



BRUCE H HAMILTON
Vice President
McGuire Nuclear Station

Duke Energy Corporation
MG01VP / 12700 Hagers Ferry Road
Huntersville, NC 28078

704-875-5333
704-875-4809 fax
bhhamilton@duke-energy.com

April 24, 2008

U. S. Nuclear Regulatory Commission
Document Control Desk
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Subject: Duke Energy Carolinas, LLC
McGuire Nuclear Station
Docket Nos. 50-369 and 50-370
Annual Radioactive Effluent Release Report

Pursuant to the requirements of Technical Specification 5.6.3 and Section 16.11-17 of the McGuire Selected Licensee Commitments (SLC) Manual, attached is the Annual Radioactive Effluent Release Report. Also included in this report is the 2008 Offsite Dose Calculation Manual and the 2008 Process Control Program (PCP) Manual.

The following Attachments form the contents of the report:

- Attachment 1 Radioactive Effluent Releases and Supplemental Information
- Attachment 2 Solid Waste Disposal Report
- Attachment 3 Unplanned Offsite Releases
- Attachment 4 Fuel Cycle Calculation
- Attachment 5 Inoperable Monitoring Equipment
- Attachment 6 Groundwater Protection Initiative

Questions concerning this report should be directed to Kay Crane, McGuire Regulatory Compliance at (704) 875-4306.


Bruce H. Hamilton

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cc: Mr. John F. Stang,
NRC Project Manager
Office of Nuclear Reactor Regulation
Mail Stop 8-H4A
Washington, D.C. 20555

Mr. Victor M. McCree, Acting Regional Administrator
U. S. Nuclear Regulatory Commission, Region II
Atlanta Federal Center
61 Forsyth Street – Suite 23T85
Atlanta, GA 30323

Division of Radiation Protection
State of North Carolina
3825 Barrett Drive
Raleigh, N.C. 27609-7221

Mr. Joe Brady
Senior Resident Inspector
McGuire Nuclear Station

Mr. William Nestel
INPO Records Center
700 Galleria Place, Suite 100
Atlanta, GA 30339-5957

Attachment 1

Radioactive Effluent Releases and Supplemental Information

McGUIRE NUCLEAR STATION

EFFLUENT RELEASE DATA

(January 1, 2007 through December 31, 2007)

This attachment includes a summary of the quantities of radioactive liquid and gaseous effluents as outlined in Regulatory Guide 1.21, Appendix B..

TABLE 1A

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
 PERIOD 1/1/07 TO 1/1/08
 GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

McGuire Nuclear Station Units 1 & 2

REPORT FOR 2007	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR

A. Fission and Activation Gases						
1. Total Release	Ci	4.96E-01	4.16E-01	5.82E-01	6.53E-01	2.15E+00
2. Avg. Release Rate	µCi/sec	6.38E-02	5.29E-02	7.32E-02	8.22E-02	6.81E-02
B. Iodine-131						
1. Total Release	Ci	2.57E-06	0.00E+00	0.00E+00	0.00E+00	2.57E-06
2. Avg. Release Rate	µCi/sec	3.30E-07	0.00E+00	0.00E+00	0.00E+00	8.14E-08
C. Particulates Half Life >= 8 days						
1. Total Release	Ci	2.40E-05	7.37E-06	1.46E-06	1.03E-05	4.32E-05
2. Avg. Release Rate	µCi/sec	3.09E-06	9.37E-07	1.84E-07	1.30E-06	1.37E-06
D. Tritium						
1. Total Release	Ci	4.05E+01	7.28E+01	3.70E+01	5.41E+01	2.05E+02
2. Avg. Release Rate	µCi/sec	5.21E+00	9.26E+00	4.66E+00	6.81E+00	6.49E+00
E. Gross Alpha Radioactivity						
1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Avg. Release Rate	µCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TABLE 1B

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
 PERIOD 1/1/07 TO 1/1/08
 GASEOUS EFFLUENTS - ELEVATED RELEASES - CONTINUOUS MODE

McGuire Nuclear Station Units 1 & 2

REPORT FOR 2007	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
1. Fission and Activation Gases						
** No Nuclide Activities **						
2. Iodines						
** No Nuclide Activities **						
3. Particulates Half Life $\geq$ 8 days						
** No Nuclide Activities **						
4. Tritium						
** No Nuclide Activities **						
5. Gross Alpha Radioactivity						
** No Nuclide Activities **						

TABLE 1B

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/07 TO 1/1/08
GASEOUS EFFLUENTS - ELEVATED RELEASES - BATCH MODE

McGuire Nuclear Station Units 1 & 2

REPORT FOR 2007	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
1. Fission and Activation Gases						
** No Nuclide Activities **						
2. Iodines						
** No Nuclide Activities **						
3. Particulates Half Life $\geq$ 8 days						
** No Nuclide Activities **						
4. Tritium						
** No Nuclide Activities **						
5. Gross Alpha Radioactivity						
** No Nuclide Activities **						

TABLE 1C

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/07 TO 1/1/08
GASEOUS EFFLUENTS - GROUND RELEASES - CONTINUOUS MODE

McGuire Nuclear Station Units 1 & 2

REPORT FOR 2007	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
1. Fission and Activation Gases						
** No Nuclide Activities **						
2. Iodines						
I-131	Ci	2.57E-06	0.00E+00	0.00E+00	0.00E+00	2.57E-06
		-----	-----	-----	-----	-----
Totals for Period...	Ci	2.57E-06	0.00E+00	0.00E+00	0.00E+00	2.57E-06
3. Particulates Half Life >= 8 days						
CO-58	Ci	1.70E-05	7.37E-06	1.46E-06	1.03E-05	3.61E-05
CR-51	Ci	6.85E-06	0.00E+00	0.00E+00	0.00E+00	6.85E-06
		-----	-----	-----	-----	-----
Totals for Period...	Ci	2.38E-05	7.37E-06	1.46E-06	1.03E-05	4.29E-05
4. Tritium						
H-3	Ci	3.91E+01	7.05E+01	3.69E+01	5.40E+01	2.00E+02
		-----	-----	-----	-----	-----
Totals for Period...	Ci	3.91E+01	7.05E+01	3.69E+01	5.40E+01	2.00E+02
5. Gross Alpha Radioactivity						
** No Nuclide Activities **						

TABLE 1C

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
 PERIOD 1/1/07 TO 1/1/08
 GASEOUS EFFLUENTS - GROUND RELEASES - BATCH MODE

McGuire Nuclear Station Units 1 & 2

REPORT FOR 2007	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
1. Fission and Activation Gases						
AR-41	Ci	4.61E-01	3.26E-01	5.63E-01	6.36E-01	1.99E+00
C-11	Ci	0.00E+00	0.00E+00	0.00E+00	1.34E-05	1.34E-05
KR-85	Ci	2.93E-02	7.22E-02	0.00E+00	0.00E+00	1.01E-01
KR-85M	Ci	0.00E+00	7.86E-05	0.00E+00	1.37E-05	9.22E-05
KR-88	Ci	0.00E+00	1.06E-04	0.00E+00	1.86E-05	1.25E-04
XE-133	Ci	4.87E-03	1.38E-02	1.77E-02	1.70E-02	5.33E-02
XE-133M	Ci	0.00E+00	2.81E-04	0.00E+00	2.55E-05	3.06E-04
XE-135	Ci	1.09E-03	3.15E-03	7.03E-04	2.79E-04	5.22E-03
Totals for Period...	Ci	4.96E-01	4.16E-01	5.82E-01	6.53E-01	2.15E+00
2. Iodines						
** No Nuclide Activities **						
3. Particulates Half Life >= 8 days						
CL-38	Ci	2.07E-07	0.00E+00	0.00E+00	0.00E+00	2.07E-07
Totals for Period...	Ci	2.07E-07	0.00E+00	0.00E+00	0.00E+00	2.07E-07
4. Tritium						
H-3	Ci	1.38E+00	2.36E+00	1.19E-01	1.82E-01	4.04E+00
Totals for Period...	Ci	1.38E+00	2.36E+00	1.19E-01	1.82E-01	4.04E+00
5. Gross Alpha Radioactivity						
** No Nuclide Activities **						

TABLE 2A

**EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/07 TO 1/1/08
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES**

McGuire Nuclear Station Units 1 & 2

REPORT FOR 2007	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
A. Fission and Activation Products						
1. Total Release	Ci	1.88E-02	1.98E-02	1.28E-02	9.81E-03	6.12E-02
2. Average Diluted Concentration						
a. Continuous Releases	µCi/ml	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
b. Batch Releases	µCi/ml	2.48E-11	2.23E-11	1.25E-11	1.02E-11	1.69E-11
B. Tritium						
1. Total Release	Ci	6.68E+02	4.38E+02	2.45E+02	2.82E+02	1.63E+03
2. Average Diluted Concentration						
a. Continuous Releases	µCi/ml	1.48E-08	3.59E-08	2.08E-08	2.44E-08	2.03E-08
b. Batch Releases	µCi/ml	8.80E-07	4.92E-07	2.40E-07	2.94E-07	4.50E-07
C. Dissolved and Entrained Gases						
1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Average Diluted Concentration						
a. Continuous Releases	µCi/ml	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
b. Batch Releases	µCi/ml	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
D. Gross Alpha Radioactivity						
1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Average Diluted Concentration						
a. Continuous Releases	µCi/ml	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
b. Batch Releases	µCi/ml	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
E. Volume of Liquid Waste						
1. Continuous Releases	liters	7.02E+07	6.08E+07	5.96E+07	5.79E+07	2.48E+08
2. Batch Releases	liters	1.81E+06	2.80E+06	1.15E+06	6.38E+05	6.41E+06
F. Volume of Dilution Water						
1. Continuous Releases	liters	7.48E+10	2.22E+10	2.07E+10	1.26E+10	1.30E+11
2. Batch Releases	liters	7.57E+11	8.88E+11	1.02E+12	9.59E+11	3.62E+12

TABLE 2B

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/07 TO 1/1/08
LIQUID EFFLUENTS - CONTINUOUS MODE

