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MICHIGAN POWER LIMITED PARTNERSHIP
LUDINGTON, MI
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UNIT HRB-001, FB-001A, FB-001B

CEMS RECERTIFICATION REPORT

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1. INTRODUCTION

The Michigan Power Cogeneration facility is located at 5795 West Sixth Street, Ludington, Michigan, adjacent to the Occidental Chemical Company ("Oxy"). The facility utilizes a General Electric ("GE") Model PG7111EA Gas Turbine Generator unit, exhausting into a heat recovery Steam Generator ("HRSG") equipped with duct burner firing. The HRSG produces both high and low-pressure steam. The steam is used to drive a Steam Turbine Generator. Steam extracted from the Steam Turbine is supplied under long-term contract to Oxy. The power generated is transformed to the required voltage for delivery to Consumer's Energy's power grid. In order to guarantee steam production at all times and meet variations in steam loads required by Oxy, the facility has two (2) Auxiliary Boilers rated at a maximum input fuel rate of 265,000 SCFH each.

A dedicated CEMS monitors NO_X, CO, O_2, and gas fuel flow from the gas turbine and HRSG stack (HRB-001). A dual sample point timeshared CEMS monitors NOx, O2, and gas fuel flow from the auxiliary boilers (FB-001A & FB-001B). Each CEMS was recently replaced resulting in a recertification event.

Custom Instrumentation Services Corporation of Englewood, Colorado built the Continuous Emission Monitoring System. Data from the CEMS is recorded and stored on a Data Acquisition System.

The CEMS on HRB-001 was designed to meet the monitoring and reporting requirements Michigan EGLE, 40 CFR 60, and 40 CFR 75. The CEMS on FB-001A & FB-001B was designed to meet the monitoring and reporting requirements Michigan EGLE and 40 CFR 60. This report presents the results of testing on the NO_x, CO, and O_2 analyzers. The testing was performed to meet the requirements of 40 CFR 60, Appendix B, Performance Specifications 2, 3, 4/4A and 40 CFR 75, Appendix A when applicable.

Field certification testing occurred 5/26/24 – 6/13/24. The tests conducted on the CEMS included Relative Accuracy, Bias Check, Calibration Error, 7-Day Drift Test, Linearity, NOx & O_2 Cycle Time Test, CO Response Time Test, and a Cylinder Gas Audit.

Montrose Air Quality Services of Elk Grove Village, IL conducted Relative Accuracy (RA) testing for NOx, CO, and O_2. Between 6/11/24 and 6/13/24 ten 21-minute runs were completed on HRB-001, FB-001A, and FB-001B. The results of the RA tests are summarized in Table 1 and Table 2. As shown, the Relative Accuracy calculations on the analyzers were within the EPA specifications for all parameters. A detailed description of the RA testing is provided in test report in Appendix 6.

A bias check evaluation was made on the HRB-001 NO_x lb/mmBtu relative accuracy results as required in 40 CFR 75. The bias adjustment factor for the NO_x monitoring systems (NO_x lb/mmBtu) is provided in Table 1. The bias test results are discussed in Section 2.2. Supporting data is provided in the relative accuracy tables in the Montrose report in Appendix 6.

The Calibration Drift tests occurred between 5/26/24 – 6/9/24 for HRB-001, FB-001A, FB-001B. The requirements of 40 CFR 75 and 40 CFR 60 were met. The results of the analyzer drift tests are summarized in Tables 1, 2, and 3. As shown, the analyzers operated well within the applicable requirements. An explanation of the drift is provided in Section 2.3 and supporting documentation is provided in Appendix 1 of this report.

Linearity tests on the NO_x and O_2 analyzers are a requirement of 40 CFR 75. The tests took place on 5/28/24 for HRB-001. The results of the tests are summarized in Table 1. As shown, the analyzers operated well within EPA requirements for all parameters. An explanation of the linearity test is provided in Section 2.4. Audit reports for the linearity test are provided in Appendix 2.

Cylinder Gas Audits on the NO_x, CO, and O_2 analyzers are a requirement of 40 CFR 60 during quarters when a RATA is not performed. Although a RATA was performed in Q2 2024, CGAs were also performed. The tests took place on between 5/24/24 and 5/28/24 for HRB-001, FB-001A, and FB-001B. The results of the tests are summarized in Tables 1, 3, and 3. As shown, the analyzers operated well within EPA requirements for all parameters. An explanation of the CGA test is provided in Section 2.5. Audit reports for the CGA tests are provided in Appendix 3.

