ACCELERATED DISTRIBUTION DEMONSTRATION SYSTEM

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9103070258 DOC.DATE: ~~90/12/31~~ NOTARIZED: NO DOCKET #
FACIL:50-244 Robert Emmet Ginna Nuclear Plant, Unit 1, Rochester G 05000244
AUTH.NAME AUTHOR AFFILIATION
MECREDY,R.C. Rochester Gas & Electric Corp.
RECIP.NAME RECIPIENT AFFILIATION

See Enviros Rpts

SUBJECT: "Semiannual Radioactive Effluent Release Rept for Jul-Dec 1990." W/910301 ltr.

DISTRIBUTION CODE: IE48D COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 33
TITLE: 50.36a(a)(2) Semiannual Effluent Release Reports

NOTES:License Exp date in accordance with 10CFR2,2.109(9/19/72). 05000244

	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL
	PD1-3 LA	3	3	PD1-3 PD	1	1
	JOHNSON,A	1	1			
INTERNAL:	AEOD/DSP/TPAB	1	1	IRM TECH ADV	1	1
	NRR/DREP/PRPB11	2	2	REG FILE 01	1	1
	RES BROOKS,B	1	1	RGN1 DRSS/RPB	2	2
	RGN1 FILE 02	1	1			
EXTERNAL:	BNL TICHLER,J03	1	1	EG&G SIMPSON,F	2	2
	NRC PDR	1	1			

R I D S / A D D S

R I D S / A D D S

NOTE TO ALL "RIDS" RECIPIENTS:

PLEASE HELP US TO REDUCE WASTE! CONTACT THE DOCUMENT CONTROL DESK, ROOM P1-37 (EXT. 20079) TO ELIMINATE YOUR NAME FROM DISTRIBUTION LISTS FOR DOCUMENTS YOU DON'T NEED!

TOTAL NUMBER OF COPIES REQUIRED: LTTR 18 ENCL 18

Env 4/wb

ROCHESTER GAS AND ELECTRIC CORPORATION • 89 EAST AVENUE, ROCHESTER, N.Y. 14649-0001

TELEPHONE
AREA CODE 716 546-2700

March 1, 1991

U.S. Nuclear Regulatory Commission
Document Control Desk
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
Vice President

P249194228

IE48
1/1

Copies to:

Mr. T. Martin
Regional Administrator
U.S. Nuclear Regulatory Commission
Region 1
475 Allendale Road
King of Prussia, PA 19406

Resident NRC Inspector
Ginna Station

Ms. Donna Ross
New York State Energy Office
Empire State Plaza
Albany, NY 12223

American Nuclear Insurers
MAELU
The Exchange Suite 245
270 Farmington Avenue
Farmington, CT 06032
ATTN: Winthrop Hayes

Central Records, Ginna Station
Category 2.22.2

SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

R. E. GINNA NUCLEAR PLANT

ROCHESTER GAS AND ELECTRIC

DOCKET NO. 50-244

JULY - DECEMBER, 1990

TABLE OF CONTENTS

LIST OF TABLES

1.0 INTRODUCTION

This Semiannual Radioactive Effluent Release Report is for Rochester Gas and Electric Corporation 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, 1990 through December 31, 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 0.207 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 releases 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:	2.45 E+02
2.	Total time period for batch releases:	5.01 E+04 min
3.	Maximum time period for a batch release:	1.49 E+04 min
4.	Average time period for batch releases:	2.05 E+02 min
5.	Minimum time period for a batch release:	1.5 E+01 min
6.	Average stream flow (LPM) during periods of release effluent into a flowing stream:	1.29 E+06 LPM

2.5.2 Gaseous

1.	Number of batch releases:	1.4E+01
2.	Total time period for batch releases:	1.03E+04 min
3.	Maximum time period for a batch release:	2.88E+03 min
4.	Average time period for batch releases:	7.35E+02min
5.	Minimum time period for a batch release:	2.48E+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 radionuclides did not meet the required lower limit of detection for 4 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 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 1990 is not included with this report, but can be made available at the R.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 6A and 6B.

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)

The PCP was updated with corrected drawings showing the addition of the demineralization system added during the last reporting period. A copy of the updated PCP is attached.

14.0 MAJOR CHANGES TO RADWASTE TREATMENT SYSTEMS

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

Table 1A

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT

GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

July - December, 1990

	Unit	Quarter	Quarter	Est. Total Error %
A. Fission & activation gases		3	4	
1. Total release	Ci	4.30E+01	3.46E+01	7.0 E+00
2. Average release rate for period	uCi/sec	5.41E+00	4.35E+00	
3. Percent of technical specification limit	%	8.59E-04	6.90E-04	
B. Iodines				
1. Total iodine-131	Ci	7.44E-05	7.24E-05	2.6 E+01
2. Average release rate for period	uCi/sec	9.36E-05	9.11E-05	
3. Percent of technical specification limit	%	2.06E-01	2.00E-01	
C. Particulates				
1. Particulates with half-lives > 8 days	Ci	8.35E-06	1.21E-05	3.0 E+01
2. Average release rate for period	uCi/sec	1.05E-06	1.52E-06	
3. Percent of technical specification limit	%	7.90E-05	1.14E-04	
4. Gross alpha radioactivity	Ci	7.04E-08	1.19E-07	
D. Tritium				
1. Total release	Ci	3.07E+01	4.41E+01	3.2 E+00
2. Average release rate for period	uCi/sec	3.86E+00	5.55E+00	
3. Percent of technical specification limit	%	4.54E-04	6.53E-04	
E. Carbon-14				
1. Total release	Ci	7.38E-01	1.01E+00	3.0 E+01
2. Average release rate for period	uCi/sec	9.28E-02	1.27E-01	
3. Percent of technical specification limit	%	4.94E-06	6.75E-06	

