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April 27, 2006

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

Subject: Duke Power Company LLC d/b/a 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 Manual (SLC), attached is the Annual Radioactive Effluent Release Report. CD-Roms are attached containing the revised Offsite Dose Calculation Manual and Radioactive Waste Process Control Program 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

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

Gary R. Peterson

IE48
A009

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Attachment 1

Radioactive Effluent Releases and Supplemental Information

McGUIRE NUCLEAR STATION

EFFLUENT RELEASE DATA

(January 1, 2005 through December 31, 2005)

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 1/1/05 TO 1/1/06
GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

McGuire Nuclear Station Units 1 & 2

REPORT FOR 2005	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
A. Fission and Activation Gases						
1. Total Release	Ci	1.19E+00	8.55E-01	6.62E-01	8.09E-01	3.51E+00
2. Avg. Release Rate	µCi/sec	1.53E-01	1.09E-01	8.33E-02	1.02E-01	1.11E-01
B. Iodine-131						
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
C. Particulates Half Life >= 8 days						
1. Total Release	Ci	6.12E-06	4.84E-05	1.31E-06	9.68E-08	5.60E-05
2. Avg. Release Rate	µCi/sec	7.87E-07	6.16E-06	1.65E-07	1.22E-08	1.77E-06
D. Tritium						
1. Total Release	Ci	6.04E+01	6.42E+01	1.29E+02	8.83E+01	3.42E+02
2. Avg. Release Rate	µCi/sec	7.77E+00	8.16E+00	1.62E+01	1.11E+01	1.08E+01
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 1/1/05 TO 1/1/06
GASEOUS EFFLUENTS - ELEVATED RELEASES - CONTINUOUS MODE

McGuire Nuclear Station Units 1 & 2

REPORT FOR 2005	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 >= 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 1/1/05 TO 1/1/06
GASEOUS EFFLUENTS - ELEVATED RELEASES - BATCH MODE

McGuire Nuclear Station Units 1 & 2

REPORT FOR 2005	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 >= 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 1/1/05 TO 1/1/06
GASEOUS EFFLUENTS - GROUND RELEASES - CONTINUOUS MODE

McGuire Nuclear Station Units 1 & 2

REPORT FOR 2005	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 >= 8 days						
CO-58	Ci	6.12E-06	4.84E-05	1.31E-06	9.68E-08	5.60E-05
Totals for Period...	Ci	6.12E-06	4.84E-05	1.31E-06	9.68E-08	5.60E-05
4. Tritium						
H-3	Ci	5.88E+01	6.38E+01	1.26E+02	8.75E+01	3.36E+02
Totals for Period...	Ci	5.88E+01	6.38E+01	1.26E+02	8.75E+01	3.36E+02
5. Gross Alpha Radioactivity						
** No Nuclide Activities **		.....	.....	.....	.....	.....

TABLE 1C

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/05 TO 1/1/06
GASEOUS EFFLUENTS - GROUND RELEASES - BATCH MODE

McGuire Nuclear Station Units 1 & 2

REPORT FOR 2005	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
1. Fission and Activation Gases						
AR-41	Ci	5.39E-01	4.56E-01	5.17E-01	4.03E-01	1.91E+00
C-11	Ci	1.46E-04	0.00E+00	0.00E+00	2.23E-05	1.68E-04
KR-85	Ci	5.81E-01	3.67E-01	8.13E-02	3.62E-01	1.39E+00
KR-85M	Ci	0.00E+00	0.00E+00	0.00E+00	2.39E-04	2.39E-04
XE-133	Ci	6.45E-02	3.12E-02	6.24E-02	4.35E-02	2.02E-01
XE-135	Ci	4.07E-03	1.71E-03	1.62E-03	4.70E-05	7.45E-03
Totals for Period...	Ci	1.19E+00	8.55E-01	6.62E-01	8.09E-01	3.51E+00
2. Iodines						
** No Nuclide Activities **		.....	.....	.....	.....	.....
3. Particulates Half Life >= 8 days						
** No Nuclide Activities **		.....	.....	.....	.....	.....
4. Tritium						
H-3	Ci	1.64E+00	3.95E-01	2.87E+00	7.67E-01	5.67E+00
Totals for Period...	Ci	1.64E+00	3.95E-01	2.87E+00	7.67E-01	5.67E+00
5. Gross Alpha Radioactivity						
** No Nuclide Activities **		.....	.....	.....	.....	.....

TABLE 2A

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/05 TO 1/1/06
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