Cycle Time Tests are a requirement of 40 CFR 75. Cycle Time Tests were performed on the HRB-001 NO_x and O_2 analyzers on 5/28/24. The results of the tests are summarized in Table 1. Explanations of the Cycle Time Test are provided in Section 2.6. Minute reports for the tests are provided in Appendix 4.

CO Response Time Tests are a requirement of 40 CFR 60. The CO Response Time Test was performed on the HRB-001 CO-L analyzer on 5/28/24. The results of the tests are summarized in Table 1. Explanations of the CO Response Time Test are provided in Section 2.7. Minute reports for the tests are provided in Appendix 5.

In summary, the CEMS at Michigan Power Limited Partnership provides reliable data and operates within the requirements of the EPA as outlined in 40 CFR 60, Appendix B, Performance Specifications 2, 3, 4/4a and 40 CFR 75, Appendix A, and Michigan EGLE.

TABLE 1. SUMMARY OF HRB-001 CEMS RECERTIFICATION RESULTS

HRB-001	RESULTS	STANDARD	PASS / FAIL
RELATIVE ACCURACY			
NO_x lb/mmBtu-(Part 75)	2.34% RA RM	7.5% RA RM or 0.015 lb/mmBtu MD[1]	PASS
NO_x ppmvd @ 15% O_2	0.68% RA RM	20% RA RM or 10% RA AS	PASS
O_2 % dry	0.85% RA RM	20% RA RM or 1% MD	PASS
CO ppmvd @ 15% O_2	0.3 ppm MD	10% RA or 5% of standard (or 5 ppm MD)**	PASS
BIAS TEST			
Adjustment Factor	1.000		PASS
7-DAY ZERO CALIBRATION DRIFT			
$NO_{x\text{-LOW}}$	0.6%	2.5 % of span or 5 ppm	PASS
$NO_{x\text{-HIGH}}$	0.3%	2.5 % of span or 5 ppm	PASS
O_2	0.1%	0.5% O2	PASS
$CO_{\text{-LOW}}$	3.8%	5.0% of zero or span (6 of 7 days)	PASS
$CO_{\text{-HIGH}}$	0.0%	5.0% of zero or span (6 of 7 days)	PASS
7-DAY SPAN CALIBRATION DRIFT			
$NO_{x\text{-LOW}}$	1.2%	2.5 % of span or 5 ppm	PASS
$NO_{x\text{-HIGH}}$	0.4%	2.5 % of span or 5 ppm	PASS
O_2	0.1%	0.5% O2	PASS
$CO_{\text{-LOW}}$	2.5%	5.0% of zero or span (6 of 7 days)	PASS
$CO_{\text{-HIGH}}$	1.0%	5.0% of zero or span (6 of 7 days)	PASS
LINEARITY			
$NO_{x\text{-HIGH}}$	2.0% LE	5% LE or 5 ppm	PASS
O_2	0.9% LE	5% LE or 0.5%	PASS
CYLINDER GAS AUDIT			
$NO_{x\text{-LOW}}$	7.9%	15% of the gas value or ±2 ppm	PASS
$CO_{\text{-LOW}}$	9.7%	15% of the gas value or ±2 ppm	PASS
$CO_{\text{-HIGH}}$	1.0%	15% of the gas value or ±5 ppm	PASS
CYCLE TIME TEST			
$NO_{x\text{-LOW}}$	2 minutes	15 minutes	PASS
$NO_{x\text{-HIGH}}$	2 minutes	15 minutes	PASS
O_2	2 minutes	15 minutes	PASS
CO RESPONSE TIME TEST			
$CO_{\text{-LOW}}$	112 seconds	240 seconds	PASS
ANALYZER SPAN			
$NO_{x\text{-LOW}}$		20 ppm	
$NO_{x\text{-HIGH}}$		100 ppm	
O_2		25%	
$CO_{\text{-LOW}}$		20 ppm	
$CO_{\text{-HIGH}}$		1000 ppm	
ANALYZER SERIAL NUMBERS			
NO_x/O_2		2039	
CO		1003	

WHERE: RA = RELATIVE ACCURACY RESULTS BASED ON REFERENCE METHOD MEAN VALUE
1 = RATA RESULTS REQUIRED FOR ANNUAL RATA FREQUENCY FOR 40 CFR 75
DRIFT, LINEARITY, AND CYCLE TIME RESULTS ARE THE HIGHEST ENCOUNTERED DURING ALL TESTS

**This value is only applicable if 40 CFR 60 PS 4A is used. Results are acceptable if the absolute mean difference (MD) between the reference method and the CEMS plus the 2.5 percent confidence coefficient is not greater than 5 ppm.