Table 1B

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT

GASEOUS EFFLUENTS - ELEVATED RELEASE

July - December, 1990

		CONTINUOUS MODE		BATCH MODE	
Nuclides Released	Unit	Quarter	Quarter	Quarter	Quarter
1. Fission gases		3	4	3	4
krypton-85	Ci	1.06E+00	1.77E-01	1.30E+00	1.59E+00
krypton-85m	Ci	2.05E-02	2.41E-02		1.21E-03
krypton-87	Ci	1.95E-02	2.31E-02		
krypton-88	Ci	2.88E-02	3.54E-02		
xenon-133	Ci	3.61E+01	2.31E+01	7.86E-03	4.52E+00
xenon-135	Ci	3.36E+00	4.32E+00		3.28E-02
xenon-135m	Ci	1.82E-01	1.53E-01		
xenon-138	Ci	6.84E-02	6.09E-02		
Others (specify)	Ci				
argon-41	Ci	2.53E-01	2.06E-01		
xenon-131m	Ci	4.08E-01	1.64E-01		1.63E-01
xenon-133m	Ci	2.01E-01	4.05E-02		1.10E-02
Total for period	Ci	4.17E+01	2.83E+01	1.31E+00	6.32E+00
2. Iodines					
iodine-131	Ci	4.38E-05	5.37E-05	4.58E-08	3.96E-07
iodine-133	Ci	3.06E-05	1.83E-05		4.58E-08
iodine-135	Ci				
Total for period	Ci	7.44E-05	7.20E-05	4.58E-08	4.42E-07
3. Particulates					
strontium-89	Ci		*		
strontium-90	Ci		*		
cesium-134	Ci				
cesium-137	Ci				
barium-lanthanum-140	Ci				
Others (specify)	Ci				
	Ci				
unidentified	Ci	8.35E-06	1.21E-05		

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, 1991.

Table 2A

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT

LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

July - December, 1990

	Unit	Quarter	Quarter	Est.Total Error, %
A. Fission and activation products		3	4	
1. Total release (not including tritium, gases, alpha)	Ci	2.39E-02	4.66E-02	7.0 E+00
2. Average diluted concentration during period	uCi/ml	1.40E-10	2.73E-10	
3. Percent of applicable limit	%	2.22E-02	3.48E-02	
B. Tritium				
1. Total release	Ci	4.27E+01	5.13E+01	3.2 E+00
2. Average diluted concentration during period	uCi/ml	2.50E-07	3.00E-07	
3. Percent of applicable limit	%	8.32E-03	1.00E-02	
C. Dissolved and entrained gases				
1. Total release	Ci	3.42E-03	2.61E-02	3.2 E+01
2. Average diluted concentration during period	uCi/ml	2.00E-11	1.53E-10	
3. Percent of applicable limit	%	1.00E-05	7.63E-05	
D. Gross alpha radioactivity				
1. Total release	Ci	5.5E-06		6.0E+01
E. Volume of waste released (prior to dilution)	liters	2.89E+07	3.60E+07	5.0 E+00
F. Volume of dilution water used during period	liters	1.71E+11	1.71E+11	5.0 E+00

Table 2B

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT

LIQUID EFFLUENTS

July - December, 1990

		CONTINUOUS MODE		BATCH MODE	
Nuclides Released	Unit	Quarter 3	Quarter 4	Quarter 3	Quarter 4
strontium-89	Ci		*	2.90E-05	*
strontium-90	Ci		*	9.39E-06	*
cesium-134	Ci	3.51E-05	2.20E-06	6.64E-04	6.02E-03
cesium-136	Ci			2.82E-04	1.84E-03
cesium-137	Ci	1.38E-04	3.24E-04	1.74E-03	7.94E-03
iodine-131	Ci	5.72E-04	1.06E-03	8.74E-03	1.53E-02
iodine-133	Ci	1.29E-04	8.33E-05	5.88E-03	3.55E-03
iodine-135	Ci	1.03E-05	1.41E-05	2.29E-03	5.37E-04
cobalt-58	Ci			2.55E-04	3.57E-05
cobalt-60	Ci			9.59E-04	8.37E-05
iron-59	Ci				
zinc-65	Ci				
manganese-54	Ci			2.19E-05	
chromium-51	Ci			2.26E-04	1.91E-05
tellurium-131 m	Ci				8.73E-03
zirconium-niobium-95	Ci			1.91E-04	3.94E-04
molybdenum-99	Ci				
technetium-99m	Ci				
barium-lanthanum-140	Ci				3.12E-05
cerium-141	Ci				5.73E-06
Other (specify)	Ci				
iron-55	Ci		*	6.15E-04	*
ruthenium-106	Ci			2.13E-04	
silver-110 m	Ci			7.06E-04	
antimony-122	Ci				2.25E-04
antimony-124	Ci			1.04E-04	3.61E-04
antimony-125	Ci			8.02E-05	
unidentified	Ci				
Total for period (above)	Ci	8.84E-04	1.48E-03	2.30E-02	4.51E-02
xenon-133	Ci			2.33E-03	2.54E-02
xenon-135	Ci			1.09E-03	7.07E-04

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, 1991.

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	7.77E+01	2E+00
	Ci	2.05E+02	5E+00
b. Dry compressible waste, contaminated equip, etc.	m^3	5.38E+01	2E+00
	Ci	3.28E-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.	Fc-55	%	1.7E+01
	Co-60	%	1.2E+01
	Ni-63	%	1.0E+01
	Co-58	%	8.8E+00
	Cs-134	%	7.1E+00
	Sb-124	%	4.5E+00
		%	
		%	
		%	
b.	Fc-55	%	2.5E+01
	Cs-137	%	2.3E+01
	Co-58	%	1.9E+01
	Co-60	%	1.5E+01
	Ni-63	%	7.9E+00
	Sb-125	%	5.3E+00
		%	

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
19	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
298	7/14/90	Fe-59,Zn-65,Cs-134,Cs-137,Ce-141	a.
305	7/18/90	Fe-59, Zn-65	a.
520	12/11/90	Mn-54,Co-58,Fe-59,Zn-65,Ce-141	a.
525	12/15/90	Ce-141	a.

