.0	0.640 -3.5
G	180°	6				0.783 -4.6	1.049 -2.7	1.175 -2.0	0.975 -1.3	1.076 0.8	1.161 2.7	1.028 3.2	1.164 3.0	1.090 2.1	1.004 1.6	1.206 0.7	1.058 -1.8	0.792 -3.5
H						0.622 -6.4	1.129 -3.7	1.129 -1.9	1.053 -0.1	1.070 2.3	0.989 2.6	1.169 2.9	1.004 4.2	1.081 3.3	1.078 2.2	1.177 2.4	1.177 0.4	0.641 -3.5
I						0.926 -3.1	1.006 -1.2	1.225 1.1	1.042 4.1	1.078 2.5	1.090 1.7	1.088 3.5	1.037 3.7	1.239 2.3	1.045 2.7	0.969 1.4		
J	13					0.643 -0.5	1.074 -0.3	1.063 1.5	1.250 3.2	1.080 2.1	1.011 2.3	1.099 3.9	1.248 3.1	1.064 1.7	1.092 1.4	0.646 -0.1		
K						0.722 0.4	1.090 1.3	1.029 1.0	1.171 1.5	1.227 1.8	1.180 2.3	1.036 1.7	1.085 0.9	0.722 0.5				
L						0.646 -0.1	0.961 0.5	1.181 0.5	1.085 0.5	1.179 0.3	0.956 0.0	0.646 0.0						
M									0.662 -0.5	0.819 -0.5	0.663 -0.3							

