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March 1, 1990

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Washington, DC 20555

Subject: Semiannual Radioactive Effluent Release Report  
R.E. Ginna Nuclear Power Plant  
Docket No. 50-244

Dear Sirs:

This Semiannual Radioactive Effluent Release Report is being submitted in accordance with the requirements of Technical Specification Section 6.9.1.4.

Very truly yours,

  
Robert C. Mecredy

9003130570 891231  
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SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

R. E. GINNA NUCLEAR PLANT  
ROCHESTER GAS AND ELECTRIC  
DOCKET NO. 50-244

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## TABLE OF CONTENTS

- 1.0 INTRODUCTION
- 2.0 SUPPLEMENTAL INFORMATION
  - 2.1 REGULATORY LIMITS
  - 2.2 MAXIMUM PERMISSIBLE CONCENTRATIONS
  - 2.3 RELEASE RATE LIMITS
  - 2.4 MEASUREMENTS AND APPROXIMATIONS OF TOTAL RADIOACTIVITY
  - 2.5 BATCH RELEASES
  - 2.6 ABNORMAL RELEASES
- 3.0 SUMMARY OF GASEOUS RADIOACTIVE EFFLUENTS
- 4.0 SUMMARY OF LIQUID RADIOACTIVE EFFLUENTS
- 5.0 SOLID WASTE
- 6.0 LOWER LIMIT OF DETECTION
- 7.0 RADIOLOGICAL IMPACT
- 8.0 METEOROLOGICAL DATA
- 9.0 LAND USE CENSUS CHANGES
- 10.0 ANNUAL TABULATION OF PERSONNEL EXPOSURE
- 11.0 LEAK TEST OF SEALED SOURCES
- 12.0 CHANGES TO THE OFFSITE DOSE CALCULATION MANUAL
- 13.0 CHANGES TO THE PROCESS CONTROL PROGRAM
- 14.0 MAJOR CHANGES TO RADWASTE TREATMENT SYSTEMS



# LIST OF TABLES

Table	1A	Gaseous Effluents - Summation of all Releases
Table	1B	Gaseous Effluents - Continuous and Batch Releases
Table	2A	Liquid Effluents - Summation of all Releases
Table	2B	Liquid Effluents - Continuous and Batch Releases
Table	3	Solid Waste and Irradiated Fuel Shipments
Table	4	Release Permits Not Meeting LLD Requirements
Table	5A	Radiation Dose to Nearest Individual Receptor from Gaseous Releases
Table	5B	Radiation Dose to Nearest Individual Receptor from Liquid Releases
Table	6A	Liquid Effluents - Summation of all Releases (corrected table for January - June, 1989)
Table	6B	Liquid Effluents - Continuous and Batch Releases (corrected table for January - June, 1989)
Table	7A	Number of Personnel and Man-Rem by Work and Job Function
Table	7B	Standard Report of Personnel Whole Body Exposure

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## 1.0

## INTRODUCTION

This Semiannual Radioactive Effluent Release Report is for Rochester Gas and Electric Company's R.E. Ginna plant and is submitted in accordance with the requirements of Technical Specification Section 6.9.1.4. The report covers the period from July 1, 1989 through December 31, 1989.

This report includes a summary of the quantities of radioactive gaseous and liquid effluents and solid waste released from the plant presented in the format outlined in appendix B of Regulatory Guide 1.21, Revision 1, June 1974.

All gaseous and liquid effluents discharged during this reporting period were in compliance with the limits of the R.E. Ginna Technical Specifications.

## 2.0 SUPPLEMENTAL INFORMATION

### 2.1 Regulatory Limits

The Technical Specification limits applicable to release of radioactive material in liquid and gaseous effluents are:

#### 2.1.1 Fission and Activation Gases

The instantaneous dose rate, as calculated in the ODCM, due to noble gases released in gaseous effluents from the site shall be limited to a release rate which would yield  $\leq 500$  mrem/yr to the total body and  $\leq 3000$  mrem/yr to the skin if allowed to continue for a full year.

The air dose, as calculated in the ODCM, due to noble gases released in gaseous effluents from the site shall be limited to the following:

- (i) During any calendar quarter to  $\leq 10$  mrad for gamma radiation and to  $\leq 20$  mrad for beta radiation.

#### 2.1.2 Radioiodine, Tritium and Particulates

The instantaneous dose rate, as calculated in the ODCM, due to radioactive materials released in gaseous effluents from the site as radioiodines, radioactive materials in particulate form, and radionuclides other than noble gases with half-lives greater than 8 days shall be limited to a release rate which would yield  $\leq 1500$  mrem/yr to any organ if allowed to continue for a full year.



The dose to an individual, as calculated in the ODCM, from radioiodine, radioactive materials in particulate form and radionuclides other than noble gases with half-lives greater than eight days released with gaseous effluents from the site shall be limited to the following:

- (i) During any calendar quarter to  $\leq 7.5$  mrem to any organ.
- (ii) During any calendar year to  $\leq 15$  mrem to any organ.

### 2.1.3 Liquid Effluents

The release of radioactive liquid effluents shall be such that the concentration in the circulating water discharge does not exceed the limits specified in accordance with Appendix B, Table II, Column 2 and notes thereto of 10CFR20. For dissolved or entrained noble gases the total activity due to dissolved or entrained noble gases shall not exceed  $2 \text{ E-4 uCi/ml}$ .

The dose or dose commitment to an individual as calculated in the ODCM from radioactive materials in liquid effluents released to unrestricted areas shall be limited:

- (i) During any calendar quarter to  $\leq 1.5$  mrem to the total body and to  $\leq 5$  mrem to any organ, and
- (ii) During any calendar year to  $\leq 3$  mrem to the total body and to  $\leq 10$  mrem to any organ.

