Consumers Energy

A CMS Energy Company

Big Rock Point Nuclear Plant
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General Manager

April 11, 2007

10 CFR 50 Appendix I, Section IV.B.1
10 CFR 50.36(a)

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555-0001

DOCKETS 50-155 AND 72-043 – LICENSE DPR-6 - BIG ROCK POINT PLANT – ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT FOR THE PERIOD OF JANUARY 1, 2006 – DECEMBER 31, 2006

In accordance with the Big Rock Point Defueled Technical Specifications Section 6.6.3, attached (Attachment 1) is the Annual Radioactive Effluent Release Report for the period of January 1, 2006 to December 31, 2006. This report includes summaries of the quantities of radioactive liquid and gaseous effluents and solid waste released from the facility. The material provided is consistent with the objectives outlined in the Offsite Dose Calculation Manual (ODCM) and the Process Control Program (PCP), and complies with Section IV.B.1of Appendix I 10 CFR 50 and 10 CFR 50.36(a).

There were no revisions to the ODCM or the PCP during the period.

Kurt M. Haas
Site General Manager

cc: Administrator, Region III, USNRC
NRC Decommissioning Inspector, Big Rock Point
NRC NMSS Project Manager, James Shepherd
ANI/MAELT – D Sherman

ATTACHMENT

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ATTACHMENT 1

Big Rock Point
Dockets 50-155 and 72-043

April 11, 2007

BIG ROCK POINT ANNUAL RADIOLOGICAL EFFLUENT RELEASE REPORT

January 1, 2006 - December 31, 2006

17 pages

BIG ROCK POINT ANNUAL RADIOACTIVE
EFFLUENT RELEASE REPORT

January 1, 2006 to December 31, 2006

This report provides information relating to radioactive effluent releases and solid radioactive waste disposal at Big Rock Point for the year 2006. The report format is detailed in Big Rock Point Offsite Dose Calculation Manual, Section III. Effluent releases from Big Rock Point are controlled by the Defueled Technical Specifications and the Offsite Dose Calculation Manual (ODCM) requirements.

The Big Rock Point Nuclear Plant ceased power operations in August 1997. During 2006 site decommissioning activities were completed. Activities included final removal of all underground structures and utilities, demobilization of all remaining site equipment, facilities and personnel. Open land areas were backfilled, contoured and seeded. The concluding site activity was the Final Status Survey which concluded that the former Big Rock Point Nuclear Plant met the radiological criteria for unrestricted use in accordance with 10 CFR 20.1402[1].

Previous decommissioning activities resulted in permanent dismantlement and removal of the designated gaseous and liquid effluent locations, also known as the off-gas stack and discharge canal, respectively. Liquid effluent monitoring is no longer conducted as all licensed discharges of radioactive liquids have ceased. Precautionary monitoring of detained surface water and ground water from dewatering operations was conducted for decommissioning activities open to the environment.

Due to the decay time since ceasing plant operations, short-lived radionuclides, including iodines and noble gases (other than Krypton-85) are neither expected nor reported.

1. Supplemental Information

   A. Batch Releases

      There were no batch releases of gaseous or liquid effluents during 2006. All batch releases of radioactive liquids as described in the ODCM ceased in 2004.

   B. Abnormal Releases

      There were no abnormal releases from Big Rock Point during 2006.

1 Letter from the US NRC dated January 8, 2007, Release of land from Part 50 License for Unrestricted Use

C. Lower Limits of Detection (LLDs) for gaseous and liquid effluents are provided in Enclosure E.

D. Radioactive Effluent Monitoring Instrumentation

Big Rock Point Offsite Dose Calculation Manual, Section I currently specifies required actions when less than the minimum number of radioactive effluent monitoring instrument channels are operable. The ODCM also specifies these actions be taken when installed effluent monitoring systems are removed from service for decommissioning.

All plant-installed liquid and gaseous radioactive effluent monitoring instrument channels have been permanently removed and dismantled. Alternate ground-level airborne measurement equipment was utilized to monitor gaseous radioactive effluents in accordance with the ODCM and site procedures.

Although no radioactive liquids were released from the site, precautionary sampling of detained surface and groundwater was conducted routinely.

2. Gaseous Effluents

Although there were no gaseous effluents released during 2006, Table 2 (Enclosure B) provides a summary of all gaseous radioactive effluent monitoring conducted during the reporting period as required by the ODCM. All alternate gaseous measurements conducted in 2006 showed no detectable radioactivity.