McGuire Nuclear Station Units 1 & 2

REPORT FOR 2005	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
A. Fission and Activation Products						
1. Total Release	Ci	2.49E-02	1.38E-02	1.58E-02	1.56E-02	7.02E-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	3.43E-11	1.45E-11	1.65E-11	1.77E-11	1.99E-11
B. Tritium						
1. Total Release	Ci	2.86E+02	3.34E+02	4.69E+02	3.46E+02	1.43E+03
2. Average Diluted Concentration						
a. Continuous Releases	µCi/ml	1.91E-08	1.19E-08	1.33E-08	2.81E-08	1.73E-08
b. Batch Releases	µCi/ml	3.94E-07	3.50E-07	4.88E-07	3.89E-07	4.06E-07
C. Dissolved and Entrained Gases						
1. Total Release	Ci	2.45E-05	7.55E-06	4.78E-06	7.81E-06	4.46E-05
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	3.37E-14	7.92E-15	4.99E-15	8.81E-15	1.27E-14
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	5.47E+07	6.14E+07	6.44E+07	7.89E+07	2.60E+08
2. Batch Releases	liters	2.59E+07	8.65E+05	1.18E+06	8.50E+05	2.87E+07
F. Volume of Dilution Water						
1. Continuous Releases	liters	5.01E+10	5.84E+10	7.47E+10	4.78E+10	2.31E+11
2. Batch Releases	liters	7.25E+11	9.53E+11	9.59E+11	8.86E+11	3.52E+12

TABLE 2B

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/05 TO 1/1/06
LIQUID EFFLUENTS - CONTINUOUS MODE

McGuire Nuclear Station Units 1 & 2

REPORT FOR 2005	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
1. Fission and Activation Products						
** No Nuclide Activities **		.....	.....	.....	.....	.....
2. Tritium						
H-3	Ci	9.57E-01	6.95E-01	9.94E-01	1.34E+00	3.99E+00
Totals for Period...	Ci	9.57E-01	6.95E-01	9.94E-01	1.34E+00	3.99E+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 1/1/05 TO 1/1/06
LIQUID EFFLUENTS - BATCH MODE

McGuire Nuclear Station Units 1 & 2

REPORT FOR 2005	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
1. Fission and Activation Products						
AG-108M	Ci	1.26E-04	0.00E+00	5.02E-05	3.74E-05	2.13E-04
AG-110M	Ci	4.86E-04	5.00E-05	2.24E-04	1.49E-04	9.08E-04
BE-7	Ci	0.00E+00	0.00E+00	0.00E+00	2.00E-05	2.00E-05
CD-115	Ci	0.00E+00	0.00E+00	0.00E+00	1.23E-05	1.23E-05
CO-57	Ci	1.28E-04	7.41E-06	5.44E-05	2.69E-06	1.93E-04
CO-58	Ci	5.51E-03	3.81E-03	2.53E-03	3.48E-03	1.53E-02
CO-60	Ci	9.78E-03	1.05E-03	7.55E-03	3.03E-03	2.14E-02
CR-51	Ci	4.21E-03	2.45E-03	1.18E-03	4.95E-03	1.28E-02
CS-134	Ci	2.04E-04	6.05E-05	8.21E-05	9.95E-05	4.47E-04
CS-137	Ci	3.24E-04	1.53E-04	3.28E-04	4.01E-04	1.21E-03
FE-59	Ci	1.57E-04	2.17E-04	2.49E-04	1.28E-04	7.51E-04
I-131	Ci	0.00E+00	0.00E+00	0.00E+00	4.07E-06	4.07E-06
MN-54	Ci	1.73E-03	1.59E-04	9.66E-04	4.21E-04	3.28E-03
NB-95	Ci	1.80E-04	8.03E-05	4.60E-05	2.35E-04	5.42E-04
NB-97	Ci	2.46E-05	8.63E-06	1.31E-05	2.20E-05	6.83E-05
SB-124	Ci	9.68E-06	2.86E-04	8.38E-06	8.18E-05	3.86E-04
SB-125	Ci	1.89E-03	5.50E-03	2.53E-03	2.45E-03	1.24E-02
SN-113	Ci	1.13E-05	0.00E+00	6.35E-06	0.00E+00	1.77E-05
SR-92	Ci	2.48E-05	0.00E+00	0.00E+00	0.00E+00	2.48E-05
ZN-65	Ci	4.87E-05	0.00E+00	0.00E+00	0.00E+00	4.87E-05
ZN-69M	Ci	5.16E-06	0.00E+00	0.00E+00	0.00E+00	5.16E-06
ZR-95	Ci	3.15E-05	1.63E-05	1.59E-05	1.10E-04	1.74E-04
		---	---	---	---	---
Totals for Period...	Ci	2.49E-02	1.38E-02	1.58E-02	1.56E-02	7.02E-02
2. Tritium						
H-3	Ci	2.85E+02	3.33E+02	4.68E+02	3.44E+02	1.43E+03
		---	---	---	---	---
Totals for Period...	Ci	2.85E+02	3.33E+02	4.68E+02	3.44E+02	1.43E+03
3. Dissolved and Entrained Gases						
XE-133	Ci	2.45E-05	7.55E-06	4.78E-06	7.81E-06	4.46E-05
		---	---	---	---	---
Totals for Period...	Ci	2.45E-05	7.55E-06	4.78E-06	7.81E-06	4.46E-05
4. Gross Alpha Radioactivity						
** No Nuclide Activities **		.....	.....	.....	.....	.....

McGUIRE NUCLEAR STATION

SUPPLEMENTAL INFORMATION

McGUIRE NUCLEAR STATION

2005 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. 2.05E+02 = TOTAL NUMBER OF BATCH RELEASES
2. 4.20E+04 = TOTAL TIME (MIN.) FOR BATCH RELEASES.
3. 3.04E+04 = MAXIMUM TIME (MIN.) FOR A BATCH RELEASE.
4. 2.05E+02 = AVERAGE TIME (MIN.) FOR A BATCH RELEASE.
5. 2.00E+00 = MINIMUM TIME (MIN.) FOR A BATCH RELEASE.
6. 1.77E+06 = AVERAGE DILUTION WATER FLOW DURING RELEASES (GPM).