McGuire Nuclear Station Units 1 & 2

REPORT FOR 2007	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
1. Fission and Activation Products						
** No Nuclide Activities **						
2. Tritium						
H-3	Ci	1.11E+00	8.00E-01	4.32E-01	3.09E-01	2.65E+00
Totals for Period...	Ci	1.11E+00	8.00E-01	4.32E-01	3.09E-01	2.65E+00
3. Dissolved and Entrained Gases						
** No Nuclide Activities **						
4. Gross Alpha Radioactivity						
** No Nuclide Activities **						

TABLE 2B

**EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/07 TO 1/1/08
LIQUID EFFLUENTS - BATCH MODE**

McGuire Nuclear Station Units 1 & 2

REPORT FOR 2007	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
1. Fission and Activation Products						
AG-108M	Ci	0.00E+00	0.00E+00	7.11E-06	0.00E+00	7.11E-06
BA-140	Ci	0.00E+00	9.70E-06	0.00E+00	0.00E+00	9.70E-06
BE-7	Ci	3.54E-05	0.00E+00	0.00E+00	0.00E+00	3.54E-05
CO-57	Ci	5.01E-06	2.89E-06	0.00E+00	5.10E-06	1.30E-05
CO-58	Ci	3.08E-03	5.67E-03	6.19E-04	5.50E-04	9.92E-03
CO-60	Ci	1.69E-03	7.40E-04	2.62E-04	6.05E-04	3.29E-03
CR-51	Ci	6.74E-05	2.67E-04	3.83E-05	0.00E+00	3.72E-04
CS-134	Ci	1.19E-03	1.69E-04	5.71E-04	4.12E-04	2.34E-03
CS-137	Ci	3.61E-03	9.70E-04	2.02E-03	1.48E-03	8.09E-03
FE-59	Ci	0.00E+00	2.07E-06	0.00E+00	0.00E+00	2.07E-06
I-131	Ci	2.04E-06	0.00E+00	0.00E+00	0.00E+00	2.04E-06
MN-54	Ci	1.44E-04	4.85E-05	1.54E-05	6.58E-05	2.74E-04
NB-95	Ci	0.00E+00	4.93E-05	3.03E-06	0.00E+00	5.23E-05
SB-122	Ci	1.87E-05	4.03E-06	5.30E-06	0.00E+00	2.80E-05
SB-124	Ci	7.92E-04	3.48E-04	1.22E-04	1.30E-05	1.28E-03
SB-125	Ci	8.14E-03	1.15E-02	9.13E-03	6.68E-03	3.54E-02
SN-113	Ci	0.00E+00	1.10E-06	0.00E+00	0.00E+00	1.10E-06
ZR-95	Ci	0.00E+00	2.22E-05	0.00E+00	0.00E+00	2.22E-05
Totals for Period...	Ci	1.88E-02	1.98E-02	1.28E-02	9.81E-03	6.12E-02
2. Tritium						
H-3	Ci	6.66E+02	4.37E+02	2.45E+02	2.82E+02	1.63E+03
Totals for Period...	Ci	6.66E+02	4.37E+02	2.45E+02	2.82E+02	1.63E+03
3. Dissolved and Entrained Gases						
** No Nuclide Activities **						
4. Gross Alpha Radioactivity						
** No Nuclide Activities **						

McGUIRE NUCLEAR STATION
SUPPLEMENTAL INFORMATION

McGUIRE NUCLEAR STATION

2007 EFFLUENT AND WASTE DISPOSAL SUPPLEMENTAL INFORMATION

I. REGULATORY LIMITS - PER UNIT

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. GASEOUS EFFLUENTS - 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

ANALYSES OF SPECIFIC RADIONUCLIDES IN SELECTED OR COMPOSITED SAMPLES AS DESCRIBED IN THE SELECTED LICENSEE COMMITMENTS ARE USED TO DETERMINE THE RADIONUCLIDE COMPOSITION OF THE EFFLUENT. SUPPLEMENTAL REPORT, PAGE 2, PROVIDES A SUMMARY DESCRIPTION OF THE METHOD USED FOR ESTIMATING OVERALL ERRORS ASSOCIATED WITH RADIOACTIVITY MEASUREMENTS.

V. BATCH RELEASES

A. LIQUID EFFLUENT

1. $2.73\text{E}+02$ = TOTAL NUMBER OF BATCH RELEASES
2. $2.91\text{E}+04$ = TOTAL TIME (MIN.) FOR BATCH RELEASES.
3. $6.38\text{E}+03$ = MAXIMUM TIME (MIN.) FOR A BATCH RELEASE.
4. $1.07\text{E}+02$ = AVERAGE TIME (MIN.) FOR A BATCH RELEASE.
5. $4.00\text{E}+00$ = MINIMUM TIME (MIN.) FOR A BATCH RELEASE.
6. $1.82\text{E}+06$ = AVERAGE DILUTION WATER FLOW DURING RELEASES (GPM).

B. GASEOUS EFFLUENT

1. $4.40\text{E}+01$ = TOTAL NUMBER OF BATCH RELEASES.
2. $1.04\text{E}+06$ = TOTAL TIME (MIN.) FOR BATCH RELEASES.
3. $4.47\text{E}+04$ = MAXIMUM TIME (MIN.) FOR A BATCH RELEASE.
4. $2.36\text{E}+04$ = AVERAGE TIME (MIN.) FOR A BATCH RELEASE.
5. $1.00\text{E}+00$ = MINIMUM TIME (MIN.) FOR A BATCH RELEASE.

VI. ABNORMAL RELEASES

A. LIQUID

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

B. GASEOUS

1. NUMBER OF RELEASES = 2
2. TOTAL ACTIVITY RELEASED (CURIES) = $1.43\text{E}-2$ (see attachment for additional information)

SUPPLEMENTAL REPORT PAGE 2

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 $\pm 25.2\%$. 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 = $\pm 20\%$
- (2) Counting error = $\pm 15\%$
- (3) Sample preparation error = $\pm 3\%$

McGUIRE NUCLEAR STATION

Assessment of Radiation Dose from Radioactive Effluents and all Uranium Fuel Cycle Sources to Members of the Public

(January 1, 2007 through December 31, 2007)

This attachment includes an assessment of radiation doses to the maximum exposed member of the public due to radioactive liquid and gaseous effluents released from the site for each calendar quarter for the calendar year of this report, as well as the total dose for the calendar year. This attachment also includes an assessment of radiation doses to the maximum exposed member of the public from all uranium fuel cycle sources within 10 miles of McGuire for the calendar year of this report to show conformance with 40 CFR 190. Methods for calculating the dose contribution from liquid and gaseous effluents are given in the ODCM.

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/07 TO 1/1/08
GASEOUS ANNUAL DOSE SUMMARY REPORT

McGuire Nuclear Station Units 1 & 2

1st Quarter 2007

=== IODINE, H3, AND PARTICULATE DOSE LIMIT ANALYSIS===== Quarter 1 2007 ===

Period-Limit	Critical Group	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q1 - Maximum Organ Dose	TEEN	THYROID	4.82E-02	1.50E+01	3.21E-01

Maximum Organ Dose Receptor Location: 0.5 Mile ENE
Critical Pathway: Inhalation

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	9.99E+01

=== NOBLE GAS DOSE LIMIT ANALYSIS===== Quarter 1 2007 ===

Period-Limit	Dose (mrad)	Limit (mrad)	% of Limit
Q1 - Maximum Gamma Air Dose	1.04E-02	1.00E+01	1.04E-01

Maximum Gamma Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
AR-41	9.99E+01

Q1 - Maximum Beta Air Dose	3.81E-03	2.00E+01	1.90E-02
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Maximum Beta Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
AR-41	9.59E+01

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/07 TO 1/1/08
GASEOUS ANNUAL DOSE SUMMARY REPORT

McGuire Nuclear Station Units 1 & 2

2nd Quarter 2007

=== IODINE, H3, AND PARTICULATE DOSE LIMIT ANALYSIS===== Quarter 2 2007 ===

Period-Limit	Critical Group	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q2 - Maximum Organ Dose	TEEN	LUNG	8.65E-02	1.50E+01	5.77E-01

Maximum Organ Dose Receptor Location: 0.5 Mile ENE
Critical Pathway: Inhalation

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	1.00E+02

=== NOBLE GAS DOSE LIMIT ANALYSIS===== Quarter 2 2007 ===

Period-Limit	Dose (mrad)	Limit (mrad)	% of Limit
Q2 - Maximum Gamma Air Dose	7.35E-03	1.00E+01	7.35E-02

Maximum Gamma Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
AR-41	9.95E+01

Q2 - Maximum Beta Air Dose	2.98E-03	2.00E+01	1.49E-02
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Maximum Beta Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
AR-41	8.67E+01
KR-85	1.14E+01

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/07 TO 1/1/08
GASEOUS ANNUAL DOSE SUMMARY REPORT

McGuire Nuclear Station Units 1 & 2

3rd Quarter 2007

=== IODINE, H3, AND PARTICULATE DOSE LIMIT ANALYSIS===== Quarter 3 2007 ===

Period-Limit	Critical Group	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q3 - Maximum Organ Dose	TEEN	LUNG	4.40E-02	1.50E+01	2.93E-01

Maximum Organ Dose Receptor Location: 0.5 Mile ENE
Critical Pathway: Inhalation

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	1.00E+02

=== NOBLE GAS DOSE LIMIT ANALYSIS===== Quarter 3 2007 ===

Period-Limit	Dose (mrad)	Limit (mrad)	% of Limit
Q3 - Maximum Gamma Air Dose	1.27E-02	1.00E+01	1.27E-01

Maximum Gamma Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
AR-41	9.99E+01

Q3 - Maximum Beta Air Dose	4.51E-03	2.00E+01	2.25E-02
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Maximum Beta Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
AR-41	9.89E+01

**EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/07 TO 1/1/08
GASEOUS ANNUAL DOSE SUMMARY REPORT**

McGuire Nuclear Station Units 1 & 2

4th Quarter 2007

=== IODINE, H3, AND PARTICULATE DOSE LIMIT ANALYSIS===== Quarter 4 2007 ===

Period-Limit	Critical Group	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q4 - Maximum Organ Dose	TEEN	LUNG	6.43E-02	1.50E+01	4.29E-01

