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McGuire Nuclear Generation Department  
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**DUKE POWER**

April 4, 1994

U. S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, D. C. 20555

Subject: McGuire Nuclear Station  
Docket Nos. 50-369 and 50-370  
Annual Radioactive Effluent Release Report

Gentlemen:

Pursuant to Commitment SLC 16.11-16 of the McGuire Nuclear Station Selected Licensee Commitment Manual, attached is the subject report covering 1993.

The following attachments are the contents of this report:

Attachment 1	Radioactive Effluent Releases and Supplementary Information
Attachment 2	Solid Waste Disposal Report
Attachment 3	Unplanned Offsite Releases
Attachment 4	Fuel Cycle Calculations
Attachment 5	Inoperable Monitoring Equipment

Revision 1, Section 1, Introduction, of the Process Control Manual was approved for use at McGuire on March 30, 1993. Revision 8 was approved for use on February 18, 1993. In addition, Revision 33 of the ODCM was approved for use at McGuire on January 1, 1992 and Revision 34 was approved for use on January 1, 1993.

Questions or comments concerning this report should be directed to Kay Crane at (704) 875-4306.

Very truly yours,

T. C. McMeekin, Vice President  
McGuire Nuclear Station

TCM:KLC

Attachments

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R PDR

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NRC Document Control  
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cc: Mr. Victor Nerses  
Office of Nuclear Reactor Regulation  
Washington, D.C. 20555

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Attachment 1

Radioactive Effluent Releases

Unit 1

MCGUIRE NUCLEAR STATION  
UNIT 1  
RADIOACTIVE EFFLUENT RELEASES  
DATE : 02/21/94

I. LIQUID RELEASES

YEAR : 1993

	UNITS	1ST QTR	2ND QTR	3RD QTR	4TH QTR	TOTAL	EC RATIO
1. GROSS RADIOACTIVITY							
A. TOTAL RELEASE	CURIES	4.38E-02	8.87E-02	1.32E-01	2.12E-02	2.85E-01	
B. AVERAGE CONCENTRATION RELEASED	UCI/ML	5.53E-11	1.22E-10	1.61E-10	2.15E-11	8.57E-11	
C. MAXIMUM CONCENTRATION RELEASED	UCI/ML	3.08E-09	2.10E-09	1.89E-09	5.46E-10	3.08E-09	
2. TRITIUM							
A. TOTAL RELEASE	CURIES	1.25E+02	1.04E+02	8.54E+01	7.45E+01	3.88E+02	
B. AVERAGE CONCENTRATION RELEASED	UCI/ML	1.57E-07	1.42E-07	1.04E-07	7.55E-08	1.17E-07	
3. DISSOLVED NOBLE GASES							
A. TOTAL RELEASE	CURIES	8.81E-02	7.15E-02	1.02E-02	1.86E-03	1.72E-01	
B. AVERAGE CONCENTRATION RELEASED	UCI/ML	1.11E-10	9.80E-11	1.25E-11	1.88E-12	5.16E-11	
4. GROSS ALPHA ACTIVITY							
A. TOTAL RELEASE	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
B. AVERAGE CONCENTRATION RELEASED	UCI/ML	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
5. VOLUME OF LIQUID WASTE TO DISCHARGE CANAL	LITERS	9.59E+05	1.58E+06	3.69E+06	6.85E+05	6.91E+06	
6. VOLUME OF DILUTION WATER	LITERS	7.93E+11	7.30E+11	8.18E+11	9.87E+11	3.33E+12	
7. RADIONUCLIDES RELEASED	CURIES						EC RATIO
H-3		1.25E+02	1.04E+02	8.54E+01	7.45E+01	3.88E+02	1.17E-04
F-18		0.00E+00	0.00E+00	1.23E-04	0.00E+00	1.23E-04	5.26E-11
NA-24		0.00E+00	1.23E-04	7.84E-05	5.72E-06	2.07E-04	1.24E-09
K-40		0.00E+00	1.40E-05	0.00E+00	0.00E+00	1.40E-05	1.05E-09
CR-51		2.01E-03	2.61E-03	6.95E-03	5.56E-04	1.21E-02	7.28E-09
MN-54		8.58E-04	9.89E-04	2.87E-03	9.98E-04	5.71E-03	5.72E-08
MN-56		0.00E+00	4.17E-07	2.80E-06	0.00E+00	3.22E-06	1.38E-11
FE-55		2.82E-03	3.93E-03	5.04E-03	8.28E-04	1.26E-02	3.79E-08
FE-59		2.22E-05	4.69E-05	4.66E-04	2.45E-06	5.38E-04	1.62E-08
CO-57		2.77E-05	7.63E-05	1.80E-04	1.67E-05	3.01E-04	1.51E-09
CO-58		2.31E-02	4.80E-02	7.35E-02	6.71E-03	1.51E-01	2.27E-06
CO-60		2.89E-03	7.51E-03	1.17E-02	2.37E-03	2.45E-02	2.45E-06
ZN-65		2.80E-06	1.20E-05	0.00E+00	0.00E+00	1.48E-05	8.91E-10
BR-82		9.48E-06	8.27E-06	5.25E-06	1.03E-06	2.40E-05	1.80E-10
RB-86		0.00E+00	1.42E-05	6.48E-05	0.00E+00	7.91E-05	3.39E-09
RB-88		1.63E-04	4.27E-05	0.00E+00	0.00E+00	2.06E-04	1.54E-10
SR-89		7.64E-05	2.65E-06	1.81E-05	4.18E-07	9.76E-05	3.67E-09
SR-92		2.53E-06	5.40E-05	0.00E+00	0.00E+00	5.65E-05	4.25E-10
Y-91M		0.00E+00	2.93E-06	0.00E+00	0.00E+00	2.93E-06	4.40E-13
ZR-95		0.00E+00	2.14E-04	9.78E-04	1.42E-04	1.33E-03	2.00E-08
ZR-97		0.00E+00	2.25E-06	2.12E-06	0.00E+00	4.37E-06	1.46E-10
NB-95		3.12E-05	4.41E-04	1.56E-03	2.67E-04	2.30E-03	2.30E-08
NB-97		9.63E-06	4.42E-05	1.94E-05	5.85E-06	7.91E-05	7.92E-11
MO-99		1.32E-04	0.00E+00	0.00E+00	0.00E+00	1.32E-04	1.98E-09
TC-99M		2.72E-04	1.45E-05	3.59E-06	1.47E-06	2.91E-04	8.75E-11
RU-103		0.00E+00	0.00E+00	6.76E-06	0.00E+00	6.76E-06	6.77E-11
RU-106		0.00E+00	0.00E+00	0.00E+00	1.01E-05	1.01E-05	1.01E-09
AG-110M		2.99E-04	6.03E-04	9.80E-05	3.92E-05	1.04E-03	5.20E-08
I-131		4.06E-03	5.19E-03	1.12E-03	6.64E-05	1.04E-02	3.14E-06
I-132		6.16E-06	1.97E-05	2.08E-05	0.00E+00	4.66E-05	1.40E-10
I-133		2.80E-04	7.33E-04	3.99E-04	9.33E-06	1.42E-03	6.10E-08
I-134		3.42E-06	1.41E-06	0.00E+00	0.00E+00	4.83E-06	3.63E-12
I-135		1.75E-05	1.36E-04	1.03E-04	0.00E+00	2.57E-04	2.57E-09
SB-122		7.45E-05	2.44E-06	8.69E-04	0.00E+00	9.46E-04	2.84E-08
SB-124		2.60E-04	5.65E-03	4.18E-03	7.80E-04	1.09E-02	4.67E-07
SB-125		8.57E-04	1.05E-02	1.83E-02	8.14E-03	3.77E-02	3.78E-07
SN-113		0.00E+00	2.16E-05	6.06E-05	1.60E-05	9.82E-05	9.84E-10
TE-132		3.92E-05	0.00E+00	9.44E-06	0.00E+00	4.86E-05	1.62E-09
CS-134		4.52E-04	4.37E-04	7.13E-04	4.06E-05	1.64E-03	5.48E-07
CS-136		3.00E-06	0.00E+00	8.55E-07	0.00E+00	3.86E-06	1.93E-10
CS-137		1.37E-03	1.17E-03	1.85E-03	1.68E-04	4.56E-03	1.37E-06
CS-138		0.00E+00	5.97E-05	0.00E+00	0.00E+00	5.97E-05	4.49E-11
BA-140		1.23E-05	1.19E-05	1.75E-05	1.17E-06	4.28E-05	1.61E-09
LA-140		3.58E-03	4.80E-05	6.83E-05	4.58E-06	3.70E-03	1.24E-07
CE-141		0.00E+00	6.81E-06	0.00E+00	0.00E+00	6.81E-06	6.82E-11
CE-144		0.00E+00	0.00E+00	1.41E-05	6.92E-06	2.10E-05	2.11E-09
NP-239		5.70E-05	0.00E+00	5.47E-05	0.00E+00	1.12E-04	1.68E-09
SB-126		0.00E+00	0.00E+00	4.06E-05	0.00E+00	4.06E-05	1.74E-09
KR-85		1.98E-04	0.00E+00	0.00E+00	0.00E+00	1.98E-04	5.94E-10
KR-85M		4.44E-05	8.57E-05	0.00E+00	0.00E+00	1.30E-04	3.91E-10
KR-87		2.82E-06	0.00E+00	7.77E-04	0.00E+00	7.80E-04	2.34E-09
KR-88		2.12E-05	1.93E-05	0.00E+00	0.00E+00	4.04E-05	1.22E-10
XE-131M		0.00E+00	3.78E-04	4.09E-04	0.00E+00	7.87E-04	2.37E-09
XE-133		7.99E-02	6.77E-02	8.91E-03	1.80E-03	1.58E-01	4.76E-07
XE-133M		1.69E-03	9.51E-04	0.00E+00	0.00E+00	2.65E-03	7.95E-09
XE-135		6.21E-03	2.36E-03	1.04E-04	5.73E-05	8.74E-03	2.63E-08
XE-135M		4.68E-06	2.25E-05	1.59E-05	0.00E+00	4.31E-05	1.30E-10

TOTAL EC RATIO 1.28E-04

SKIN	MAXIMUM DOSE-	1.32E-04 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	SHORE
	CO 58	7.69 %				
	CO 60	68.50 %				
	CS 137	15.76 %				
BONE	MAXIMUM DOSE-	5.93E-03 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	FISH
	CS 134	18.72 %				
	CS 137	79.49 %				
LIVER	MAXIMUM DOSE-	1.61E-02 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	59.96 %				
	CS 134	11.34 %				
	CS 137	28.08 %				
T. BODY	MAXIMUM DOSE-	1.21E-02 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	DRINKING
	H 3	59.73 %				
	CS 134	14.16 %				
	CS 137	25.40 %				
THYROID	MAXIMUM DOSE-	1.47E-02 MREM	CRITICAL AGE-	INFANT	CRITICAL PATHWAY-	DRINKING
	H 3	63.70 %				
	I 131	36.23 %				
KIDNEY	MAXIMUM DOSE-	1.17E-02 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	82.21 %				
	CS 137	12.57 %				
LUNG	MAXIMUM DOSE-	1.04E-02 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	92.64 %				
	CS 137	5.12 %				
GI-LLI	MAXIMUM DOSE-	9.97E-03 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	96.53 %				