B. GASEOUS EFFLUENT

1. 5.20E+01 = TOTAL NUMBER OF BATCH RELEASES.
2. 1.05E+06 = TOTAL TIME (MIN.) FOR BATCH RELEASES.
3. 4.48E+04 = MAXIMUM TIME (MIN.) FOR A BATCH RELEASE.
4. 2.02E+04 = AVERAGE TIME (MIN.) FOR A BATCH RELEASE.
5. 2.08E+02 = 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 = 0
2. TOTAL ACTIVITY RELEASED (CURIES) = 0

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 ± 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 = ± 20%

(2) Counting error = ± 15%

(3) Sample preparation error = ± 3%

McGUIRE NUCLEAR STATION

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

(January 1, 2005 through December 31, 2005)

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 1/1/05 TO 1/1/06
GASEOUS ANNUAL DOSE SUMMARY REPORT

McGuire Nuclear Station Units 1 & 2

1st Quarter 2005

=== IODINE, H3, AND PARTICULATE DOSE LIMIT ANALYSIS======= Quarter 1 2005 ====

Period-Limit	Critical Group	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q1 - Maximum Organ Dose	CHILD	LUNG	1.71E-01	1.50E+01	1.14E+00

Maximum Organ Dose Receptor Location: 0.5 Mile E
Critical Pathway: Vegetation

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	1.00E+02

=== NOBLE GAS DOSE LIMIT ANALYSIS========== Quarter 1 2005 ====

Period-Limit	Dose (mrad)	Limit (mrad)	% of Limit
Q1 - Maximum Gamma Air Dose	1.22E-02	1.00E+01	1.22E-01

Maximum Gamma Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
AR-41	9.92E+01

Q1 - Maximum Beta Air Dose	7.18E-03	2.00E+01	3.59E-02

Maximum Beta Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
AR-41	5.94E+01
KR-85	3.80E+01

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/05 TO 1/1/06
GASEOUS ANNUAL DOSE SUMMARY REPORT

McGuire Nuclear Station Units 1 & 2

2nd Quarter 2005

=== IODINE, H3, AND PARTICULATE DOSE LIMIT ANALYSIS======= Quarter 2 2005 ====

Period-Limit	Critical Group	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q2 - Maximum Organ Dose	CHILD	LUNG	1.82E-01	1.50E+01	1.21E+00

Maximum Organ Dose Receptor Location: 0.5 Mile E
Critical Pathway: Vegetation

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	1.00E+02

=== NOBLE GAS DOSE LIMIT ANALYSIS========== Quarter 2 2005 ====

Period-Limit	Dose (mrad)	Limit (mrad)	% of Limit
Q2 - Maximum Gamma Air Dose	1.03E-02	1.00E+01	1.03E-01

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	5.42E-03	2.00E+01	2.71E-02

Maximum Beta Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
AR-41	6.65E+01
KR-85	3.18E+01

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/05 TO 1/1/06
GASEOUS ANNUAL DOSE SUMMARY REPORT

McGuire Nuclear Station Units 1 & 2

3rd Quarter 2005

=== IODINE, H3, AND PARTICULATE DOSE LIMIT ANALYSIS======= Quarter 3 2005 ====

Period-Limit	Critical Group	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q3 - Maximum Organ Dose	CHILD	LUNG	3.65E-01	1.50E+01	2.44E+00

Maximum Organ Dose Receptor Location: 0.5 Mile E
Critical Pathway: Vegetation

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	1.00E+02

=== NOBLE GAS DOSE LIMIT ANALYSIS========== Quarter 3 2005 ====

Period-Limit	Dose (mrad)	Limit (mrad)	% of Limit
Q3 - Maximum Gamma Air Dose	1.17E-02	1.00E+01	1.17E-01

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

Q3 - Maximum Beta Air Dose	4.64E-03	2.00E+01	2.32E-02

Maximum Beta Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
AR-41	8.81E+01
KR-85	8.25E+00

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/05 TO 1/1/06
GASEOUS ANNUAL DOSE SUMMARY REPORT

McGuire Nuclear Station Units 1 & 2

4th Quarter 2005

=== IODINE, H3, AND PARTICULATE DOSE LIMIT ANALYSIS======= Quarter 4 2005 ====

Period-Limit	Critical Group	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q4 - Maximum Organ Dose	CHILD	LUNG	2.50E-01	1.50E+01	1.67E+00

Maximum Organ Dose Receptor Location: 0.5 Mile E
Critical Pathway: Vegetation

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	1.00E+02

=== NOBLE GAS DOSE LIMIT ANALYSIS========== Quarter 4 2005 ====

Period-Limit	Dose (mrad)	Limit (mrad)	% of Limit
Q4 - Maximum Gamma Air Dose	9.11E-03	1.00E+01	9.11E-02

Maximum Gamma Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
AR-41	9.94E+01