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

1990 QUARTER 3

	Adult			Teen			Child			Infant		
Direction	Total Body	Skin	Thyroid	Total Body	Skin	Thyroid	Total Body	Skin	Thyroid	Total Body	Skin	Thyroid
N	4.3E-8	3.2E-8	4.4E-8	4.5E-8	3.2E-8	4.6E-8	4.4E-8	3.2E-8	4.4E-8	3.1E-8	3.2E-8	3.1E-8
NNE	1.2E-7	1.2E-7	1.2E-7	1.2E-7	1.2E-7	1.2E-7	1.1E-7	1.2E-7	1.2E-7	8.4E-8	1.2E-7	8.6E-8
NE	9.6E-8	7.6E-8	9.7E-8	9.7E-8	7.6E-8	9.8E-8	9.0E-8	7.6E-8	9.1E-8	6.4E-8	7.6E-8	6.5E-8
ENE	7.3E-8	5.1E-8	7.3E-8	7.4E-8	5.1E-8	7.5E-8	6.9E-8	5.1E-8	7.0E-8	4.8E-8	5.1E-8	4.9E-8
E	8.1E-7	5.0E-7	9.1E-7	1.0E-6	6.5E-7	1.1E-6	1.8E-6	1.2E-6	1.9E-6	1.7E-6	1.5E-6	1.9E-6
ESE	1.5E-6	9.7E-7	1.6E-6	2.0E-6	1.4E-6	2.1E-6	3.8E-6	3.0E-6	4.1E-6	8.2E-7	6.1E-7	1.1E-6
SE	1.4E-6	1.0E-6	1.5E-6	1.8E-6	1.4E-6	2.0E-6	3.4E-6	2.8E-6	3.6E-6	1.5E-6	1.4E-6	1.8E-6
SSE	2.6E-7	1.5E-7	3.0E-7	2.8E-7	1.5E-7	3.3E-7	3.4E-7	1.5E-7	4.2E-7	2.0E-7	1.5E-7	3.1E-7
S	3.2E-7	9.6E-8	3.7E-7	3.5E-7	9.6E-8	4.0E-7	4.5E-7	9.6E-8	5.4E-7	2.4E-7	9.6E-8	3.4E-7
SSW	9.0E-7	4.2E-7	1.0E-6	9.7E-7	4.2E-7	1.1E-6	1.2E-6	4.3E-7	1.4E-6	5.0E-7	4.2E-7	6.8E-7
SW	6.4E-7	2.5E-7	7.2E-7	7.1E-7	2.6E-7	8.0E-7	9.3E-7	2.6E-7	1.1E-6	6.3E-7	2.6E-7	8.5E-7
WSW	1.6E-6	1.1E-6	1.7E-6	2.2E-6	1.6E-6	2.3E-6	4.4E-6	3.6E-6	4.6E-6	1.3E-6	9.4E-7	1.7E-6
W	8.2E-7	3.5E-7	8.5E-7	9.9E-7	4.5E-7	1.0E-6	1.6E-6	7.9E-7	1.7E-6	7.5E-7	3.2E-7	8.8E-7
WNW	3.9E-8	6.4E-8	4.0E-8	3.9E-8	6.4E-8	4.0E-8	4.1E-8	6.4E-8	4.3E-8	3.4E-8	6.4E-8	3.4E-8
NW	8.0E-9	4.6E-9	8.1E-9	8.1E-9	4.6E-9	8.2E-9	7.3E-9	4.6E-9	7.5E-9	5.0E-9	4.6E-9	5.1E-9
NNW	4.5E-8	3.7E-8	4.5E-8	4.5E-8	3.7E-8	4.5E-8	4.1E-8	3.7E-8	4.2E-8	2.9E-8	3.7E-8	3.0E-8