Maximum Organ Dose Receptor Location: 0.5 Mile ENE
Critical Pathway: Inhalation

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	1.00E+02

=== NOBLE GAS DOSE LIMIT ANALYSIS===== Quarter 4 2007 ===

Period-Limit	Dose (mrad)	Limit (mrad)	% of Limit
Q4 - Maximum Gamma Air Dose	1.43E-02	1.00E+01	1.43E-01

Maximum Gamma Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
AR-41	9.99E+01

Q4 - Maximum Beta Air Dose	5.08E-03	2.00E+01	2.54E-02
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Maximum Beta Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
AR-41	9.91E+01

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/07 TO 1/1/08
GASEOUS ANNUAL DOSE SUMMARY REPORT

McGuire Nuclear Station Units 1 & 2

ANNUAL 2007

=== IODINE, H3, AND PARTICULATE DOSE LIMIT ANALYSIS===== Annual 2007 =====

Period-Limit	Critical Group	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Yr - Maximum Organ Dose	TEEN	LUNG	2.43E-01	3.00E+01	8.10E-01

Maximum Organ Dose Receptor Location: 0.5 Mile ENE
Critical Pathway: Inhalation

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	1.00E+02

=== NOBLE GAS DOSE LIMIT ANALYSIS===== Annual 2007 =====

Period-Limit	Dose (mrad)	Limit (mrad)	% of Limit
Yr - Maximum Gamma Air Dose	4.46E-02	2.00E+01	2.23E-01

Maximum Gamma Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
AR-41	9.98E+01

Yr - Maximum Beta Air Dose	1.64E-02	4.00E+01	4.09E-02
----------------------------	----------	----------	----------

Maximum Beta Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
AR-41	9.61E+01

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/07 TO 1/1/08
LIQUID ANNUAL DOSE SUMMARY REPORT

McGuire Nuclear Station Units 1 & 2

1st Quarter 2007

=== BATCH LIQUID RELEASES ===				Quarter 1 2007 =====	
Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q1 - Maximum Organ Dose	CHILD	LIVER	1.20E-01	1.00E+01	1.20E+00
Q1 - Total Body Dose	CHILD		9.59E-02	3.00E+00	3.20E+00

Maximum Organ

Critical Pathway: Potable Water

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
---------	------------

H-3	7.54E+01
CS-137	1.75E+01
CS-134	7.07E+00

Total Body

Critical Pathway: Potable Water

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
---------	------------

H-3	9.48E+01
-----	----------

=== CONTINUOUS LIQUID RELEASES (WC) ===				Quarter 1 2007 =====	
Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q1 - Maximum Organ Dose	CHILD	LIVER	1.53E-03	1.00E+01	1.53E-02
Q1 - Total Body Dose	CHILD		1.53E-03	3.00E+00	5.11E-02

Maximum Organ

Critical Pathway: Potable Water

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
---------	------------

H-3	1.00E+02
-----	----------

Total Body

Critical Pathway: Potable Water

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
---------	------------

H-3	1.00E+02
-----	----------

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/07 TO 1/1/08
LIQUID ANNUAL DOSE SUMMARY REPORT

McGuire Nuclear Station Units 1 & 2

2nd Quarter 2007

=== BATCH LIQUID RELEASES ===				Quarter 2 2007 ===	
Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
-----	-----	-----	-----	-----	-----
Q2 - Maximum Organ Dose	CHILD	LIVER	5.73E-02	1.00E+01	5.73E-01
Q2 - Total Body Dose	CHILD		5.23E-02	3.00E+00	1.74E+00

Maximum Organ

Critical Pathway: Potable Water

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
-----	-----

H-3	8.96E+01
-----	----------

CS-137	8.51E+00
--------	----------

Total Body

Critical Pathway: Potable Water

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
-----	-----

H-3	9.81E+01
-----	----------

=== CONTINUOUS LIQUID RELEASES (WC) ===				Quarter 2 2007 ===	
Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
-----	-----	-----	-----	-----	-----
Q2 - Maximum Organ Dose	CHILD	LIVER	3.75E-03	1.00E+01	3.75E-02
Q2 - Total Body Dose	CHILD		3.75E-03	3.00E+00	1.25E-01

Maximum Organ

Critical Pathway: Potable Water

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
-----	-----

H-3	1.00E+02
-----	----------

Total Body

Critical Pathway: Potable Water

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
-----	-----

H-3	1.00E+02
-----	----------

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/07 TO 1/1/08
LIQUID ANNUAL DOSE SUMMARY REPORT

McGuire Nuclear Station Units 1 & 2

3rd Quarter 2007

=== BATCH LIQUID RELEASES ===				Quarter 3 2007	
Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q3 - Maximum Organ Dose	CHILD	LIVER	3.73E-02	1.00E+01	3.73E-01
Q3 - Total Body Dose	ADULT		2.80E-02	3.00E+00	9.34E-01

Maximum Organ

Critical Pathway: Potable Water

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	6.78E+01
CS-137	2.39E+01
CS-134	8.29E+00

Total Body

Critical Pathway: Potable Water

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	6.78E+01
CS-137	2.18E+01
CS-134	1.04E+01

=== CONTINUOUS LIQUID RELEASES (WC) ===				Quarter 3 2007	
Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q3 - Maximum Organ Dose	CHILD	LIVER	2.20E-03	1.00E+01	2.20E-02
Q3 - Total Body Dose	CHILD		2.20E-03	3.00E+00	7.32E-02

Maximum Organ

Critical Pathway: Potable Water

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	1.00E+02

Total Body

Critical Pathway: Potable Water

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	1.00E+02

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/07 TO 1/1/08
LIQUID ANNUAL DOSE SUMMARY REPORT

McGuire Nuclear Station Units 1 & 2

4th Quarter 2007

=== BATCH LIQUID RELEASES ===				Quarter 4 2007	
Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q4 - Maximum Organ Dose	CHILD	LIVER	4.04E-02	1.00E+01	4.04E-01
Q4 - Total Body Dose	CHILD		3.26E-02	3.00E+00	1.09E+00

Maximum Organ

Critical Pathway: Potable Water

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	7.68E+01
CS-137	1.73E+01
CS-134	5.88E+00

Total Body

Critical Pathway: Potable Water

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	9.52E+01

=== CONTINUOUS LIQUID RELEASES (WC) ===				Quarter 4 2007	
Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q4 - Maximum Organ Dose	CHILD	LIVER	2.57E-03	1.00E+01	2.57E-02
Q4 - Total Body Dose	CHILD		2.57E-03	3.00E+00	8.57E-02

Maximum Organ

Critical Pathway: Potable Water

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	1.00E+02

Total Body

Critical Pathway: Potable Water

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	1.00E+02

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/07 TO 1/1/08
LIQUID ANNUAL DOSE SUMMARY REPORT

McGuire Nuclear Station Units 1 & 2

ANNUAL 2007

=== BATCH LIQUID RELEASES ===				Annual 2007 =====	
Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Yr - Maximum Organ Dose	CHILD	LIVER	2.42E-01	2.00E+01	1.21E+00
Yr - Total Body Dose	CHILD		1.97E-01	6.00E+00	3.29E+00

Maximum Organ

Critical Pathway: Potable Water

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
-----	-----
H-3	7.76E+01
CS-137	1.65E+01
CS-134	5.85E+00

Total Body

Critical Pathway: Potable Water

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
-----	-----
H-3	9.54E+01

=== CONTINUOUS LIQUID RELEASES (WC) ===				Annual 2007 =====	
Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Yr - Maximum Organ Dose	CHILD	LIVER	8.50E-03	2.00E+01	4.25E-02
Yr - Total Body Dose	CHILD		8.50E-03	6.00E+00	1.42E-01

Maximum Organ

Critical Pathway: Potable Water

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
-----	-----
H-3	1.00E+02

Total Body

Critical Pathway: Potable Water

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
-----	-----
H-3	1.00E+02

Attachment 2

Solid Waste Disposal Report

REPORT PERIOD
JANUARY - DECEMBER 2007

McGUIRE NUCLEAR STATION
SOLID RADIOACTIVE WASTE SHIPPED TO DISPOSAL FACILITIES

Attachment 1

TYPES OF WASTES SHIPPED Waste from Liquid Systems	Number of	Number of	Container	Disposal	Volume	Waste	Total
	Shipments	Containers	Type	ft ³	m ³	Class	Curies
(A) dewatered powdex resin (brokered)	none						
(B) dewatered powdex resin	none						
(C) dewatered bead resin (brokered)	none						
(D) dewatered bead resin	none						
(E) dewatered radwaste system resin	none						
(F) dewatered primary bead resin	2	2	HIC	55.89	1.58	B	2.18E+02
(G) dewatered mechanical filter media	none						
(H) dewatered mechanical filter media (brokered)	4	25	HIC	131.94	3.74	C	1.81E+02
(I) solidified waste	none						
Dry Solid Waste							
(A) dry active waste (compacted)	none						
dry active waste (non-compacted)	none						
dry active waste (brokered/compacted)							
dry active waste (brokered/non-compacted)	16	78	DBP	4723.48	133.71	A/U	9.310E-01
(B) sealed sources/smoke detectors	none						
(C) sealed sources	none						
(D) irradiated components	none						
Totals	22	105		4911.31	139.03		3.999E+02

2/25/2008

**MCGUIRE NUCLEAR SITE
SUMMARY OF MAJOR RADIONUCLIDE COMPOSITION
2007**

Type of waste	Nuclide	% Abundance
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1. Waste from liquid systems:

A. Dewatered Powdex Resin (brokered)	No shipments in 2007
B. Dewatered Powdex Resin	No shipments in 2007
C. Dewatered Bead Resin (brokered)	No shipments in 2007
D. Dewatered Bead Resin	No shipments in 2007
E. Dewatered Radwaste System Resin (brokered)	No shipments in 2007
F. Dewatered Primary Bead Resin (brokered)	

2007 - 20

<u>Nuclide</u>	<u>%Abundance</u>
Mn-54	2.18
Co-57	.37
Co-58	.90
Co-60	17.60
Cs-137	3.32
Cs-134	.76
Ni-63	56.74
Fe-55	17.49
Sb-125	.30
H-3	.03
Sr-90	.04
Be-7	.28