### 2.2 Maximum Permissible Concentrations (MPC)

2.2.1 For gaseous effluents, maximum permissible concentrations are not directly used in release rate calculations since the applicable limits are stated in terms of dose rate at the unrestricted area boundary.

2.2.2 For liquid effluents, the maximum permissible concentration values specified in 10CFR20, Appendix B, Table II, column 2 are used to calculate release rates and permissible concentrations at the unrestricted area boundary. A value of  $2\text{E-04 uCi/ml}$  is used as the MPC for dissolved and entrained noble gases in liquid effluents.



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## 2.3

Release Rate Limits

The release rate limits for fission and activation gases from the R.G.&E Ginna plant are not based on the average energy of the radionuclide mixture in gaseous effluents; therefore, this value is not applicable. However, the average energy of the radionuclide mixture was 0.137 Mev.

## 2.4

Measurements and Approximations of Total Radioactivity

Gamma spectroscopy was the primary analysis method used to determine the radionuclide composition and concentration of gaseous and liquid effluents. Composite samples were analyzed for Sr-89, Sr-90 and Fe-55 by a contract laboratory. Tritium and alpha analysis were done using liquid scintillation and gas flow proportional counting respectively.

The total radioactivity in effluent release was determined from the measured concentration of each radionuclide present and the total volume of effluents released.

## 2.5

Batch Releases

## 2.5.1

Liquid

1.	Number of batch release:	4.46 E+02
2.	Total time period for batch releases:	6.30 E+04 min
3.	Maximum time period for a batch release:	1.03 E+04 min
4.	Average time period for batch releases:	1.35 E+02 min
5.	Minimum time period for a batch release:	1.0 E+01 min
6.	Average stream flow (LPM) during periods of release effluent into a flowing stream:	9.02 E+02

## 2.5.2

Gaseous

1.	Number of batch releases:	4E+00
2.	Total time period for batch releases:	1.31E+03 min
3.	Maximum time period for a batch release:	4.83E+02 min
4.	Average time period for batch releases:	3.28E+02min
5.	Minimum time period for a batch release:	2.46E+02 min



## 2.6 Abnormal Releases

There were no abnormal releases of liquid or gaseous effluents during the reporting period.

## 3.0 SUMMARY OF GASEOUS RADIOACTIVE EFFLUENTS

The quantities of radioactive material released in gaseous effluents are summarized in tables 1A and 1B. All releases were considered to be elevated releases.

## 4.0 SUMMARY OF LIQUID RADIOACTIVE EFFLUENTS

The quantities of radioactive material released in liquid effluents are summarized in tables 2A and 2B.

Corrected pages for the January 1 - June 30, 1989 Liquid Effluent Release Report are included to update data not available when the earlier report was prepared. The additional data and those values which changed are marked along the margin of Tables 6A and 6B.

## 5.0 SOLID WASTES

The quantities of radioactive material released in shipments of solid waste transported from the site during the reporting period are summarized in table 3. Principal nuclides were determined by gamma spectroscopy and non- gamma emitters were calculated from scaling factors determined by an independent laboratory from representative samples of that waste type.

## 6.0 LOWER LIMIT OF DETECTION NOT MET

There were 2 liquid releases for which 1 or more gamma emitting radionuclide did not meet the required lower limit for detection. These are listed by release number in table 4.

## 7.0 RADIOLOGICAL IMPACT

An assessment of doses to the maximally exposed individual from gaseous and liquid effluents was performed for locations representing the maximum dose. In all cases, doses were well below Technical Specification limits. Doses were assessed based upon actual meteorological conditions considering the noble gas exposure, inhalation, ground plane and ingestion pathways. The ingestion pathways considered were the produce, vegetable, goat's milk, cow's milk and meat pathway. The results of this assessment are presented in Tables 5A and 5B.



8.0 METEOROLOGICAL DATA

The annual summary of hourly meteorological data collected during 1989 is not included with this report, but can be made available at the RG&E Ginna Plant as allowed by Technical Specifications.

9.0 LAND USE CHANGES

There were no changes in critical receptor location for dose calculations during the reporting period.

10.0 ANNUAL TABULATION OF PERSONNEL EXPOSURE

The annual tabulation of the number of station, utility and other personnel receiving exposures greater than 100 mrem/yr and their associated man-rem exposure according to work and job function required by Technical Specification 6.9.2.2 and 10CFR20.407 is included as Tables 7A and 7B.

11.0 LEAK TEST OF SEALED SOURCES

No sealed sources were found to be leaking when smeared by both wet and dry smears.

12.0 CHANGES TO THE OFFSITE DOSE CALCULATION MANUAL (ODCM)

There were no changes to the ODCM during the report period.

13.0 CHANGES TO THE PROCESS CONTROL PROGRAM (PCP)

There were no changes to the PCP during the reporting period.

14.0 MAJOR CHANGES TO RADWASTE TREATMENT SYSTEMS

There were no major changes to the Radwaste Treatment Systems during the reporting period.