Q4 - Maximum Beta Air Dose	5.01E-03	2.00E+01	2.50E-02

Maximum Beta Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
AR-41	6.38E+01
KR-85	3.40E+01

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/05 TO 1/1/06
GASEOUS ANNUAL DOSE SUMMARY REPORT

McGuire Nuclear Station Units 1 & 2

ANNUAL 2005

=== IODINE, H3, AND PARTICULATE DOSE LIMIT ANALYSIS======= Annual 2005 ========

Period-Limit	Critical Group	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Yr - Maximum Organ Dose	CHILD	LUNG	9.69E-01	3.00E+01	3.23E+00

Maximum Organ Dose Receptor Location: 0.5 Mile E
Critical Pathway: Vegetation

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	1.00E+02

=== NOBLE GAS DOSE LIMIT ANALYSIS========== Annual 2005 ========

Period-Limit	Dose (mrad)	Limit (mrad)	% of Limit
Yr - Maximum Gamma Air Dose	4.32E-02	2.00E+01	2.16E-01

Maximum Gamma Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
AR-41	9.94E+01

Yr - Maximum Beta Air Dose	2.23E-02	4.00E+01	5.56E-02

Maximum Beta Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
AR-41	6.81E+01
KR-85	2.94E+01

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/05 TO 1/1/06
LIQUID ANNUAL DOSE SUMMARY REPORT

McGuire Nuclear Station Units 1 & 2

1st Quarter 2005

=== BATCH LIQUID RELEASES ========== Quarter 1 2005 ======

Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q1 - Maximum Organ Dose	CHILD	LIVER	4.45E-02	1.00E+01	4.45E-01
Q1 - Total Body Dose	CHILD		4.17E-02	3.00E+00	1.39E+00

Maximum Organ
Critical Pathway: Potable Water
Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	9.13E+01

Total Body
Critical Pathway: Potable Water
Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	9.75E+01

=== CONTINUOUS LIQUID RELEASES (WC) ========== Quarter 1 2005 ======

Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q1 - Maximum Organ Dose	CHILD	LIVER	1.97E-03	1.00E+01	1.97E-02
Q1 - Total Body Dose	CHILD		1.97E-03	3.00E+00	6.57E-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 1/1/05 TO 1/1/06
LIQUID ANNUAL DOSE SUMMARY REPORT

McGuire Nuclear Station Units 1 & 2

2nd Quarter 2005

=== BATCH LIQUID RELEASES ========== Quarter 2 2005 ======

Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q2 - Maximum Organ Dose	CHILD	LIVER	3.76E-02	1.00E+01	3.76E-01
Q2 - Total Body Dose	CHILD		3.67E-02	3.00E+00	1.22E+00

Maximum Organ
Critical Pathway: Potable Water
Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	9.71E+01

Total Body
Critical Pathway: Potable Water
Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	9.94E+01

=== CONTINUOUS LIQUID RELEASES (WC) ========== Quarter 2 2005 ======

Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q2 - Maximum Organ Dose	CHILD	LIVER	1.24E-03	1.00E+01	1.24E-02
Q2 - Total Body Dose	CHILD		1.24E-03	3.00E+00	4.14E-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 1/1/05 TO 1/1/06
LIQUID ANNUAL DOSE SUMMARY REPORT

McGuire Nuclear Station Units 1 & 2

3rd Quarter 2005

=== BATCH LIQUID RELEASES ========== Quarter 3 2005 ======

Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q3 - Maximum Organ Dose	CHILD	LIVER	5.36E-02	1.00E+01	5.36E-01
Q3 - Total Body Dose	CHILD		5.20E-02	3.00E+00	1.73E+00

Maximum Organ
Critical Pathway: Potable Water
Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	9.59E+01

Total Body
Critical Pathway: Potable Water
Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	9.89E+01

=== CONTINUOUS LIQUID RELEASES (WC) ========== Quarter 3 2005 ======

Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q3 - Maximum Organ Dose	CHILD	LIVER	1.40E-03	1.00E+01	1.40E-02
Q3 - Total Body Dose	CHILD		1.40E-03	3.00E+00	4.68E-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 1/1/05 TO 1/1/06
LIQUID ANNUAL DOSE SUMMARY REPORT

McGuire Nuclear Station Units 1 & 2

4th Quarter 2005

=== BATCH LIQUID RELEASES ========== Quarter 4 2005 ======

Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q4 - Maximum Organ Dose	CHILD	LIVER	4.38E-02	1.00E+01	4.38E-01
Q4 - Total Body Dose	CHILD		4.16E-02	3.00E+00	1.39E+00

Maximum Organ
Critical Pathway: Potable Water
Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	9.37E+01

Total Body
Critical Pathway: Potable Water
Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	9.87E+01

=== CONTINUOUS LIQUID RELEASES (WC) ========== Quarter 4 2005 ======

Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q4 - Maximum Organ Dose	CHILD	LIVER	2.96E-03	1.00E+01	2.96E-02
Q4 - Total Body Dose	CHILD		2.96E-03	3.00E+00	9.87E-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 1/1/05 TO 1/1/06
LIQUID ANNUAL DOSE SUMMARY REPORT