2007- 35

<u>Nuclide</u>	<u>%Abundance</u>
Mn-54	4.29
Co-57	.59
Co-58	.65
Co-60	17.71
Cs-137	2.61
Cs-134	.81
Ni-63	54.80
Fe-55	18.29
H-3	.02
Sr-90	.03
Sb-125	.19

G/ Dewatered Mechanical Filter Media

H. Dewatered Mechanical Filter Media (brokered)

2007- 01

<u>Nuclide</u>	<u>%Abundance</u>
Mn-54	.36
Co-57	.01
Co-58	.02
Co-60	32.08
Cs-137	.01
Fe-55	39.63
Ni-63	27.36
H-3	.02
C-14	.31
Sb-125	.08
Ag-110m	.04
Ce-144	.01
Pu-241	.06

2007- 02

<u>Nuclide</u>	<u>%Abundance</u>
Mn-54	1.16
Co-57	.03
Co-58	.01
Co-60	28.16
Cs-137	.01
Fe-55	54.91
Ni-63	15.23
H-3	.01
C-14	.15
Sb-125	.13
Ag-108m	.01
Ag-110m	.1
Ce-144	.01
Zn-65	.01
Pu-241	.05

2007-33

<u>Nuclide</u>	<u>%Abundance</u>
Mn-54	5.47
Co-57	.29
Co-58	1.68
Co-60	18.68
Cs-137	.36
Cs-134	.03
Fe-55	41.45
Ni-63	11.27
H-3	25.93
C-14	.03
Sb-125	.29
Ce-144	.02

2007 - 37

<u>Nuclide</u>	<u>%Abundance</u>
Mn-54	5.47
Co-57	.29
Co-58	1.68
Co-60	26.03
Cs-137	1.52
Cs-134	.40
Fe-55	48.50
Ni-63	13.88
C-14	.59
Sb-125	.65
Ce-144	.11
Zr-95	.06
Sn-113	.03
Zn-65	.30
Tc-99	.47

I. Solidified Waste

No shipments in 2007

2. Dry Solid Waste:

A. Dry Active Waste (compacted)

Compaction no longer performed on-site.

Dry Active Waste (non-compacted)

No shipments in 2007

Dry Active Waste (brokered/compacted)

No shipments in 2007

Dry Active Waste (brokered/non-compacted)

2007- 03

<u>Nuclide</u>	<u>%Abundance</u>
Mn-54	1.15
Co-57	.06
Co-58	6.89
Co-60	24.01
Cs-137	1.28
Fe-55	44.48
Ni-63	17.32
C-14	2.28
Sb-125	.77
Zr-95	.43
Nb-95	1.14
Sr-90	.18

2007- 04

<u>Nuclide</u>	<u>%Abundance</u>
Co-57	.06
Mn-54	1.11
Co-58	5.21
Co-60	24.73
Cs-137	1.33
Fe-55	45.24
Ni-63	18.04
C-14	2.37
Zr-95	0.32
Sb-125	.78
Sr-90	.19
Nb-95	.62

2007- 06

<u>Nuclide</u>	<u>%Abundance</u>
Co-57	.06
Mn-54	1.15
Co-58	6.68
Co-60	24.10
Cs-137	1.29
Fe-55	44.55
Ni-63	17.45
C-14	2.29
Zr-95	.42
Sb-125	.77
Sr-90	.18
Nb-95	1.06

2007- 11

<u>Nuclide</u>	<u>%Abundance</u>
Co-57	.06
Mn-54	1.15
Co-58	6.72
Co-60	24.10
Cs-137	1.28
Ni-63	17.38
Fe-55	44.58
Zr-95	.42
C-14	2.29
Sb-125	.77
Sr-90	.18
Nb-95	1.07

2007- 12

<u>Nuclide</u>	<u>%Abundance</u>
Co-57	.06
Mn-54	1.15
Co-58	6.82
Co-60	24.07
Cs-137	1.28
Fe-55	44.51
Ni-63	17.34
C-14	2.28
Zr-95	.43
Sb-125	.76
Sr-90	.18
Nb-95	1.10

2007-15

<u>Nuclide</u>	<u>%Abundance</u>
Co-57	.06
Mn-54	1.15
Co-58	6.88
Co-60	24.02
Cs-137	1.28
Fe-55	44.47
Ni-63	17.34
C-14	2.28
Zr-95	.43
Sb-125	.77
Sr-90	.18
Nb-95	1.13

2007- 17

<u>Nuclide</u>	<u>%Abundance</u>
Co-57	.06
Mn-54	1.15
Co-58	6.95
Co-60	24.02
Cs-137	1.28
Fe-55	44.40
Ni-63	17.31
C-14	2.28
Zr-95	.44
Sb-125	.76
Sr-90	.18
Nb-95	1.16

2007- 22

<u>Nuclide</u>	<u>%Abundance</u>
Co-57	.06
Mn-54	1.16
Co-58	7.26
Co-60	23.88
Cs-137	1.27
Fe-55	44.26
Ni-63	17.18
C-14	2.26
Zr-95	.46
Sb-125	.76
Sr-90	.18
Nb-95	1.27

2007- 26

<u>Nuclide</u>	<u>%Abundance</u>
Co-57	.06
Mn-54	1.11
Co-58	5.08
Co-60	24.76
Cs-137	1.33
Fe-55	45.31
Ni-63	18.09
C-14	2.38
Zr-95	.31
Sb-125	.78
Sr-90	.19
Nb-95	.60

2007- 32

<u>Nuclide</u>	<u>%Abundance</u>
Co-57	.06
Mn-54	1.12
Co-58	5.48
Co-60	24.66
Cs-137	1.32
Fe-55	45.13
Ni-63	17.88
C-14	2.36
Zr-95	.33
Sb-125	.78
Sr-90	.19
Nb-95	.69

2007- 23

<u>Nuclide</u>	<u>%Abundance</u>
Co-57	.06
Mn-54	1.16
Co-58	7.19
Co-60	23.90
Cs-137	1.27
Fe-55	44.31
Ni-63	17.20
C-14	2.26
Zr-95	.45
Sb-125	.76
Sr-90	.18
Nb-95	1.25

2007- 29

<u>Nuclide</u>	<u>%Abundance</u>
Co-57	.06
Mn-54	1.16
Co-58	7.21
Co-60	23.92
Cs-137	1.27
Fe-55	44.24
Ni-63	17.22
C-14	2.27
Zr-95	.45
Sb-125	.76
Sr-90	.18
Nb-95	1.25

2007- 34

<u>Nuclide</u>	<u>%Abundance</u>
Co-57	.06
Mn-54	1.14
Co-58	6.13
Co-60	24.34
Cs-137	1.30
Fe-55	44.85
Ni-63	17.64
C-14	2.32
Zr-95	.38
Sb-125	.77
Sr-90	.18
Nb-95	.88

2007- 36

<u>Nuclide</u>	<u>%Abundance</u>
Co-57	.06
Mn-54	1.13
Co-58	5.83
Co-60	24.45
Cs-137	1.31
Fe-55	45.06
Ni-63	17.72
C-14	2.34
Zr-95	.36
Sb-125	.77
Sr-90	.18
Nb-95	.79

2007- 38

<u>Nuclide</u>	<u>%Abundance</u>
Co-57	.06
Mn-54	1.14
Co-58	6.57
Co-60	24.15
Cs-137	1.29
Fe-55	44.63
Ni-63	17.47
C-14	2.30
Zr-95	.41
Sb-125	.77
Sr-90	.18
Nb-95	1.02

2007- 39

<u>Nuclide</u>	<u>%Abundance</u>
Co-57	.06
Mn-54	1.15
Co-58	7.07
Co-60	23.93
Cs-137	1.27
Fe-55	44.37
Ni-63	17.27
C-14	2.27
Zr-95	.45
Sb-125	.76
Sr-90	.18
Nb-95	1.20

B. Sealed Sources

No shipments in 2007

C. Sealed Sources/Smoke Detectors

No shipments in 2007

D. Irradiated Components

No shipments in 2007

Attachment 3

Unplanned Offsite Releases

McGUIRE NUCLEAR STATION

UNPLANNED RELEASES

(January 1, 2007 through December 31, 2007)

There were two unplanned gaseous radioactive releases to the environment in 2007. There were no unplanned liquid radioactive effluent releases to the environment in 2007.

June 18, 2007

Memorandum To: Annual Radioactive Effluent Release Report

CC: Steve Mooneyhan, H. J. Sloan, Joyce Correll, C.D. Ingram, Jim Kammer, Ken Ashe, Kay Crane

From: William C. Spencer
RP Staff
Radiation Protection
McGuire Nuclear Station

Re: Unplanned release to the Unit 1 Vent Reference PIP M-07-3543

Event Summary:

See referenced PIP for details.

On June 14, 2007 09:40 to 12:02 hours, a normal WGD-T-A release was in progress to the Unit 1 Vent. Later in the release a pressure drop of 5 psi from WGD-T-E was observed. The WGD-T-A release was secured at 12:02 hrs. From trend analysis of 1 EMF 50, increased counts were seen in two discreet spikes above normal. 1 EMF 50 trip 2 actuation (auto release termination) was not reached. No off site release limits were challenged.

1.3E-2 curies of fission and activation gas (noble gas) was released to the unit 1 vent during this event. The source of the noble gas was determined to be due to leak-by from 1 WG-98 (E in-service WGD-T sample isolation valve) into the WGD-T-A release discharge line.

Sequence of events:

- On 6/13/07 WGD-T-A was sampled for a planned release on 6/14/07.
- 6/14/07 09:40 WGD-T-A release started. A normal expected count per min (cpm) was seen on 1 EMF 50 and unit vent monitor 1 EMF 36.
- 10:00 1 EMF 50 trend shows increase cpm from ~ 8400 cpm to 18,600 cpm which lasts until 11:00hrs. 1 EMF 50 cpm return to normal.
- 11:20 1 EMF 50 cpm shows increase to 19,000 cpm.
- 12:02 release secured by Chemistry.
- Chemistry reported 5 psi pressure drop (204 ft3) released from WGD-T-E to RP.
- WGD-T-E sampled to account for activity released to the unit 1 vent.
- SRPMP 8-2 "Investigation of Unusual Radiological Occurrences" was completed to document the Unplanned Release investigation.

