SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

R. E. GINNA NUCLEAR PLANT

ROCHESTER GAS AND ELECTRIC

DOCKET NO. 50-244

JANUARY - JUNE 1990

9009110086 900829
PDR ADOCK 05000244
R PDC

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 - Gaseous 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

1.0 INTRODUCTION

This Semiannual Radioactive Effluent Release Report is for Rochester Gas and Electric Corporation'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 January 1, 1990 through June 30, 1990.

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 ≤ 7.5 mrem to any organ.

(ii) During any calendar year to ≤ 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 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 ≤ 1.5 mrem to the total body and to ≤ 5 mrem to any organ, and

(ii) During any calendar year to ≤ 3 mrem to the total body and to ≤ 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 2E-04 uCi/ml is used as the MPC for dissolved and entrained noble gases in liquid effluents.

2.3 Release Rate Limits

The release rate limits for fission and activation gases from the R.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 0.285 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:	2.61 E+02
2.	Total time period for batch releases:	4.47 E+04 min
3.	Maximum time period for a batch release:	6.15 E+03 min
4.	Average time period for batch releases:	1.71 E+02 min
5.	Minimum time period for a batch release:	9.0 E+00 min
6.	Average stream flow (LPM) during periods of effluent releases into the flowing stream:	
	a. Effluent Release Flow	4.46 E+02 LPM
	b. Dilution Stream Flow	9.94 E+05 LPM

2.5.2 Gaseous

1.	Number of batch releases:	1.4E+01
2.	Total time period for batch releases:	2.33E+04 min
3.	Maximum time period for a batch release:	3.81E+03 min
4.	Average time period for batch releases:	1.67E+03 min
5.	Minimum time period for a batch release:	2.44E+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.

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

One or more gamma emitting radionuclide did not meet the required lower limit for detection for 1 gaseous release and 24 liquid releases. 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 will be performed and reported in the July - December, 1990 Semi-Annual Report for the year of 1990.

8.0 METEOROLOGICAL DATA

Not applicable for this report.

9.0 LAND USE CHANGES

Not applicable for this report.

10.0 ANNUAL TABULATION OF PERSONNEL EXPOSURE

This data will be in the report issued for July-December, 1990.

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)

During the current reporting period, the PCP was changed to include a vendor supplied demineralization system for processing of liquid radwaste. This system utilizes mixed media filtration, anion, cation and mixed bed resin to process water from the waste hold-up tank.

The installation of the demineralization system for processing of liquid radwaste was necessary because the evaporator and recycle systems were not able to effectively process the liquid waste due to reduced capacity of the evaporator package; and the onsite storage capability was near capacity and severely limiting operation flexibility.

Section V on spent bead resin processing was further segregated to include sections on primary processing, effluent stream processing and shipment preparation. This was necessitated by the production of spent resin from the vendor supplied demineralization system.

Liquid radwaste processed through a demineralization system results in the production of spent bead resin media. Bead resin is a normal waste form produced and disposed of at Ginna as described in Section V.A. Therefore, additional production of this waste form will meet existing criteria.

Leakage from the spent fuel pit was added as a source of liquid waste.

A copy of the PCP with the changed sections marked is included with this report.

14.0 MAJOR CHANGES TO RADWASTE TREATMENT SYSTEMS

During the current reporting period, a temporary liquid radwaste system was installed to supplement the waste evaporator. The system is a fluidized transfer demineralization system consisting of 5 to 6 resin vessels, booster pump, mechanical filter, dewatering pump and process control unit. The entire system is interconnected with flexible reinforced non-collapsible butyl rubber hoses designed for temperatures between -20°F and 180°F and pressure from 0 to 300 psig. The supplied system is designed and operated in accordance with the following standards and operating parameters:

a) Reg Guide 1.143
b) ANSI SS.2
c) ANSI/ASME B31.1
d) ASME B+PV Code Section VIII and IX
e) Pressure 0-150 psig
f) Temperature 50-135°F (resin limited)
g) Flow 15-200 gpm
h) Hydro tested to 225 psig

The shut-off head of the booster pump and the monitor tank transfer pump is 100 and 115 psig respectively. This is well below the design of all the temporary system components.

The temporary system processes waste from the waste hold-up tank using one of the monitoring tanks as a batch tank. Provisions have been made to allow the waste to be recycled through the resin beds until chemistry and activity release parameters are met. When the resin media is spent, it is sluiced to a shipping container for disposal.