TABLE 2. SUMMARY OF FB-001A CEMS RECERTIFICATION RESULTS

FB-001A	RESULTS	STANDARD	PASS / FAIL
RELATIVE ACCURACY			
NO_x lb/mmBtu	1.09% RA RM	20% RA RM or 10% RA AS	PASS
O_2 % dry	2.26% RA RM	20% RA RM or 1% MD	PASS
7-DAY ZERO CALIBRATION DRIFT			
NO_x	0.6%	2.5 % of span or 5 ppm	PASS
O_2	0.0%	0.5% O2	PASS
7-DAY SPAN CALIBRATION DRIFT			
NO_x	2.1%	2.5 % of span or 5 ppm	PASS
O_2	0.1%	0.5% O2	PASS
CYLINDER GAS AUDIT			
NO_x	0.3%	15% of the gas value or ±5 ppm	PASS
O_2	0.5%	15% of the gas value	PASS
ANALYZER SPAN			
NO_x		100 ppm	
O_2		25%	
ANALYZER SERIAL NUMBERS			
NO_x/O_2		2038	

WHERE: RA = RELATIVE ACCURACY RESULTS BASED ON REFERENCE METHOD MEAN VALUE
1 = RATA RESULTS REQUIRED FOR ANNUAL RATA FREQUENCY FOR 40 CFR 75
DRIFT AND LINEARITY RESULTS ARE THE HIGHEST ENCOUNTERED DURING ALL TESTS

TABLE 3. SUMMARY OF FB-001B CEMS RECERTIFICATION RESULTS

FB-001B	RESULTS	STANDARD	PASS / FAIL
RELATIVE ACCURACY			
NO_x lb/mmBtu	0.78% RA RM	20% RA RM or 10% RA AS	PASS
O_2 % dry	1.81% RA RM	20% RA RM or 1% MD	PASS
7-DAY ZERO CALIBRATION DRIFT			
NO_x	0.7%	2.5 % of span or 5 ppm	PASS
O_2	0.0%	0.5% O2	PASS
7-DAY SPAN CALIBRATION DRIFT			
NO_x	0.9%	2.5 % of span or 5 ppm	PASS
O_2	0.1%	0.5% O2	PASS
CYLINDER GAS AUDIT			
NO_x	2.5%	15% of the gas value or ±5 ppm	PASS
O_2	0.8%	15% of the gas value	PASS
ANALYZER SPAN			
NO_x		100 ppm	
O_2		25%	
ANALYZER SERIAL NUMBERS			
NO_x/O_2		2038	

WHERE: RA = RELATIVE ACCURACY RESULTS BASED ON REFERENCE METHOD MEAN VALUE
1 = RATA RESULTS REQUIRED FOR ANNUAL RATA FREQUENCY FOR 40 CFR 75
DRIFT AND LINEARITY RESULTS ARE THE HIGHEST ENCOUNTERED DURING ALL TESTS

2. CEMS CERTIFICATION

Field tests were performed for CEMS certification in accordance with the criteria in 40 CFR 60, Appendix B, 40 CFR Part 75, Appendix A, and Michigan EGLE. The results for all tests were determined from the data collected by the DAHS. The computer printouts for each field test are included in the Appendices.

2.1 RELATIVE ACCURACY

Montrose Air Quality Services performed the relative accuracy testing. Montrose and the testing met the EPA Air Emissions Testing Body (AETB) requirements. Each test run was a minimum of 21 minutes in duration and consisted of sampling for NO_x, CO, and O_2. The times during which the tests were performed are shown in the Montrose report.