3. Liquid Effluents

There were no liquid effluent batch releases during 2006. Detained surface and groundwater from excavations was released to the lake via a site drainage ditch. ODCM Section 2.1.1 specifies that effluents purposefully discharged to the lake from surface and groundwater that have been detained for sedimentation will undergo precautionary sampling and analysis for tritium and radionuclides other than dissolved or entrained noble gases.

Table 3 (Enclosure C) lists and summarizes detained surface and groundwater released during the reporting period. Total liquid effluent radioactivity, released in 2006 consisted of tritium and was less than tritium released during 2005 (4.63 E-04 Ci versus 1.05E-03 Ci, respectively).

4. Solid Waste

Table 4 (Enclosure D) summarizes all solid radwaste volume shipped, classification, processing employed, sources, Curie quantity, and nuclide content. Radwaste shipments were made either to the Barnwell Waste Management Facility in Barnwell, South Carolina, or Envirocare of Utah via a radwaste processing facility. The total volume of material shipped during 2006 was less than 2005 shipment volume, and the total activity for 2006 waste shipments was significantly less than 2005 (151 Ci versus 12.1 Ci) due primarily to the reduction in waste volume and type.

5. Summary of Radiological Impact on Man

The ODCM, Section III, Item 1.6 specifies that the Annual Effluent Release Report shall provide potential dose calculations based on measured effluent to liquid and gaseous pathways if estimates of dose exceed 1 millirem to an organ or total body of any individual or more that 1 person-rem to the population within 50 miles. During the year 2006 no quarterly or annual dose calculations exceeded 1 millirem or 1 person-rem from releases to either liquid or gaseous pathways.

6. Offsite Dose Calculation Manual (ODCM)

The ODCM describes the radiological release requirements for the Big Rock site. The ODCM was not revised in 2006.

7. Process Control Program (PCP)

The Process Control Program describes solid waste processing and disposal methods utilized at the Big Rock Point site. The PCP was not revised during 2006.

Enclosure A
1 Page

Consumers Energy
Big Rock Point

RADIOACTIVE EFFLUENT RELEASE REPORT

LIQUID RELEASES SUMMARY

January 1, 2006 – December 31, 2006

TABLE 1
BATCH RELEASES
January 1, 2006 to December 31, 2006

A. GASEOUS - Continuous release only; no batch releases.

B. LIQUID *	Units	1ST QTR	2ND QTR	3RD QTR	4TH QTR
Number of Releases		2	7	0	0
Total Release Time	Minutes	1712	7357	0	0
Maximum Release Time	Minutes	1342	1945	0	0
Average Release Time	Minutes	856	1051	0	0
Minimum Release Time	Minutes	370	375	0	0

* Liquid monitoring consisted of precautionary monitoring of detained surface and groundwater from the detention pond prior to release.

Enclosure B
3 Pages

Consumers Energy
Big Rock Point

RADIOACTIVE EFFLUENT RELEASE REPORT

GASEOUS EFFLUENTS - SUMMATION OF RELEASES

January 1, 2006 – December 31, 2006

TABLE 2
GASEOUS EFFLUENT RELEASES
January 1, 2006 to December 31, 2006

A. FISSION AND ACTIVATION GASES	Units	1ST QTR	2ND QTR	3RD QTR	4TH QTR	Est Total Error %
1. Total release	Ci	0.00	0.00	0.00	0.00	N/A
2. Average release rate for period	µCi/sec	N/A	N/A	N/A	N/A	
3. Percent of annual avg EC	%	N/A	N/A	N/A	N/A	

B. IODINES						
1. Total Iodine	Ci	0.00	0.00	0.00	0.00	N/A
2. Average release rate for period	µCi/sec	N/A	N/A	N/A	N/A	
3. Percent of annual avg EC	%	N/A	N/A	N/A	N/A	

C. PARTICULATES						
1. Particulates with half-life >8 day	Ci	0.00	0.00	0.00	0.00	N/A
2. Average release rate for period	µCi/sec	N/A	N/A	N/A	N/A	
3. Percent of annual avg EC	%	N/A	N/A	N/A	N/A	
4. Gross alpha radioactivity	Ci	N/A	N/A	N/A	N/A	

D. TRITIUM					
1. Total Release	Ci	0.00	0.00	0.00	0.00
2. Average release rate for period	µCi/sec	N/A	N/A	N/A	N/A
3. Percent of annual avg EC	%	N/A	N/A	N/A	N/A