SKIN	MAXIMUM DOSE-	3.70E-04 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	SHORE
	CO 58	7.22 %				
	CO 60	72.79 %				
	SB 125	10.44 %				
	CS 137	5.43 %				
BONE	MAXIMUM DOSE-	5.90E-03 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	FISH
	CS 134	19.98 %				
	CS 137	76.93 %				
LIVER	MAXIMUM DOSE-	1.55E-02 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	58.01 %				
	CS 134	12.49 %				
	CS 137	28.06 %				
T. BODY	MAXIMUM DOSE-	1.18E-02 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	DRINKING
	H 3	57.34 %				
	CS 134	15.47 %				
	CS 137	25.18 %				
THYROID	MAXIMUM DOSE-	1.58E-02 MREM	CRITICAL AGE-	INFANT	CRITICAL PATHWAY-	DRINKING
	H 3	55.19 %				
	I 131	44.63 %				
KIDNEY	MAXIMUM DOSE-	1.11E-02 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	80.92 %				
	CS 134	5.40 %				
	CS 137	12.78 %				
LUNG	MAXIMUM DOSE-	9.81E-03 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	91.51 %				
	CS 137	5.22 %				
GI-LLI	MAXIMUM DOSE-	1.22E-02 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	DRINKING
	H 3	55.25 %				
	CO 58	7.65 %				
	NB 95	27.86 %				

SKIN	MAXIMUM DOSE-	5.15E-04 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	SHORE
	CO 58	6.93 %				
	CO 60	72.46 %				
	SB 125	11.79 %				
	CS 137	5.50 %				
BORE	MAXIMUM DOSE-	8.37E-03 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	FISH
	CS 134	20.83 %				
	CS 137	76.50 %				
LIVER	MAXIMUM DOSE-	1.59E-02 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	FISH
	H 3	41.25 %				
	CS 134	17.99 %				
	CS 137	38.56 %				
T. BODY	MAXIMUM DOSE-	1.21E-02 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	FISH
	H 3	40.67 %				
	CS 134	22.19 %				
	CS 137	34.44 %				
THYROID	MAXIMUM DOSE-	7.84E-03 MREM	CRITICAL AGE-	INFANT	CRITICAL PATHWAY-	DRINKING
	H 3	81.29 %				
	I 131	18.52 %				
KIDNEY	MAXIMUM DOSE-	9.57E-03 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	68.65 %				
	CS 134	9.27 %				
	CS 137	20.90 %				
LUNG	MAXIMUM DOSE-	7.75E-03 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	84.76 %				
	CS 137	9.33 %				
GI-LLI	MAXIMUM DOSE-	1.87E-02 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	FISH
	H 3	26.34 %				
	CO 58	6.65 %				
	MB 95	58.71 %				

SKIN	MAXIMUM DOSE-	9.50E-05 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	SHORE
	CO 60	68.12 %				
	SB 125	23.70 %				
BONE	MAXIMUM DOSE-	6.23E-04 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	FISH
	CS 134	13.21 %				
	CS 137	79.48 %				
LIVER	MAXIMUM DOSE-	5.47E-03 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	87.88 %				
	CS 137	8.66 %				
T. BODY	MAXIMUM DOSE-	4.97E-03 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	96.70 %				
THYROID	MAXIMUM DOSE-	4.89E-03 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	98.40 %				
KIDNEY	MAXIMUM DOSE-	5.03E-03 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	95.63 %				
LUNG	MAXIMUM DOSE-	4.91E-03 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	97.94 %				
GI-LLI	MAXIMUM DOSE-	5.83E-03 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	DRINKING
	H 3	61.92 %				
	MB 95	30.99 %				



02/21/94

SKIN MAXIMUM DOSE- 1.07E-03 MREM CRITICAL AGE- TEEN CRITICAL PATHWAY- SHORE

CO	58	6.73 %
CO	60	71.60 %
SB	125	11.46 %
CS	137	6.37 %

BONE MAXIMUM DOSE- 1.98E-02 MREM CRITICAL AGE- CHILD CRITICAL PATHWAY- FISH

CS	134	19.72 %
CS	137	77.57 %

LIVER MAXIMUM DOSE- 5.10E-02 MREM CRITICAL AGE- CHILD CRITICAL PATHWAY- DRINKING

H	3	57.29 %
CS	134	12.55 %
CS	137	28.81 %

T. BODY MAXIMUM DOSE- 3.86E-02 MREM CRITICAL AGE- ADULT CRITICAL PATHWAY- DRINKING

H	3	56.77 %
CS	134	15.59 %
CS	137	25.92 %

THYROID MAXIMUM DOSE- 4.19E-02 MREM CRITICAL AGE- INFANT CRITICAL PATHWAY- DRINKING

H	3	67.72 %
I	131	32.15 %

KIDNEY MAXIMUM DOSE- 3.63E-02 MREM CRITICAL AGE- CHILD CRITICAL PATHWAY- DRINKING

H	3	80.55 %
CS	134	5.47 %
CS	137	13.22 %

LUNG MAXIMUM DOSE- 3.20E-02 MREM CRITICAL AGE- CHILD CRITICAL PATHWAY- DRINKING

H	3	91.43 %
CS	137	5.42 %

GI-LLI MAXIMUM DOSE- 4.39E-02 MREM CRITICAL AGE- ADULT CRITICAL PATHWAY- DRINKING

H	3	49.97 %
CO	58	5.71 %
NB	95	36.77 %

SKIN	MAXIMUM DOSE-	1.07E-03 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	SHORE
	CO 58	6.73 %				
	CO 60	71.60 %				
	SB 125	11.46 %				
	CS 137	6.37 %				
BONE	MAXIMUM DOSE-	1.98E-02 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	FISH
	CS 134	19.72 %				
	CS 137	77.57 %				
LIVER	MAXIMUM DOSE-	5.10E-02 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	57.29 %				
	CS 134	12.55 %				
	CS 137	28.81 %				
T. BODY	MAXIMUM DOSE-	3.86E-02 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	DRINKING
	H 3	56.77 %				
	CS 134	15.59 %				
	CS 137	25.92 %				
THYROID	MAXIMUM DOSE-	4.19E-02 MREM	CRITICAL AGE-	INFANT	CRITICAL PATHWAY-	DRINKING
	H 3	67.72 %				
	I 131	32.15 %				
KIDNEY	MAXIMUM DOSE-	3.63E-02 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	80.55 %				
	CS 134	5.47 %				
	CS 137	13.22 %				
LUNG	MAXIMUM DOSE-	3.20E-02 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	91.43 %				
	CS 137	5.42 %				
GI-LLI	MAXIMUM DOSE-	4.39E-02 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	DRINKING
	H 3	49.97 %				
	CO 58	5.71 %				
	NO 95	36.77 %				

MCGUIRE NUCLEAR STATION  
UNIT 1  
RADIOACTIVE EFFLUENT RELEASES  
DATE : 02/14/94

II. AIRBORNE RELEASES

YEAR : 1993

	UNITS	1ST QTR	2ND QTR	3RD QTR	4TH QTR	TOTAL	
1. TOTAL NOBLE GASES	CURIES	9.74E+01	1.38E+02	1.94E+02	5.47E+01	4.84E+02	
2. TOTAL HALOGENS	CURIES	1.82E-04	3.12E-04	6.12E-04	2.15E-05	1.13E-03	
3. TOTAL PARTICULATE GROSS BETA-GAMMA	CURIES	4.12E-06	2.39E-06	1.88E-05	3.17E-05	5.70E-05	
4. TOTAL TRITIUM	CURIES	4.10E+00	6.63E+00	2.50E+01	5.60E+00	4.13E+01	
5. TOTAL PARTICULATE GROSS ALPHA ACTIVITY	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
6. MAXIMUM NOBLE GAS RELEASE RATE	UCI/SEC	1.60E+03	1.60E+03	1.60E+03	1.60E+03	1.60E+03	
7. RADIONUCLIDES RELEASED	CURIES						EC RATIO
H-3		4.10E+00	6.63E+00	2.50E+01	5.60E+00	4.13E+01	9.43E-04

PARTICULATES

F-18	1.45E-07	1.00E-07	2.64E-07	0.00E+00	5.09E-07	1.16E-11
NA-24	0.00E+00	0.00E+00	4.76E-08	0.00E+00	4.76E-08	1.55E-11
CL-38	3.81E-08	0.00E+00	8.35E-08	3.63E-08	1.58E-07	6.00E-12
CR-51	0.00E+00	0.00E+00	9.68E-09	0.00E+00	9.68E-09	7.36E-13
MN-56	0.00E+00	0.00E+00	2.68E-08	0.00E+00	2.68E-08	3.05E-12
CO-58	1.79E-08	1.13E-08	1.27E-05	1.69E-06	1.44E-05	3.30E-08
CO-60	0.00E+00	0.00E+00	3.65E-06	0.00E+00	3.65E-06	1.66E-07
BR-82	6.91E-08	2.58E-08	2.74E-08	6.09E-08	1.83E-07	8.36E-11
BR-84	0.00E+00	0.00E+00	4.80E-08	0.00E+00	4.80E-08	1.37E-12
RB-88	2.12E-06	1.09E-06	3.22E-07	2.14E-05	2.49E-05	6.32E-10
RB-89	0.00E+00	0.00E+00	5.29E-07	0.00E+00	5.29E-07	6.03E-12
AG-110M	0.00E+00	0.00E+00	6.42E-09	0.00E+00	6.42E-09	1.46E-10
TE-132	0.00E+00	0.00E+00	1.30E-09	0.00E+00	1.30E-09	3.29E-12
CS-137	1.33E-06	3.61E-09	0.00E+00	0.00E+00	1.33E-06	1.52E-08
CS-138	4.10E-07	1.10E-06	8.65E-07	0.00E+00	2.37E-06	6.76E-11
BA-139	0.00E+00	5.79E-08	1.12E-07	0.00E+00	1.70E-07	9.71E-12
W-187	0.00E+00	0.00E+00	8.71E-08	0.00E+00	8.71E-08	1.92E-11
C-11	0.00E+00	0.00E+00	0.00E+00	8.50E-06	8.50E-06	3.23E-11

HALOGENS

I-130	0.00E+00	5.04E-07	0.00E+00	0.00E+00	5.04E-07	3.83E-10
I-131	1.50E-04	2.31E-04	4.54E-04	2.89E-06	8.38E-04	9.56E-06
I-132	2.81E-07	2.43E-06	1.32E-04	4.54E-06	1.40E-04	1.59E-08
I-133	3.13E-05	7.12E-05	2.18E-05	1.41E-05	1.38E-04	3.16E-07
I-134	3.46E-08	1.51E-06	1.82E-06	0.00E+00	3.37E-06	1.28E-10
I-135	7.33E-07	5.36E-06	2.02E-06	0.00E+00	8.11E-06	3.09E-09