Measured $F_{\Delta H}^N$
% Difference between
measured and predicted

90°

Measured - Predicted
Predicted x 100 %



Cycle 8 - Flux Map VIII

Hot Zero Power, D bank inserted

ROCHESTER GAS AND ELECTRIC CORPORATION

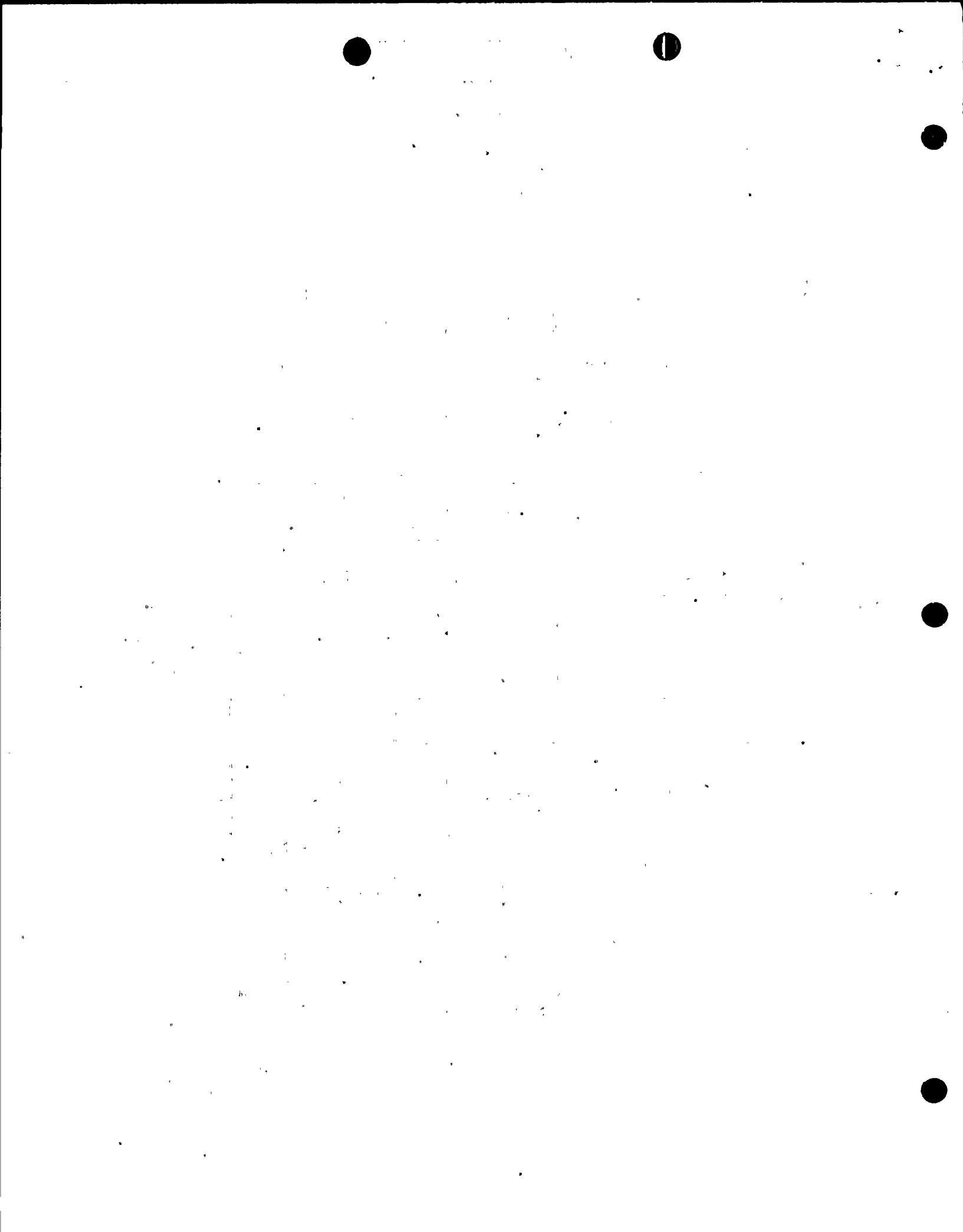
CORE MAP

Measured $F_{\Delta H}^N$

270°

	1	2	3	4	5	6	7	8	9	10	11	12	13	
A —						0.561 -6.9	0.682 -6.2	0.567 -5.8						— A
B —				0.652 -6.9	0.892 -6.9	0.966 -6.9	0.820 -5.0	1.006 -3.0	0.932 -2.7	0.683 -2.4				— B
C —			0.817 0.5	1.196 0.5	1.022 -2.4	0.969 -2.8	0.644 -2.0	0.984 -1.1	1.032 -1.6	1.162 -2.4	0.788 -3.1			— C
D —		0.678 -3.4	1.199 0.5	1.167 0.5	1.305 0.4	1.041 0.2	0.894 0.1	1.031 -0.7	1.300 0.0	1.164 0.3	1.188 -0.4	0.680 -3.1		— D
E —		0.928 -3.4	1.107 5.2	1.341 2.8	1.125 1.8	1.160 0.3	1.175 0.5	1.171 1.3	1.138 3.0	1.353 3.7	1.046 -0.6	0.892 -7.2		— E
F —	0.582 -3.4	1.005 -3.4	0.973 -2.6	1.062 1.8	1.199 3.6	1.134 1.6	1.345 0.7	1.136 1.8	1.180 2.0	1.045 0.1	0.957 -4.1	0.975 -6.3	0.584 -3.1	— F
180° G —	0.687 -5.8	0.830 -4.0	0.636 -3.2	0.884 -1.3	1.183 1.1	1.332 0.4	1.195 0.6	1.340 1.1	1.183 1.1	0.888 -0.9	0.621 -5.5	0.828 -4.2	0.729 0.0	— G 0°
H —	0.558 -7.6	0.986 -5.3	0.960 -4.0	1.024 -2.0	1.155 0.0	1.138 2.0	1.364 2.3	1.126 0.9	1.170 1.3	1.061 1.5	0.989 -1.1	1.023 -1.7	0.610 0.9	— H
I —		0.912 -5.3	1.014 -3.8	1.285 -1.7	1.120 1.1	1.201 3.6	1.231 4.9	1.187 2.3	1.122 1.3	1.327 1.5	1.056 0.2	0.949 -1.4		— I
J —		0.681 -3.3	1.160 -3.1	1.146 -1.6	1.305 -0.0	1.068 2.0	0.909 1.8	1.058 1.02	1.320 1.1	1.182 1.5	1.193 -0.4	0.686 -2.6		— J
K —			0.804 -1.3	1.179 -1.3	1.052 -0.1	0.989 -1.1	0.653 -0.9	1.009 0.9	1.080 2.5	1.228 2.7	0.810 -0.6			— K
L —				0.715 1.8	0.969 0.8	1.032 -0.8	0.856 -0.8	1.056 1.4	1.004 4.3	0.734 4.3				— L
M —						0.600 -0.6	0.724 -0.6	0.611 1.4						— M
	1	2	3	4	5	6	7	8	9	10	11	12	13	
									measured-predicted	predicted		x 100%		
														N