Table 1A

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT

GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

January 1 - June 30, 1990

	Unit	Quarter	Quarter	Est. Total Error %
A. Fission & activation gases		1	2	
1. Total release	Ci	1.66E+02	4.28E+01	7.0E+00
2. Average release rate for period	uCi/sec	2.13E+01	5.44E+00	
3. Percent of technical specification limit	%	3.38E-03	8.64E-04	
B. Iodines				
1. Total iodine-131	Ci	2.57E-03	3.10E-03	2.6E+01
2. Average release rate for period	uCi/sec	3.31E-04	3.94E-04	
3. Percent of technical specification limit	%	7.26E-01	8.67E-01	
C. Particulates				
1. Particulates with half-lives > 8 days	Ci	7.24E-01	1.16E+00	3.0E+01
2. Average release rate for period	uCi/sec	9.31E-02	1.49E-01	
3. Percent of technical specification limit	%	4.95E-06	7.93E-06	
4. Gross alpha radioactivity	Ci			
D. Tritium				
1. Total release	Ci	3.27E+01	1.66E+01	3.2E+00
2. Average release rate for period	uCi/sec	4.21E+00	2.11E+00	
3. Percent of technical specification limit	%	4.95E-04	2.48E-04	

Table 1B

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT

GASEOUS EFFLUENTS - ELEVATED RELEASE

		CONTINUOUS MODE		BATCH MODE	
Nuclides Released	Unit	Quarter	Quarter	Quarter	Quarter
1. Fission gases		1	2	1	2
krypton-85	Ci	1.75E-01		1.76E+00	4.58E+00
krypton-85m	Ci	4.59E-02	6.67E-03		
krypton-87	Ci	4.41E-02	1.20E-03		
krypton-88	Ci	8.68E-02	1.53E-02		
xenon-133	Ci	1.44E+02	6.97E+00	3.08E+02	2.65E+01
xenon-135	Ci	9.76E+00	2.95E+00	4.28E-02	
xenon-135m	Ci	1.64E+00	1.36E-01		
xenon-138	Ci	7.02E-02	4.70E-02		
Others (specify)	Ci				
argon-41	Ci	2.70E-01	6.91E-02		
xenon-131m	Ci	3.15E-01	6.04E-03	3.32E+00	1.52E+00
xenon-133m	Ci	2.54E+00	9.36E-03	1.99E+00	2.57E-02
Total for period	Ci	1.59E+02	1.02E+01	7.12E+00	3.26E+01
2. Iodines					
iodine-131	Ci	1.83E-03	2.21E-03	1.11E-04	8.58E-04
iodine-133	Ci	6.25E-04	2.70E-05	8.40E-07	3.28E-07
iodine-135	Ci				
Total for period	Ci	2.46E-03	2.24E-03	1.12E-04	8.58E-04
3. Particulates					
strontium-89	Ci				
strontium-90	Ci				
cesium-134	Ci				
cesium-137	Ci	2.24E-06			
barium-lanthanum-140	Ci				
Others (specify)	Ci				
cobalt-60	Ci	5.29E-07			
carbon-14	Ci	3.74E-01	3.73E-01	3.50E-01	7.84E-01
unidentified	Ci	7.79E-06	5.83E-06	1.53E-07	

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

Table 2A

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT

LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

January 1 - June 30, 1990

	Unit	Quarter	Quarter	Est.Total Error, %
A. Fission and activation products		1	2	
1. Total release (not including tritium, gases, alpha)	Ci	4.63E-02	3.34E-02	9.0E+00
2. Average diluted concentration during period	uCi/ml	3.31E-10	2.81E-10	
3. Percent of applicable limit	%	5.12E-02	1.55E-02	
B. Tritium				
1. Total release	Ci	1.45E+02	8.24E+01	3.2E+00
2. Average diluted concentration during period	uCi/ml	1.04E-06	6.92E-07	
3. Percent of applicable limit	%	3.46E-02	2.31E-02	
C. Dissolved and entrained gases				
1. Total release	Ci	2.34E-01	3.37E-02	8.0E+00
2. Average diluted concentration during period	uCi/ml	1.67E-09	2.83E-10	
3. Percent of applicable limit	%	8.36E-04	1.42E-04	
D. Gross alpha radioactivity				
1. Total release	Ci			
E. Volume of waste released (prior to dilution)	liters	2.77E+07	2.65E+07	5.0E+00
F. Volume of dilution water used during period	liters	1.40E+11	1.19E+11	5.0E+00