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Table 1A

## EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT

## GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

July - December, 1989

	Unit	Quarter	Quarter	Est. Total Error %
A. Fission & activation gases		3	4	
1. Total release	Ci	9.14E+01	3.99E+02	7.0 E+00
2. Average release rate for period	uCi/sec	1.15E+01	5.02E+01	
3. Percent of technical specification limit	%	1.83E-03	7.97E-03	
B. Iodines				
1. Total iodine-131	Ci	2.05E-04	1.91E-04	2.6 E+01
2. Average release rate for period	uCi/sec	2.58E-05	2.40E-05	
3. Percent of technical specification limit	%	5.67E-02	5.28E-02	
C. Particulates				
1. Particulates with half-lives > 8 days	Ci	5.60E-01	5.68E-01	3.0 E+01
2. Average release rate for period	uCi/sec	7.05E-02	7.15E-02	
3. Percent of technical specification limit	%	3.75E-06	3.80E-06	
4. Gross alpha radioactivity	Ci			
D. Tritium				
1. Total release	Ci	1.66E+01	2.39E+01	3.2 E+00
2. Average release rate for period	uCi/sec	2.09E+00	3.01E+00	
3. Percent of technical specification limit	%	2.46E-04	3.54E-04	

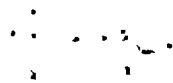




Table 1B

## EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT

## GASEOUS EFFLUENTS - ELEVATED RELEASE

July - December, 1989

Nuclides Released	Unit	CONTINUOUS MODE		BATCH MODE	
		Quarter	Quarter	Quarter	Quarter
1. Fission gases		3	4	3	4
krypton-85	Ci			7.77E-02	5.56E-01
krypton-85m	Ci	4.65E-01	1.03E-01		
krypton-87	Ci	4.13E-02	6.13E-02		
krypton-88	Ci	6.49E-02	1.08E-02		
xenon-133	Ci	7.49E+01	3.83E+02	1.47E-01	2.70E-01
xenon-135	Ci	1.49E+01	7.02E+00		
xenon-135m	Ci	3.35E-01	2.08E-01		
xenon-138	Ci	2.26E-01	1.65E-01		
Others (specify)	Ci				
argon-41	Ci	1.10E-01	6.81E-01		
xenon-131m	Ci	1.17E-01	4.58E+00	6.56E-03	1.24E-02
xenon-133m	Ci	2.79E-02	2.16E+00	5.14E-04	
Total for period	Ci	9.12E+01	3.98E+02	2.32E-01	8.38E-01
2. Iodines					
iodine-131	Ci	2.05E-04	1.91E-04		
iodine-133	Ci	2.48E-05	4.03E-05		
iodine-135	Ci				
Total for period	Ci	2.30E-04	2.31E-04		
3. Particulates					
strontium-89	Ci				*
strontium-90	Ci				*
cesium-134	Ci				
cesium-137	Ci				
barium-lanthanum-140	Ci				
Others (specify)	Ci				
carbon-14	Ci	3.80E-01	3.88E-01	1.80E-01	1.80E-01
	Ci				
unidentified	Ci	1.01E-04	5.55E-06		

Note: Isotopes for which no value is given were not identified in applicable releases.

\* Sample sent out for analysis but results not yet received. Data for identified isotopes will be included with next semi-annual report for January - June, 1990.

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Table 2A

## EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT

## LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

July - December, 1989

	Unit	Quarter	Quarter	Est.Total Error, %
A. Fission and activation products		3	4	
1. Total release (not including tritium, gases, alpha)	Ci	1.27E-02	3.15E-03	9.0 E+00
2. Average diluted concentration during period	uCi/ml	7.93E-11	1.94E-11	
3. Percent of applicable limit	%	7.93E-03	7.89E-04	
B. Tritium				
1. Total release	Ci	1.88E+02	4.96E+01	3.2 E+00
2. Average diluted concentration during period	uCi/ml	1.18E-06	3.04E-07	
3. Percent of applicable limit	%	3.92E-02	1.01E-02	
C. Dissolved and entrained gases				
1. Total release	Ci		3.70E-04	3.0 E+01
2. Average diluted concentration during period	uCi/ml		2.27E-12	
3. Percent of applicable limit	%		1.14E-06	
D. Gross alpha radioactivity				
1. Total release	Ci			
E. Volume of waste released (prior to dilution)	liters	3.28E+07	2.91E+07	5.0 E+00
F. Volume of dilution water used during period	liters	1.60E+11	1.63E+11	5.0 E+00



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Table 2B

## EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT

## LIQUID EFFLUENTS

July - December, 1989

Nuclides Released	Unit	CONTINUOUS MODE		BATCH MODE	
		Quarter	Quarter	Quarter	Quarter
		3	4	3	4
strontium-89	Ci		*		*
strontium-90	Ci		*		*
cesium-134	Ci			3.93E-04	1.21E-04
cesium-137	Ci	2.62E-04	1.77E-05	5.64E-03	2.27E-03
iodine-131	Ci	4.93E-05	5.55E-06	3.34E-03	3.38E-04
cobalt-58	Ci	1.06E-07		1.02E-03	5.19E-05
cobalt-60	Ci	6.44E-07	3.32E-07	6.46E-04	1.96E-04
iron-59	Ci				
zinc-65	Ci				
manganese-54	Ci			1.75E-05	3.75E-06
chromium-51	Ci				
zirconium-niobium-95	Ci			2.87E-05	1.66E-06
molybdenum-99	Ci				
technetium-99m	Ci				
barium-lanthanum-140	Ci				9.44E-06
cerium-141	Ci				
Other (specify)	Ci				
silver-110m	Ci			3.62E-05	1.15E-07
antimony-124	Ci			1.60E-04	8.31E-05
antimony-125	Ci			1.21E-04	3.37E-05
iodine-133	Ci			9.91E-04	1.16E-07
iodine-135	Ci			9.69E-06	
cesium-136	Ci			3.35E-05	
unidentified	Ci				
Total for period (above)	Ci	3.21E-04	3.72E-05	1.24E-02	3.11E-03
xenon-133	Ci				3.67E-04
xenon-135	Ci				3.03E-06

NOTE: Isotopes for which no value is given were not identified in applicable releases.