TABLE 5A

RADIATION DOSES TO NEAREST INDIVIDUAL RECEPTOR
FROM GASEOUS RELEASES IN REM

1990 QUARTER 4

	Adult			Teen			Child			Infant		
Direction	Total Body	Skin	Thyroid	Total Body	Skin	Thyroid	Total Body	Skin	Thyroid	Total Body	Skin	Thyroid
N	4.1E-8	4.4E-8	4.1E-8	4.3E-8	4.4E-8	4.4E-8	4.4E-8	4.4E-8	4.5E-8	3.4E-8	4.4E-8	3.5E-8
NNE	3.4E-8	3.6E-8	3.5E-8	3.5E-8	3.6E-8	3.6E-8	3.4E-8	3.6E-8	3.5E-8	2.6E-8	3.6E-8	2.6E-8
NE	5.2E-8	5.6E-8	5.3E-8	5.4E-8	5.6E-8	5.5E-8	5.3E-8	5.6E-8	5.5E-8	4.1E-8	5.6E-8	4.2E-8
ENE	3.5E-8	3.5E-8	3.6E-8	3.5E-8	3.5E-8	3.6E-8	3.3E-8	3.5E-8	3.4E-8	2.4E-8	3.5E-8	2.5E-8
E	2.3E-7	1.9E-7	2.5E-7	2.4E-7	1.9E-7	2.6E-7	2.8E-7	1.9E-7	3.2E-7	1.9E-7	1.9E-7	2.3E-7
ESE	1.6E-6	1.5E-6	1.7E-6	2.3E-6	2.2E-6	2.4E-6	5.0E-6	4.9E-6	5.2E-6	2.7E-6	2.7E-6	2.9E-6
SE	4.0E-7	4.2E-7	4.3E-7	5.5E-7	5.5E-7	5.8E-7	1.1E-6	1.0E-6	1.1E-6	2.5E-7	2.9E-7	3.4E-7
SSE	2.0E-7	2.7E-7	2.1E-7	2.2E-7	2.7E-7	2.3E-7	2.5E-7	2.7E-7	2.7E-7	2.2E-7	2.7E-7	2.7E-7
S	1.7E-7	1.8E-7	2.0E-7	1.8E-7	1.8E-7	2.2E-7	2.0E-7	1.8E-7	2.7E-7	1.3E-7	1.8E-7	2.1E-7
SSW	1.9E-7	2.1E-7	2.2E-7	2.0E-7	2.1E-7	2.3E-7	2.3E-7	2.1E-7	2.8E-7	1.7E-7	2.1E-7	2.2E-7
SW	5.3E-7	5.5E-7	6.2E-7	7.3E-7	7.4E-7	8.2E-7	1.4E-7	1.4E-6	1.6E-6	2.6E-7	3.3E-7	4.1E-7
WSW	4.7E-7	4.1E-7	5.8E-7	5.5E-7	4.7E-7	6.8E-7	8.6E-7	7.1E-7	1.1E-6	3.3E-7	3.7E-7	6.3E-7
W	2.7E-7	2.1E-7	3.1E-7	3.0E-7	2.2E-7	3.4E-7	3.8E-7	2.5E-7	4.6E-7	2.1E-7	2.2E-7	3.5E-7
WNW	3.3E-8	4.3E-8	3.6E-8	3.4E-8	4.3E-8	3.7E-8	3.8E-8	4.4E-8	4.2E-8	2.4E-8	4.3E-8	2.4E-8
NW	1.4E-8	1.4E-8	1.5E-8	1.5E-8	1.4E-8	1.5E-8	1.3E-8	1.4E-8	1.4E-8	1.0E-8	1.4E-8	1.1E-8
NNW	1.8E-8	1.7E-8	1.8E-8	1.8E-8	1.7E-8	1.8E-8	1.7E-8	1.7E-8	1.7E-8	1.2E-8	1.7E-8	1.3E-8

TABLE 5B

RADIATION DOSE TO NEAREST INDIVIDUAL
FROM LIQUID RELEASES IN MREM

	Adult	Teen	Child	Infant
First Quarter				
Total Body	4.7E-3	2.8E-3	2.0E-3	1.1E-3
Bone	3.8E-3	4.0E-3	5.1E-3	9.6E-5
Thyroid	5.1E-3	4.5E-3	7.5E-3	7.5E-3
Second Quarter				
Total Body	6.6E-3	3.8E-3	2.0E-3	6.4E-4
Bone	6.0E-3	6.3E-3	7.9E-3	1.9E-4
Thyroid	1.4E-3	1.2E-3	2.0E-3	2.0E-3
Third Quarter				
Total Body	2.2E-3	1.3E-3	7.9E-4	3.2E-4
Bone	1.7E-3	1.8E-3	2.3E-3	4.5E-5
Thyroid	2.4E-3	2.1E-3	3.6E-3	3.6E-3
Fourth Quarter				
Total Body	1.2E-2	7.2E-3	3.2E-3	4.1E-4
Bone	9.3E-3	9.8E-3	1.2E-2	1.8E-4
Thyroid	3.9E-3	3.5E-3	5.7E-3	5.8E-3

Table 6A

ROCHESTER GAS & ELECTRIC CORPORATION GINNA STATION
NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION
FOR 90/01/01 - 90/12/31

ACTUAL WHOLE BODY DOSE		NO. OF PERSONNEL (> or = 100)			TOTAL MAN-REM		
WORK PERMIT CATERGORY	WORK GROUP	CONTRACT WORKERS	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT WORKERS	STATION EMPLOYEES	UTILITY EMPLOYEES
REACTOR OPERATIONS & SURV	MAINTENANCE PERSONNEL	205	36	84	1.261	1.641	0.401
	OPERATING PERSONNEL	2	30	0	0.822	6.990	0.000
	HEALTH PHY. PERSONNEL	53	14	4	16.935	2.669	0.265
	SUPERVISORY PERSONNEL	35	16	9	1.901	2.462	1.000
	ENGINEERING PERSONNEL	9	0	2	0.223	0.000	0.000
ROUTINE MAINTENANCE	MAINTENANCE PERSONNEL	264	37	158	48.354	4.340	12.416
	OPERATING PERSONNEL	2	21	0	0.000	1.074	0.000
	HEALTH PHY. PERSONNEL	50	14	4	10.180	5.046	0.186
	SUPERVISORY PERSONNEL	30	16	7	4.769	0.549	0.654
	ENGINEERING PERSONNEL	8	0	2	1.170	0.000	0.197
INSERVICE INSPECTION	MAINTENANCE PERSONNEL	48	20	28	1.007	0.176	0.803
	OPERATING PERSONNEL	0	1	0	0.000	0.063	0.000
	HEALTH PHY. PERSONNEL	9	2	0	0.064	0.181	0.000
	SUPERVISORY PERSONNEL	14	8	6	0.710	0.318	0.127
	ENGINEERING PERSONNEL	4	0	0	0.202	0.000	0.000
SPECIAL MAINTENANCE	MAINTENANCE PERSONNEL	266	37	157	80.717	6.974	69.181
	OPERATING PERSONNEL	2	22	0	0.017	1.519	0.000
	HEALTH PHY. PERSONNEL	43	10	3	3.127	1.288	0.011
	SUPERVISORY PERSONNEL	36	16	9	7.717	2.263	3.547
	ENGINEERING PERSONNEL	8	0	2	1.120	0.000	0.108
WASTE PROCESSING	MAINTENANCE PERSONNEL	28	6	9	1.131	0.035	0.011
	OPERATING PERSONNEL	2	3	0	0.020	0.035	0.000
	HEALTH PHY. PERSONNEL	15	3	2	1.806	1.244	0.098
	SUPERVISORY PERSONNEL	2	3	2	0.006	0.117	0.003
	ENGINEERING PERSONNEL	0	0	0	0.000	0.000	0.000
REFUELING	MAINTENANCE PERSONNEL	83	13	23	13.181	1.477	1.123
	OPERATING PERSONNEL	1	13	0	0.003	2.267	0.000
	HEALTH PHY. PERSONNEL	11	4	1	1.703	1.034	0.012
	SUPERVISORY PERSONNEL	4	3	3	0.187	0.443	0.153
	ENGINEERING PERSONNEL	2	0	0	0.216	0.000	0.000
MODIFICATIONS	MAINTENANCE PERSONNEL	19	2	1	0.102	0.052	0.047
	OPERATING PERSONNEL	0	0	0	0.000	0.000	0.000
	HEALTH PHY. PERSONNEL	0	0	0	0.000	0.000	0.000
	SUPERVISORY PERSONNEL	6	0	0	0.070	0.000	0.000
	ENGINEERING PERSONNEL	1	0	0	0.000	0.000	0.000
TOTAL	MAINTENANCE PERSONNEL	277	37	161	145.753	14.694	83.982
	OPERATING PERSONNEL	2	30	0	0.862	11.948	0.000
	HEALTH PHY. PERSONNEL	55	14	4	33.815	11.463	0.572
	SUPERVISORY PERSONNEL	37	16	9	15.360	6.153	5.483
	ENGINEERING PERSONNEL	10	0	2	2.932	0.000	0.305
GRAND TOTAL	==========	381	96	176	198.722	44.257	90.342