The total Noble gas activity released was reported on (GWR) Gaseous Waste Release # 2007051.

The unplanned activity was evaluated against off site dose limits using current ODCM methodology on the attached spreadsheet.

Safety Significance:

The health and safety of the public were not compromised by this event. The total activity released was insignificant. Calculated dose and dose rate to the Total Body, Skin, Gamma Air, and Beta Air were all less than one tenth of one percent (<0.1%) of the limits specified by Selected Licensee Commitments and Code of Federal Regulations.

W.C. Spencer
RP Staff Support
Radiation Protection
McGuire Nuclear Station

Joyce Correll
General Supervisor
Radiation Protection
McGuire Nuclear Station

December 06, 2007

Memorandum To: Annual Radioactive Effluent Release Report

CC: Steve Mooneyhan, H. J. Sloan, Joyce Correll, C.D. Ingram, Jim Kammer, Ken Ashe, Kay Crane

From: William C. Spencer
RP Staff
Radiation Protection
McGuire Nuclear Station

Re: Unplanned release to the Unit 1 Vent Reference PIP M-07-6220

Event Summary:

See referenced PIP for details.

On December 06, 2007 09:43 to 09:44 hours, a normal WGDTC release was initiated to the Unit 1 Vent. At initiation of the release a high rad trip occurred on 0EMF-50 immediately terminating the release. While investigating the trip actuation a pressure drop of ~1 psi from WGDTC-E (in-service tank) was observed and a pressure increase of ~1 psi was seen in WGDTC-C. Attempts to release WGDTC-C were terminated. From trend analysis of 1 EMF 50, increased counts were seen from one ~66,000 cpm spike which caused the Trip 2 actuation (auto release termination). Trending the Unit Vent Monitor 1EMF-36 indicated no counts above normal background. No off site release limits were challenged.

A conservative calculation indicates 1.27E-3 curies of fission and activation gas (noble gas) were released to the Unit 1 Vent during this event. The source of the noble gas was determined to be due to leak-by from 1 WG-98 (E in-service WGDTC sample isolation valve) into the WGDTC-C tank and discharge line.

Sequence of events:

- On 12/5/07 WGDTC-C was sampled for a planned release on 12/6/07.
- 12/6/07 09:43 WGDTC-C release started.
- 09:44 An instantaneous spike was seen on 1 EMF 50 of ~ 66,000 cpm and the release was auto terminated.
- 12:02 release secured by Chemistry.
- Chemistry reported ~0.2 psi pressure drop (8.2 ft3) released from WGDTC-E to Unit 1 Vent.
- WGDTC-E sampled to account for activity released to the unit 1 vent.
- SRPMP 8-2 "Investigation of Unusual Radiological Occurrences" was completed to document the Unplanned Release investigation.

The total Noble gas activity released was reported on (GWR) Gaseous Waste Release # 2007088.

The unplanned activity was evaluated against off site dose limits using current ODCM methodology on the attached spreadsheet.

Safety Significance:

The health and safety of the public were not compromised by this event. The total activity released was insignificant. Calculated dose and dose rate to the Total Body, Skin, Gamma Air, and Beta Air were all less than three tenths of one percent (<0.3%) of the limits specified by Selected Licensee Commitments and Code of Federal Regulations.

W.C. Spencer
RP Staff Support
Radiation Protection
McGuire Nuclear Station

Joyce Correll
General Supervisor
Radiation Protection
McGuire Nuclear Station

Attachment 4

Fuel Cycle Calculation

**McGuire Nuclear Station
2007 Radioactive Effluent Releases
40CFR190 Uranium Fuel Cycle Dose Calculation Results**

In accordance with the requirements of 40CFR190, the annual dose commitment to any member of the general public shall be calculated to assure that doses are limited to 25 millirems to the total body or any organ with the exception of the thyroid which is limited to 75 millirems. The fuel cycle dose assessment for McGuire Nuclear Station only includes liquid and gaseous effluent dose contributions from McGuire and direct and air-scatter dose from McGuire's onsite Independent Spent Fuel Storage Installation (ISFSI) since no other uranium fuel cycle facility contributes significantly to McGuire's maximum exposed individual. The combined dose to a maximum exposed individual from McGuire's effluent releases and direct and air-scatter dose from McGuire's ISFSI is well below 40CFR190 limits as shown by the following summary:

I. 2007 McGuire 40CFR190 Effluent Dose Summary

The 40CFR190 effluent dose analysis to the maximum exposed individual from liquid and gas releases includes the dose from noble gases (i.e., total body and skin).

Maximum Total Body Dose = 4.40E-01 mrem

Maximum Location: 0.5 Mile, East-Northeast Sector
Critical Age: Adult
Gas non-NG Contribution: 55%
Gas NG Contribution: 4%
Liquid Contribution: 41%

Maximum Organ (other than TB) Dose = 4.57E-01 mrem

Maximum Location: 0.5 Mile, East-Northeast Sector
Critical Age: Child
Critical Organ: Liver
Gas Contribution: 47%
Liquid Contribution: 53%

II. 2007 McGuire 40CFR190 ISFSI Dose Summary

Direct and air-scatter radiation dose contributions from the onsite Independent Spent Fuel Storage Installation (ISFSI) at McGuire have been calculated and documented in the "McGuire Nuclear Site 10CFR72.212 Written Evaluations" report. The maximum dose rate to the nearest resident from the McGuire ISFSI is conservatively calculated to be 9.92 mrem/year.

The attached excerpt from the "McGuire Nuclear Site 10CFR72.212 Written Evaluations" report is provided to document the method used to calculate the McGuire ISFSI 9.92 mrem/year dose estimate.

C. 10CFR72.212(b)(2)(iii)- Requirements of 72.104

Criterion

"...the requirements of 72.104 have been met."

Evaluation

Historical TLD Monitoring

The following table documents the actual radiological dose in rems at the owner controlled fence on top of the berm overlooking the ISFSI (Lotus Notes from Mary J. Foreman to Norman T. Simms, dated June 15, 2004). Actual dose to the public from the ISFSI is only available at this owner controlled fence. Therefore, a normalization factor is derived by comparing the actual dose to the calculated dose. The normalization factor is applied to the calculated values for the intake waterway and the exclusion area boundary to approximate the actual dose values from the ISFSI in those areas around the plant.

Location#	3Q '02	4Q '02	1Q '03	2Q '03	3Q '03	4Q '03	1Q '04
76	0.032	0.036	0.042	0.055	0.056	0.043	0.058
77	0.020	0.028	0.028	0.039	0.036	0.035	0.043
# of Days	91	92	91	92	98	83	98

Location # 76 indicates the greatest dose of 0.058 rems during a 98 day period in the first quarter of 2004. This is equivalent to 0.0247 mrem per hour for a total population of ten TN-32 casks. The calculated dose for this same location using conservative computer models is 0.744 mrem per hour. A normalization value is derived by dividing the actual dose by the calculated dose, which is $0.0247/0.744 = 0.0332$. (A recent Lotus Notes from Mary J. Foreman to N.T. Simms, dated April 24, 2006 indicates that the dose at Location # 76 is 0.044 rems for a period of 89 days during the 1Q '06. Ten TN-32 casks and nine NAC UMS casks were on the ISFSI pad, but for simplicity and conservatism the 1Q '04 value will continue to be used. Please note that the normalization factor will only be used for the TN-32 casks).

ISFSI Controlled Area Boundary (ISFSI and Site Operations)

It is stipulated in 10CFR72.104(a) that the annual dose equivalent to any real individual who is located beyond the controlled area of the ISFSI (as defined in 10CFR 72.3) must not exceed 25 mrem to the whole body, 75 mrem to the thyroid, and 25 mrem to any critical organ during normal operations and anticipated occurrences.³ This dose equivalent must include contributions from

³ For McGuire, compliance with this regulation will also assure compliance with 40 CFR Part 190.

planned releases to the environment, direct radiation from ISFSI operations, and any other radiation from uranium fuel cycle operations within the region.

The combined and skyshine dose rates at various distances for one cask stored with 7 year cooled fuel (inner) and 10 year cooled fuel (outer) were analyzed by Transnuclear.⁴ The best-fit empirical equation for skyshine dose rate as a function of distance is $y = 0.0156e^{-0.0112x}$ for gammas and $y = 0.0274e^{-0.0129x}$ for neutrons, where y is dose rate (mrem/hr) and x is distance (meters), applicable from 20 to 1000 meters. Likewise, the best-fit empirical equation for total dose rate (direct and skyshine) as a function of distance is $y = 492.69x^{-2.1688}$ for gammas and $y = 166.95x^{-2.0696}$ for neutrons, where y is dose rate (mrem/hr) and x is distance (meters), applicable from 20 to 80 meters. Based upon conservative engineering judgement, the McGuire power generation contribution at the Exclusion Area Boundary (EAB) is determined to be 3 mrem per year. The 3 mrem per year is independent of the ISFSI.

The combined and skyshine dose rates at various distances for a 2x6 cask array with 5 year cooled fuel were analyzed by NAC.⁵ Skyshine dose rates are located in Table 6-4 on page 12 and combined dose rates are located in Table 6-6 on page 14. Both tables account for the effects of both gammas and neutrons.

The controlled area of the MNS ISFSI is defined to be coextensive with the McGuire Nuclear Site EAB. The annual dose for a maximally exposed individual at this boundary must be below 25 mrem in accordance with 10CFR72.104 (cited above). For a conservative estimate, the individual is assumed to have a 100% occupancy time (8750 hours per year) at the boundary. The individual is also considered to be occupying the point on the EAB closest to the ISFSI, which would be just south of the Cowans Ford Dam close to the river. This point on the EAB is determined to be 425 meters from the ISFSI and the calculated dose only considers skyshine radiation. Direct radiation from the casks is shielded by the ground due to the significant drop in elevation from the ISFSI to the river. The combination of calculated and actual dose to an individual due to the ISFSI is determined to be 9.9 mrem and the dose due to McGuire power generation is 3 mrem per year for a total dose of 12.9 mrem per year. Therefore, the ISFSI controlled area boundary radiation limits are met for the McGuire ISFSI.