Figure 2



Cycle 8 - Flux Map VIII

25% Power, D bank @ 175 steps

ROCHESTER GAS AND ELECTRIC CORPORATION

CORE MAP

Measured $\frac{E_N}{\Delta H}$

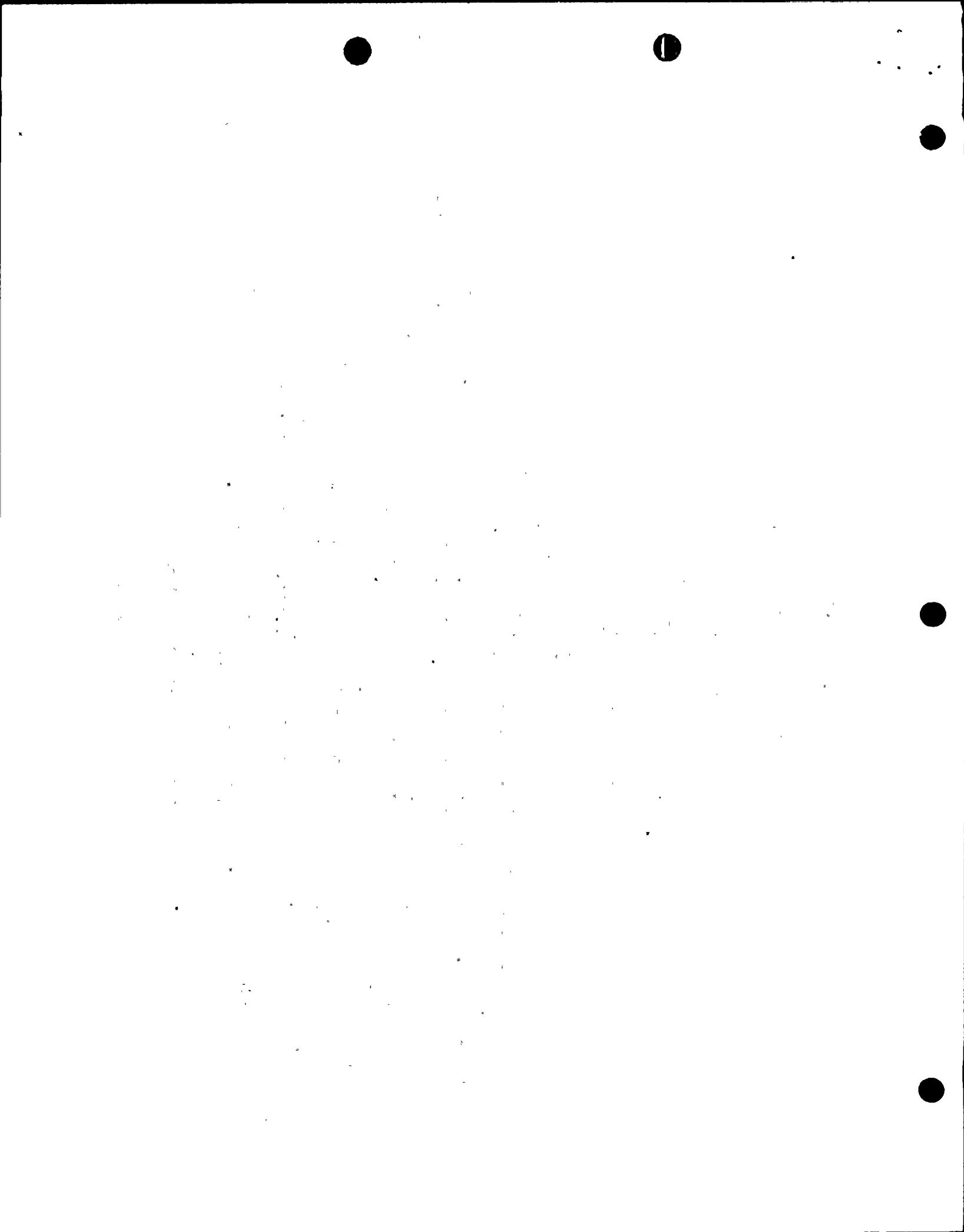
270°

	1	2	3	4	5	6	7	8	9	10	11	12	13						
A —						0.682 1.2	0.812 -2.0	0.646 -4.1						— A					
B —						0.677 1.2	0.980 1.2	1.175 1.2	1.051 -0.6	1.146 -1.3	0.959 -1.0	0.654 -2.2		— B					
C —						0.756 1.2	1.111 1.2	1.032 1.2	1.123 -0.0	1.113 -0.9	1.124 0.0	1.021 0.2	1.073 -2.3	0.712 -4.7	— C				
D —						0.673 0.4	1.113 1.2	1.071 1.2	1.227 1.5	1.047 0.8	0.946 -2.0	1.029 -0.9	1.211 0.2	1.045 -1.3	1.069 -2.8	0.640 -4.6	— D		
E —						0.972 0.4	1.029 0.8	1.223 1.0	1.023 2.1	1.078 3.0	1.074 1.1	1.050 0.3	1.012 1.0	1.211 0.0	1.012 -0.9	0.947 -2.2	— E		
F —						0.676 -0.4	1.164 0.4	1.116 -0.6	1.039 -0.3	1.059 1.0	0.989 2.1	1.173 2.6	0.993 2.5	1.070 2.1	1.042 -0.0	1.099 -2.1	1.130 -2.6	0.651 -3.3	— F
180°	G —					0.816 -1.5	1.054 -0.1	1.111 0.8	0.954 -1.3	1.067 0.3	1.148 1.1	1.022 2.0	1.166 2.7	1.094 2.8	0.967 0.1	1.085 -3.2	1.019 -3.3	0.795 -4.1	— G 0°
H —						0.654 -3.0	1.144 -1.5	1.117 -0.6	1.043 0.0	1.056 0.9	0.984 1.6	1.162 2.0	0.993 2.6	1.068 2.1	1.048 0.5	1.115 -0.8	1.133 -2.5	0.645 -4.4	— H
I —						0.947 -2.4	1.009 -1.4	1.222 0.8	1.026 2.2	1.072 2.0	1.088 1.9	1.072 2.1	1.025 1.4	1.230 0.4	1.027 -0.6	0.964 -0.6		— I	