E. WHOLE BODY DOSE					
1. Beta Air dose at Site Boundary due to Noble Gases (ODCM Section I, 1.3.1 a (1) (2))	mrads	0.00	0.00	0.00	0.00
2. Percent limit	%	N/A	N/A	N/A	N/A
3. Gamma Air dose at Site Boundary due to Noble Gas (ODCM Section I, 1.3.1 a (1) (2))	mrads	0.00	0.00	0.00	0.00
4. Percent limit	%	N/A	N/A	N/A	N/A

F. ORGAN DOSE (ODCM Section I, 1.3.b (1) (2))					
1. Maximum organ dose to public based on Critical Receptors (child bone)	mrem	0.00	0.00	0.00	0.00
2. Percent of limit (7.5 mrem/quarter)	%	N/A	N/A	N/A	N/A

TABLE 2
GASEOUS EFFLUENT RELEASES
January 1, 2006 to December 31, 2006

1. **FISSION GASES**	Units	1ST QTR	2ND QTR	3RD QTR	4TH QTR
Krypton-85m	Ci	0.00	0.00	0.00	0.00
Krypton-87	Ci	0.00	0.00	0.00	0.00
Krypton-88	Ci	0.00	0.00	0.00	0.00
Xenon-133	Ci	0.00	0.00	0.00	0.00
Xenon-133m	Ci	0.00	0.00	0.00	0.00
Xenon-135	Ci	0.00	0.00	0.00	0.00
Xenon-135m	Ci	0.00	0.00	0.00	0.00
Xenon-138	Ci	0.00	0.00	0.00	0.00
Total for Period	Ci	0.00	0.00	0.00	0.00

2. **IODINES**					
Iodine-131	Ci	0.00	0.00	0.00	0.00
Iodine-132	Ci	0.00	0.00	0.00	0.00
Iodine-133	Ci	0.00	0.00	0.00	0.00
Iodine-134	Ci	0.00	0.00	0.00	0.00
Iodine-135	Ci	0.00	0.00	0.00	0.00
Total for Period	Ci	0.00	0.00	0.00	0.00

TABLE 2
GASEOUS EFFLUENT RELEASES
January 1, 2006 to December 31, 2006

3. **PARTICULATES***	Units	1ST QTR	2ND QTR	3RD QTR	4TH QTR
Chromium-51	Ci	N/A	N/A	N/A	N/A
Manganese-54	Ci	N/A	N/A	N/A	N/A
Cobalt-58	Ci	N/A	N/A	N/A	N/A
Iron-59	Ci	N/A	N/A	N/A	N/A
Cobalt-60	Ci	N/A	N/A	N/A	N/A
Zinc-65	Ci	N/A	N/A	N/A	N/A
Silver-110m	Ci	N/A	N/A	N/A	N/A
Cesium-134	Ci	N/A	N/A	N/A	N/A
Cesium-137	Ci	N/A	N/A	N/A	N/A
Barium-140	Ci	N/A	N/A	N/A	N/A
Europium-152	Ci	N/A	N/A	N/A	N/A
Strontium-89	Ci	N/A	N/A	N/A	N/A
Strontium-90	Ci	N/A	N/A	N/A	N/A
Net unidentified beta	Ci	N/A	N/A	N/A	N/A
Total	Ci	0.00	0.00	0.00	0.00