GASES

AR-41	1.12E+00	4.93E+00	5.38E+00	6.60E-01	1.21E+01	2.76E-03
KR-85	1.02E+00	0.00E+00	1.88E+00	5.61E-01	3.46E+00	1.13E-05
KR-85M	3.28E-01	6.64E-01	5.83E-01	9.07E-02	1.67E+00	3.80E-05
KR-87	5.37E-02	1.65E-01	1.55E-01	1.22E-02	3.86E-01	4.40E-05
KR-88	3.44E-01	6.85E-01	6.07E-01	9.16E-02	1.73E+00	4.38E-04
XE-131M	3.14E-01	6.29E-01	3.63E-01	7.87E-02	1.39E+00	1.58E-06
XE-133	8.81E+01	1.20E+02	1.64E+02	4.99E+01	4.22E+02	1.93E-03
XE-133M	1.28E+00	1.45E+00	4.00E+00	3.20E-01	7.05E+00	2.68E-05
XE-135	4.81E+00	9.80E+00	1.65E+01	2.99E+00	3.41E+01	1.11E-03
XE-135M	8.80E-03	1.31E-02	1.20E-02	3.71E-03	3.76E-02	2.14E-06
XE-138	1.62E-03	1.46E-02	2.99E-04	1.32E-03	1.79E-02	2.04E-06

TOTAL EC RATIO 7.31E-03

MCGUIRE UNIT 1 GAS DOSE 001-090 93 RELEASE WEIGHTED NET REPORT SUMMARY 02/14/94  
SPECIAL LOCATION  
AT 0.50 MILES E

NOBLE GAS EXPOSURE:

BETA AIR DOSE = 7.87E-02 MILLIRADS  
GAMMA AIR DOSE = 3.86E-02 MILLIRADS

TOTAL BODY DOSE = 2.39E-02 MILLIREM

KR 88	9.74%
XE133	52.47%
XE135	18.85%
AR 41	16.74%

TOTAL SKIN DOSE = 5.98E-02 MILLIREM

KR 88	5.36%
XE133	59.12%
XE135	19.98%
AR 41	10.70%

MCGUIRE UNIT 1 GAS DOSE 001-090 93 RELEASE WEIGHTED NET REPORT SUMMARY  
SPECIAL LOCATION  
AT 1.00 MILES ESE

02/14/94

IODINE, PARTICULATE, AND TRITIUM EXPOSURE SUMMARY:

MAXIMUM ORGAN - THYROID  
CRITICAL AGE - INFANT  
CRITICAL PATHWAY - GOATMILK @ 98.66%

MAXIMUM ORGAN DOSE = 3.51E-02 MILLIREM  
H 3 5.66%  
I 131 94.11%

HCGUI. UNIT 1 GAS DOSE 091-181 93 RELEASE WEIGHTED MET REPORT SUMMARY  
SPECIAL LOCATION  
AT 0.50 MILES NNE

02/14/94

NOBLE GAS EXPOSURE:

BETA AIR DOSE = 2.34E-01 MILLIRADS  
GAMMA AIR DOSE = 1.67E-01 MILLIRADS

TOTAL BODY DOSE = 1.07E-01 MILLIREM

KR 88	8.95%
XE133	30.34%
XE135	16.41%
AR 41	42.16%

TOTAL SKIN DOSE = 2.31E-01 MILLIREM

KR 88	5.71%
XE133	39.36%
XE135	20.02%
AR 41	31.14%

MCGUIRE UNIT 1 GAS DOSE 091-181 93 RELEASE WEIGHTED NET REPORT SUMMARY  
SPECIAL LOCATION  
AT 1.00 MILES ESE

02/14/94

IODINE, PARTICULATE, AND TRITIUM EXPOSURE SUMMARY:

MAXIMUM ORGAN - THYROID  
CRITICAL AGE - INFANT  
CRITICAL PATHWAY - GOATHILK @ 97.66%

MAXIMUM ORGAN DOSE = 3.25E-02 MILLIREM  
H 3 10.75%  
I 131 88.91%

MCGUIRE UNIT 1 GAS DOSE 182-273 93 RELEASE WEIGHTED MET REPORT SUMMARY 02/14/94  
SPECIAL LOCATION  
AT 0.50 MILES NNE

NOBLE GAS EXPOSURE:

BETA AIR DOSE = 4.40E-01 MILLIRADS  
GAMMA AIR DOSE = 2.31E-01 MILLIRADS

TOTAL BODY DOSE = 1.44E-01 MILLIREM  
KR 88 5.10%  
XE133 46.57%  
XE135 19.63%  
AR 41 26.83%

TOTAL SKIN DOSE = 3.53E-01 MILLIREM  
KR 88 2.87%  
XE133 53.56%  
XE135 21.11%  
AR 41 17.57%



MCGUIRE UNIT 1 GAS DOSE 182-273 93 RELEASE WEIGHTED NET REPORT SUMMARY  
SPECIAL LOCATION  
AT 0.50 MILES E

02/14/94

IODINE, PARTICULATE, AND TRITIUM EXPOSURE SUMMARY:

MAXIMUM ORGAN - THYROID  
CRITICAL AGE - CHILD  
CRITICAL PATHWAY - VEGET @ 77.20%

MAXIMUM ORGAN DOSE = 7.28E-02 MILLIREM  
H 3 80.21%  
I 131 19.60%

MCGUIRE UNIT 1 GAS DOSE 274-365 93 RELEASE WEIGHTED NET REPORT SUMMARY 02/14/94  
SPECIAL LOCATION  
AT 0.50 MILES NNE

NOBLE GAS EXPOSURE:

BETA AIR DOSE = 9.14E-02 MILLIRADS  
GAMMA AIR DOSE = 4.37E-02 MILLIRADS

TOTAL BODY DOSE = 2.70E-02 MILLIREM  
XE133 55.63%  
XE135 19.47%  
AR 41 19.84%

TOTAL SKIN DOSE = 6.76E-02 MILLIREM  
XE133 62.55%  
XE135 20.40%  
AR 41 12.64%

MCGUIRE UNIT 1 GAS DOSE 274-365 93 RELEASE WEIGHTED NET REPORT SUMMARY  
SPECIAL LOCATION  
AT 0.50 MILES SSE

02/14/94

IODINE, PARTICULATE, AND TRITIUM EXPOSURE SUMMARY:

MAXIMUM ORGAN - THYROID  
CRITICAL AGE - CHILD  
CRITICAL PATHWAY - VEGET @ 78.10%

MAXIMUM ORGAN DOSE = 1.88E-02 MILLIREM  
H 3 98.79%

MCGUIRE UNIT 1 GAS DOSE 001-365 93 RELEASE WEIGHTED MET REPORT SUMMARY 02/14/94  
SPECIAL LOCATION  
AT 0.50 MILES NNE

NOBLE GAS EXPOSURE:

BETA AIR DOSE = 8.14E-01 MILLIRADS  
GAMMA AIR DOSE = 4.67E-01 MILLIRADS

TOTAL BODY DOSE = 2.93E-01 MILLIREM  
KR 88 6.75%  
XE133 41.76%  
XE135 18.24%  
AR 41 31.36%

TOTAL SKIN DOSE = 6.90E-01 MILLIREM  
KR 88 3.95%  
XE133 50.01%  
XE135 20.51%  
AR 41 21.30%

MCGUIRE UNIT 1 GAS DOSE 001-365 93 RELEASE WEIGHTED MET REPORT SUMMARY 02/14/94  
SPECIAL LOCATION  
AT 1.00 MILES ESE

IODINE, PARTICULATE, AND TRITIUM EXPOSURE SUMMARY:

MAXIMUM ORGAN - THYROID  
CRITICAL AGE - INFANT  
CRITICAL PATHWAY - GOATMILK @ 97.10%

MAXIMUM ORGAN DOSE = 1.34E-01 MILLIREM  
H 3 16.29%  
I 131 83.50%

Attachment 1

Radioactive Effluent Releases

Unit 2

MCGUIRE NUCLEAR STATION  
UNIT 2  
RADIOACTIVE EFFLUENT RELEASES  
DATE : 02/21/94

I. LIQUID RELEASES

YEAR : 1993

	UNITS	1ST QTR	2ND QTR	3RD QTR	4TH QTR	TOTAL	
1. GROSS RADIOACTIVITY							
A. TOTAL RELEASE	CURIES	4.38E-02	8.87E-02	1.32E-01	2.12E-02	2.85E-01	
B. AVERAGE CONCENTRATION RELEASED	UCI/ML	5.53E-11	1.22E-10	1.61E-10	2.15E-11	8.57E-11	
C. MAXIMUM CONCENTRATION RELEASED	UCI/ML	3.08E-09	2.10E-09	1.89E-09	5.46E-10	3.08E-09	
2. TRITIUM							
A. TOTAL RELEASE	CURIES	1.25E+02	1.04E+02	8.54E+01	7.45E+01	3.88E+02	
B. AVERAGE CONCENTRATION RELEASED	UCI/ML	1.57E-07	1.42E-07	1.04E-07	7.55E-08	1.17E-07	
3. DISSOLVED NOBLE GASES							
A. TOTAL RELEASE	CURIES	8.81E-02	7.15E-02	1.02E-02	1.86E-03	1.72E-01	
B. AVERAGE CONCENTRATION RELEASED	UCI/ML	1.11E-10	9.80E-11	1.25E-11	1.88E-12	5.16E-11	
4. GROSS ALPHA ACTIVITY							
A. TOTAL RELEASE	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
B. AVERAGE CONCENTRATION RELEASED	UCI/ML	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
5. VOLUME OF LIQUID WASTE TO DISCHARGE CANAL	LITERS	9.59E+05	1.58E+06	3.69E+06	6.85E+05	6.91E+06	
6. VOLUME OF DILUTION WATER	LITERS	7.93E+11	7.30E+11	8.18E+11	9.87E+11	3.33E+12	
7. RADIONUCLIDES RELEASED	CURIES						EC RATIO
H-3		1.25E+02	1.04E+02	8.54E+01	7.45E+01	3.88E+02	1.17E-04
F-18		0.00E+00	0.00E+00	1.23E-04	0.00E+00	1.23E-04	5.26E-11
NA-24		0.00E+00	1.23E-04	7.84E-05	5.72E-06	2.07E-04	1.24E-09
K-40		0.00E+00	1.40E-05	0.00E+00	0.00E+00	1.40E-05	1.05E-09
CR-51		2.01E-03	2.61E-03	6.95E-03	5.56E-04	1.21E-02	7.28E-09
MN-54		8.58E-04	9.89E-04	2.87E-03	9.98E-04	5.71E-03	5.72E-08
MH-56		0.00E+00	4.17E-07	2.80E-06	0.00E+00	3.22E-06	1.38E-11
FE-55		2.82E-03	3.93E-03	5.04E-03	8.28E-04	1.26E-02	3.79E-08
FE-59		2.22E-05	4.69E-05	4.66E-04	2.45E-06	5.38E-04	1.62E-08
CO-57		2.77E-05	7.63E-05	1.80E-04	1.67E-05	3.01E-04	1.51E-09
CO-58		2.31E-02	4.80E-02	7.35E-02	6.71E-03	1.51E-01	2.27E-06
CO-60		2.89E-03	7.51E-03	1.17E-02	2.37E-03	2.45E-02	2.45E-06
ZN-65		2.80E-06	1.20E-05	0.00E+00	0.00E+00	1.48E-05	8.91E-10
BR-82		9.48E-06	8.27E-06	5.25E-06	1.03E-06	2.40E-05	1.80E-10
RB-86		0.00E+00	1.42E-05	6.48E-05	0.00E+00	7.91E-05	3.39E-09
RB-88		1.63E-04	4.27E-05	0.00E+00	0.00E+00	2.06E-04	1.54E-10
SR-89		7.64E-05	2.65E-06	1.81E-05	4.18E-07	9.76E-05	3.67E-09
SR-92		2.53E-06	5.40E-05	0.00E+00	0.00E+00	5.65E-05	4.25E-10
Y-91M		0.00E+00	2.93E-06	0.00E+00	0.00E+00	2.93E-06	4.40E-13
ZR-95		0.00E+00	2.14E-04	9.78E-04	1.42E-04	1.33E-03	2.00E-08
ZR-97		0.00E+00	2.25E-06	2.12E-06	0.00E+00	4.37E-06	1.46E-10
NB-95		3.12E-05	4.41E-04	1.56E-03	2.67E-04	2.30E-03	2.30E-08
NB-97		9.63E-06	4.42E-05	1.94E-05	5.85E-06	7.91E-05	7.92E-11
MO-99		1.32E-04	0.00E+00	0.00E+00	0.00E+00	1.32E-04	1.98E-09
TC-99M		2.72E-04	1.45E-05	3.59E-06	1.47E-06	2.91E-04	8.75E-11
RU-103		0.00E+00	0.00E+00	6.76E-06	0.00E+00	6.76E-06	6.77E-11
RU-106		0.00E+00	0.00E+00	0.00E+00	1.01E-05	1.01E-05	1.01E-09
AG-110M		2.99E-04	6.03E-04	9.80E-05	3.92E-05	1.04E-03	5.20E-08
I-131		4.06E-03	5.19E-03	1.12E-03	6.64E-05	1.04E-02	3.14E-06
I-132		6.16E-06	1.97E-05	2.08E-05	0.00E+00	4.66E-05	1.40E-10
I-133		2.80E-04	7.33E-04	3.99E-04	9.33E-06	1.42E-03	6.10E-08
I-134		3.42E-06	1.41E-06	0.00E+00	0.00E+00	4.83E-06	3.63E-12
I-135		1.75E-05	1.36E-04	1.03E-04	0.00E+00	2.57E-04	2.57E-09
SB-122		7.45E-05	2.44E-06	8.69E-04	0.00E+00	9.46E-04	2.84E-08
SB-124		2.60E-04	5.65E-03	4.18E-03	7.80E-04	1.09E-02	4.67E-07
SB-125		8.57E-04	1.05E-02	1.83E-02	8.14E-03	3.77E-02	3.78E-07
SN-113		0.00E+00	2.16E-05	6.06E-05	1.60E-05	9.82E-05	9.84E-10
TE-132		3.92E-05	0.00E+00	9.44E-06	0.00E+00	4.86E-05	1.62E-09
CS-134		4.52E-04	4.37E-04	7.13E-04	4.06E-05	1.64E-03	5.48E-07
CS-136		3.00E-06	0.00E+00	8.55E-07	0.00E+00	3.86E-06	1.93E-10
CS-137		1.37E-03	1.17E-03	1.85E-03	1.68E-04	4.56E-03	1.37E-06
CS-138		0.00E+00	5.97E-05	0.00E+00	0.00E+00	5.97E-05	4.49E-11
BA-140		1.23E-05	1.19E-05	1.75E-05	1.17E-06	4.28E-05	1.61E-09
LA-140		3.58E-03	4.80E-05	6.83E-05	4.58E-06	3.70E-03	1.24E-07
CE-141		0.00E+00	6.81E-06	0.00E+00	0.00E+00	6.81E-06	6.82E-11
CE-144		0.00E+00	0.00E+00	1.41E-05	6.92E-06	2.10E-05	2.11E-09
NP-239		5.70E-05	0.00E+00	5.47E-05	0.00E+00	1.12E-04	1.68E-09
SB-126		0.00E+00	0.00E+00	4.06E-05	0.00E+00	4.06E-05	1.74E-09
KR-85		1.98E-04	0.00E+00	0.00E+00	0.00E+00	1.98E-04	5.94E-10
KR-85M		4.44E-05	8.57E-05	0.00E+00	0.00E+00	1.30E-04	3.91E-10
KR-87		2.82E-06	0.00E+00	7.77E-04	0.00E+00	7.80E-04	2.34E-09
KR-88		2.12E-05	1.93E-05	0.00E+00	0.00E+00	4.04E-05	1.22E-10
XE-131M		0.00E+00	3.78E-04	4.09E-04	0.00E+00	7.87E-04	2.37E-09
XE-133		7.99E-02	6.77E-02	8.91E-03	1.80E-03	1.58E-01	4.76E-07
XE-133M		1.69E-03	9.51E-04	0.00E+00	0.00E+00	2.65E-03	7.95E-09
XE-135		6.21E-03	2.36E-03	1.04E-04	5.73E-05	8.74E-03	2.63E-08
XE-135M		4.68E-06	2.25E-05	1.59E-05	0.00E+00	4.31E-05	1.30E-10

TOTAL EC RATIO 1.28E-04

SKIN	MAXIMUM DOSE-	1.32E-04 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	SHORE
	CO 58	7.69 %				
	CO 60	68.50 %				
	CS 137	15.76 %				
BONE	MAXIMUM DOSE-	5.93E-03 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	FISH
	CS 134	18.72 %				
	CS 137	79.49 %				
LIVER	MAXIMUM DOSE-	1.61E-02 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	59.96 %				
	CS 134	11.34 %				
	CS 137	28.08 %				
T. BODY	MAXIMUM DOSE-	1.21E-02 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	DRINKING
	H 3	59.73 %				
	CS 134	14.16 %				
	CS 137	25.40 %				
THYROID	MAXIMUM DOSE-	1.47E-02 MREM	CRITICAL AGE-	INFANT	CRITICAL PATHWAY-	DRINKING
	H 3	63.70 %				
	I 131	36.23 %				
KIDNEY	MAXIMUM DOSE-	1.17E-02 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	82.21 %				
	CS 137	12.57 %				
LUNG	MAXIMUM DOSE-	1.04E-02 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	92.64 %				
	CS 137	5.12 %				
GI-LLI	MAXIMUM DOSE-	9.97E-03 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	96.53 %				



SKIN	MAXIMUM DOSE-	3.70E-04 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	SHORE
	CO	58 7.22 %				
	CO	60 72.79 %				
	SB	125 10.44 %				
	CS	137 5.43 %				
BONE	MAXIMUM DOSE-	5.90E-03 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	FISH
	CS	134 19.98 %				
	CS	137 76.93 %				
LIVER	MAXIMUM DOSE-	1.55E-02 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H	3 58.01 %				
	CS	134 12.49 %				
	CS	137 28.06 %				
T. BODY	MAXIMUM DOSE-	1.18E-02 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	DRINKING
	H	3 57.34 %				
	CS	134 15.47 %				
	CS	137 25.18 %				
THYROID	MAXIMUM DOSE-	1.58E-02 MREM	CRITICAL AGE-	INFANT	CRITICAL PATHWAY-	DRINKING
	H	3 55.19 %				
	I	131 44.63 %				
KIDNEY	MAXIMUM DOSE-	1.11E-02 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H	3 80.92 %				
	CS	134 5.40 %				
	CS	137 12.78 %				
LUNG	MAXIMUM DOSE-	9.81E-03 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H	3 91.51 %				
	CS	137 5.22 %				
GI-LLI	MAXIMUM DOSE-	1.22E-02 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	DRINKING
	H	3 55.25 %				
	CO	58 7.65 %				
	NB	95 27.86 %				

SKIN	MAXIMUM DOSE-	5.15E-04 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	SHORE
	CO 58	6.93 %				
	CO 60	72.46 %				
	SB 125	11.79 %				
	CS 137	5.50 %				
BONE	MAXIMUM DOSE-	8.37E-03 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	FISH
	CS 134	20.83 %				
	CS 137	76.50 %				
LIVER	MAXIMUM DOSE-	1.59E-02 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	FISH
	H 3	41.35 %				
	CS 134	17.99 %				
	CS 137	38.56 %				
T. BODY	MAXIMUM DOSE-	1.21E-02 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	FISH
	H 3	40.67 %				
	CS 134	22.19 %				
	CS 137	34.44 %				
THYROID	MAXIMUM DOSE-	7.84E-03 MREM	CRITICAL AGE-	INFANT	CRITICAL PATHWAY-	DRINKING
	H 3	81.29 %				
	I 131	18.52 %				
KIDNEY	MAXIMUM DOSE-	9.57E-03 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	68.65 %				
	CS 134	9.27 %				
	CS 137	20.90 %				
LUNG	MAXIMUM DOSE-	7.75E-03 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	84.76 %				
	CS 137	9.33 %				
GI-LLI	MAXIMUM DOSE-	1.87E-02 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	FISH
	H 3	26.34 %				
	CO 58	6.65 %				
	NB 95	58.71 %				

SKIN	MAXIMUM DOSE-	9.50E-05 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	SHORE
	CO 60	68.12 %				
	SB 125	23.70 %				
BONE	MAXIMUM DOSE-	6.23E-04 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	FISH
	CS 134	13.21 %				
	CS 137	79.48 %				
LIVER	MAXIMUM DOSE-	5.47E-03 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	87.88 %				
	CS 137	8.66 %				
T. BODY	MAXIMUM DOSE-	4.97E-03 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	96.70 %				
THYROID	MAXIMUM DOSE-	4.89E-03 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	98.40 %				
KIDNEY	MAXIMUM DOSE-	5.03E-03 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	95.63 %				
LUNG	MAXIMUM DOSE-	4.91E-03 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	97.94 %				
GI-LLI	MAXIMUM DOSE-	5.83E-03 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	DRINKING
	H 3	61.92 %				
	NB 95	30.99 %				

SKIN	MAXIMUM DOSE-	1.07E-03 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	SHORE
	CO 58	6.73 %				
	CO 60	71.60 %				
	SB 125	11.46 %				
	CS 137	6.37 %				
BONE	MAXIMUM DOSE-	1.98E-02 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	FISH
	CS 134	19.72 %				
	CS 137	77.57 %				
LIVER	MAXIMUM DOSE-	5.10E-02 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	57.29 %				
	CS 134	12.55 %				
	CS 137	28.81 %				
T. BODY	MAXIMUM DOSE-	3.86E-02 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	DRINKING
	H 3	56.77 %				
	CS 134	15.59 %				
	CS 137	25.92 %				
THYROID	MAXIMUM DOSE-	4.19E-02 MREM	CRITICAL AGE-	INFANT	CRITICAL PATHWAY-	DRINKING
	H 3	67.72 %				
	I 131	32.15 %				
KIDNEY	MAXIMUM DOSE-	3.63E-02 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	80.55 %				
	CS 134	5.47 %				
	CS 137	13.22 %				
LUNG	MAXIMUM DOSE-	3.20E-02 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	91.43 %				
	CS 137	5.42 %				
GI-LLI	MAXIMUM DOSE-	4.39E-02 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	DRINKING
	H 3	49.97 %				
	CO 58	5.71 %				
	NB 95	36.77 %				