J —						0.662 -1.4	1.088 -1.3	1.059 -0.2	1.226 1.1	1.051 0.5	0.969 0.3	1.059 1.3	1.244 2.6	1.094 3.1	1.110 0.7	0.663 -1.3		— J	
K —						0.741 -1.1	1.093 -0.8	1.016 -0.7	1.101 -2.4	1.107 -1.8	1.124 -0.3	1.038 1.5	1.124 2.1	0.756 0.9			— K		
L —						0.666 -1.0	0.963 -0.7	1.149 -1.3	1.042 -1.2	1.155 -0.7	0.970 -0.0	0.672 -0.1				— L			
M —									0.674 -0.2	0.829 -0.1	0.674 -0.1					— M			

Measured $\frac{E_N}{\Delta H}$
% Difference between
measured and predicted

measured-predicted
predicted x 100%

Figure 3



ROCHESTER GAS AND ELECTRIC CORPORATION

CORE MAP

Measured $F_{\Delta H}^N$

270°

1	2	3	4	5	6	7	8	9	10	11	12	13
---	---	---	---	---	---	---	---	---	----	----	----	----

A —

0.671	0.822	0.671
0.0	-0.1	-0.1

— A

B —

0.667	0.960	1.152	1.052	1.148	0.956	0.670
0.0	0.0	-0.0	-0.2	-0.3	-0.3	0.5

— B

C —

0.739	1.082	1.012	1.119	1.130	1.118	1.011	1.092	0.752
-0.4	-0.4	-0.3	-0.5	-0.9	-0.6	-0.4	0.5	1.3

— C

D —

0.662	1.084	1.048	1.201	1.040	0.968	1.038	1.196	1.047	1.090	0.677
-0.9	-0.4	-0.4	-0.4	-0.6	-1.0	-0.7	-0.8	-0.5	0.1	1.4

— D

E —

0.951	1.007	1.203	1.004	1.054	1.071	1.057	0.998	1.186	0.999	0.946
-0.9	-0.9	-0.4	-0.3	-0.2	-0.2	0.0	-0.8	-1.8	-1.7	-1.4

— E

F —

0.664	1.140	1.112	1.037	1.055	0.982	1.161	0.988	1.060	1.040	1.107	1.136	0.688
-0.9	-0.9	-1.04	-1.1	-0.2	0.2	0.5	0.8	0.2	-0.8	-1.5	-1.2	-0.3