* Particulates with half-life > 8 days

Enclosure C
2 Pages

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Big Rock Point

RADIOACTIVE EFFLUENT RELEASE REPORT

LIQUID EFFLUENTS - SUMMATION OF RELEASES

January 1, 2006 – December 31, 2006

TABLE 3
LIQUID EFFLUENT RELEASES
January 1, 2006 to December 31, 2006

A. FISSION AND ACTIVATION PRODUCTS	Units	1ST QTR	2ND QTR	3RDQTR	4TH QTR	Est Total Error %
1. Total release (not including tritium, gases, alpha)	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
2. Average diluted concentration during period	µCi/ml	N/A	N/A	N/A	N/A	
3. Percent of EC	%	N/A	N/A	N/A	N/A	
B. TRITIUM 1. Total release	Ci	3.1E-4	1.485E-4	0.00E+00	0.00E+00	1.5%
2. Average diluted concentration during period	µCi/ml	1.08E-8	5.0E-8	N/A	N/A	
3. Percent of EC	%	1.08E-3	5.0E-3	N/A	N/A	
C. DISSOLVED AND ENTRAINED GASES 1. Total release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
2. Average diluted concentration during period	µCi/ml	N/A	N/A	N/A	N/A	
3. Percent of EC	%	N/A	N/A	N/A	N/A	
D. GROSS ALPHA RADIOACTIVITY	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
E. VOLUME OF WASTE RELEASED ** (Prior to dilution)	Liters	1.94E+05	1.31E+06	0.00E+00	0.00E+00	
F. VOLUME OF DILUTION WATER USED DURING PERIOD	Liters	2.97E+07	2.97E+07	0.00E+00	0.00E+00	
G. MAXIMUM DOSE COMMITMENT WHOLEBODY	mrem	1.60E-07	5.98E-07	0.00E+00	0.00E+00	
Percent of ODCM Section I, 2.3.1 a (1.5 mrem)	%	<0.01	<0.01	0	0	
H. MAXIMUM DOSE COMMITMENT - ORGAN	mrem	1.60E-07	5.98E-07	0.00E+00	0.00E+00	
Percent of ODCM Section I, 2.3.1 b (3.0 mrem)	%	<0.01	<0.01	0	0	

TABLE 3
LIQUID EFFLUENT RELEASES
January 1, 2006 to December 31, 2006

1. **NUCLIDES RELEASED**	Units	1ST QTR	2ND QTR	3RD QTR	4TH QTR
Chromium-51	Ci	<LLD	<LLD	--	--
Manganese 54	Ci	<LLD	<LLD	--	--
Cobalt-58	Ci	<LLD	<LLD	--	--
Iron-59	Ci	<LLD	<LLD	--	--
Cobalt-60	Ci	<LLD	<LLD	--	--
Zinc-65	Ci	<LLD	<LLD	--	--
Strontium-89	Ci	<LLD	<LLD	--	--
Strontium-90	Ci	<LLD	<LLD	--	--
Molybdenum-99	Ci	<LLD	<LLD	--	--
Silver-110m	Ci	<LLD	<LLD	--	--
Iodine-131	Ci	<LLD	<LLD	--	--
Cesium-134	Ci	<LLD	<LLD	--	--
Cesium-137	Ci	<LLD	<LLD	--	--
Antimony-125	Ci	<LLD	<LLD	--	--
Tin-113	Ci	<LLD	<LLD	--	--
Net Unidentified Beta	Ci	<LLD	<LLD	--	--
Fission & Activation Product Total	Ci	<LLD	<LLD	--	--
Xenon-133	Ci	<LLD	<LLD	--	--
Tritium	Ci	3.14E-04	1.49E-04	--	--
Grand Total	Ci	3.14E-04	1.49E-04	--	--

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RADIOACTIVE EFFLUENT RELEASE REPORT
SOLID WASTE

January 1, 2006 – December 31, 2006

TABLE 4
SOLID WASTE SHIPMENT SUMMARY
January 1, 2006 to December 31, 2006

Waste Class	Source of Waste	Solidification Agent	Container Type	Volume (Cu. Ft.)	Total Curies*	Principal Radionuclides*
AU	Concrete, metal, and DAW from building demolition	None	Metal Box and Exempt Packaging	263195	1.21E+01	Co-60, Fe-55, Mn-54, Ni-63, Am-241, Pu-241, H-3, Cs-137
			TOTALS	263195	1.21E+01	

* Gamma isotopes are measured quantities, all others are estimated from scaling factors.

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RADIOACTIVE EFFLUENT RELEASE REPORT
LOWER LIMIT OF DETECTION FOR BIG ROCK EFFLUENTS

January 1, 2006 - December 31, 2006

Gaseous Effluents

Nuclide	LLD (µCi/cc)*
Mn-54	6 E-14
Co-58	5 E-14
Fe-59	2 E-13
Co-60	9 E-14
Zn-65	2 E-14
Nb-95	6 E-14
Zr-95	8 E-14
Ag-110m	5 E-14
Sb-125	2 E-14
Cs-134	5 E-14
Cs-137	6 E-14
Ce-144	3 E-13
Am-241	2 E-13

Liquid Effluents

Nuclide	LLD (µCi/cc)*
Mn-54	1 E-07
Co-58	2 E-07
Fe-59	1 E-07
Co-60	3 E-07
Zn-65	3 E-07
Nb-95	1 E-07
Nb-95	1 E-07
Nb-95	1 E-07
Zr-95	3 E-07
Ag-110m	2 E-07
Sb-125	2 E-07
Cs-134	2 E-07
Cs-137	2 E-07
Ce-144	5 E-07
Am-241	4 E-07

* Based on gamma isotopic analysis for a
Typical stack filter and typical liquid batch release