Table 6B

STANDARD REPORT OF PERSONNEL WHOLE BODY EXPOSURE 1990

DOSE (REM)	NUMBER OF PEOPLE
00.000 - 00.000	903
00.001 - 00.100	349
00.101 - 00.250	183
00.251 - 00.500	201
00.501 - 00.750	125
00.751 - 01.000	62
01.001 - 02.000	67
02.001 - 03.000	4
03.001 - 04.000	0
04.001 - 05.000	0

Total number of personnel monitored 1894

The total collective dose for 1990 is 346.7 person-rem based on the sum of all personnel TLD badge readings.

FIVE HIGHEST EXPOSURES FOR THE YEAR

A	2.810
B	2.269
C	2.250
D	2.150
E	1.946

This report contains all personnel monitored during 1990.

Process Control Program

for

Ginna Station

Rochester Gas and Electric Corporation
Revision 4, December 21, 1990

I. Introduction

The Radiological Effluent Technical Specifications require the establishment of a Process Control Program (PCP). The PCP herein is a manual outlining the method for processing wet solid wastes and for solidification of liquid wastes. It includes applicable process parameters and evaluation methods used at Ginna Station to assure compliance with the requirements of 10 CFR Part 71 prior to shipment of containers of radioactive waste from the site.

The Ginna PCP encompasses five types of solid wastes:

a. Cemented Evaporator Bottoms
b. Solidified Sludge
c. Oily Waste
d. Dewatered Bead Resin
e. Filters

A radwaste sampling and analysis program has been instituted to assure compliance with 10CFR Part 61. Scaling factors have been developed to calculate concentrations of hard to measure isotopes from more easily determined isotopes. The scaling factors will enable concentrations of all required isotopes to be determined for each radwaste shipment.

All radioactive waste is shipped to a licensed burial site in accordance with applicable Nuclear Regulatory Commission, Department of Transportation, and State Regulations, including burial site regulation requirements.

To assure personnel exposure is minimized, ALARA considerations are addressed in all phases of the solidification process.

II. Cemented Evaporator Bottoms

A. General Description

The waste holdup tank, located in the auxiliary building, accepts liquid waste from all floor drains, certain system drains, resin sluice water, laundry and shower waste, spent fuel pit leak off and the chemical drain tank.

The liquid from the waste holdup tank is processed through cuno type filters to the waste evaporator.

The waste evaporator processes water from the waste holdup tank in a batch mode. The distillate is polished by mixed bed (HOH) demineralizer resin, collected in waste condensate and monitor tanks, sampled, analyzed and released to the discharge canal.

As an alternative, the boric acid evaporator can be used to process excess waste water which has been transferred to a CVCS holdup tank. Mixed bed (HOH) resins can also be used to polish the distillate. Sampling and release is done as for waste evaporator distillate.

The concentrates from either evaporator are processed through the waste evaporator feed tank for disposal through the drumming system as described in this section.

A third alternative available is vendor supplied demineralization systems which utilize mixed media filtration, anion (OH), cation (H) and mixed bed (HOH) resin to process water from the waste holdup system. This process can be utilized on a once through and/or recirc mode. The product water is sampled, analyzed and released to the discharge canal, the same as for the evaporator systems. Spent resins are sluiced from the vessels and shipped as described in Section V, Spent Bead Resin.

The operation of the evaporators is controlled by several operating procedures, S-3.4C, D, E, and F for the boric acid evaporator and S-4.1A, B, and C for the waste evaporator operation. The vendor demineralization systems are also controlled by plant procedures. The currently used system is controlled via S-4.1.27. The parameters used to control the batch operations are boric acid concentration and gross degassed activity. These concentrations are limited by procedure although activity may be further limited by burial ground dose rate limits.