MCGUIRE NUCLEAR STATION  
UNIT 2  
RADIOACTIVE EFFLUENT RELEASES  
DATE : 02/14/94

11. AIRBORNE RELEASES

YEAR : 1993

	UNITS	1ST QTR	2ND QTR	3RD QTR	4TH QTR	TOTAL	
1. TOTAL NOBLE GASES	CURIES	9.74E+01	1.38E+02	1.94E+02	5.47E+01	4.84E+02	
2. TOTAL HALOGENS	CURIES	1.82E-04	3.12E-04	6.12E-04	2.15E-05	1.13E-03	
3. TOTAL PARTICULATE GROSS BETA-GAMMA	CURIES	4.12E-06	2.39E-06	1.88E-05	3.17E-05	5.70E-05	
4. TOTAL TRITIUM	CURIES	4.10E+00	6.63E+00	2.50E+01	5.60E+00	4.13E+01	
5. TOTAL PARTICULATE GROSS ALPHA ACTIVITY	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
6. MAXIMUM NOBLE GAS RELEASE RATE	UCI/SEC	1.60E+03	1.60E+03	1.60E+03	1.60E+03	1.60E+03	
7. RADIONUCLIDES RELEASED	CURIES						EC RATIO
H-3		4.10E+00	6.63E+00	2.50E+01	5.60E+00	4.13E+01	9.43E-04
PARTICULATES							
F-18		1.45E-07	1.00E-07	2.64E-07	0.00E+00	5.09E-07	1.16E-11
NA-24		0.00E+00	0.00E+00	4.76E-08	0.00E+00	4.76E-08	1.55E-11
CL-38		3.81E-08	0.00E+00	8.35E-08	3.63E-08	1.58E-07	6.00E-12
CR-51		0.00E+00	0.00E+00	9.68E-09	0.00E+00	9.68E-09	7.36E-13
MN-56		0.00E+00	0.00E+00	2.68E-08	0.00E+00	2.68E-08	3.05E-12
CO-58		1.79E-08	1.13E-08	1.27E-05	1.69E-06	1.44E-05	3.30E-08
CO-60		0.00E+00	0.00E+00	3.65E-06	0.00E+00	3.65E-06	1.66E-07
BR-82		6.91E-08	2.58E-08	2.74E-08	6.09E-08	1.83E-07	8.36E-11
BR-84		0.00E+00	0.00E+00	4.80E-08	0.00E+00	4.80E-08	1.37E-12
RB-88		2.12E-06	1.09E-06	3.22E-07	2.14E-05	2.49E-05	6.32E-10
RB-89		0.00E+00	0.00E+00	5.29E-07	0.00E+00	5.29E-07	6.03E-12
AG-110M		0.00E+00	0.00E+00	6.42E-09	0.00E+00	6.42E-09	1.46E-10
TE-132		0.00E+00	0.00E+00	1.30E-09	0.00E+00	1.30E-09	3.29E-12
CS-137		1.33E-06	3.61E-09	0.00E+00	0.00E+00	1.33E-06	1.52E-08
CS-138		4.10E-07	1.10E-06	8.65E-07	0.00E+00	2.37E-06	6.76E-11
BA-139		0.00E+00	5.79E-08	1.12E-07	0.00E+00	1.70E-07	9.71E-12
W-187		0.00E+00	0.00E+00	8.71E-08	0.00E+00	8.71E-08	1.99E-11
C-11		0.00E+00	0.00E+00	0.00E+00	8.50E-06	8.50E-06	3.23E-11
HALOGENS							
I-130		0.00E+00	5.04E-07	0.00E+00	0.00E+00	5.04E-07	3.83E-10
I-131		1.50E-04	2.31E-04	4.54E-04	2.89E-06	8.38E-04	9.56E-06
I-132		2.81E-07	2.43E-06	1.32E-04	4.54E-06	1.40E-04	1.59E-08
I-133		3.13E-05	7.12E-05	2.18E-05	1.41E-05	1.38E-04	3.16E-07
I-134		3.46E-08	1.51E-06	1.82E-06	0.00E+00	3.37E-06	1.28E-10
I-135		7.33E-07	5.36E-06	2.02E-06	0.00E+00	8.11E-06	3.09E-09
GASES							
AR-41		1.12E+00	4.93E+00	5.38E+00	6.60E-01	1.21E+01	2.76E-03
KR-85		1.02E+00	0.00E+00	1.88E+00	5.61E-01	3.46E+00	1.13E-05
KR-85M		3.28E-01	6.64E-01	5.83E-01	9.07E-02	1.67E+00	3.80E-05
KR-87		5.37E-02	1.65E-01	1.55E-01	1.22E-02	3.86E-01	4.40E-05
KR-88		3.44E-01	6.85E-01	6.07E-01	9.16E-02	1.73E+00	4.38E-04
XE-133M		3.14E-01	6.29E-01	3.63E-01	7.87E-02	1.39E+00	1.58E-06
XE-133		8.81E+01	1.20E+02	1.64E+02	4.99E+01	4.22E+02	1.93E-03
XE-133M		1.28E+00	1.45E+00	4.00E+00	3.20E-01	7.05E+00	2.68E-05
XE-135		4.81E+00	9.80E+00	1.65E+01	2.99E+00	3.41E+01	1.11E-03
XE-135M		8.80E-03	1.31E-02	1.20E-02	3.71E-03	3.76E-02	2.14E-06
XE-138		1.62E-03	1.46E-02	2.99E-04	1.32E-03	1.79E-02	2.04E-06
TOTAL EC RATIO							7.31E-03

MCGUIRE UNIT 2 GAS DOSE 001-090 93 RELEASE WEIGHTED NET REPORT SUMMARY 02/14/94  
SPECIAL LOCATION  
AT 0.50 MILES E

NOBLE GAS EXPOSURE:

BETA AIR DOSE = 7.87E-02 MILLIRADS  
GAMMA AIR DOSE = 3.86E-02 MILLIRADS

TOTAL BODY DOSE = 2.39E-02 MILLIREM

KR 88	9.74%
XE133	52.47%
XE135	18.85%
AR 41	16.74%

TOTAL SKIN DOSE = 5.98E-02 MILLIREM

KR 88	5.36%
XE133	59.12%
XE135	19.98%
AR 41	10.76%

MCGUIRE UNIT 2 GAS DOSE 001-090 93 RELEASE WEIGHTED MET REPORT SUMMARY  
SPECIAL LOCATION  
AT 1.00 MILES ESE

02/14/94

IODINE, PARTICULATE, AND TRITIUM EXPOSURE SUMMARY:

MAXIMUM ORGAN - THYROID  
CRITICAL AGE - INFANT  
CRITICAL PATHWAY - GOATMILK @ 98.66%

MAXIMUM ORGAN DOSE = 3.51E-02 MILLIREM  
H 3 5.66%  
I 131 94.11%

MCGUIRE UNIT 2 GAS DOSE 091-181 93 RELEASE WEIGHTED NET REPORT SUMMARY 02/14/94  
SPECIAL LOCATION  
AT 0.50 MILES NNE

NOBLE GAS EXPOSURE:

BETA AIR DOSE = 2.34E-01 MILLIRADS  
GAMMA AIR DOSE = 1.67E-01 MILLIRADS

TOTAL BODY DOSE = 1.07E-01 MILLIREM  
KR 88 8.95%  
XE133 30.34%  
XE135 16.41%  
AR 41 42.16%

TOTAL SKIN DOSE = 2.31E-01 MILLIREM  
KR 88 5.71%  
XE133 39.36%  
XE135 20.02%  
AR 41 31.14%



MCGUIRE UNIT 2 GAS DOSE 091-181 93 RELEASE WEIGHTED MET REPORT SUMMARY 02/14/94  
SPECIAL LOCATION  
AT 1.00 MILES ESE

IODINE, PARTICULATE, AND TRITIUM EXPOSURE SUMMARY:

MAXIMUM ORGAN - THYROID  
CRITICAL AGE - INFANT  
CRITICAL PATHWAY - GOATMILK @ 97.66%

MAXIMUM ORGAN DOSE = 3.25E-02 MILLIREM  
H 3 10.75%  
I 131 88.91%

MCGUIRE UNIT 2 GAS DOSE 182-273 93 RELEASE WEIGHTED NET REPORT SUMMARY  
SPECIAL LOCATION  
AT 0.50 MILES NNE

02/14/94

NOBLE GAS EXPOSURE:

BETA AIR DOSE = 4.40E-01 MILLIRADS  
GAMMA AIR DOSE = 2.31E-01 MILLIRADS

TOTAL BODY DOSE = 1.44E-01 MILLIREM  
KR 88 5.10%  
XE133 46.57%  
XE135 19.63%  
AR 41 26.83%

TOTAL SKIN DOSE = 3.53E-01 MILLIREM  
KR 88 2.87%  
XE133 53.56%  
XE135 21.11%  
AR 41 17.57%

MCGUIRE UNIT 2 GAS DOSE 182-273 93 RELEASE WEIGHTED NET REPORT SUMMARY  
SPECIAL LOCATION  
AT 0.50 MILES E

02/14/94

IODINE, PARTICULATE, AND TRITIUM EXPOSURE SUMMARY:

MAXIMUM ORGAN - THYROID  
CRITICAL AGE - CHILD  
CRITICAL PATHWAY - VEGET @ 77.20%

MAXIMUM ORGAN DOSE = 7.28E-02 MILLIREM  
H 3 80.21%  
I 131 19.60%

MCQUIRE UNIT 2 GAS DOSE 274-365 93 RELEASE WEIGHTED NET REPORT SUMMARY 02/14/94  
SPECIAL LOCATION  
AT 0.50 MILES NNE

NOBLE GAS EXPOSURE:

BETA AIR DOSE = 9.14E-02 MILLIRADS  
GAMMA AIR DOSE = 4.37E-02 MILLIRADS

TOTAL BODY DOSE = 2.70E-02 MILLIREM  
XE133 55.63%  
XE135 19.47%  
AR 41 19.84%

TOTAL SKIN DOSE = 6.76E-02 MILLIREM  
XE133 62.55%  
XE135 20.40%  
AR 41 12.64%

MCGUIRE UNIT 2 GAS DOSE 274-365 93 RELEASE WEIGHTED MET REPORT SUMMARY  
SPECIAL LOCATION  
AT 0.50 MILES SSE

02/14/94

IODINE, PARTICULATE, AND TRITIUM EXPOSURE SUMMARY:

MAXIMUM ORGAN - THYROID  
CRITICAL AGE - CHILD  
CRITICAL PATHWAY - VEGET @ 78.10%  
MAXIMUM ORGAN DOSE = 1.88E-02 MILLIREM  
H 3 98.79%

HCGUIRE UNIT 2 GAS DOSE 001-365 93 RELEASE WEIGHTED NET REPORT SUMMARY 02/14/94  
SPECIAL LOCATION  
AT 0.50 MILES NNE

NOBLE GAS EXPOSURE:

BETA AIR DOSE = 8.14E-01 MILLIRADS  
GAMMA AIR DOSE = 4.67E-01 MILLIRADS

TOTAL BODY DOSE = 2.93E-01 MILLIREM  
KR 88 6.75%  
XE133 41.76%  
XE135 18.24%  
AR 41 31.36%

TOTAL SKIN DOSE = 6.90E-01 MILLIREM  
KR 88 3.95%  
XE133 50.01%  
XE135 20.51%  
AR 41 21.30%

MCGUIRE UNIT 2 GAS DOSE 001-365 93 RELEASE WEIGHTED NET REPORT SUMMARY 02/14/94  
SPECIAL LOCATION  
AT 1.00 MILES ESE

IODINE, PARTICULATE, AND TRITIUM EXPOSURE SUMMARY:

MAXIMUM ORGAN - THYROID  
CRITICAL AGE - INFANT  
CRITICAL PATHWAY - GOATMILK @ 97.10%  
MAXIMUM ORGAN DOSE = 1.34E-01 MILLIREM  
H 3 16.29%  
I 131 83.50%