\* Sample sent out for analysis but results not yet received. Data for identified isotopes will be included with next Semi-Annual Report for January - June, 1990.



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Table 3

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT  
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (Not irradiated fuel)

1. Type of waste	Unit	6-month Period	Est. Total Error %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m <sup>3</sup> Ci	1.27E+02 3.66E+01	2E+00 5E+00
b. Dry compressible waste, contaminated equip, etc.	m <sup>3</sup> Ci	1.13E+01 4.63E-01	2E+00 5E+00
c. Irradiated components, control rods, etc.	m <sup>3</sup> Ci		
d. Other (describe)	m <sup>3</sup> Ci		

2. Estimate of major nuclide composition (by type of waste)

a. Co-60	%	3.7E+01
Cs-137	%	2.5E+01
Fe-55	%	1.1E+01
Ni-63	%	1.0E+01
Cs-134	%	5.9E+00
Mn-54	%	3.0E+00
Co-58	%	2.4E+00
H-3	%	1.6E+00
Sb-125	%	1.3E+00
b. Fe-55	%	4.0E+01
Ni-63	%	3.4E+01
Co-60	%	1.6E+01
Co-58	%	6.0E+00
Sr-90	%	2.0E-01
C-14	%	2.2E+00
Cs-137	%	1.0E-01

3. Solid Waste Disposition

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
21	Highway Vehicle	Barnwell, SC

B. IRRADIATED FUEL SHIPMENTS (Disposition)

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
None		



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RELEASE PERMITS NOT MEETING LLD REQUIREMENTS

a. Activity from other isotopes caused an increased background resulting in the LLD calculation exceeding 5E-07 uCi/ml for the listed isotopes.



TABLE 5A

RADIATION DOSES TO NEAREST INDIVIDUAL RECEPTOR  
FROM GASEOUS RELEASES IN REM

1989 QUARTER 1

Direction	Adult			Teen			Child			Infant		
	Total Body	Skin	Thyroid	Total Body	Skin	Thyroid	Total Body	Skin	Thyroid	Total Body	Skin	Thyroid
N	2.0E-8	1.6E-8	2.1E-8	2.2E-8	1.6E-8	2.2E-8	2.2E-8	1.6E-8	2.3E-8	1.7E-8	1.6E-8	1.8E-8
NNE	3.0E-8	2.1E-8	3.1E-8	3.2E-8	2.1E-8	3.3E-8	3.2E-8	2.1E-8	3.4E-8	2.4E-8	2.1E-8	2.5E-8
NE	8.8E-8	7.1E-8	9.0E-8	9.5E-8	7.1E-8	9.7E-8	9.8E-8	7.1E-8	1.0E-7	7.6E-8	7.1E-8	7.8E-8
ENE	1.2E-7	1.1E-7	1.3E-7	1.3E-7	1.1E-7	1.3E-7	1.3E-7	1.1E-7	1.4E-7	1.0E-7	1.1E-7	1.1E-7
E	7.4E-7	6.9E-7	7.5E-7	7.6E-7	6.9E-7	7.6E-7	7.3E-7	6.9E-7	7.3E-7	5.8E-7	6.9E-7	5.9E-7
ESE	6.4E-7	5.4E-7	6.4E-7	6.7E-7	5.4E-7	6.8E-7	6.8E-7	5.4E-7	6.8E-7	5.3E-7	5.4E-7	5.4E-7
SE.	8.4E-7	1.3E-6	8.4E-7	8.7E-7	1.3E-6	8.7E-7	8.9E-7	1.3E-6	9.0E-7	8.2E-7	1.3E-6	8.2E-7
SSE	1.5E-7	1.4E-7	1.5E-7	1.6E-7	1.4E-7	1.6E-7	1.3E-7	1.4E-7	1.6E-7	1.3E-7	1.4E-7	1.3E-7
S	2.6E-7	1.7E-7	2.7E-7	2.8E-7	1.7E-7	2.8E-7	2.7E-7	1.7E-7	2.8E-7	2.0E-7	1.7E-7	2.1E-7
SSW	2.2E-6	2.3E-7	2.2E-6	2.2E-6	2.3E-7	2.2E-6	2.0E-6	2.3E-7	2.0E-6	1.2E-6	2.3E-7	1.2E-6
SW	1.9E-7	2.3E-7	1.9E-7	2.0E-7	2.3E-7	2.1E-7	2.1E-7	2.3E-7	2.2E-7	1.8E-7	2.3E-7	1.8E-7
WSW	4.6E-7	3.9E-7	4.7E-7	5.5E-7	3.9E-7	5.5E-7	6.4E-7	3.9E-7	6.5E-7	5.3E-7	3.9E-7	5.4E-7
W	1.4E-7	1.5E-7	1.4E-7	1.4E-7	1.5E-7	1.4E-7	1.4E-7	1.5E-7	1.4E-7	1.2E-7	1.5E-7	1.2E-7
WNW	1.2E-7	5.5E-8	1.2E-7	1.2E-7	5.5E-8	1.2E-7	1.1E-7	5.5E-8	1.1E-7	7.5E-8	5.5E-8	7.6E-8
NW	7.1E-9	6.2E-9	7.2E-9	7.5E-9	6.2E-9	7.7E-9	7.7E-9	6.2E-9	7.9E-9	5.9E-9	6.2E-9	6.1E-9
NNW	9.2E-8	7.8E-9	9.4E-9	9.8E-9	7.8E-9	1.0E-8	1.0E-8	7.8E-9	1.0E-8	7.8E-9	7.8E-9	8.0E-9

10-10-68

1. The first part of the report discusses the general situation of the company and the results of the audit. It also mentions the fact that the company has been operating for a number of years and that the audit was conducted in accordance with the standards of the Institute of Chartered Accountants.