The drumming process is currently controlled by procedure RD-16.2. The only chemical parameter which is controlled for solidification is the solution pH. A pH between 6.0 and 8.5 is required to insure that the cement will properly solidify in the least amount of time. If waste is to be drummed with the pH of the waste outside of these parameters a solidification test is performed to insure proper solidification may be achieved.

The drum filling is controlled by weight and/or level indication to control the amounts of liquid and cement to a predetermined ratio. This ratio is determined by performing a solidification test. For normal waste evaporator bottoms within the above pH requirements approximately 1 gal. of evaporator bottoms is solidified with 20 pounds of masonry cement and one pound of meta silicate as an accelerator. The minimal amount of accelerator limits the rate of the solidification process. The drums are not sealed until the solidification is verified complete and the drums are at ambient temperature. This is typically two weeks after drum filling.

The quality control section is notified prior to solidification and also prior to shipping so they may perform periodic surveillance on these processes. A minimum of 10% of all drums are visually checked for proper solidification by the QC section. If a drum is found which is not properly solidified the remaining drums in that batch are also checked. The drums are then set aside to give additional time for curing.

If the drum(s) still do not solidify, the material can be removed from the drum and mixed with more of the solidifying agent and allowed to cure.

An alternative to resolidification is to place the drum in an acceptable (to the burial site) overpack and ship to the burial site.

As a precaution, a lab test would also be performed on the next evaporator waste to insure there were no unknown matrix or chemical changes in the system which would cause the failure.

Also on one drum from approximately every tenth evaporator bottoms batch, a drum will be mechanically checked to insure that the total drum contents have properly solidified.

QC also monitors the drum loading and shipping to insure compliance with all shipping and burial regulations. After the drumming process has been completed, the drums are weighed, surveyed, serialized and stored in one of the drum storage areas. Prior to shipment the drums are cleaned, resurveyed, and labeled, in accordance with the RD-10 series procedures.

III. Solidified Sludge

A. General Description

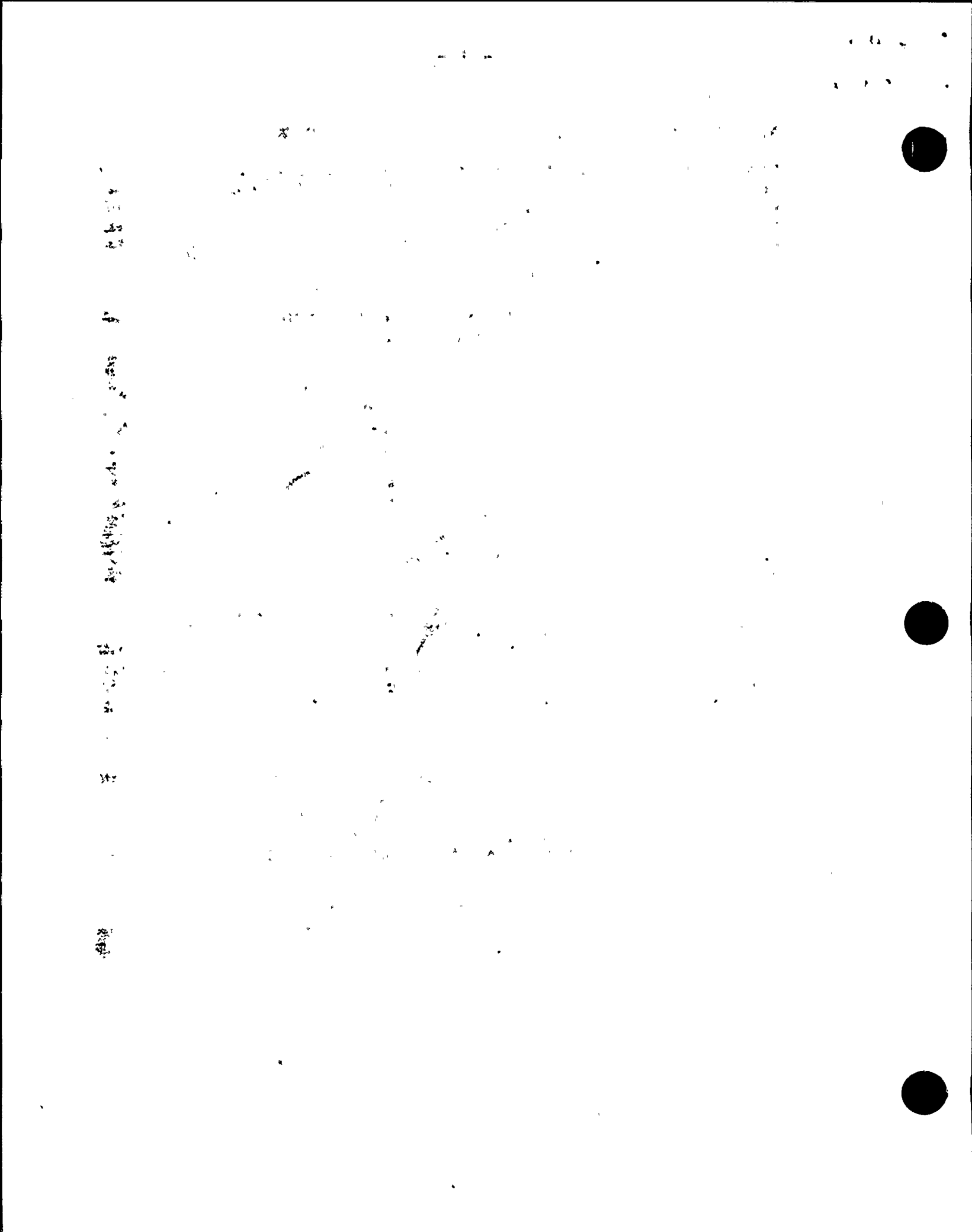
Suspended solids and other sludges occasionally require processing. This material is processed using a vendor supplied system. A Topical Report demonstrating satisfactory processing by a vendor is required. The vendors procedures would then be PORC approved, and if necessary, a 50.59 review. Lab samples are then created and tested. Following quality control review, full scale solidification would be performed.