McGuire Nuclear Station Units 1 & 2

ANNUAL 2005

=== BATCH LIQUID RELEASES ========== Annual 2005 =========

Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Yr - Maximum Organ Dose	CHILD	LIVER	1.79E-01	2.00E+01	8.97E-01
Yr - Total Body Dose	CHILD		1.72E-01	6.00E+00	2.87E+00

Maximum Organ
Critical Pathway: Potable Water
Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	9.47E+01

Total Body
Critical Pathway: Potable Water
Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	9.87E+01

=== CONTINUOUS LIQUID RELEASES (WC) ========== Annual 2005 =========

Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Yr - Maximum Organ Dose	CHILD	LIVER	7.22E-03	2.00E+01	3.61E-02
Yr - Total Body Dose	CHILD		7.22E-03	6.00E+00	1.20E-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 2005

McGUIRE NUCLEAR STATION
SOLID RADIOACTIVE WASTE SHIPPED TO DISPOSAL FACILITIES

Attachment 1

TYPES OF WASTES SHIPPED	Number of Shipments	Number of Containers	Container Type	Disposal Volume ft^3	Disposal Volume m^3	Waste Class	Total Curies
Waste from Liquid Systems							
(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	1	1	HIC	215	6.09	B	4.15E+00
(F) dewatered primary bead resin	1	1	HIC	120	3.40	B	5.51E+01
(G) dewatered mechanical filter media	none						
(H) dewatered mechanical filter media (brokered)	none						
(I) solidified waste	none						
Dry Solid Waste							
(A) dry active waste (compacted)	none						
dry active waste (non-compacted)	1	1	HIC	195	5.52	A/S	1.64E+00
dry active waste (brokered/compacted)							
dry active waste (brokered/non-compacted)	9	17	DBP	877.55	24.85	A/U	2.280E+00
(B) sealed sources/smoke detectors	none						
(C) sealed sources	none						
(D) irradiated components	none						
Totals	**12**	**20**		**1407.55**	**39.86**		**6.317E+01**

4/24/2006

MCGUIRE NUCLEAR SITE
SUMMARY OF MAJOR RADIONUCLIDE COMPOSITION
2005

Type of waste	Nuclide	% Abundance

1. Waste from liquid systems:

A. Dewatered Powdex Resin (brokered) — No shipments in 2005

B. Dewatered Powdex Resin — No shipments in 2005

C. Dewatered Bead Resin (brokered) — No shipments in 2005

D. Dewatered Bead Resin — No shipments in 2005

E. Dewatered Radwaste System Resin (brokered)
2005-20

Nuclide	%Abundance
Co-60	3.26
Cs-137	21.97
Fe-55	7.38
Ni-63	67.27
Sb-125	0.13

F. Dewatered Primary Bead Resin (brokered)
2005-29

Nuclide	%Abundance
Mn-54	.73
Co-57	0.08
Co-58	1.48
C0-60	17.26
Cs-137	2.65
Cs-134	0.07
Ni-63	61.78
Fe-55	15.55
Sb-125	.33
H-3	.02
Sr-90	.03

G. Dewatered Mechanical Filter Media — No shipments in 2005

H. Dewatered Mechanical Filter Media (brokered) — No shipments in 2005

I. Solidified Waste — No shipments in 2005

2. Dry Solid Waste:

A. Dry Active Waste (compacted) — Compaction no longer performed on-site.

Dry Active Waste (non-compacted)

2005-07 DAW

Nuclide	%Abundance
Cr-51	6.72
Mn-54	.55
Co-58	20.92
Co-60	2.76
Cs-137	.56
Fe-55	11.51
Ni-63	5.41
H-3	49.22
Zr-95	.83
Nb-95	1.52

Dry Active Waste (brokered/compacted) — No shipments in 2005

Dry Active Waste (brokered/non-compacted)

2005-01 DAW

Nuclide	%Abundance
Cr-51	7.28
Mn-54	0.55
Co-58	21.35
Co-60	2.71
Cs-137	0.55
Fe-55	11.31
Ni-63	5.28
H-3	48.51
Zr-95	0.84
Nb-95	1.61

2005-02 DAW

Nuclide	%Abundance
Cr-51	6.83
Mn-54	0.55
Co-58	20.96
Co-60	2.74
Cs-137	0.55
Fe-55	11.44
Ni-63	5.36
H-3	49.20
Zr-95	0.83
Nb-95	1.54

2005-08 DAW

Nuclide	%Abundance
Cr-51	9.28
Mn-54	0.53
H-3	45.90
Co-58	22.59
Co-60	2.57
Cs-137	.52
Ni-63	4.99
Fe-55	10.78
Zr-95	.91
Nb-95	1.93

2005-10 DAW

Nuclide	%Abundance
Cr-51	7.96
Mn-54	0.54
Co-58	21.80
Co-60	2.66
Cs-137	0.54
Fe-55	11.12
Ni-63	5.17
H-3	47.62
Zr-95	0.87
Nb-95	1.72

2005-16 DAW

Nuclide	%Abundance
Cr-51	8.48
Mn-54	0.54
Co-58	22.16
Co-60	2.62
Cs-137	0.53
Fe-55	10.98
Ni-63	5.10
H-3	46.89
Zr-95	0.88
Nb-95	1.81