The selection of an individual on the EAB south of the dam is totally arbitrary in order to choose the closest point on the EAB to the ISFSI. This location is owned by Duke Energy and no member of the public would be permitted to occupy this location continuously. The regulations speak of the "real individual" when

⁴ TN Calc 1083-20, "TN-32 Cask for Duke Power, TN-32 MCMP Models for Determining Off-Site Doses," Rev. 0, dated 4/06/2000.

⁵ NAC Calc 12418-5001, "Skyshine Evaluation of McGuire ISFSI," Rev.0, dated 11/26/03.

addressing radiation exposure. Factually, this "real individual" is located beyond the EAB on the eastern side of the plant.

General Environment from Total Nuclear Fuel Cycle (ISFSI and Site Operations)

40CFR190 applies to radiation doses received by members of the public in the general environment and to radioactive materials introduced to the general environment as the result of all operations which are part of the Nuclear Fuel Cycle. The McGuire ISFSI is located in the immediate proximity of McGuire Nuclear Station and as such compliance with 40CFR190 must be demonstrated.

The McGuire UFSAR (Section 2.1.2.2, "Boundaries for Establishing Effluent Release Limits") and Selected Licensee Commitments Manual (Section 16.11, "Radiological Effluents Control") defines "unrestricted areas" to be coextensive with the EAB and beyond. Likewise, "general environment" is defined to be coextensive with the EAB and beyond.

It is stipulated in 40CFR190.10(a) that the annual dose equivalent shall not exceed 25 mrem to the whole body, 75 mrem to the thyroid, and 25 mrem to any other organ of any member of the public as a result of exposures to planned discharges of radioactive materials, radon and its daughters excepted, to the general environment from uranium fuel cycle operations and to radiation from these operations. As illustrated previously in showing compliance with 10CFR 72.104(a), the calculated dose at the EAB is 12.9 mrem per year, within the 25 mrem allowable limit. The summation of the doses from the ISFSI and McGuire power generation to the General Environment are well within the allowable limits.

Dose Inside ISFSI Controlled Area (ISFSI Operations)

Regulations permit the controlled area to be traversed by public roads and waterways as cited in 10CFR72.106(c). Since the public is permitted access into the controlled area at McGuire, the dose rate must be below 2 mrem per hour and the annual dose must be below 100 mrem within the controlled area.⁶

A member of the public is postulated to be located between the owner controlled fence and the EAB at a point close to the security buoys near the intake structure of the nuclear station, the closest approach for such an individual to the ISFSI. This area is accessible as shoreline covered with large stones for erosion control and is not a location where individual members of the public would typically be found. Regulatory Guide 1.109, "Calculation of Annual Doses to Man From Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I," provides a recommended value of 67 hours per year of "shoreline recreation" for the maximum exposed individual in the vicinity of a nuclear station. Although the shoreline area near McGuire is not recreational in nature, use of this value as an occupancy factor would be conservative. For

⁶ 10CFR20.1301(b). See also 10CFR20.1301(a)(2).

additional conservatism the residence time was more than doubled to 150 hours and utilized in the dose calculations for an individual in the vicinity of the McGuire intake structure close to the ISFSI.

The maximum dose rate at the owner controlled fence closest to the ISFSI was determined to be 0.28 mrem per hour (direct radiation and skyshine), within the 2 mrem per hour allowable limit. Finally, the annual dose resulting from ISFSI to the public inside the McGuire EAB in the vicinity of the intake structure, using a residence time of 150 hours, is determined to be 5.79 mrem (skyshine only - earthen berm acts as a shield), within the 100 mrem allowable limit.

These calculations show that the McGuire ISFSI containing ten TN-32A casks and 24 NAC UMS casks meets the radiological requirements of 10CFR72.104, 10CFR20.1301 and 40CFR190.

Tabulations

Normalization Factor (NF)

TN-32A Casks

Actual radiological dose at the owner controlled fence divided by the calculated dose.

Actual dose =
 $(0.058 \text{ rem} \times 1000 \text{ mrem/rem}) / (98 \text{ days} \times 24 \text{ hrs/day}) = 0.0247 \text{ mrem/hr}$

Calculated dose = 0.744 mrem/hr
(see "top of berm at owner controlled fence" below)

$NF = 0.0247 / 0.744 = 0.0332$

Due to the amount of conservatisms utilized in the computer models, the actual measured dose at the owner controlled fence is only 3% of the calculated values. Since historical TLD measurements are not available for the waterway and exclusion area boundary, the NF and calculated values are used to approximate the actual dose from the TN-32 casks for those two areas.

Top of berm at owner controlled fence - 70 meters from ISFSI

TN-32A casks

Using the previous equations for total dose and a distance of 70 meters the total dose rate (gammas and neutrons) for one cask is $7.443 \text{ E}^{-02} \text{ mrem/hr}$.

$$(10) \text{ Casks} \times 7.443 \text{ E}^{-02} \text{ mrem/hr} = 0.744 \text{ mrem per hour}$$

Actual measured dose rate for the first ten casks stored in the ISFSI = 0.0247 mrem per hour

NAC - UMS Casks

Using the calculated value from the NAC evaluation located in Table 6-6, "2x6 Cask Array Combined Dose Rates", the total dose rate (gammas and neutrons) at a distance of 70 meters is 1125.6 mrem/yr. This equates to :

$$(1125.6 \text{ mrem/yr}) / (8760 \text{ hours per yr}) = 0.128 \text{ mrem per hour}$$

Total Expected Dose Rate at Owner Controlled Fence at Top of Berm

Ten TN-32A Casks (actual) plus (2X) 2X6 Array NAC UMS Casks (calculated)

$$0.0247 \text{ mrem per hr} + 2(0.128) \text{ mrem per hr} = 0.2807 \text{ mrem per hr}$$

Waterway beyond security buoys on other side of berm from ISFSI - 135 meters from ISFSI

TN-32A Casks

Using the previous equations for skyshine and a distance of 135 meters the skyshine dose (gammas and neutrons) for one cask is $8.24 \text{ E}^{-03} \text{ mrem/hr}$.

$$(10) \text{ Casks} \times 8.24 \text{ E}^{-03} \text{ mrem/hr} \times 150 \text{ hrs (residence time/yr)} = 12.36 \text{ mrem per year}$$

$$\text{Normalized actual dose} = 0.0332 \times 12.36 \text{ mrem/yr} = 0.410 \text{ mrem per year}$$

Total expected dose for ten TN-32A casks (actual)
0.410 mrem per year

NAC-UMS Casks

Using the calculated value from the NAC evaluation located in Table 6-4, "2x6 Cask Array Scattered Dose Rates", the total dose rate (gammas and neutrons) at a distance of 135 meters is 157.3 mrem/yr. For a residence time of 150 hours this equates to :

$$(157.3 \text{ mrem/yr}) / (8760 \text{ hrs/yr}) \times 150 \text{ hrs (residence time/yr)} = 2.69 \text{ mrems / yr}$$

Total Expected Dose at Waterway on Other Side of Berm

Ten TN-32A Casks (actual) plus (2X) 2X6 Array NAC UMS Casks (calculated)

$$0.410 \text{ mrem per year} + 2(2.69) \text{ mrem per year} = 5.79 \text{ mrem per year}$$

Individual Sited on Exclusion Area Boundary Below Dam - 425 meters from ISFSI

TN-32A Casks

Using the previous equations for skyshine and a distance of 425 meters the skyshine dose (gammas and neutrons) for one cask is $2.48 \text{ E}^{-04} \text{ mrem/hr}$.

$$(10) \text{ Casks} \times 2.48 \text{ E}^{-04} \text{ mrem/hr} \times 8760 \text{ hours per year} = 21.7 \text{ mrem / yr}$$

$$\text{Normalized actual dose} = 0.0332 \times 21.7 \text{ mrem/yr} = 0.720 \text{ mrem / yr}$$

Total expected dose for ten TN-32A casks (actual)
 0.720 mrem / yr

NAC-UMS Casks

Using the calculated value from the NAC evaluation located in Table 6-4, "2x6 Cask Array Scattered Dose Rates", the total dose rate (gammas and neutrons) at a distance of 425 meters is 4.6 mrem/yr .

Total Expected Dose at Exclusion Area Boundary

Ten TN-32A Casks (actual) plus (2X) 2X6 Array NAC UMS Casks (calculated)

$$0.720 \text{ mrem per year} + 2(4.6) \text{ mrem per year} = 9.92 \text{ mrem per year}$$

McGUIRE NUCLEAR STATION
2007 METEOROLOGICAL JOINT FREQUENCY DISTRIBUTIONS
OF WIND SPEED, WIND DIRECTION, AND ATMOSPHERIC
STABILITY
USING WINDS AT THE 10 METER LEVEL

(Hours of Occurrence)

McGuire NUCLEAR STN. METEOROLOGY (2007) PROG=XOQFREQ

10M WIND SPEED/DIRECTION/DELTA-T STABILITY
STABILITY CLASSES BASED ON DELTA-T BETWEEN UPPER-LOWER LEVELS

PASQUILL STABILITY A

	WIND SPEED CLASS											TOTAL
	0.75-	1.00-	1.25-	1.50-	2.00-	3.00-	4.00-	5.00-	6.00-	8.00-	>9.99	
	0.99	1.24	1.49	1.99	2.99	3.99	4.99	5.99	7.99	9.99	M/S	
	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	
SECTOR												
-N-	.	1	5	12	3	1	.	.	.	5	.	27
-NNE-	.	.	2	17	14	1	.	.	.	1	1	36
-NE-	.	.	.	9	25	9	5	1	.	.	.	49
-ENE-	.	.	1	11	26	19	5	1	1	.	.	64
-E-	.	.	.	6	12	12	1	.	.	.	.	31
-ESE-	.	.	.	5	9	2	.	.	.	.	.	16
-SE-	.	.	.	2	.	.	1	.	.	.	.	3
-SSE-	.	.	.	.	5	.	.	.	.	.	.	5
-S-	.	.	.	3	9	.	.	.	.	.	.	12
-SSW-	.	.	.	2	19	9	5	.	.	.	.	35
-SW-	.	.	.	5	25	26	21	1	2	.	.	80
-WSW-	.	.	1	2	35	34	10	2	3	1	.	88
-W-	1	.	2	9	15	9	1	.	.	.	.	37
-WNW-	.	.	.	5	10	1	.	.	.	.	.	16
-NW-	.	.	2	4	3	.	.	.	5	2	4	20
-NNW-	.	3	4	10	4	.	.	.	1	2	1	25
TOTAL	1	4	17	102	214	123	49	5	12	11	6	544