### 2. The second part of the report discusses the results of the audit.

The results of the audit are as follows: The company has been operating for a number of years and has a good reputation. The audit was conducted in accordance with the standards of the Institute of Chartered Accountants. The results of the audit are as follows: The company has been operating for a number of years and has a good reputation. The audit was conducted in accordance with the standards of the Institute of Chartered Accountants.

The company has been operating for a number of years and has a good reputation. The audit was conducted in accordance with the standards of the Institute of Chartered Accountants. The results of the audit are as follows: The company has been operating for a number of years and has a good reputation. The audit was conducted in accordance with the standards of the Institute of Chartered Accountants.

The company has been operating for a number of years and has a good reputation. The audit was conducted in accordance with the standards of the Institute of Chartered Accountants. The results of the audit are as follows: The company has been operating for a number of years and has a good reputation. The audit was conducted in accordance with the standards of the Institute of Chartered Accountants.

TABLE 5A

RADIATION DOSES TO NEAREST INDIVIDUAL RECEPTOR  
FROM GASEOUS RELEASES IN REM

1989 QUARTER 2

Direction	Adult			Teen			Child			Infant		
	Total Body	Skin	Thyroid	Total Body	Skin	Thyroid	Total Body	Skin	Thyroid	Total Body	Skin	Thyroid
N	4.5E-8	6.4E-9	4.5E-8	4.8E-8	6.4E-9	4.8E-8	4.6E-8	6.4E-9	4.7E-8	3.0E-8	6.4E-9	3.1E-8
NNE	5.7E-8	9.0E-9	5.8E-8	6.0E-8	9.0E-9	6.1E-8	5.9E-8	9.0E-9	6.0E-8	3.8E-8	9.0E-9	3.9E-8
NE	9.1E-8	1.2E-8	9.2E-8	9.5E-8	1.2E-8	9.7E-8	9.2E-8	1.2E-8	9.4E-8	5.9E-8	1.2E-8	6.1E-8
ENE	1.6E-7	8.9E-9	1.6E-7	1.7E-7	8.9E-9	1.8E-7	1.7E-7	8.9E-9	1.7E-7	1.1E-7	8.9E-9	1.1E-7
E	4.2E-6	2.5E-6	4.3E-6	5.8E-6	4.0E-6	5.8E-6	1.1E-5	9.4E-6	1.2E-5	3.5E-6	2.7E-6	3.7E-6
ESE	2.7E-6	1.8E-6	2.8E-6	3.7E-6	2.8E-6	3.8E-6	7.6E-6	6.4E-6	7.7E-6	3.6E-6	3.1E-6	3.8E-6
SE	1.3E-6	8.2E-7	1.3E-6	1.6E-6	1.1E-6	1.7E-6	3.0E-6	2.3E-6	3.0E-6	3.9E-6	3.5E-6	3.9E-6
SSE	4.8E-7	3.3E-7	4.8E-7	6.4E-7	4.7E-7	6.5E-7	1.2E-6	1.0E-6	1.3E-6	1.7E-6	1.5E-6	1.7E-6
S	1.8E-6	9.9E-7	1.9E-6	2.4E-6	1.4E-6	2.4E-6	4.3E-6	3.2E-6	4.4E-6	2.3E-6	1.9E-6	2.4E-6
SSW	1.3E-6	9.2E-7	1.4E-6	1.8E-6	1.3E-6	1.8E-6	3.5E-6	2.9E-6	3.6E-6	4.0E-6	3.6E-6	4.0E-6
SW	3.6E-6	2.0E-6	3.7E-6	4.5E-6	2.5E-6	4.6E-6	7.5E-6	4.8E-6	7.7E-6	7.4E-6	5.8E-6	7.6E-6
WSW	2.4E-6	1.1E-6	2.4E-6	3.1E-6	1.7E-6	3.2E-6	5.7E-6	4.0E-6	5.9E-6	4.2E-6	3.5E-6	4.4E-6
W	1.5E-6	6.8E-7	1.5E-6	1.9E-6	1.0E-6	1.9E-6	3.3E-6	2.2E-6	3.4E-6	2.0E-6	1.5E-6	2.1E-6
WNW	3.5E-7	1.6E-7	3.6E-7	4.0E-7	2.0E-7	4.1E-7	6.0E-7	3.5E-7	6.2E-7	1.1E-7	9.8E-8	1.2E-7
NW	2.2E-8	1.1E-8	2.2E-8	2.3E-8	1.1E-8	2.3E-8	2.2E-8	1.1E-8	2.2E-8	1.5E-8	1.1E-8	1.5E-8
NNW	4.0E-8	9.2E-9	4.0E-8	4.1E-8	9.2E-9	4.1E-8	3.9E-8	9.2E-9	3.9E-8	2.5E-8	9.2E-9	2.6E-8