Table 2B

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT

LIQUID EFFLUENTS

		CONTINUOUS MODE		BATCH MODE	
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 1	Quarter 2
strontium-89	Ci			1.63E-05	
strontium-90	Ci			5.27E-06	1.81E-04
cesium-134	Ci			8.19E-04	1.57E-03
cesium-137	Ci	1.75E-06	1.01E-04	4.68E-03	6.86E-03
iodine-131	Ci	9.71E-05	1.47E-06	1.90E-02	3.83E-03
cobalt-58	Ci			1.29E-03	2.08E-03
cobalt-60	Ci		1.43E-07	5.89E-03	3.25E-03
iron-59	Ci			2.31E-06	9.95E-05
zinc-65	Ci				
manganese-54	Ci			1.93E-04	2.94E-04
chromium-51	Ci				2.85E-03
zirconium-niobium-95	Ci			4.58E-04	6.93E-04
molybdenum-99	Ci				6.69E-06
technetium-99m	Ci				
barium-lanthanum-140	Ci			2.41E-06	2.37E-04
cerium-141	Ci				
Other (specify)	Ci				
silver-110m	Ci			3.12E-03	1.10E-03
cesium-136	Ci			2.27E-04	
iodine-133	Ci	2.88E-06	3.11E-06	6.94E-03	3.40E-03
iodine-135	Ci	1.03E-06	9.69E-06	1.19E-03	3.41E-03
ruthenium-103	Ci				4.22E-05
ruthenium-106	Ci			1.56E-04	
antimony-122	Ci			1.10E-04	
antimony-124	Ci			4.08E-04	1.32E-03
antimony-125	Ci			4.80E-04	5.42E-05
tellurium-131m	Ci				2.49E-04
iron-55	Ci			1.17E-03	1.83E-03
unidentified	Ci				
Total for period (above)	Ci	1.03E-04	1.16E-04	4.62E-02	3.34E-02
xenon-133	Ci			2.33E-01	3.28E-02
xenon-135	Ci			1.11E-03	8.51E-04

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

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^3	2.63 E+01	2E+00
	Ci	2.16 E+01	5E+00
b. Dry compressible waste, contaminated equip, etc.	m^3	4.05 E+01	2E+00
	Ci	2.37 E+00	5E+00
c. Irradiated components, control rods, etc.	m^3		
	Ci		
d. Other (describe)	m^3		
	Ci		

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

a.	Fe-55	%	2.3 E+01
	Co-60	%	1.9 E+01
	Sb-125	%	1.3 E+01
	Cs-137	%	8.7 E+00
	Co-58	%	6.8 E+00
	Ni-63	%	1.8 E+01
b.	Fe-55	%	2.6 E+01
	Co-60	%	1.5 E+01
	Ni-63	%	7.9 E+00
	Cs-137	%	2.3 E+01
	Co-58	%	1.9 E+01
	Sb-125	%	5.3 E+00

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
25	Highway Vehicle	Barnwell, SC

B. IRRADIATED FUEL SHIPMENTS (Disposition)

Number of Shipments	Mode of Transportation	Destination
None		

Table 4

RELEASE PERMITS NOT MEETING LLD REQUIREMENTS

No.	Date	Isotopes	Cause
9000019-G	4/9/90	Co-60, Ce-144	a
9000120-L	3/8/90	Fe-59, Zn-65, Cs-134, Ce-141	b
9000136-L	3/19/90	Fe-59, Zn-65, Cs-134, Ce-141	b
9000141-L	3/22/90	Fe-59, Zn-65, Cs-134, Cs-137, Ce-141	b
9000144-L	3/23/90	Fe-59, Zn-65, Ce-141	b
9000145-L	3/23/90	Fe-59, Zn-65, Ce-141	b
9000146-L	3/24/90	Fe-59, Zn-65	b
9000149-L	3/26/90	Ce-141	b
9000159-L	4/1/90	Zn-65, Cs-134, Ce-141	b
9000166-L	4/5/90	Zn-65	b
9000167-L	4/5/90	Fe-59, Zn-65, Cs-134, Ce-141	b
9000168-L	4/6/90	Fe-59, Zn-65, Cs-134	b
9000172-L	4/10/90	Zn-65, Cs-134	b
9000174-L	4/10/90	Zn-65, Cs-134, Ce-141	b
9000175-L	4/13/90	Zn-65	b
9000177-L	4/17/90	Fe-59	b
9000178-L	4/18/90	Fe-59, Zn-65	b
9000184-L	4/23/90	Zn-65	b
9000186-L	4/25/90	Fe-59, Zn-65	b
9000196-L	4/30/90	Fe-59, Zn-65	b
9000210-L	5/10/90	Fe-59, Zn-65	b
9000233-L	5/24/90	Cs-134, Ce-141	b
9000252-L	6/9/90	Fe-59, Zn-65, Ce-141	b
9000253-L	6/9/90	Fe-59, Zn-65	b
9000276-L	6/26/90	Fe-59, Zn-65	b