McGuire NUCLEAR STN. METEOROLOGY (2007) PROG=XOQFREQ

10M WIND SPEED/DIRECTION/DELTA-T STABILITY
STABILITY CLASSES BASED ON DELTA-T BETWEEN UPPER-LOWER LEVELS

PASQUILL STABILITY B

	WIND SPEED CLASS											TOTAL
	0.75-	1.00-	1.25-	1.50-	2.00-	3.00-	4.00-	5.00-	6.00-	8.00-	>9.99	
	0.99	1.24	1.49	1.99	2.99	3.99	4.99	5.99	7.99	9.99	M/S	
	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	
SECTOR												
-N-	.	.	1	13	14	8	2	5	9	8	.	60
-NNE-	.	.	2	15	25	21	9	7	9	4	1	93
-NE-	.	.	2	8	15	10	13	11	2	.	.	61
-ENE-	.	.	.	8	15	12	4	.	2	.	.	41
-E-	.	.	.	5	12	5	.	.	.	.	.	22
-ESE-	.	.	1	1	1	5	.	.	.	.	.	8
-SE-	.	.	.	.	5	2	.	1	.	.	.	8
-SSE-	.	.	1	2	3	3	.	.	.	.	.	9
-S-	.	.	.	3	13	1	.	.	.	.	.	17
-SSW-	.	.	1	2	20	13	4	3	.	.	.	43
-SW-	.	.	1	3	13	33	20	10	6	.	.	86
-WSW-	.	.	1	4	23	18	11	3	6	.	.	66
-W-	.	.	1	8	5	4	7	1	1	.	.	27
-WNW-	2	.	2	1	6	6	1	.	2	.	.	20
-NW-	.	1	6	1	5	1	3	2	5	9	6	39
-NNW-	.	.	7	7	4	.	1	.	12	4	2	37
TOTAL	2	1	26	81	179	142	75	43	54	25	9	637

McGuire NUCLEAR STN. METEOROLOGY (2007) PROG=XOQFREQ

10M WIND SPEED/DIRECTION/DELTA-T STABILITY
STABILITY CLASSES BASED ON DELTA-T BETWEEN UPPER-LOWER LEVELS

PASQUILL STABILITY C

	WIND SPEED CLASS										TOTAL
	1.00- 1.24	1.25- 1.49	1.50- 1.99	2.00- 2.99	3.00- 3.99	4.00- 4.99	5.00- 5.99	6.00- 7.99	8.00- 9.99	>9.99 M/S	
	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	
	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	
SECTOR											
-N-	4	3	13	42	21	9	14	19	6	.	131
-NNE-	.	5	15	29	17	33	13	24	11	.	147
-NE-	1	4	6	11	22	30	18	5	.	.	97
-ENE-	.	1	4	10	11	8	1	1	.	.	36
-E-	.	2	4	10	6	.	1	.	.	.	23
-ESE-	1	1	2	11	2	1	.	.	.	.	18
-SE-	.	1	2	6	2	.	.	.	.	.	11
-SSE-	.	.	.	9	.	.	.	.	.	.	9
-S-	.	.	4	18	3	1	.	.	.	.	26
-SSW-	.	.	2	15	17	1	.	.	.	.	35
-SW-	.	1	2	30	25	24	13	11	.	.	106
-WSW-	1	3	2	21	14	6	4	12	.	.	63
-W-	1	3	2	11	10	6	5	.	.	.	38
-WNW-	1	3	3	3	7	6	2	1	.	.	26
-NW-	1	3	.	4	2	12	8	10	10	2	52
-NNW-	3	2	2	7	1	6	12	25	8	6	72
TOTAL	13	32	63	237	160	143	91	108	35	8	890

McGuire NUCLEAR STN. METEOROLOGY (2007) PROG=XOQFREQ

10M WIND SPEED/DIRECTION/DELTA-T STABILITY
STABILITY CLASSES BASED ON DELTA-T BETWEEN UPPER-LOWER LEVELS

PASQUILL STABILITY D

	WIND SPEED CLASS													TOTAL
	0.45- 0.74	0.75- 0.99	1.00- 1.24	1.25- 1.49	1.50- 1.99	2.00- 2.99	3.00- 3.99	4.00- 4.99	5.00- 5.99	6.00- 7.99	8.00- 9.99	>9.99 M/S		
	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.		
	SECTOR													
-N-	.	.	4	8	24	57	48	53	31	14	3	.	242	
-NNE-	.	2	2	10	21	62	50	56	30	18	4	.	255	
-NE-	.	.	2	11	24	149	203	172	114	35	.	.	710	
-ENE-	.	.	.	7	29	115	103	42	5	2	.	.	303	
-E-	.	1	1	7	18	90	91	9	2	.	.	.	219	
-ESE-	.	2	3	3	23	62	45	10	4	.	.	.	152	
-SE-	.	1	5	6	34	103	36	7	.	.	.	.	192	
-SSE-	.	.	2	10	26	50	9	1	2	1	.	.	101	
-S-	.	.	.	10	24	84	25	6	3	2	.	.	154	
-SSW-	.	1	5	5	18	90	68	11	4	2	.	.	204	
-SW-	.	2	1	9	30	118	199	122	64	17	1	.	563	
-WSW-	.	1	4	10	31	75	59	38	26	22	9	.	275	
-W-	.	1	7	8	21	54	47	25	10	10	4	.	187	
-WNW-	1	3	2	5	12	31	22	40	18	9	3	2	148	
-NW-	.	.	2	7	5	27	42	36	31	31	13	11	205	
-NNW-	.	1	5	6	22	34	37	30	27	41	14	2	219	
TOTAL	1	15	45	122	362	1201	1084	658	371	204	51	15	4129	

McGuire NUCLEAR STN. METEOROLOGY (2007) PROG=XOQFREQ

10M WIND SPEED/DIRECTION/DELTA-T STABILITY
STABILITY CLASSES BASED ON DELTA-T BETWEEN UPPER-LOWER LEVELS

PASQUILL STABILITY E

	WIND SPEED CLASS										TOTAL
	0.45- 0.74	0.75- 0.99	1.00- 1.24	1.25- 1.49	1.50- 1.99	2.00- 2.99	3.00- 3.99	4.00- 4.99	5.00- 5.99	6.00- 7.99	
	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	
SECTOR											
-N-	1	1	1	4	8	16	4	3	.	1	39
-NNE-	.	1	1	4	7	8	5	1	2	.	29
-NE-	.	.	.	2	6	14	1	1	.	.	24
-ENE-	.	3	.	4	8	6	1	1	.	.	23
-E-	.	2	4	5	11	8	.	.	.	.	30
-ESE-	1	2	7	2	16	14	2	.	.	.	44
-SE-	1	8	5	8	22	45	15	.	.	.	104
-SSE-	2	3	9	22	44	24	1	.	.	.	105
-S-	1	6	9	22	50	81	2	.	.	.	171
-SSW-	1	8	14	20	54	160	29	2	.	.	288
-SW-	2	6	9	8	46	156	83	12	2	1	325
-WSW-	1	7	9	20	55	61	17	.	5	3	178
-W-	.	3	12	13	18	26	8	.	.	1	81
-WNW-	.	3	8	8	15	17	5	5	1	.	62
-NW-	2	2	4	7	10	19	18	6	.	.	68
-NNW-	.	1	3	.	4	12	5	1	.	.	26
TOTAL	12	56	95	149	374	667	196	32	10	6	1597

McGuire NUCLEAR STN. METEOROLOGY (2007) PROG=XOQFREQ

. 10M WIND SPEED/DIRECTION/DELTA-T STABILITY
STABILITY CLASSES BASED ON DELTA-T BETWEEN UPPER-LOWER LEVELS

PASQUILL STABILITY F

	WIND SPEED CLASS										TOTAL
	0.45- 0.74	0.75- 0.99	1.00- 1.24	1.25- 1.49	1.50- 1.99	2.00- 2.99	3.00- 3.99	4.00- 4.99	5.00- 5.99	6.00- 7.99	
	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	
SECTOR											
-N-	2	1	1	.	.	.	.	.	.	.	4
-NNE-	.	1	1	1	1	.	.	.	.	.	4
-NE-	1	.	2	.	.	.	.	.	.	.	3
-ENE-	1	1	.	.	1	.	.	.	.	.	3
-E-	.	1	.	.	.	.	.	.	.	.	1
-ESE-	.	1	2	1	2	.	.	.	.	.	6
-SE-	2	2	2	4	5	5	.	.	.	.	20
-SSE-	2	3	3	3	8	4	.	1	.	.	24
-S-	1	6	8	11	20	41	.	.	.	.	87
-SSW-	3	17	19	21	41	18	.	.	.	.	119
-SW-	2	19	20	19	23	39	2	.	.	.	124
-WSW-	2	17	11	17	19	28	.	.	.	.	94
-W-	1	9	3	6	6	6	2	.	.	.	33
-WNW-	1	4	2	2	3	6	3	2	1	.	24
-NW-	.	1	1	3	2	5	1	.	.	.	13
-NNW-	.	1	2	.	2	.	.	.	.	.	6
TOTAL	18	84	77	88	133	152	8	3	1	1	565