2005-19 DAW

Nuclide	%Abundance
Cr-51	6.30
Mn-54	0.56
Co-58	20.51
Co-60	2.79
Cs-137	0.57
Fe-55	11.63
Ni-63	5.46
H-3	49.93
Zr-95	0.80
Nb-95	1.45

2005-22 DAW

Nuclide	%Abundance
Cr-51	3.82
Mn-54	0.57
Co-58	17.61
Co-60	3.01
Cs-137	0.62
Fe-55	12.43
Ni-63	5.94
H-3	54.34
Zr-95	0.67
Nb-95	.99

2005-27 DAW

Nuclide	%Abundance
Cr-51	7.04
Mn-54	0.55
Co-58	21.16
Co-60	2.73
Cs-137	0.55
Fe-55	11.42
Ni-63	5.32
H-3	48.82
Zr-95	0.83
Nb-95	1.57

2005-30 DAW

Nuclide	%Abundance
Cr-51	3.85
Mn-54	0.57
Co-58	17.64
Co-60	3.01
Cs-137	0.62
Fe-55	12.44
Ni-63	5.94
H-3	54.25
Zr-95	0.68
Nb-95	.99

B. Sealed Sources — No shipments in 2005

C. Sealed Sources/Smoke Detectors — No shipments in 2005

D. Irradiated Components — No shipments in 2005

Attachment 3

Unplanned Offsite Releases

McGUIRE NUCLEAR STATION

UNPLANNED RELEASES

(January 1, 2005 through December 31, 2005)

There were no unplanned gaseous or unplanned liquid radioactive effluent releases to the environment in 2005.

Attachment 4

Fuel Cycle Calculation

McGuire Nuclear Station
2005 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. 2005 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 = 1.15E+00 mrem

Maximum Location: 0.5 Mile, East Sector
Critical Age: Child
Gas non-NG Contribution: 84%
Gas NG Contribution: 1%
Liquid Contribution: 15%

Maximum Organ (other than TB) Dose = 1.15E+00 mrem

Maximum Location: 0.5 Mile, East Sector
Critical Age: Child
Critical Organ: Liver
Gas Contribution: 84%
Liquid Contribution: 16%

II. 2005 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 5.32 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 5.32 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.

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 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

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

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 5.3 mrem and the dose due to McGuire power generation is 3 mrem per year for a total dose of 8.3 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 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

[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.

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 mrems to the whole body, 75 mrems to the thyroid, and 25 mrems 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 8.3 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 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 0.153 mrem per hour (direct radiation and skyshine), within the

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

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 3.1 mrem (skyshine only - earthen berm acts as a shield), within the 100 mrem allowable limit.

These calculations show that the McGuire ISFSI 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 rem X 1000 mrem/rem) / (98 days X 24 hrs/day) = 0.0247 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 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 E^{-02} mrem/hr.

(10) Casks X 7.443 E^{-02} mrem/hr = 0.744 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 mrem/yr) / (8760 hours per yr) = 0.128 mrem per hour

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

Ten TN-32A Casks (actual) plus Twelve NAC UMS Casks (calculated)

0.0247 mrem per hr + 0.128 mrem per hr = 0.153 mrem per hr

<u>Waterway beyond security buoys on other side of berm from ISFSI - 135 meters from ISFSI</u>

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 E^{-03} mrem/hr.

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

Normalized actual dose = 0.0332 X 12.36 mrem/yr = 0.410 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 mrem/yr) / (8760 hrs/yr) x 150 hrs (residence time/yr) = 2.69 mrems / yr

Total Expected Dose at Waterway on Other Side of Berm

Ten TN-32A Casks (actual) plus Twelve NAC UMS Casks (calculated)

0.410 mrem per year + 2.69 mrem per year = 3.10 mrem per year

<u>Individual Sited on Exclusion Area Boundary Below Dam - 425 meters from ISFSI</u>

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 E^{-04} mrem/hr.

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

Normalized actual dose = 0.0332 X 21.7 mrem/yr = 0.720 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 Twelve NAC UMS Casks (calculated)

0.720 mrem per year + 4.6 mrem per year = 5.32 mrem per year

McGUIRE NUCLEAR STATION

2005 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 (2005) 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											
	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	TOTAL
	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.
SECTOR												
-N-	1	2	3	4	1	.	.	.	2	11	9	33
-NNE-	.	.	2	5	5	2	3	.	1	1	.	19
-NE-	.	.	1	4	13	11	7	10	6	.	.	52
-ENE-	.	.	.	.	15	11	3	3	.	.	.	32
-E-	.	.	.	4	15	12	1	2	.	.	.	34
-ESE-	.	.	.	1	9	10	4	1	1	.	.	26
-SE-	.	.	.	.	2	4	3	.	.	.	.	9
-SSE-	.	.	.	.	.	2	5	2	.	.	.	9
-S-	.	.	.	.	3	6	4	3	.	.	.	16
-SSW-	.	.	.	.	.	3	7	5	4	.	.	19
-SW-	.	.	.	.	2	9	10	9	2	.	.	32
-WSW-	.	.	.	.	.	15	15	5	3	.	.	38
-W-	.	.	.	.	2	2	1	.	1	.	.	6
-WNW-	.	.	.	1	2	1	.	.	5	4	1	14
-NW-	.	.	.	1	2	.	.	.	2	.	.	5
-NNW-	.	.	.	.	.	1	.	.	1	4	.	6
TOTAL	1	2	6	20	71	89	63	40	28	20	10	350