Attachment 1

Supplemental Information



MCGUIRE NUCLEAR STATION  
EFFLUENT AND WASTE DISPOSAL SUPPLEMENTAL INFORMATION  
REPORT DATE: 03/01/94  
PERIOD COVERED: START DAY = 001 STOP DAY = 365

I. REGULATORY LIMITS

A. NOBLE GASES - AIR DOSE

1. CALENDAR QUARTER - GAMMA DOSE = 5 MRAD
2. CALENDAR QUARTER - BETA DOSE = 10 MRAD
3. CALENDAR YEAR - GAMMA DOSE = 10 MRAD
4. CALENDAR YEAR - BETA DOSE = 20 MRAD

B. LIQUID EFFLUENTS - DOSE

1. CALENDAR QUARTER - TOTAL BODY DOSE = 1.5 MREM
2. CALENDAR QUARTER - ORGAN DOSE = 5 MREM
3. CALENDAR YEAR - TOTAL BODY DOSE = 3 MREM
4. CALENDAR YEAR - ORGAN DOSE = 10 MREM

C. IODINE - 131 AND 133, TRITIUM, PARTICULATES W/T 1/2 > 8 DAYS - ORGAN DOSE

1. CALENDAR QUARTER = 7.5 MREM
2. CALENDAR YEAR = 15 MREM

II. MAXIMUM PERMISSIBLE EFFLUENT CONCENTRATIONS

- A. GASEOUS EFFLUENTS - INFORMATION FOUND IN OFFSITE DOSE CALCULATION MANUAL
- B. LIQUID EFFLUENTS - INFORMATION FOUND IN 10CFR20, APPENDIX B, TABLE 2, COLUMN 2

III. AVERAGE ENERGY - NOT APPLICABLE

IV. MEASUREMENTS AND APPROXIMATIONS OF TOTAL RADIOACTIVITY  
INFORMATION FOUND IN OFFSITE DOSE CALCULATION MANUAL

V. BATCH RELEASES

A. LIQUID EFFLUENT

1. 4.89E+02 = TOTAL NUMBER OF BATCH RELEASES
2. 2.76E+05 = TOTAL TIME(MIN.) FOR BATCH RELEASES.
3. 9.97E+03 = MAXIMUM TIME(MIN.) FOR A BATCH RELEASE.
4. 5.64E+02 = AVERAGE TIME(MIN.) FOR A BATCH RELEASE.
5. 1.30E+01 = MINIMUM TIME(MIN.) FOR A BATCH RELEASE.
6. 1.48E+06 = AVERAGE DILUTION WATER FLOW DURING RELEASES(GPM).

B. GASEOUS EFFLUENT

1. 1.71E+02 = TOTAL NUMBER OF BATCH RELEASES.
2. 1.80E+06 = TOTAL TIME(MIN.) FOR BATCH RELEASES.
3. 4.46E+04 = MAXIMUM TIME(MIN.) FOR A BATCH RELEASE.
4. 1.06E+04 = AVERAGE TIME(MIN.) FOR A BATCH RELEASE.
5. 3.00E+01 = MINIMUM TIME(MIN.) FOR A BATCH RELEASE.

VI. ABNORMAL RELEASES

A. LIQUID

1. NUMBER OF RELEASES See Attachment
2. TOTAL ACTIVITY RELEASED(CURIES) See Attachment

B. GASEOUS

1. NUMBER OF RELEASES 0
2. TOTAL ACTIVITY RELEASED(CURIES) 0

SUPPLEMENTAL REPORT PAGE 2

McGUIRE NUCLEAR STATION

Values represented by "0.00E+00" within the body of the Annual report are below the minimum detectable limits of the McGuire counting systems. Typical MDA's for the McGuire counting systems are listed below:

<u>ISOTOPE</u>	<u>ENERGY (Kev)</u>	<u>AVERAGE MDA</u>
<u>Liquid</u>		
Xe-133	80	6.0E-08
Ce-144	133	1.2E-07
Kr-88	196	1.7E-07
Xe-135	249	2.3E-08
Kr-87	402	2.5E-07
Cs-137	661	2.6E-07
Mo-99	778	4.3E-07
Mn-54	834	2.2E-08
Zn-65	1115	4.0E-08
Co-60	1332	4.4E-08
<u>Gas</u>		
Xe-133	80	2.5E-08
Kr-85m	151	1.0E-08
Xe-131m	163	3.3E-07
Kr-38	196	4.7E-08
Xe-133m	233	7.9E-08
Xe-135	249	9.5E-09
Xe-138	258	6.3E-06
Kr-87	402	4.7E-08
Kr-85	514	2.5E-06
Xe-135m	526	1.9E-06
Ar-41	1293	3.6E-08

SUPPLEMENTAL REPORT PAGE 3

McGUIRE NUCLEAR STATION

The estimated percentage of error for both Liquid and Gaseous effluent release data at McGuire Nuclear Station has been determined to be  $\pm 16.1\%$ . This value was derived by taking the square root of the sum of the squares of the following discrete individual estimates of error:

- (1) Flow rate determining devices =  $\pm 5\%$
- (2) Counting error =  $\pm 15\%$
- (3) Sample preparation error =  $\pm 3\%$

Attachment 2

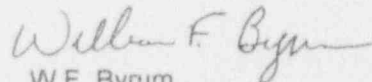
Solid Waste Disposal Report

March 14, 1994

MEMORANDUM TO : Robert Sharpe

SUBJECT : McGuire Nuclear Station  
Annual Solid Radwaste Disposal Report - 1993

Attached is the Annual Solid Radwaste Disposal Report for the period of January 1, 1993 through December 31, 1993. The format of the report includes information as required by McGuire Nuclear Station Selected Licensee Commitment Manual Section 16.11.



W.F. Byrum  
Radiation Protection Manager  
McGuire Nuclear Station

cc: D.C. Britton  
J.C. Correll  
G.T. Johnson  
R.P. Michael  
L.E. Loucks

**McGUIRE NUCLEAR STATION**  
**SOLID RADIOACTIVE WASTE SHIPPED TO A DISPOSAL FACILITY**  
**REPORT PERIOD** 1/1/93 **THROUGH** 12/31/93

* TYPES OF WASTE SHIPPED	Number of Shipments	Number of Containers	Container Type	Burial Volume		Waste Class	Total Ci
				(cubic ft)	(cu. meter)		
<b>WASTE FROM LIQUID SYSTEMS</b>							
(A) Dewatered 2% Powdex Resin (brokered)	2	3	x STC HIC	515.40	14.58	x A A/S B C	5.97E-03
(B) Dewatered 2% Powdex Resin			STC HIC			A A/S B C	
(C) Dewatered 2% Bead Resin (brokered)	3	6	x STC HIC	522.34	14.78	x A A/S B C	1.14E-01
(D) Dewatered 2% Bead Resin			STC HIC			A A/S B C	
(E) Dewatered Radwaste System Resin	1	1	1 STC HIC	194.10	5.49	1 A A/S B C	3.90E+04
(F) Dewatered Primary Bead Resin	2	2	2 STC HIC	166.80	4.72	2 A A/S B C	2.07E+02
(G) Dewatered Mechanical Filter Media	3	9	x STC HIC	91.80	2.60	4 A A/S B C 5	3.67E+00
(H) Dewatered Mechanical Filter Media (Brokered)	1	1	x STC HIC	18.00	0.51	x A A/S B C	1.11E-01
(I) Solidified Waste			STC HIC			A A/S B C	
<b>DRY SOLID WASTE</b>							
(A) Dry Active Waste (compacted)			STC HIC			A A/S B C	
Dry Active Waste (non-compacted)			STC HIC			A A/S B C	
Dry Active Waste (brokered)	8	16	x STC HIC	1537.99	43.52	x A A/S B C	4.58E+00
Dry Active Waste (brokered/non-compactible)	4	17	x STC HIC	420.19	11.89	x A A/S B C	6.30E-01
(B) Sealed Sources/Smoke Detectors			STC HIC			A A/S B C	
(C) Sealed Sources			STC HIC			A A/S B C	
(D) Irradiated Components	1	4	x STC HIC	30.00	0.85	x A A/S B C	4.56E-01
<b>TOTALS</b>	<b>25</b>	<b>59</b>		<b>3496.62</b>	<b>98.95</b>		<b>3.92E+04</b>

\* McGuire shipments to waste processors

SUMMARY OF MAJOR RADIONUCLIDE COMPOSITION

Type of Waste

1. Waste from Liquid Systems:

	Nuclide	% Abundance
(A) Dewatered Secondary Powdex Resin (Brokered)	Fe-55	71.2
	Co-58	2.8
	Co-60	2.1
	Ni-63	20.8
	C-14	0.03
	Nb-95	0.01
	Cs-134	0.02
	Cs-137	0.1
	Mn-54	0.05
	H-3	2.9
(B) Dewatered Secondary Powdex Resin	None shipped to disposal facility this report period.	
(C) Dewatered Secondary Bead Resin (Brokered)	Fe-55	96.8
	C-14	0.5
	Cs-134	0.3
	Cs-137	2.4
(D) Dewatered Secondary Bead Resin	None shipped to disposal facility this report period.	
(E) Dewatered Radwaste System Resin	Mn-54	3.8
	Fe-55	12.1
	Co-58	12.4
	Co-60	22.5
	Ni-63	13.4
	Sb-125	2.4
	C-14	0.1
	Sr-90	0.1
	Cs-134	10.4
	Cs-137	22.6
	Ce-144	0.1
Pu-241	0.1	

(F) Dewatered Primary Bead Resin	Mn-54	10.3
	Fe-55	10.0
	Co-57	0.5
	Co-58	23.4
	Co-60	19.7
	Ni-63	11.7
	Sb-125	2.3
	Sr-90	0.04
	Cs-134	8.3
	Cs-137	13.7
	Pu-241	0.08

(G) Dewatered Cartridge Filters	Co-60	14.3
	Mn-54	2.75
	Fe-55	67.0
	Co-58	4.4
	Ni-63	10.9
	H-3	0.1
	Cs-137	0.1
	Pu-241	4.4

(H) Dewatered Cartridge Filters (Brokered) (same as (G) above)

(I) Solidified Waste None shipped to disposal facility this report period.

2. Dry Solid Waste

	Nuclide	% Abundance
(A) Dry Active Waste	Sr-90	0.01
	Mn-54	1.26
	Co-58	2.04
	Co-60	13.3
	Cs-137	0.1
	Fe-55	71.4
	Ni-63	10.5
	Pu-241	0.13
	Sb-125	0.38
	Ce-144	0.01

(B) Sealed Sources / Smoke Detectors None shipped to disposal facility this report period.



(C) Sealed Sources

None shipped to disposal facility  
this report period.

(D) Irradiated Components

Co-60	99.9
Mn-54	0.04
Cr-51	0.04
Fe-59	0.01
Co-58	0.02

Attachment 3

Unplanned Offsite Releases

## Update on the 2B Containment Spray Heat Exchanger Leakage

The following information is an update on the 2B Containment Spray (NS) Heat Exchanger (HX) leakage that was previously described in the 1992 McGuire Annual report and is provided for reference purposes on the next page of this report.