IV. Oily Waste

A. General Description

Oily waste is solidified by methods acceptable to licensed burial sites. An approved method is to add an emulsifier to the oily waste, then water at a neutral pH. The mixture is then solidified by adding "Envirostone" gypsum cement. The method is described in the RD-16 series of procedures.

An alternative method that may be employed would utilize filtration. As a vendor supplied system, this would require PORC review and approval.



V. Spent Bead Resin

A. General Description

Bead resin is used to remove chemical and radioactive contamination from the reactor coolant, the chemical and volume control system, the spent fuel pool, and the liquid waste processing system, and may be used to process the effluent stream described in Section IIA of the PCP.

B. Primary Processing

When the resin is exhausted or reaches a radiation limit, the spent resin is sluiced to one of two 150 cubic foot spent resin storage tanks. After sufficient resin has been collected in one of the storage tanks, a QA order is initiated for use of a transport cask certified by the NRC for transporting greater than Type A quantities of radioactive material. Upon arrival on site, the transport cask is inspected using a Quality Control Inspection Procedure (QCIP) specific for each type of cask to ensure the cask meets all the requirements of the Certificate of Compliance and 10 CFR 71. A liner, which contains internal piping to completely dewater the resin, is installed in the cask. The cask is handled, loaded and unloaded using procedure RD-10 series specific for the model cask used. Piping is run from the drumming station to the manway in the top of the liner. Using procedures, spent resin is then slurried from the spent resin storage into the liner with water used for sparging and mixing the resin and nitrogen gas pressure used to move the resin. A representative sample of the resin is obtained and the concentration of each radioisotope is calculated. After the resin is dewatered or cemented, the liner is capped and sealed and the top is put back on the cask.

C. Effluent Stream Processing

Liquid waste from all floor drains, regeneration wastes, certain system drains, resin sluice water, laundry and shower waste and the chemical drain tank may be processed by a vendor supplied temporary demineralizer system in lieu of the evaporator described in Section IIA of the PCP.

The demin system located in the drumming station consists of a control skid for system isolation and flow control, mechanical prefilter for roughing filtration and five 15 ft^3 sluicable demin vessels arranged in series.

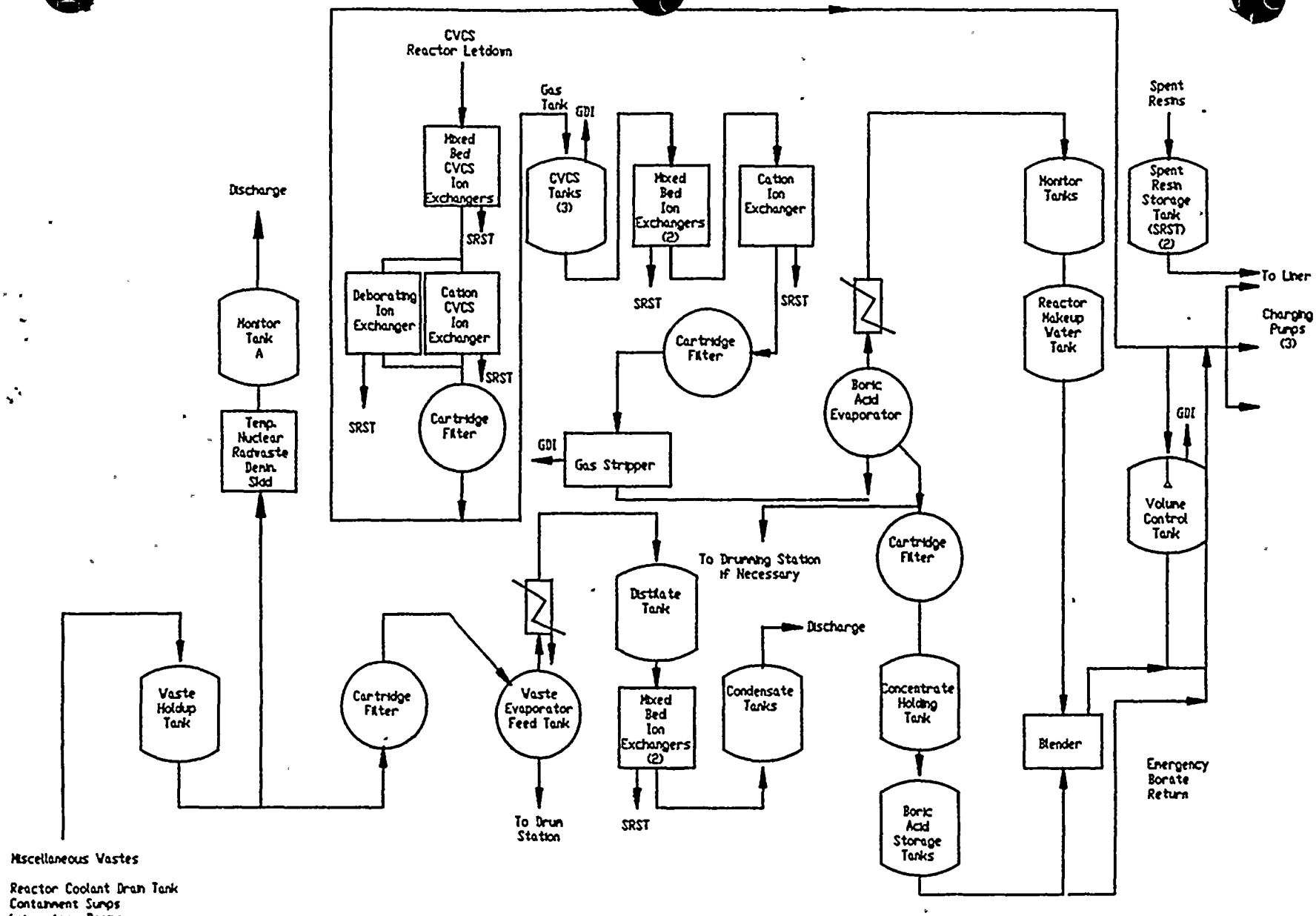
When the resin is exhausted or reaches a radiation limit, the spent resin is sluiced to a certified cask, utilizing procedures. A liner, which contains internal piping to completely dewater the resin, is installed in the cask. A representative sample of the resin is obtained and the concentration of each radioisotope is calculated.