TABLE 5A

RADIATION DOSES TO NEAREST INDIVIDUAL RECEPTOR  
FROM GASEOUS RELEASES IN REM

1989 QUARTER 3

Direction	Adult			Teen			Child			Infant		
	Total Body	Skin	Thyroid	Total Body	Skin	Thyroid	Total Body	Skin	Thyroid	Total Body	Skin	Thyroid
N	9.0E-8	1.6E-7	4.4E-7	9.1E-8	1.6E-7	5.7E-7	8.9E-8	1.6E-7	7.2E-7	7.7E-8	1.6E-7	6.6E-7
NNE	1.0E-7	1.3E-7	5.4E-6	1.1E-7	1.3E-7	7.2E-6	1.1E-7	1.3E-7	9.5E-6	8.9E-8	1.3E-7	8.8E-6
NE	9.6E-8	1.1E-7	9.2E-6	1.0E-7	1.1E-7	1.2E-5	1.1E-7	1.1E-7	1.6E-5	8.8E-8	1.1E-7	1.5E-5
ENE	5.4E-8	5.9E-8	5.9E-6	6.0E-8	5.9E-8	8.0E-6	6.3E-8	5.9E-8	1.0E-5	5.1E-8	5.9E-8	9.7E-6
E	1.4E-6	1.5E-6	7.6E-5	1.7E-6	1.7E-6	8.4E-5	2.6E-6	2.5E-6	1.4E-4	1.3E-6	1.4E-6	1.2E-4
ESE	3.2E-6	3.3E-6	2.0E-4	3.6E-6	3.6E-6	2.2E-4	5.0E-6	4.7E-6	3.8E-4	2.9E-6	3.2E-6	3.1E-4
SE	2.0E-6	2.5E-6	9.3E-5	2.3E-6	2.6E-6	1.0E-4	3.1E-6	3.3E-6	1.7E-4	2.1E-6	2.6E-6	1.4E-4
SSE	7.0E-7	7.5E-7	4.6E-5	7.9E-7	8.1E-7	5.1E-5	1.1E-6	1.1E-6	8.9E-5	8.2E-7	8.5E-7	8.5E-5
S	4.4E-6	4.6E-6	2.6E-4	5.0E-6	5.1E-6	2.6E-4	7.5E-6	7.0E-6	4.6E-4	3.3E-6	4.1E-6	2.4E-4
SSW	3.1E-6	3.0E-6	2.1E-4	3.6E-6	3.4E-6	2.3E-4	5.5E-6	4.9E-6	3.7E-4	3.9E-6	4.2E-6	2.3E-4
SW	3.0E-6	3.0E-6	2.6E-5	4.1E-6	4.0E-6	3.2E-5	8.0E-6	7.7E-6	5.7E-5	3.1E-6	3.3E-6	6.0E-5
WSW	1.7E-6	1.8E-6	3.0E-5	2.4E-6	2.4E-6	3.6E-5	5.0E-6	4.8E-6	6.2E-5	2.3E-6	2.4E-6	6.9E-5
W	1.3E-6	1.4E-6	3.5E-6	1.8E-6	1.8E-6	4.8E-6	3.5E-6	3.5E-6	7.7E-6	1.8E-6	2.0E-6	6.1E-6
WNW	2.5E-7	3.3E-7	3.6E-7	3.0E-7	3.8E-7	4.0E-7	5.0E-7	5.5E-7	6.4E-7	1.3E-7	2.6E-7	1.4E-7
NW	2.8E-8	4.7E-8	3.1E-7	2.8E-8	4.7E-8	4.1E-7	2.8E-8	4.7E-8	5.3E-7	2.4E-8	4.7E-8	4.9E-7
NNW	3.4E-8	6.0E-8	3.5E-8	3.4E-8	6.0E-8	3.6E-8	3.3E-8	6.0E-8	3.5E-8	2.9E-8	6.0E-8	3.1E-8

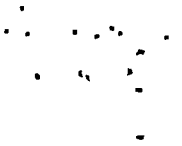




TABLE 5A

RADIATION DOSES TO NEAREST INDIVIDUAL RECEPTOR  
FROM GASEOUS RELEASES IN REM

1989 QUARTER 4

Direction	Adult			Teen			Child			Infant		
	Total Body	Skin	Thyroid	Total Body	Skin	Thyroid	Total Body	Skin	Thyroid	Total Body	Skin	Thyroid
N	3.6E-7	8.8E-7	3.6E-7	3.6E-7	8.8E-7	3.7E-7	3.6E-7	8.8E-7	3.6E-7	3.4E-7	8.8E-7	3.4E-7
NNE	4.2E-7	1.0E-6	4.3E-7	4.3E-7	1.0E-6	4.3E-7	4.2E-7	1.0E-6	1.3E-7	4.0E-7	1.0E-6	4.0E-7
NE	1.6E-7	3.5E-7	1.7E-7	1.7E-7	3.5E-7	1.7E-7	1.6E-7	3.5E-7	1.7E-7	1.5E-7	3.5E-7	1.5E-7
ENE	1.4E-7	3.0E-7	1.5E-7	1.4E-7	3.0E-7	1.5E-7	1.4E-7	3.0E-7	1.5E-7	1.3E-7	3.0E-7	1.3E-7
E	1.4E-6	2.0E-6	1.7E-6	1.5E-6	2.1E-6	1.9E-6	2.0E-6	2.5E-6	2.6E-6	1.1E-6	2.1E-6	1.8E-6
ESE	1.2E-6	1.5E-6	1.9E-6	1.4E-6	1.6E-6	2.1E-6	1.8E-6	1.9E-6	3.0E-6	9.7E-7	1.5E-6	2.2E-6
SE	1.4E-6	2.2E-6	1.6E-6	1.5E-6	2.2E-6	1.7E-6	1.7E-6	2.4E-6	2.1E-6	1.2E-6	2.2E-6	1.7E-6
SSE	2.0E-7	2.5E-7	2.2E-7	2.2E-7	2.6E-7	2.4E-7	2.8E-7	3.0E-7	3.1E-7	2.6E-7	3.1E-7	3.1E-7
S	5.6E-7	7.2E-7	6.1E-7	5.9E-7	7.4E-7	6.5E-7	7.0E-7	8.2E-7	7.9E-7	5.6E-7	7.9E-7	7.0E-7
SSW	7.9E-7	1.7E-6	9.8E-7	8.4E-7	1.7E-6	1.0E-6	9.9E-7	1.8E-6	1.3E-6	8.3E-7	1.8E-6	1.0E-6
SW	7.8E-7	1.2E-6	1.1E-6	8.7E-7	1.3E-6	1.2E-6	1.2E-6	1.5E-6	1.7E-6	1.1E-6	1.5E-6	1.6E-6
WSW	1.8E-6	3.8E-6	2.0E-6	2.0E-6	3.9E-6	2.1E-6	2.4E-6	4.2E-6	2.6E-6	2.1E-6	4.1E-6	2.4E-6
W	2.1E-6	4.6E-6	2.1E-6	2.2E-6	4.6E-6	2.2E-6	2.5E-6	4.8E-6	2.6E-6	2.0E-6	4.6E-6	2.2E-6
WNW	9.1E-7	1.9E-6	9.4E-7	9.7E-7	2.0E-6	9.9E-7	1.2E-6	2.1E-6	1.2E-6	7.2E-7	4.9E-6	7.2E-7
NW	1.5E-7	3.7E-7	1.5E-7	1.5E-7	3.7E-7	1.5E-7	1.5E-7	3.7E-7	1.5E-7	1.4E-7	3.7E-7	1.5E-7
NNW	1.0E-7	2.5E-7	1.1E-7	1.1E-7	2.5E-7	1.1E-7	1.0E-7	2.5E-7	1.1E-7	9.8E-8	2.5E-7	1.0E-7



