BIG ROCK POINT INDEPENDENT SPENT FUEL STORAGE INSTALLATION
2019 RADIOACTIVE EFFLUENT RELEASE REPORT

This report provides information relating to radioactive effluent releases and solid radioactive waste disposal at Big Rock Point (BRP) for the year 2019. The report format is detailed in the BRP Offsite Dose Calculation Manual (ODCM). Effluent releases from BRP are controlled by the Defueled Technical Specifications and the ODCM requirements.

2019 Operating History

On January 8, 2007, the Nuclear Regulatory Commission (NRC) approved release of the former BRP nuclear plant property for unrestricted use in accordance with the BRP License Termination Plan[1]. On April 11, 2007, the license for BRP, DPR-06, was transferred to Entergy Nuclear Operations, Inc.

During 2019, normal independent spent fuel storage installation (ISFSI) operations continued. There were no operational activities that generated any solid radioactive waste.

Liquid and gaseous effluent monitoring is no longer conducted as the former BRP nuclear plant property has been released from the license. Short-lived radionuclides, including iodine and noble gas, are neither expected nor reported.

1. Supplemental Information

   I. Batch Releases

   There were no batch releases of gaseous or liquid effluents during 2019. All batch releases of radioactive liquids as described in the ODCM ceased in 2004. Reference Table 6.

   II. Abnormal Releases

   There were no abnormal releases from BRP during 2019.

   III. Radioactive Effluent Monitoring Instrumentation

   BRP ODCM currently specifies required actions when less than the minimum numbers 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.

[1] Letter from the USNRC dated January 8, 2007, "Release of Land from Part 50 License for Unrestricted Use"

2. Gaseous Effluents

There were no gaseous effluents released during 2019.

3. Liquid Effluents

There were no liquid effluent batch releases during 2019.

4. Solid Waste

There was no solid radioactive waste generated or shipped during 2019.

5. Summary of Radiological Impact on Man

The ODCM specifies that the annual effluent release report provide potential dose calculations based on measured effluent to liquid and gaseous pathways, if estimates of dose exceed one millirem to an organ or total body of any individual or more than one person-rem to the population within 50 miles. During 2019, there were no releases. Therefore, no calculations were required.

6. Offsite Dose Calculation Manual

The ODCM describes the radiological release requirements for the BRP site. No ODCM changes in 2019 had any effect on the Radiological Effluent Program at BRP.

7. Process Control Program (PCP)

The Process Control Program (PCP) describes solid waste processing and disposal methods utilized at the BRP site. Changes to the fleet procedure governing the PCP have no effect on the BRP site in 2019.

8. Independent Spent Fuel Storage Installation (ISFSI) Monitoring

I. FACILITY DESCRIPTION

The Independent Spent Fuel Storage Installation (ISFSI) is located within the owner-controlled area of the Big Rock Point (BRP) site. The storage of spent fuel at BRP meets the requirements of 10 CFR 72, and the Certificate of Compliance No. 72-1026, issued by the Nuclear Regulatory Commission (NRC).

II. EFFLUENT LIMITS AND CONTROLS

The ISFSI operates under effluent control limits as required by 10 CFR 72.104. However, the design of the sealed storage canisters at the ISFSI precludes any gaseous or liquid effluent releases.

III. RADIOLOGICAL EFFLUENT RELEASES

As noted in Section II, by design, there are no radioactive liquid or gaseous effluents originating from the ISFSI facility. The annual radiological surveillance performed during this reporting period did not indicate any release of radioactivity from the ISFSI.

IV. ISFSI ENVIRONMENTAL MONITORING PROGRAM

The BRP Radiological Environmental Monitoring Program (REMP) is described in the Offsite Dose Calculation Manual (ODCM), Section I, Subsection 4.0. The ISFSI Environmental Monitoring Program, which is contained within the BRP REMP, consists of thermoluminescent dosimeters (TLDs) at four locations along the perimeter of the ISFSI site, and three control TLDs 10.5, 10.8, and 12.6 miles from the site. Quarterly TLDs are read quarterly, as reflected in Section VI. Quarterly measurements are compared to control measurements to evaluate compliance with 10 CFR 72.104. The results for the ISFSI TLDs and the control TLDs measured in 2019 are summarized in Section VI.

V. SAMPLE ANOMALIES

None.

VI. ISFSI ENVIRONMENTAL MEASUREMENTS

BRP ISFSI Environmental TLD Results (mR)
January 2019 – December 2019

TLD No./Location	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
BRP-18 / 137 meters NW of ISFSI	18	15	16	15
BRP-19 / 137 meters SW of ISFSI	18	19	19	21
BRP-20 / 137 meters SE of ISFSI	21	16	22	21
BRP-21 / 137 meters NE of ISFSI	18	15	16	18
Control Location – Petoskey BRP-05	17	15	16	18
Control Location – Boyne City BRP-06	18	17	20	19
Control Location – Ironton BRP-07	17	19	19	21

VII. Conclusions

When compared to the control locations, it is evident that the dose from ISFSI operations during the reporting period does not exceed the limits as defined in 10 CFR 72.104.