McGuire NUCLEAR STN. METEOROLOGY (2007) PROG=XOQFREQ

10M WIND SPEED/DIRECTION/DELTA-T STABILITY
STABILITY CLASSES BASED ON DELTA-T BETWEEN UPPER-LOWER LEVELS

PASQUILL STABILITY G

	WIND SPEED CLASS							TOTAL NO.
	0.45- 0.74	0.75- 0.99	1.00- 1.24	1.25- 1.49	1.50- 1.99	2.00- 2.99	4.00- 4.99	
	NO.	NO.	NO.	NO.	NO.	NO.	NO.	
SECTOR								
-N-	1	.	1	.	.	.	.	2
-NNE-	2	.	2	.	.	.	.	4
-NE-	1	1	.	.	.	.	.	2
-ENE-	1	.	.	.	.	.	.	1
-E-	.	2	2	.	.	.	.	4
-ESE-	.	1	.	.	.	.	.	1
-SE-	1	1	.	.	.	.	.	2
-SSE-	1	.	2	1	1	2	.	7
-S-	3	6	4	7	6	3	.	29
-SSW-	7	20	19	16	10	1	.	73
-SW-	6	25	23	6	5	1	.	66
-WSW-	2	23	8	7	3	4	.	47
-W-	2	3	4	5	3	1	.	18
-WNW-	3	8	1	2	2	1	.	17
-NW-	.	1	.	1	.	.	1	3
-NNW-	.	1	.	.	.	.	.	1
-CALM-	2	.	.	.	.	.	.	2
TOTAL	32	92	66	45	30	13	1	279

McGuire NUCLEAR STN. METEOROLOGY (2007) PROG=XOQFREQ

10M WIND SPEED/DIRECTION/DELTA-T STABILITY
STABILITY CLASSES BASED ON DELTA-T BETWEEN UPPER-LOWER LEVELS

ALL STABILITY CLASSES

SECTOR	WIND SPEED CLASS												TOTAL
	0.45-	0.75-	1.00-	1.25-	1.50-	2.00-	3.00-	4.00-	5.00-	6.00-	8.00-	>9.99	
	0.74	0.99	1.24	1.49	1.99	2.99	3.99	4.99	5.99	7.99	9.99	M/S	
	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	
-N-	4	2	12	21	70	132	82	67	50	43	22	.	505
-NNE-	2	4	6	24	76	138	94	99	52	51	20	2	568
-NE-	2	1	5	19	53	214	245	221	144	42	.	.	946
-ENE-	2	4	.	13	61	172	146	60	7	6	.	.	471
-E-	.	6	7	14	44	132	114	10	3	.	.	.	330
-ESE-	1	6	13	8	49	97	56	11	4	.	.	.	245
-SE-	4	12	12	19	65	164	55	8	1	.	.	.	340
-SSE-	5	6	16	37	81	97	13	2	2	1	.	.	260
-S-	5	18	21	50	110	249	31	7	3	2	.	.	496
-SSW-	11	46	57	63	129	323	136	23	7	2	.	.	797
-SW-	10	52	53	44	114	382	368	199	90	37	1	.	1350
-WSW-	5	48	33	59	116	247	142	65	40	46	10	.	811
-W-	3	17	27	38	67	118	80	39	16	12	4	.	421
-WNW-	5	20	14	22	41	74	44	54	22	12	3	2	313
-NW-	2	4	9	29	22	63	64	58	41	51	34	23	400
-NNW-	.	4	16	19	47	61	43	38	39	80	28	11	386
-CALM-	2	.	.	.	.	.	.	.	.	.	.	.	2
TOTAL	63	250	301	479	1145	2663	1713	961	521	385	122	38	8641

Attachment 5

Inoperable Monitoring Equipment

Failure to meet Remedial Action F.2 "Restore the channel to Operable status" for inoperable instrument from SLC TABLE 16.11.2, 4.d.

October 29, 2007

1WPFT5120 (Flow Rate Monitor) measures and totalizes the flow rate from the turbine building sump (TBS) discharge to the conventional cooling (RC) system. SLC 16.11.2 has a 30 day completion time requirement for effluent flow rate measurement instrumentation. The normal operational alignment for the turbine building sump discharge is to one of two hold-up ponds via the conventional waste (WC) system. SLC 16.11.2 requires flow rate monitors at all times when the turbine building sump discharge is aligned to the RC flow path. It also requires an 18 month channel calibration for this instrumentation.

Performance of the channel calibration on 1WPFT5120 requires re-alignment of the turbine building sump to the RC cross-over release path to process flow through 1WPFT5120 flow instrumentation. When flow verification was performed on 5/23/2007, the totalized flow was consistently found to be out of tolerance (OOT) low. Due to maintenance limited resources for unit startup from 1EOC18, repair work was rescheduled. During the flow rate monitor inoperable period, operations realigned the turbine building sump discharge flow path to the normal alignment (TBS to WC). The normal alignment flow path does not utilize 1WPFT5120.

1WPFT5120 is a Rosemount magnetic flow transmitter that requires removal from the system for internal inspection of the measurement electrodes. When maintenance recommenced work on 6/12/2007, the totalizer output was again found OOT low. Engineering was consulted and additional testing validated that 1WPFT5120 output was the problem. The flow element was removed and the electrodes were found coated and required cleaning. After restoration of the flow element into the flow path, the totalized output now indicated OOT high. A decision was then made to order a replacement instrument. However, there was no duplicate replacement model available from the manufacturer. An expedited order from the manufacturer was made. In addition a plant modification was required for installation of the updated replacement model.

During preparations for installation of the new replacement model 8705, it was found to be 3.5 inches shorter than the original model 8701. This required an additional piping modification to allow mate up to the new instrumentation.

Once installed and testing of the new transmitter completed, the positive zero return (PZR) function was found to require a different (positive) voltage for activation. Another field modification was required for installation of a new power supply to perform this PZR function. All required modifications were completed and instrumentation passed calibration criteria on 9/06/2007.

These actions required 106 days from start of channel calibration when 1WPFT5120 was declared inoperable for PM, until instrumentation was replaced and satisfactorily tested and declared operable. The effluent release alignment (TBS to RC) which required 1WPFT5120 was only aligned to this flow path during the period of time testing was required for comparison of totalized output to volumetric calculation of turbine building sump discharge.

Event Time Line:

5/23/2007: Start Channel Calibration, 30 day clock starts
5/24/2007: Mode 4 startup support, reschedule work for two weeks
6/12/2007: Maintenance recommences work (20 days into LCO)
6/22/2007: Flow element clean, and still OOT, decided to replace (LCO expires)
7/26/2007: Attempt to install replacement instrumentation, requires piping modification
8/06/2007: Installed replacement flow element and transmitter
8/15/2007: New flow instrumentation passes calibration criterion.
9/06/2007: Replacement instrumentation required additional power supply for PZR
9/06/2007: New flow instrumentation passes functional verification
9/06/2007: 1WPFT5120 removed from TSAIL.

W. C. Spencer
RP Staff Scientist
McGuire Nuclear Station

Joyce Correll
Supervising Scientist
McGuire Nuclear Station

Attachment 6

Groundwater Protection Initiative

McGUIRE NUCLEAR STATION

INFORMATION TO SUPPORT THE NUCLEAR ENERGY INSTITUTE (NEI)

GROUNDWATER PROTECTION INITIATIVE

Duke Energy has implemented the Nuclear Energy Institute (NEI) Groundwater Protection Initiative (June 2007), a voluntary groundwater investigation project adopted by the United States commercial nuclear power industry. This initiative was developed to ensure timely and effective management of situations involving inadvertent releases of licensed material to ground water. As part of this program, the McGuire Nuclear Station installed fifty ground water monitoring wells. With the existing ten wells there are now a total of 60 ground water monitoring wells in place at McGuire. These wells are currently being sampled quarterly. All samples are being analyzed for tritium and gamma emitters, with selected wells being analyzed for Strontium 89 and 90. No gamma activity (other than naturally occurring radionuclides) or Strontium was identified in any of the well samples. Results from sampling during 2007 confirmed existing knowledge of tritium concentrations in the site ground water (shown in the table below). No new potential problem areas were identified.

The following monitoring wells were sampled during 2007.

<u>Well Name</u>	<u>Well Location</u>	<u>Annual Average Tritium Concentration in pCi/l</u>
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M-20	South of Hwg. 73	658
M-20R	South of Hwg. 73	627
M-21	South of Hwg. 73	229
M-22	South of Hwg. 73	193
M-22R	South of Hwg. 73	581
M-23	South of Acs. Rd.	293
M-30	WWCB	<MDA
M-30R	WWCB	277
M-31	Access road	<MDA
M-32	Main entrance	762
M-33	Main entrance	1130
M-34R	Access road	443
M-34DR	Access road	396
M-42	U-2 Rx. Bldg.	975
M-48	U-2 SFP	638
M-48R	U-2 SFP	743
M-48DR	U-2 SFP	747
M-53	North of plant	921
M-55	North Admin. Bldg.	<MDA
M-59	U-2 Doghouse	472
M-60	MOC Parking	<MDA
M-62	S of RWF	570
M-64	Rdwst. Bldg.	449
M-66	S of SSF	554
M-66R	S of SSF	285
M-68	U-1 RMWST	830

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M-70	U-1 SFP	305
M-70R	U-1 SFP	282
M-70DR	U-1 SFP	191
M-72	Rdwst. Trench	650
M-76	West of U-1 SFP	470
M-82	River	1,581
M-84	River	5,036
M-84R	River	6,407
M-85	River	1,255
M-87	Landfarm	250
M-89	Landfarm	446
M-90	Landfarm	270
M-91	East of WC	292
M-91R	East of WC	376
M-92	N of WC Ponds	247
M-92R	N of WC Ponds	173
M-93	North of IHUP	265
M-93R	North of IHUP	493
M-94	SE of IHUP	221
M-95	Lower Parking	385
M-95R	Lower Parking	<MDA
M-96	West Parking	<MDA
M-96R	West Parking	255
M-97	East Parking	356
M-98	S of Admin. Bldg.	<MDA
M-98R	S of Admin. Bldg.	<MDA
M-100R	SE of WC	330
M-101	SE of WC	456
M-102	SW of WC	7,727
M-103	South of WC	2,431
M-103R	South of WC	2,427
M-104R	West of WC	11,050
M-104DR	West of WC	5,563
M-105	Landfarm	394

pCi/l - pico curies per liter

MDA - Minimum detectable activity

20,000 pCi/l - the Environmental Protection Agency drinking water standard for tritium. This standard applies only to water that is used for drinking.

1,000,000 pCi/l - the 10CFR20, Appendix B, Table 2, Column 2, Effluent Concentration limit for tritium.