a. Grab sample for release was not large enough to meet the LLD of 1E-12 uCi/ml in the count time selected.

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

GINNA STATION

PLANT OPERATIONS REVIEW COMMITTEE MEETING

DATE: 90/01/12 MEETING # 005

MEMBERS PRESENT:	MEMBER	ALTERNATE
CHAIRMAN	J. A. WIDAY	
SUPT. GINNA SUPPORT SERVICES		
OPERATIONS MANAGER		L. F. SMITH
MAINTENANCE MANAGER		
TECHNICAL MANAGER	S. T. ADAMS	
RESULTS & TEST SUPERVISOR	G. E. JOSS	
REACTOR ENGINEER		
HP & CHEMISTRY MANAGER	D. L. FILKINS	
QUALITY CONTROL ENGINEER		
I & C SUPERVISOR		
NUCLEAR ASSURANCE MANAGER		
MAINT PLANNING/SCHED MANAGER		

OTHERS ATTENDING

R. PLOOF

PORC. SECRETARY J. WRIGHT/L. STAVALONE

THE CHAIRMAN CALLED THE MEETING TO ORDER.

3.0 REVIEW OF PROCEDURE CHANGES

3.2.0-90-005-001 PT-3 89-4459

CONTAINMENT SPRAY PUMPS AND
NaOH ADDITIVE SYSTEM
THE PROC. SPEC. PRESENTED THIS PCN:
IT REQUESTED THIS PROCEDURE BE DELETED TO ALLOW INCORPORATION OF NEW SPECIFIC MONTHLY AND QUARTERLY TEST PROCEDURES PT-3M AND PT-3Q. THE COMMITTEE REVIEWED AND RECOMMENDED APPROVAL OF THIS PROCEDURE FOR DELETION. THIS CONSTITUTES A PROCEDURE CHANGE THAT MEETS THE EXEMPTION REQUIREMENTS OF THE 10 CFR

CHANGES OR VIOLATIONS WERE INVOLVED AND THERE ARE NO UNREVIEWED SAFETY QUESTIONS. THIS ITEM IS COMPLETE.

9.0 OTHER DISCUSSION

9.1.0-90-005-001

SAFETY ANALYSIS FOR TEMPORARY RADWASTE DEMINERALIZER SYSTEM

THE TECHNICAL MANAGER PRESENTED THE ATTACHED SAFETY ANALYSIS FOR THE TEMPORARY RADWASTE DEMINERALIZER SYSTEM. PORC REVIEWED THIS ANALYSIS AND PRELIMINARY SAFETY EVALUATION AND CONCLUDED THE PROPOSED TEMPORARY MODIFICATION DOES NOT INVOLVE AN UNREVIEWED SAFETY QUESTION. THIS ITEM IS COMPLETE.

ALL OF THE ABOVE ITEMS WERE REVIEWED BY THE COMMITTEE WITH RESPECT TO THE TECHNICAL SPECIFICATIONS AND THE COMMITTEE HAS DETERMINED THAT NO TECHNICAL SPECIFICATION CHANGES OR VIOLATIONS WERE INVOLVED IN THE CHANGES AND THERE ARE NO UNREVIEWED SAFETY QUESTIONS.

THE CHAIRMAN ADJOURNED THE MEETING.

3.

Lori Stavalone

Ø. WRIGHT/L. STAVALONE
PORC SECRETARY

APPROVED BY: S M Spector

S. M. SPECTOR
SUPERINTENDENT

T. L. Alexander

T. L. ALEXANDER
QC ENGINEER