TABLE 1
Big Rock Point
Batch Releases
January 1, 2019 to December 31, 2019

A. GASEOUS	Units	1ST QTR	2ND QTR	3RD QTR	4TH QTR
Number of Releases		N/A	N/A	N/A	N/A
Total Release Time	Minutes	N/A	N/A	N/A	N/A
Maximum Release Time	Minutes	N/A	N/A	N/A	N/A
Average Release Time	Minutes	N/A	N/A	N/A	N/A
Minimum Release Time	Minutes	N/A	N/A	N/A	N/A

B. LIQUID	Units	1ST QTR	2ND QTR	3RD QTR	4TH QTR
Number of Releases		N/A	N/A	N/A	N/A
Total Release Time	Minutes	N/A	N/A	N/A	N/A
Maximum Release Time	Minutes	N/A	N/A	N/A	N/A
Average Release Time	Minutes	N/A	N/A	N/A	N/A
Minimum Release Time	Minutes	N/A	N/A	N/A	N/A

TABLE 2
Big Rock Point
Gaseous Effluent Releases
January 1, 2019 to December 31, 2019

A. FISSION AND ACTIVATION GASES	Units	1ST QTR	2ND QTR	3RD QTR	4TH QTR	Est Total Error %
1. Total release	Ci	N/A	N/A	N/A	N/A	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	N/A	N/A	N/A	N/A	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	N/A	N/A	N/A	N/A	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	N/A	N/A	N/A	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

E. WHOLE BODY DOSE					
1. Beta Air dose at Site Boundary due to Noble Gases (ODCM Section 1, 1.3.2 a (1) (2))	mrads	N/A	N/A	N/A	N/A
2. Percent limit	%	N/A	N/A	N/A	N/A
3. Gamma Air dose at Site Boundary due to Noble Gas (ODCM Section 1, 1.3.2 a (1) (2))	mrads	N/A	N/A	N/A	N/A
4. Percent limit	%	N/A	N/A	N/A	N/A

F. ORGAN DOSE (ODCM Section 1, 1.3.2b (1) (2))					
1. Maximum organ dose to pubic based on Critical Receptors (child bone)	mrem	N/A	N/A	N/A	N/A
2. Percent of limit (7.5 mrem/quarter)	%	N/A	N/A	N/A	N/A

TABLE 3
Big Rock Point
Gaseous Effluent Releases
January 1, 2019 to December 31, 2019

1. FISSION GASES	Units	1ST QTR	2ND QTR	3RD QTR	4TH QTR
Total for Period	Ci	N/A	N/A	N/A	N/A

2. IODINES					
Total for Period	Ci	N/A	N/A	N/A	N/A

3. PARTICULATES*	Units	1ST QTR	2ND QTR	3RD QTR	4TH QTR
Total	Ci	N/A	N/A	N/A	N/A

* Particulates with half-life >8 days

TABLE 4
Big Rock Point
Liquid Effluent Releases
January 1, 2019 to December 31, 2019

A. FISSION AND ACTIVATION PRODUCTS	Units	1ST QTR	2ND QTR	3RD QTR	4TH QTR	Est Total Error %
1. Total release (not including tritium, gases, alpha)	Ci	N/A	N/A	N/A	N/A	N/A
2. Average diluted concentration during period	µCi/ml	N/A	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	N/A	N/A	N/A	N/A	N/A
2. Average diluted concentration during period	µCi/ml	N/A	N/A	N/A	N/A	N/A
3. Percent of EC	%	N/A	N/A	N/A	N/A	

C. DISSOLVED AND ENTRAINED GASES						
1. Total release	Ci	N/A	N/A	N/A	N/A	N/A
2. Average diluted concentration during period	µCi/ml	N/A	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	N/A	N/A	N/A	N/A	N/A

E. VOLUME OF WASTE RELEASED (Prior to dilution)	Liters	N/A	N/A	N/A	N/A

F. VOLUME OF DILUTION WATER USED DURING PERIOD	Liters	N/A	N/A	N/A	N/A

G. MAXIMUM DOSE COMMITMENT WHOLEBODY	mrem	N/A	N/A	N/A	N/A
Percent of ODCM Section 1, 2.3.2 a (1.5 mrem)	%	N/A	N/A	N/A	N/A

H. MAXIMUM DOSE COMMITMENT – ORGAN	Mrem	N/A	N/A	N/A	N/A
Percent of ODCM Section 1, 2.3.2 b (3.0 mrem)	%	N/A	N/A	N/A	N/A

TABLE 5
Big Rock Point
Liquid Effluent Releases
January 1, 2019 to December 31, 2019

1. **NUCLIDES RELEASED**	Units	1ST QTR	2ND QTR	3RD QTR	4TH QTR
Fission & Activation Product Total	Ci	N/A	N/A	N/A	N/A
Tritium	Ci	N/A	N/A	N/A	N/A
Total	Ci	N/A	N/A	N/A	N/A