— F

180° G —

0.813	1.039	1.119	0.964	1.070	1.154	1.028	1.163	1.083	0.973	1.118	1.044	0.827
-1.1	-1.2	-1.8	-1.3	-0.3	0.6	1.1	1.4	0.9	-0.5	-1.8	-0.7	0.6

— G 0°

H —

0.662	1.132	1.097	1.038	1.060	0.989	1.171	1.000	1.063	1.041	1.116	1.149	0.676
-1.3	-1.7	-2.5	-1.1	0.5	1.0	1.5	2.1	0.7	-0.8	-0.9	-0.2	0.8

— H

I —

0.945	0.999	1.205	1.023	1.076	1.088	1.070	1.010	1.206	1.019	0.972
-1.7	-1.9	-0.4	1.6	1.6	1.0	1.0	0.3	-0.3	0.1	1.1

— I

J —

0.661	1.081	1.055	1.222	1.059	.975	1.050	1.211	1.058	1.100	0.682
-1.0	-0.9	-0.0	1.0	0.6	-0.3	-0.2	0.9	0.2	0.8	2.0

— J

K —

0.744	1.091	1.024	1.124	1.136	1.129	1.024	1.097	0.754
-0.1	0.1	0.6	-0.5	-0.8	0.0	0.6	0.6	1.2