McGuire NUCLEAR STN. METEOROLOGY (2005) 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											
	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	TOTAL
	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.
SECTOR												
-N-	1	2	3	16	18	3	2	4	7	9	.	65
-NNE-	.	4	6	15	16	11	17	10	13	4	.	96
-NE-	.	.	.	13	21	29	28	37	10	.	.	138
-ENE-	.	.	.	5	23	8	6	5	.	.	.	47
-E-	.	.	.	8	9	18	4	.	.	.	.	39
-ESE-	.	.	.	4	19	7	3	.	.	.	.	33
-SE-	.	.	.	4	15	9	2	1	.	.	.	31
-SSE-	.	.	.	.	9	6	1	.	.	.	.	16
-S-	.	.	.	1	6	4	1	.	.	.	.	12
-SSW-	.	1	.	1	7	16	8	1	.	.	.	34
-SW-	.	.	.	6	11	25	13	6	3	2	.	66
-WSW-	.	.	.	7	21	18	11	4	9	.	.	70
-W-	.	.	3	3	5	4	4	1	.	.	.	20
-WNW-	1	.	2	5	7	3	1	2	5	5	2	33
-NW-	1	2	2	3	5	2	3	1	1	2	2	24
-NNW-	1	1	4	3	2	3	2	.	3	7	2	28
TOTAL	4	10	20	94	194	166	106	72	51	29	6	752

McGuire NUCLEAR STN. METEOROLOGY (2005) 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											
	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	TOTAL
	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.
SECTOR												
-N-	1	2	10	19	39	19	13	9	13	.	.	125
-NNE-	1	3	.	20	35	48	23	22	15	1	.	168
-NE-	.	1	3	12	27	49	68	37	4	.	.	201
-ENE-	.	2	.	14	28	26	17	5	.	.	.	92
-E-	.	.	.	4	22	10	5	1	.	.	.	42
-ESE-	.	.	2	4	9	18	2	.	.	.	.	35
-SE-	.	.	.	3	26	4	.	.	.	.	.	33
-SSE-	.	1	1	5	7	1	.	.	1	.	.	16
-S-	.	.	1	4	11	11	1	.	.	.	.	28
-SSW-	.	.	.	2	13	17	9	2	2	.	.	45
-SW-	.	.	2	3	29	29	16	7	2	1	.	89
-WSW-	1	.	2	7	16	13	8	7	8	1	.	63
-W-	.	1	2	8	8	5	8	1	4	6	1	44
-WNW-	.	1	1	3	9	8	4	8	14	12	.	60
-NW-	.	2	2	4	3	7	7	7	9	9	7	57
-NNW-	.	5	4	9	10	6	3	9	10	9	1	66
TOTAL	3	18	30	121	292	271	184	115	82	39	9	1164

McGuire NUCLEAR STN. METEOROLOGY (2005) 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												
	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	TOTAL
	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.
SECTOR													
-N-	1	1	5	14	28	61	54	33	15	15	4	1	232
-NNE-	.	2	8	8	30	83	112	70	37	25	5	1	381
-NE-	.	2	3	5	30	195	280	219	93	27	.	.	854
-ENE-	1	2	5	2	26	137	167	71	7	.	.	.	418
-E-	.	1	3	3	24	80	99	28	7	.	.	.	245
-ESE-	.	3	5	6	19	78	45	5	1	1	.	.	163
-SE-	.	2	2	7	26	108	28	3	3	.	.	.	179
-SSE-	.	.	3	9	27	33	3	1	.	.	.	.	76
-S-	.	.	3	6	23	60	44	15	7	1	.	.	159
-SSW-	.	2	4	5	14	88	61	30	10	2	.	.	216
-SW-	.	2	4	5	20	116	138	103	21	13	1	.	423
-WSW-	.	4	7	16	36	49	47	37	14	20	1	.	231
-W-	.	5	9	9	30	36	31	26	13	3	3	.	165
-WNW-	1	5	3	7	20	34	28	26	12	23	5	3	167
-NW-	.	2	2	11	12	16	28	43	32	21	16	3	186
-NNW-	.	.	3	5	17	23	23	19	17	18	10	3	138
-CALM-	5	.	.	.	.	.	.	.	.	.	.	.	5
TOTAL	8	33	69	118	382	1197	1188	729	289	169	45	11	4238