D. Shipment Preparation:

The cask is surveyed for radiation and contamination and properly labeled and marked as specified in procedures for packaging shipment of radioactive materials. The procedures include instructions on any special requirements of the burial site to which the shipment is being sent. A radioactive shipment record is prepared and all necessary shipping papers and instructions are given to the carrier. The vehicle is placarded, the cask sealed with security seals, and the Quality Control inspection is complete. The resin is then transported to the burial site.

VI. Filters

When filters become saturated or have a high dose rate, they are dewatered and then replaced. The spent filters are placed in a High Integrity Container or solidified in an approved media and shipped in accordance with 10CFR71, 10CFR61 and burial site licenses. The maximum dose rate allowed on the surface of the container is determined by the shielding of the package in which the container is shipped. Shipping requirements for specific packages are addressed in the RD-10 series of procedures.



OPERATIONAL RADWASTE DIAGRAM

R. E. GINNA

RW-15
REV. 00
11/6/90

FIGURE I

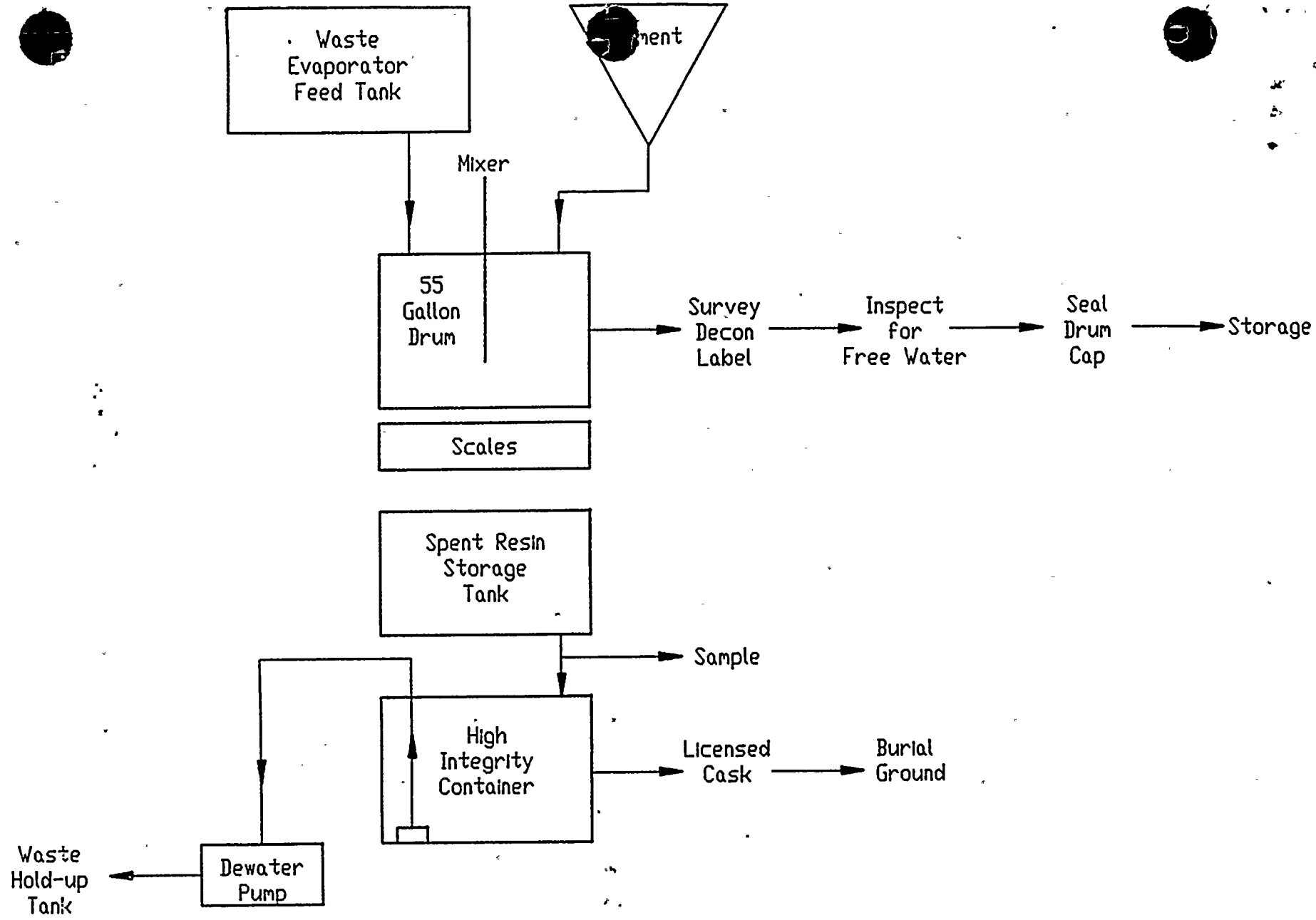


figure 2

RW-16
REV. 00
11/6/90