— K

L —

0.676	0.971	1.165	1.063	1.166	0.974	0.676
1.1	0.9	1.0	1.0	1.1	1.2	1.1

— L

M —

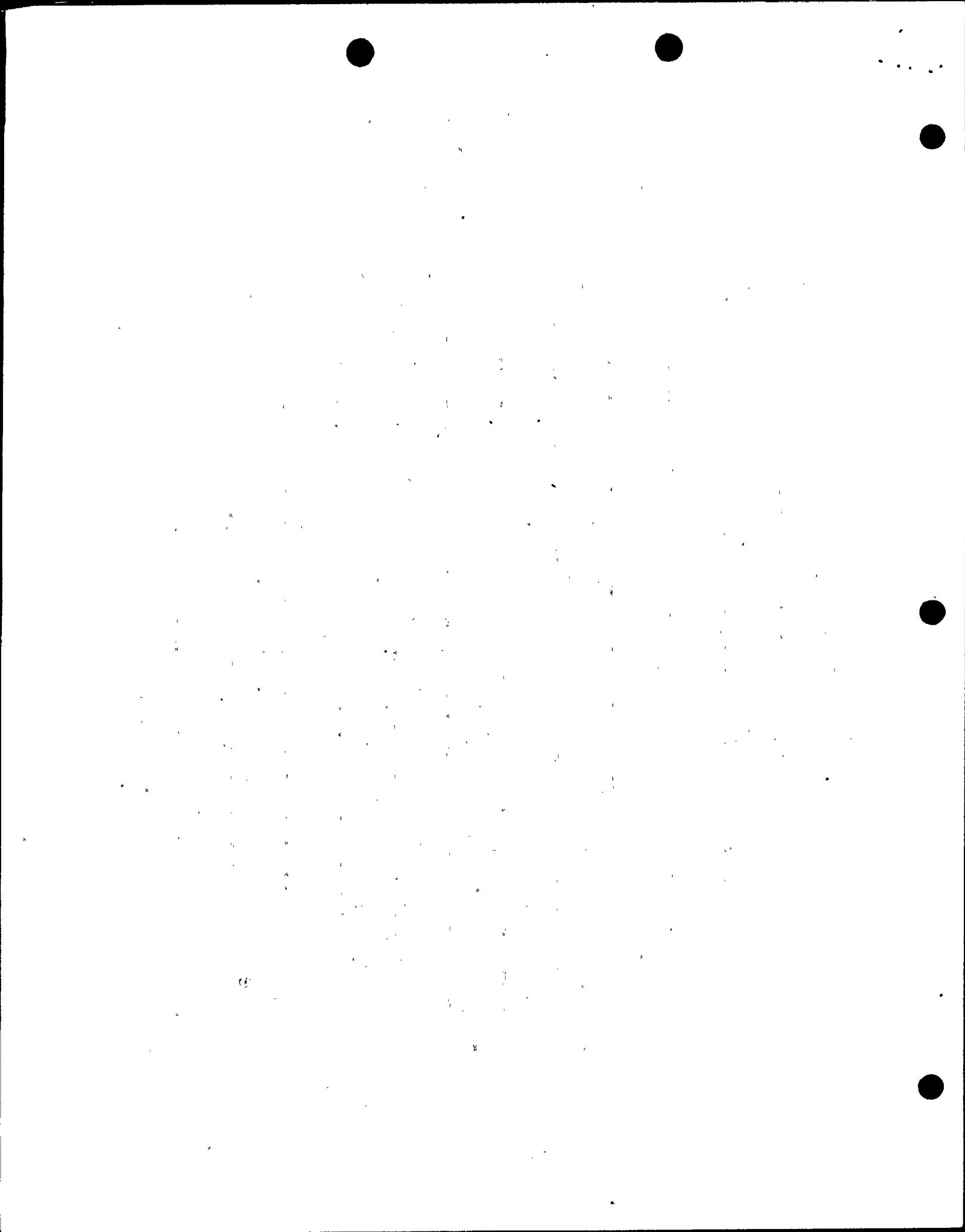
0.687	0.844	0.684
2.4	2.4	2.0

Measured $F_{\Delta H}^N$

← % Difference between measured and predicted

90° $\frac{\text{measured-predicted}}{\text{predicted}} \times 100\%$

Figure 4



Cycle 8 Flux Map VIII - 5

80% Power, D bank @ 210 steps

ROCHESTER GAS AND ELECTRIC CORPORATION

CORE MAP

Measured F_{AH}^N

270°

	1	2	3	4	5	6	7	8	9	10	11	12	13							
A						0.659 -2.8	0.824 -1.0	0.679 0.1						A						
B						0.643 -2.8	0.933 -2.8	1.133 -2.8	1.059 -1.5	1.161 -0.4	0.956 -0.4	0.671 1.4		B						
C						0.737 0.5	1.081 0.5	1.004 -0.8	1.124 -1.3	1.173 -1.5	1.129 -1.0	1.008 -0.4	1.092 1.4	0.757 3.1	C					
D						0.643 -2.9	1.084 0.5	1.046 0.5	1.203 0.2	1.048 -0.7	0.979 -0.8	1.038 -0.9	1.187 0.1	1.043 1.3	1.092 3.2	D				
E						0.932 -3.0	1.014 0.1	1.203 0.3	1.001 0.5	1.052 0.7	1.072 0.9	1.063 1.7	0.999 0.4	1.179 -1.6	0.991 -2.2	0.930 -3.1	E			
F						0.657 -3.0	1.129 -3.0	1.122 -1.4	1.050 0.1	1.050 0.4	0.974 1.0	1.161 2.3	0.995 3.2	1.061 1.5	1.042 -0.7	1.113 -2.2	1.133 -2.6	0.667 -1.5	F	
G						0.817 -1.8	1.042 -2.8	1.162 -2.3	0.983 -0.2	1.070 0.7	1.145 1.5	1.025 2.9	1.162 3.0	1.082 1.8	0.984 -0.2	1.166 -1.9	1.056 -1.6	0.830 -0.2	G	0°
H						0.670 -0.9	1.137 -2.4	1.104 -3.1	1.042 -0.8	1.058 1.4	0.982 1.9	1.164 2.7	1.000 3.7	1.062 1.8	1.047 -0.3	1.130 -0.8	1.157 -0.6	0.678 0.1	H	
I						0.946 -1.7	0.993 -2.1	1.196 -0.4	1.016 1.9	1.068 2.0	1.088 2.0	1.070 2.1	1.009 1.3	1.202 0.1	1.015 -0.0	0.970 0.9		I		
J						0.658 -0.8	1.072 -0.8	1.043 -0.1	1.212 0.9	1.064 1.1	0.991 0.5	1.056 0.3	1.209 0.6	1.053 0.8	1.090 0.9	0.676 1.8		J		
K						0.734 -0.3	1.074 -0.5	1.016 0.1	1.135 -0.7	1.189 -0.6	1.142 -0.1	1.020 0.5	1.087 0.7	0.747 1.5			K			
L							0.670 0.9	0.968 0.5	1.171 0.3	1.077 0.4	1.171 0.4	0.966 0.4	0.666 0.3				L			
M									0.687 1.4	0.846 1.4	0.685 1.0						M			

Measured F_{AH}^N
% Difference between
measured and predicted

90°

measured-predicted $\times 100\%$

Figure 5