TABLE 5B

RADIATION DOSE TO NEAREST INDIVIDUAL  
FROM LIQUID RELEASES IN MREM

	<u>Adult</u>	<u>Teen</u>	<u>Child</u>	<u>Infant</u>
First Quarter				
Total Body	2.07E-6	2.11E-6	1.91E-6	1.13E-6
Bone	1.02E-6	1.46E-6	2.02E-6	1.49E-6
Thyroid	2.08E-6	2.12E-6	1.92E-6	1.13E-6
Second Quarter				
Total Body	4.56E-6	6.17E-6	1.20E-5	4.25E-6
Bone	1.30E-5	2.04E-5	4.80E-5	1.20E-5
Thyroid	4.65E-6	6.27E-6	1.22E-5	4.40E-6
Third Quarter				
Total Body	3.60E-6	4.58E-6	8.22E-6	2.78E-6
Bone	9.50E-6	1.42E-5	3.15E-5	6.59E-6
Thyroid	2.77E-4	2.82E-4	4.73E-4	2.35E-4
Fourth Quarter				
Total Body	8.24E-7	9.90E-7	1.54E-6	6.23E-7
Bone	1.13E-6	1.73E-6	3.75E-6	1.33E-6
Thyroid	1.38E-6	1.49E-6	2.29E-6	1.11E-6



Table 6A

## EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT

## LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

Corrected Page for Quarter 2

January - June, 1989

	Unit	Quarter 1	Quarter 2	Est.Total Error, %
A. Fission and activation products				
1. Total release (not including tritium, gases, alpha)	Ci	2.25E-02	4.28E-02	1.1 E+01
2. Average diluted concentration during period	uCi/ml	1.80E-10	3.86E-10	
3. Percent of applicable limit	%	2.38E-02	5.31E-03	
B. Tritium				
1. Total release	Ci	1.82E+02	1.72E+02	3.2 E+00
2. Average diluted concentration during period	uCi/ml	1.48E-06	1.55E-06	
3. Percent of applicable limit	%	4.93E-02	5.17E-02	
C. Dissolved and entrained gases				
1. Total release	Ci	1.67E-04		3.0 E+01
2. Average diluted concentration during period	uCi/ml	1.34E-12		
3. Percent of applicable limit	%	1.34E-06		
D. Gross alpha radioactivity				
1. Total release	Ci			
E. Volume of waste released (prior to dilution)				
	liters	3.05E+07	2.63E+07	5.0 E+00
F. Volume of dilution water used during period				
	liters	1.25E+11	1.11E+11	5.0 E+00

Corrected for Sr-89, Sr-90 and Fe-55 results received from contract laboratory after normal report period.

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Table 6B  
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT

LIQUID EFFLUENTS

Corrected Page for Quarter 2

January - June, 1989

Nuclides Released	Unit	CONTINUOUS MODE		BATCH MODE	
		Quarter	Quarter	Quarter	Quarter
		1	2	1	2
strontium-89	Ci	3.62E-05			4.16E-06
strontium-90	Ci				9.77E-06
cesium-134	Ci		2.53E-06	2.02E-04	1.33E-03
cesium-137	Ci	2.81E-04	1.20E-04	2.43E-03	5.03E-03
iodine-131	Ci	8.82E-06	5.35E-05	5.94E-03	2.38E-03
cobalt-58	Ci	5.05E-05	6.39E-05	1.40E-04	6.50E-03
cobalt-60	Ci		5.05E-07	1.92E-04	2.34E-03
iron-59	Ci				
zinc-65	Ci			9.29E-09	
manganese-54	Ci			5.42E-07	2.43E-04
chromium-51	Ci			1.70E-06	6.25E-06
zirconium-niobium-95	Ci			7.36E-06	1.18E-04
molybdenum-99	Ci			2.36E-05	5.80E-05
technetium-99m	Ci				
barium-lanthanum-140	Ci			3.34E-06	1.79E-05
cerium-141	Ci			9.50E-06	1.44E-04
Other (specify)	Ci				
silver-110m	Ci			3.45E-05	4.95E-04
antimony-124	Ci		2.40E-08	2.08E-05	1.17E-02
antimony-125	Ci		5.35E-05	5.15E-06	5.94E-03
iodine-133	Ci	4.16E-05	8.89E-05	8.53E-03	4.08E-03
iodine-135	Ci	5.19E-05	2.20E-06	4.49E-03	1.69E-03
iron-55	Ci				3.11E-04
unidentified	Ci				
Total for period (above)	Ci	4.70E-04	3.85E-04	2.20E-02	4.24E-02
xenon-133	Ci			1.67E-04	
xenon-135	Ci				

NOTE: Isotopes for which no value is given were not identified in applicable releases.