The 2B NS HX was replaced in July of 1993 during the 2EOC8 refueling outage. No further evidence of tube leakage has been seen since the replacement. From January until replacement in July the leakage was calculated and sample analyses were performed several times over the period. The calculated leak rate ranged from a high of 10.7 gph to a low of 1.3 gph. Periodic sample data and corresponding liquid volumes were used to estimate the following maximum activity released, and dose commitment to the public from the releases:

### Isotopic Curies Released (Maximum)

H-3	4.13E+00
Cs-137	1.51E-04
Co-60	2.37E-06
Xe-133m	1.82E-04
Xe-135	1.82E-05

### Estimated Dose to the Public (mRem) (Maximum)

Total Body (Critical Age: Adult, Critical Pathway: Fish)

2.63E-04

Maximum Organ (Critical Organ: Liver, Age: Adult, Pathway: Fish)

3.71E-04

From 1992 Annual Report:

ABNORMAL RELEASES

In June of 1992 samples of the Nuclear Service Water System (RN) side of the Containment Spray (NS) heat exchanger (HX) indicated that NS to RN leakage was occurring in the 2B NS HX. There is no RN flow through the NS HXs unless there is an accident condition. Steps have been taken to reduce corrosion on the RN side of the HXs during routine plant operations. The RN side of the NS HXs are placed in wet lay up and corrosion inhibitor chemicals are introduced. As a result of the accelerated corrosion from the RN system, the 2B NS HX has developed leaks in some of the HX tubes. The water from the tube side of the NS HX is provided from the Refueling Water Storage Tank (FWST). As the pressure from the FWST is higher than the shell side RN pressure, the tube leaks result in small amounts of radioactivity being introduced to the RN side of the HX. The RN outlet valve for 2B NS HX leaks by at a nominal rate of approximately 4.4 gallons per hour. This leak-by subsequently allows slight amounts of radioactivity to be introduced to the total RN system. In August of 1992 Eddy Current testing was performed on the 2B NS HX and all identified leaking tubes were plugged. In September of 1992 it was discovered that there was some new leakage of radioactivity into the RN side of the HX. Due to the accelerated corrosion associated with the 2B NS HX it has been scheduled to be replaced in the upcoming Unit 2 Refueling Outage in July of 1993. None of the other three NS HXs have shown any leakage into the RN side of the HXs.

The leak rate was calculated to be approximately 4.36 gph during the period in question (June - December). Effluent discharge was via the discharge canal with full available condenser cooling water pump dilution. Periodic sample data and corresponding liquid volumes were used to estimate the following maximum activity released and dose commitment to the public from the releases:

**Isotopic Curies Released (Maximum)**

H-3	6.41E-02
Cs-134	1.30E-05
Cs-137	2.67E-05
Co-58	2.11E-06
Co-60	5.46E-06
Xe-133	6.76E-05
Xe-135	5.52E-06

**Estimated Dose to the Public (mRem) (Maximum)**

Total Body (Adult, Fish Pathway)	1.83E-04
Maximum Organ (Liver, Teen, Fish Pathway)	2.59E-04

December 14, 1993

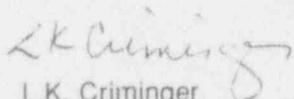
MEMORANDUM TO FILE

Subject: McGuire Nuclear Station  
Aux. Electric Boiler Room Flooding  
On 10/11/93

On October 11, 1993, the Aux. Electric Boiler Room was discovered to be flooding. Per PIP 0-M93-0985, 50-100 gallons of water were estimated to have leaked out of the room. As indicated on the RP Shift Log, Operations notified RP that an unknown volume of water was released to the WWCB via the yard drain. A sample of the water indicated  $5.2E-5$   $\mu\text{Ci/ml}$  of tritium.

The estimated maximum volume was used to calculate activity released during this event (19.7  $\mu\text{Ci}$ ), and was accounted for on ERL #018.

This memo will be placed in the annual effluent report for 1993.



L.K. Criminger  
RP Shift Relief Supervisor  
McGuire Nuclear Station

LKC/ah

cc: J.W. Foster  
J.S. Mooneyhan  
Annual Report

MCGUIRE NUCLEAR STATION  
 RADIOACTIVE EFFLUENT RELEASES  
 02/15/94

PERIOD COVERED: START DAY = 001  
 STOP DAY = 365

TYPE COVERED: MNSCCW

I. LIQUID RELEASES

	UNITS	PERIOD COVERED	YEAR TO STOP
1. GROSS RADIOACTIVITY			
A. TOTAL RELEASE	CURIES	3.88E-03	3.88E-03
2. TRITIUM			
A. TOTAL RELEASE	CURIES	8.83E+00	8.83E+00
3. DISSOLVED NOBLE GASES			
A. TOTAL RELEASE	CURIES	0.00E+00	0.00E+00
4. ALPHA ACTIVITY			
A. TOTAL RELEASE	CURIES	0.00E+00	0.00E+00

DO YOU WANT THE ISOTOPE LIST?(Y/N)

Y

5. RADIONUCLIDES

CO-58	1.72E-03	1.72E-03
CO-60	2.94E-04	2.94E-04
CS-134	5.44E-05	5.44E-05
CS-137	1.82E-03	1.82E-03

TOTAL VOLUME DISCHARGED (GALS.) 1.26E+08 1.26E+08

SUMMARY COMPLETE  
 THANK YOU

SKIN	MAXIMUM DOSE-	1.93D-04 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	SHORE
	CO 60	24.36 %				
	CS 137	71.71 %				
BONE	MAXIMUM DOSE-	3.19D-02 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	FISH
	CS 137	97.88 %				
LIVER	MAXIMUM DOSE-	3.56D-02 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	FISH
	H 3	5.06 %				
	CS 137	91.19 %				
T. BODY	MAXIMUM DOSE-	2.40D-02 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	FISH
	H 3	10.61 %				
	CS 137	84.94 %				
THYROID	MAXIMUM DOSE-	3.43D-03 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	98.99 %				
KIDNEY	MAXIMUM DOSE-	1.35D-02 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	FISH
	H 3	18.81 %				
	CS 137	78.11 %				
LUNG	MAXIMUM DOSE-	7.06D-03 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	FISH
	H 3	48.10 %				
	CS 137	50.04 %				
GI-LLI	MAXIMUM DOSE-	3.71D-03 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	91.61 %				
	CS 137	5.72 %				

METEOROLOGICAL DATA



MCQUIRE METEOROLOGICAL SURVEY TOWER DATA FOR PERIOD OF 01-01-93 THRU 12-31-93  
 WIND OCCURRENCES BY SECTOR + SPEED CLASS(PERCENT) DATE OF REPORT 02-14-94  
 SUMMARY OF PASQUILL A

WIND SECTOR	1.0-3.2	3.3-5.5	5.6-7.8	7.9-10.0	10.1-12.3	12.4-14.5	14.6-16.7	16.8-19.0	19.1-21.2	>21.2 MPH
SECTOR TOTAL	1.0-3.2	3.3-5.5	5.6-7.8	7.9-10.0	10.1-12.3	12.4-14.5	14.6-16.7	16.8-19.0	19.1-21.2	>21.2 MPH
	.45-1.49	1.5-2.49	2.5-3.49	3.5-4.49	4.5-5.49	5.5-6.49	6.5-7.49	7.5-8.49	8.5-9.49	>9.5 M/S
360.0	00.02	00.96	01.19	00.29	00.16	00.02	00.05	00.00	00.00	00.01
-M-										
22.5	00.00	00.68	00.97	00.48	00.30	00.22	00.09	00.06	00.02	00.02
-NNE-										
45.0	00.01	00.19	00.47	00.24	00.05	00.08	00.03	00.02	00.00	00.00
-NE-										
67.5	00.00	00.11	00.17	00.03	00.01	00.01	00.00	00.00	00.00	00.00
-ENE-										
90.0	00.00	00.11	00.15	00.00	00.00	00.00	00.00	00.00	00.00	00.00
-E-										
112.5	00.00	00.15	00.14	00.02	00.00	00.00	00.00	00.00	00.00	00.00
-ESE-										
135.0	00.02	00.10	00.11	00.06	00.01	00.00	00.00	00.00	00.00	00.00
-SE-										
157.5	00.00	00.07	00.13	00.01	00.00	00.00	00.00	00.00	00.00	00.00
-SSE-										
180.0	00.00	00.09	00.21	00.01	00.00	00.00	00.00	00.00	00.00	00.00
-S-										
202.5	00.00	00.05	00.15	00.14	00.07	00.02	00.00	00.01	00.00	00.00
-SSH-										
225.0	00.01	00.03	00.24	00.22	00.08	00.05	00.00	00.00	00.00	00.00
-SH-										
247.5	00.01	00.03	00.07	00.03	00.05	00.01	00.01	00.00	00.00	00.00
-WSH-										
270.0	00.00	00.02	00.05	00.06	00.03	00.02	00.00	00.00	00.00	00.00
-W-										
292.5	00.00	00.05	00.02	00.08	00.02	00.00	00.01	00.01	00.00	00.00
-WNW-										
315.0	00.02	00.08	00.03	00.09	00.08	00.07	00.02	00.05	00.00	00.00
-NW-										
337.5	00.01	00.27	00.10	00.10	00.08	00.02	00.00	00.02	00.05	00.01
-NNW-										
CALM	00.00									
TOTAL	000.10	002.99	004.20	001.86	000.94	000.52	000.21	000.16	000.07	000.04



SUMMARY OF PASQUILL C  
 MCGUIRE METEOROLOGICAL SURVEY TOWER DATA  
 WIND OCCURRENCES BY SECTOR + SPEED CLASS (PERCENT)  
 FOR PERIOD OF 01-01-93 THRU 12-31-93  
 DATE OF REPORT 02-14-94

WIND SECTOR	1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH >9.5 M/S
360.0	00.05	00.45	00.22	00.08	00.15	00.06	00.00	00.00	00.00	00.01
-N-										
22.5	00.00	00.54	00.39	00.42	00.49	00.27	00.10	00.02	00.00	00.00
-NNE-										
45.0	00.00	00.23	00.30	00.15	00.16	00.06	00.02	00.06	00.01	00.01
-NE-										
67.5	00.00	00.10	00.13	00.03	00.02	00.00	00.00	00.00	00.00	00.00
-ENE-										
90.0	00.00	00.10	00.03	00.01	00.00	00.00	00.00	00.00	00.00	00.00
-E-										
112.5	00.00	00.08	00.03	00.00	00.00	00.00	00.00	00.00	00.00	00.00
-ESE-										
135.0	00.01	00.22	00.05	00.02	00.00	00.00	00.00	00.00	00.00	00.00
-SE-										
157.5	00.00	00.08	00.06	00.03	00.00	00.00	00.00	00.00	00.00	00.00
-SSE-										
180.0	00.00	00.10	00.30	00.10	00.01	00.02	00.02	00.00	00.00	00.00
-S-										
202.5	00.01	00.10	00.33	00.18	00.18	00.13	00.07	00.03	00.00	00.00
-SSW-										
225.0	00.06	00.06	00.16	00.25	00.14	00.02	00.02	00.03	00.00	00.00
-SH-										
247.5	00.01	00.10	00.08	00.07	00.06	00.07	00.01	00.00	00.00	00.00
-WSW-										
270.0	00.00	00.08	00.10	00.07	00.09	00.02	00.01	00.00	00.00	00.00
-W-										
292.5	00.00	00.08	00.01	00.05	00.01	00.03	00.08	00.05	00.00	00.00
-W84-										
315.0	00.01	00.08	00.01	00.02	00.06	00.03	00.02	00.00	00.00	00.00
-NW-										
337.5	00.02	00.29	00.06	00.05	00.05	00.02	00.02	00.00	00.01	00.00
-N84-										
CALM	00.00									
TOTAL	000.17	002.69	002.26	001.53	001.42	000.73	000.37	000.19	000.02	000.02