McGuire NUCLEAR STN. METEOROLOGY (2005) 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											
	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	TOTAL
	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.
SECTOR												
-N-	1	1	.	3	5	8	4	1	1	6	.	30
-NNE-	.	4	1	1	16	20	1	1	1	1	.	46
-NE-	.	.	1	1	11	8	2	4	.	.	.	27
-ENE-	.	2	1	5	8	5	1	3	1	.	.	26
-E-	1	1	5	4	5	6	2	.	.	.	.	24
-ESE-	.	.	3	5	10	21	4	.	.	.	.	43
-SE-	.	3	6	7	12	42	8	1	.	.	.	79
-SSE-	1	3	11	12	32	25	2	3	.	.	.	89
-S-	1	6	7	13	28	49	4	1	1	1	.	111
-SSW-	2	9	12	16	48	106	16	4	1	.	.	214
-SW-	1	3	12	16	34	102	61	12	.	1	.	242
-WSW-	.	6	10	31	50	50	17	3	1	.	1	169
-W-	1	5	5	16	17	22	13	3	.	.	.	82
-WNW-	1	2	9	9	15	13	10	5	1	.	.	65
-NW-	1	1	2	4	8	16	9	6	1	1	.	49
-NNW-	.	1	1	1	4	10	9	2	.	.	.	28
-CALM-	1	.	.	.	.	.	.	.	.	.	.	1
TOTAL	11	47	86	144	303	503	163	49	8	10	1	1325

McGuire NUCLEAR STN. METEOROLOGY (2005) 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								
	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	TOTAL
	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.
SECTOR									
-N-	1	1	.	1	1	.	.	.	4
-NNE-	2	2	4	.	.	2	.	.	10
-NE-	1	1	.	.	.	.	.	.	2
-ENE-	.	1	.	.	.	.	.	.	1
-E-	.	1	.	.	1	.	.	.	2
-ESE-	.	.	2	.	2	.	.	.	4
-SE-	.	3	.	.	.	1	1	.	5
-SSE-	2	3	4	1	8	2	.	.	20
-S-	2	8	6	10	32	16	.	.	74
-SSW-	2	6	15	27	48	25	2	.	125
-SW-	3	10	11	16	21	33	3	.	97
-WSW-	7	9	9	19	22	19	8	.	93
-W-	3	1	5	3	8	3	1	.	24
-WNW-	1	2	3	5	2	6	5	.	24
-NW-	1	.	1	.	1	1	.	.	4
-NNW-	.	.	.	2	1	.	.	1	4
-CALM-	1	.	.	.	.	.	.	.	1
TOTAL	26	48	60	84	147	108	20	1	494

McGuire NUCLEAR STN. METEOROLOGY (2005) 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							
	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	TOTAL
	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.
SECTOR								
-N-	2	3	.	1	1	.	.	7
-NNE-	2	1	3	1	1	1	.	9
-NE-	2	.	1	1	.	.	.	4
-ENE-	1	.	.	.	.	.	.	1
-E-	1	1	.	.	.	.	.	2
-ESE-	1	.	.	.	.	.	.	1
-SE-	.	1	.	.	.	.	.	1
-SSE-	2	6	.	1	.	1	.	10
-S-	6	3	3	5	4	6	.	27
-SSW-	9	21	29	23	18	6	.	106
-SW-	4	25	12	14	7	4	2	68
-WSW-	4	13	10	9	8	7	1	52
-W-	2	1	1	3	1	2	.	10
-WNW-	1	1	.	.	.	.	.	2
-NW-	1	1	.	.	.	.	.	2
-NNW-	1	1	.	.	.	.	.	2
-CALM-	4	.	.	.	.	.	.	4
TOTAL	43	78	59	58	40	27	3	308

McGuire NUCLEAR STN. METEOROLOGY (2005) PROG=XOQFREQ
10M WIND SPEED/DIRECTION/DELTA-T STABILITY
STABILITY CLASSES BASED ON DELTA-T BETWEEN UPPER-LOWER LEVELS

ALL STABILITY CLASSES

	WIND SPEED CLASS												
	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	TOTAL
	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.
SECTOR													
-N-	5	9	11	35	74	127	80	49	29	43	24	10	496
-NNE-	4	10	23	18	87	162	174	114	70	55	11	1	729
-NE-	3	3	6	11	70	264	371	326	177	47	.	.	1278
-ENE-	2	5	8	7	53	208	213	100	21	.	.	.	617
-E-	2	4	8	7	46	132	141	38	10	.	.	.	388
-ESE-	1	3	10	13	40	136	84	14	2	2	.	.	305
-SE-	.	9	8	14	45	194	54	9	4	.	.	.	337
-SSE-	5	12	19	24	72	77	14	10	2	1	.	.	236
-S-	9	17	19	35	92	151	69	22	11	2	.	.	427
-SSW-	13	38	61	71	131	245	115	58	19	8	.	.	759
-SW-	8	40	39	53	91	297	267	154	43	21	4	.	1017
-WSW-	11	33	36	77	130	162	119	74	31	40	3	.	716
-W-	6	12	21	36	67	78	56	42	15	8	9	1	351
-WNW-	4	11	16	24	46	71	55	36	23	47	26	6	365
-NW-	3	5	9	19	29	43	46	59	41	34	27	12	327
-NNW-	1	3	10	16	34	45	42	27	26	32	30	6	272
-CALM-	11	.	.	.	.	.	.	.	.	.	.	.	11
TOTAL	88	214	304	460	1107	2392	1900	1132	524	340	134	36	8631

Attachment 5

Inoperable Monitoring Equipment

McGuire Nuclear Station

Inoperable Monitoring Equipment

(January 1, 2005 through December 31, 2005)

There were no SLC related effluent monitoring instruments out of service greater than the SLC limits for operability.