Corrected for Sr-89, Sr-90 and Fe-55 results received from contract laboratory after normal report period.



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Table 7A

ROCHESTER GAS & ELECTRIC CORPORATION GINNA STATION  
NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION  
FOR 89/01/01 - 89/12/31

EST. WHOLE BODY DOSE		NO. OF PERSONNEL (> or = 100)			TOTAL MAN-REM		
WORK PERMIT CATEGORY	WORK GROUP	CONTRACT WORKERS	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT WORKERS	STATION EMPLOYEES	UTILITY EMPLOYEES
REACTOR OPERATIONS & SURV	MAINTENANCE PERSONNEL	223	42	135	2.887	4.371	1.620
	OPERATING PERSONNEL	2	31	0	0.189	13.822	0.000
	HEALTH PHY. PERSONNEL	54	14	3	27.899	5.480	0.530
	SUPERVISORY PERSONNEL	63	14	16	3.173	2.758	0.740
	ENGINEERING PERSONNEL	31	1	5	2.731	0.155	0.252
ROUTINE MAINTENANCE	MAINTENANCE PERSONNEL	354	42	191	81.110	13.075	39.674
	OPERATING PERSONNEL	1	30	0	0.020	1.952	0.000
	HEALTH PHY. PERSONNEL	50	14	3	10.920	2.659	0.577
	SUPERVISORY PERSONNEL	77	13	16	11.758	1.876	5.249
	ENGINEERING PERSONNEL	28	1	5	2.263	0.007	0.479
INSERVICE INSPECTION	MAINTENANCE PERSONNEL	99	22	55	10.808	0.738	5.311
	OPERATING PERSONNEL	1	14	0	0.085	0.455	0.000
	HEALTH PHY. PERSONNEL	14	4	1	0.287	0.803	0.000
	SUPERVISORY PERSONNEL	33	9	10	2.884	0.900	1.139
	ENGINEERING PERSONNEL	14	0	3	0.907	0.000	0.183
SPECIAL MAINTENANCE	MAINTENANCE PERSONNEL	331	42	187	193.916	12.054	130.481
	OPERATING PERSONNEL	0	27	0	0.000	1.432	0.000
	HEALTH PHY. PERSONNEL	47	11	2	7.535	1.828	0.267
	SUPERVISORY PERSONNEL	75	13	14	27.198	2.610	5.711
	ENGINEERING PERSONNEL	29	1	4	12.402	0.005	0.210
WASTE PROCESSING	MAINTENANCE PERSONNEL	80	20	24	8.026	0.911	0.772
	OPERATING PERSONNEL	0	13	0	0.000	0.265	0.000
	HEALTH PHY. PERSONNEL	27	12	2	5.763	0.705	0.760
	SUPERVISORY PERSONNEL	10	3	2	0.030	0.045	0.000
	ENGINEERING PERSONNEL	5	0	1	0.000	0.000	0.010
REFUELING	MAINTENANCE PERSONNEL	64	27	34	14.235	1.135	4.528
	OPERATING PERSONNEL	0	7	0	0.000	1.953	0.000
	HEALTH PHY. PERSONNEL	8	6	0	1.310	1.746	0.000
	SUPERVISORY PERSONNEL	16	3	5	1.490	0.040	0.595
	ENGINEERING PERSONNEL	0	0	1	0.000	0.000	0.835
TOTAL	MAINTENANCE PERSONNEL	359	42	191	310.982	32.284	182.386
	OPERATING PERSONNEL	2	31	0	0.294	19.879	0.000
	HEALTH PHY. PERSONNEL	55	14	3	53.714	13.221	2.134
	SUPERVISORY PERSONNEL	82	16	17	46.533	8.229	13.434
	ENGINEERING PERSONNEL	31	1	5	18.303	0.167	1.969
GRAND TOTAL	=====	520	101	216	429.826	73.780	199.923

NOTE: This report is based on SRPD (Self Reading Pocket Dosimeter) exposures taken from the WORK PERMITS.



Table 7B

STANDARD REPORT OF PERSONNEL WHOLE BODY EXPOSURE 1989

<u>DOSE (REM)</u>	<u>NUMBER OF PEOPLE</u>
00.000 - 00.000	849
00.001 - 00.100	422
00.101 - 00.250	186
00.251 - 00.500	181
00.501 - 00.750	144
00.751 - 01.000	99
01.001 - 02.000	205
02.001 - 03.000	16
03.001 - 04.000	1
04.001 - 05.000	0

Total number of personnel monitored 2103

The total collective dose for 1989 is 605 person-rem based on the sum of all personnel TLD badge readings.

FIVE HIGHEST EXPOSURES FOR THE YEAR

A	3.236
B	2.967
C	2.393
D	2.342
E	2.327

This report contains all personnel monitored during 1989.