MC GUIRE METEOROLOGICAL SURVEY TOWER DATA FOR PERIOD OF 01-01-93 THRU 12-31-93  
 SUMMARY OF PASQUILL D WIND OCCURRENCES BY SECTOR + SPEED CLASS (PERCENT) DATE OF REPORT 02-14-94

WIND SECTOR	OR STAT	WIND SPEED CLASS										DATE OF REPORT	02-14-94
		1.0-3.2	3.3-5.5	5.6-7.8	7.9-10.0	10.1-12.3	12.4-14.5	14.6-16.7	16.8-19.0	19.1-21.2	>21.2 MPH		
360.0	002.45	00.16	00.64	00.45	00.42	00.43	00.18	00.10	00.02	00.05	00.00	00.00	00.00
-N-													
22.5	005.45	00.14	00.92	01.45	01.39	00.92	00.43	00.11	00.09	00.00	00.00	00.00	00.00
-NNE-													
45.0	006.63	00.02	00.84	01.64	01.85	01.30	00.67	00.07	00.01	00.02	00.01	00.01	00.01
-NE-													
67.5	002.27	00.11	00.32	00.80	00.73	00.23	00.07	00.01	00.00	00.00	00.00	00.00	00.00
-ENE-													
90.0	000.66	00.05	00.29	00.24	00.08	00.00	00.00	00.00	00.00	00.00	00.00	00.00	00.00
-E-													
112.5	000.87	00.08	00.49	00.29	00.01	00.00	00.00	00.00	00.00	00.00	00.00	00.00	00.00
-ESE-													
135.0	000.72	00.10	00.41	00.18	00.03	00.00	00.00	00.00	00.00	00.00	00.00	00.00	00.00
-SE-													
157.5	000.78	00.08	00.31	00.19	00.07	00.07	00.01	00.05	00.00	00.00	00.00	00.00	00.00
-SSE-													
180.0	002.02	00.18	00.56	00.72	00.22	00.16	00.15	00.03	00.00	00.00	00.00	00.00	00.00
-S-													
202.5	003.70	00.18	00.94	01.21	00.80	00.34	00.18	00.05	00.00	00.00	00.00	00.00	00.00
-SSW-													
225.0	003.06	00.30	00.82	00.60	00.56	00.34	00.13	00.09	00.02	00.00	00.00	00.00	00.00
-SW-													
247.5	001.43	00.23	00.48	00.41	00.15	00.11	00.03	00.02	00.00	00.00	00.00	00.00	00.00
-WSW-													
270.0	000.99	00.17	00.26	00.15	00.14	00.10	00.08	00.05	00.01	00.03	00.00	00.00	00.00
-W-													
292.5	001.05	00.11	00.29	00.19	00.08	00.08	00.17	00.05	00.08	00.00	00.00	00.00	00.00
-WPH-													
315.0	001.12	00.06	00.16	00.18	00.21	00.23	00.18	00.06	00.03	00.01	00.00	00.00	00.00
-WN-													
337.5	001.37	00.11	00.34	00.21	00.25	00.25	00.16	00.02	00.02	00.01	00.00	00.00	00.00
-NNW-													
CALM	00.00												
TOTAL	034.57	002.08	008.17	009.11	007.09	004.56	002.64	000.71	000.28	000.12	000.01	000.01	000.01

SUMMARY OF PASQUILL E MCGUIRE METEOROLOGICAL SURVEY TOWER DATA FOR PERIOD OF 01-01-93 THRU 12-31-93  
 WIND OCCURRENCES BY SECTOR + SPEED CLASS (PERCENT) DATE OF REPORT 02-14-94

WIND SECTOR	1.0-3.2	3.3-5.5	5.6-7.8	7.9-10.0	10.1-12.3	12.4-14.5	14.6-16.7	16.8-19.0	19.1-21.2	>21.2 MPH
SECTOR TOTAL	1.0-3.2	3.3-5.5	5.6-7.8	7.9-10.0	10.1-12.3	12.4-14.5	14.6-16.7	16.8-19.0	19.1-21.2	>21.2 MPH
360.0	00.06	00.26	00.26	00.19	00.08	00.01	00.00	00.00	00.00	00.00
-N-	00.06	00.26	00.26	00.19	00.08	00.01	00.00	00.00	00.00	00.00
22.5	00.06	00.38	00.34	00.10	00.01	00.07	00.01	00.00	00.00	00.00
-NNE-	00.06	00.38	00.34	00.10	00.01	00.07	00.01	00.00	00.00	00.00
45.0	00.11	00.31	00.23	00.07	00.03	00.01	00.00	00.00	00.00	00.00
-NE-	00.11	00.31	00.23	00.07	00.03	00.01	00.00	00.00	00.00	00.00
67.5	00.07	00.33	00.26	00.10	00.06	00.01	00.00	00.00	00.00	00.00
-ENE-	00.07	00.33	00.26	00.10	00.06	00.01	00.00	00.00	00.00	00.00
90.0	00.14	00.62	00.34	00.02	00.01	00.00	00.00	00.00	00.00	00.00
-E-	00.14	00.62	00.34	00.02	00.01	00.00	00.00	00.00	00.00	00.00
112.5	00.18	00.71	00.11	00.00	00.00	00.00	00.00	00.00	00.00	00.00
-ESE-	00.18	00.71	00.11	00.00	00.00	00.00	00.00	00.00	00.00	00.00
135.0	00.25	00.43	00.05	00.08	00.00	00.00	00.00	00.00	00.00	00.00
-SE-	00.25	00.43	00.05	00.08	00.00	00.00	00.00	00.00	00.00	00.00
157.5	00.30	00.22	00.09	00.01	00.00	00.00	00.01	00.00	00.00	00.00
-SSE-	00.30	00.22	00.09	00.01	00.00	00.00	00.01	00.00	00.00	00.00
180.0	00.30	00.70	00.65	00.32	00.10	00.11	00.05	00.01	00.00	00.00
-S-	00.30	00.70	00.65	00.32	00.10	00.11	00.05	00.01	00.00	00.00
202.5	00.37	01.30	01.29	00.46	00.09	00.03	00.00	00.00	00.00	00.00
-SSW-	00.37	01.30	01.29	00.46	00.09	00.03	00.00	00.00	00.00	00.00
225.0	00.40	00.82	00.54	00.18	00.08	00.00	00.03	00.00	00.01	00.00
-SW-	00.40	00.82	00.54	00.18	00.08	00.00	00.03	00.00	00.01	00.00
247.5	00.38	00.56	00.31	00.09	00.03	00.03	00.01	00.00	00.00	00.00
-WSW-	00.38	00.56	00.31	00.09	00.03	00.03	00.01	00.00	00.00	00.00
270.0	00.40	00.33	00.14	00.10	00.02	00.01	00.00	00.00	00.00	00.00
-W-	00.40	00.33	00.14	00.10	00.02	00.01	00.00	00.00	00.00	00.00
292.5	00.30	00.31	00.25	00.15	00.11	00.02	00.03	00.02	00.02	00.00
-WNW-	00.30	00.31	00.25	00.15	00.11	00.02	00.03	00.02	00.02	00.00
315.0	00.16	00.46	00.38	00.30	00.16	00.03	00.00	00.00	00.00	00.00
-NW-	00.16	00.46	00.38	00.30	00.16	00.03	00.00	00.00	00.00	00.00
337.5	00.14	00.30	00.43	00.15	00.10	00.01	00.00	00.00	00.00	00.00
-NNW-	00.14	00.30	00.43	00.15	00.10	00.01	00.00	00.00	00.00	00.00
CALM	00.01									
TOTAL	003.62	008.04	005.67	002.32	000.88	000.41	000.15	000.03	000.03	000.00

SUMMARY OF PASQUILL F TOWER DATA FOR PERIOD OF 01-01-93 THRU 12-31-93

WIND SECTOR	WIND OCCURRENCES BY SECTOR + SPEED CLASS (PERCENT)										DATE OF REPORT	02-14-94
	1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH >9.5 M/S		
SECTOR TOTAL	000.41	000.14	000.19	000.07	000.01	000.00	000.00	000.00	000.00	000.00	000.00	000.00
360.0												
N-N												
22.5												
NNE-												
45.0												
NE-												
67.5												
E-NE-												
90.0												
E-												
112.5												
ESE-												
135.0												
SE-												
157.5												
SSE-												
180.0												
S-												
202.5												
SSW-												
225.0												
SW-												
247.5												
WSW-												
270.0												
W-												
292.5												
WNW-												
315.0												
WW-												
337.5												
WNW-												
CALM	00.01											
TOTAL	009.02	004.08	003.84	000.99	000.07	000.03	000.00	000.01	000.00	000.00	000.00	000.00



Attachment 4

Fuel Cycle Calculations



MAXIMUM TOTAL BODY	MNE 0.50 MILES	6.72E-01	AGE : ADULT
	MNS.GAS	5.87E-01	87.2 %
		KR 88	6.7 %
		XE133	41.7 %
		XE135	18.2 %
		AR 41	31.3 %
	MNS.LIQUID	7.72E-02	11.4 %
	CRITICAL PATH	DRINKING	56.6 %
		H 3	56.8 %
		CS 134	15.6 %
		CS 137	25.9 %
	CNS.GAS	8.42E-03	1.2 %
		XE133	23.7 %
		XE135	5.4 %
		AR 41	69.5 %

MAXIMUM ORGAN	ESE 1.00 MILES	3.64E-01	AGE : INFANT	ORGAN : THYROID
	MNS.GAS	2.69E-01	73.8 %	
	CRITICAL PATH	GOAT MILK	97.1 %	
		H 3	16.2 %	
		I 131	83.5 %	
	MNS.LIQUID	8.37E-02	22.9 %	
	CRITICAL PATH	DRINKING	100.0 %	
		H 3	67.7 %	
		I 131	32.1 %	
	CNS.GAS	1.16E-02	3.1 %	
	CRITICAL PATH	GOAT MILK	94.0 %	
		H 3	43.5 %	
		I 131	56.1 %	

1993 HCGUIRE FUEL CYCLE SUMMARY      DAYS 001-365    02/21/94 AT 10:16

MAXIMUM TOTAL BODY    NNE    0.50 MILES      6.72E-01      AGE : ADULT

MAXIMUM ORGAN        ESE    1.00 MILES      3.64E-01      AGE : INFANT      ORGAN : THYROID

Attachment 5

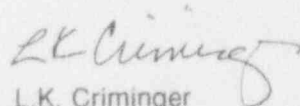
Inoperable Monitoring Equipment

January 12, 1994

MEMORANDUM TO FILE

Subject: McGuire Nuclear Station  
Inoperable Instruments Exceeding  
Selected Licensee Commitments (SLC) Limits

During the time frame from January 1, 1993, to December 31, 1993, there were no SLC related effluent monitoring instruments out of service greater than the SLC limits for inoperability.



L.K. Criminger  
R.P. Shift Relief Supervisor  
McGuire Nuclear Station

LKC/ah

cc: J.W. Foster  
J.S. Mooneyhan  
Annual Report