The reference methods used by Montrose are outlined below:

CONSTITUENT	METHOD
NO_x	EPA METHOD 7E
O_2	EPA METHOD 3A
CO	EPA METHOD 10

As shown in the Relative Accuracy tables in the Montrose report in Appendix 6, relative accuracy is reported as an error and is the sum of the absolute mean value of the differences between the reference method tests and the instrument readings, plus the 95 percent confidence interval of the differences, expressed as a percentage of the mean reference method value or the emission standard.

The analyzer response was determined from the average of readings taken every minute for the duration of the time the relative accuracy tests were performed. The 1-Minute Data Reports from the CEMS are included in the Montrose report.

The analyzers passed the relative accuracy requirements (as stated in 40 CRF 60, Appendix B Performance Specification 2, 3, and 4a). In addition, the NO_x analyzer on HRB-001 passed the relative accuracy requirements as stated in 40 CRF 75, Appendix A and the NO_x systems qualify for annual RATA frequency under 40 CFR 75. The NO_x system had a relative accuracy and a mean difference significantly less than 7.5% and 0.015 lb/mmBtu, respectively.

2.2 BIAS CHECK

The relative accuracy result for NOx lb/mmBtu was checked for low bias by determining if the mean difference between the test team's values and the CEMS values is greater than the absolute value of the confidence coefficient. The bias adjustment factors (BAF) for HRB-001 was determined to be 1.000. In general, the BAF is determined after each RATA test.

2.3 7-DAY CALIBRATION DRIFT

All drift tests occurred on seven consecutive unit-operating days when the units were combusting fuel. The NO_x and O_2 calibration gases used for the calibration error test meet the requirements of the EPA 40 CFR 75, Appendix A Protocol Gas Verification Program (PGVP). The data from calibrations occurring over seven days are summarized in Appendix 1 of this report. As shown, the calibration error for all analyzers were well within EPA requirements as stated in 40 CFR 60, Appendix B and 40 CFR 75, Appendix A.

2.4 LINEARITY

To perform the linearity tests, the high range of the HRB-001 NO_x analyzer and O_2 analyzers were challenged three times with each of three levels of calibration gas (low, mid and high). The mean difference between the analyzer response and the calibration gas value, as a percentage of the calibration gas value, must be within 5%. The result was within the requirements of 40 CFR 75, Appendix A. A summary of the linearity test results and the certificates of analysis for the cylinders are provided in Appendix 2.

2.5 CYLINDER GAS AUDIT

To perform the cylinder gas audits, the NO_x-L, CO, and O_2 analyzers were challenged three times with a low and mid calibration gas. The mean difference between the analyzer response and the calibration gas value, as a percentage of the calibration gas value, must be within 15%. The result was within the requirements of 40 CFR 60, Appendix F. A summary of the CGA results are provided in Appendix 3.

2.6 CYCLE TIME TEST

To perform the test, the NO_x and O_2 analyzers were challenged with a zero gas and high level (80 to 100% of span) calibration gas. Both the upscale and down scale response times were determined. As stated in 40 CFR 75, Appendix A, the response time to reach 95% of the gas value must be less than 15 minutes. For the NO_x system (NO_x and O_2 analyzers), the longer of the two analyzer response times is the response time for the system. The system response time met this requirement.

2.7 CO RESPONSE TIME TEST

To perform this test, the CO analyzer was challenged with a zero gas and high level (50 to 100% of range) calibration gas. Both the upscale and down scale response time averages were determined. As stated in 40 CFR 60, Appendix B, Performance Specification 4A the response time to reach 95% of the gas value must be less than 4 minutes. For the upscale and downscale readings the longer of the two analyzers response times is the response time for the analyzer. The system response time met this requirement. Audit reports that show the analyzers response in one minute increments are located in Appendix 5.

3. DISCUSSION OF RESULTS

The CEMS on HRB-001, FB-001A, and FB-001B at Michigan Power Limited Partnership successfully met all the requirements of the Michigan EGLE and the EPA as outlined in 40 CFR 60 and 40 CFR 75.

APPENDIX 1

7-DAY DRIFT TEST

Michigan Power Limited Partnership

7-Day Drift Test

Turbine HRB-001 CO ppm/L

Time	Instrument Span	Zero Reference	Zero Measured	Zero Drift	Zero Drift Limit	Span Reference	Span Measured	Span Drift	Span Drift Limit	Status
5/30/2024 07:15	20	0.00	-0.05	-0.05	1.00	17.98	17.97	-0.01	1.00	On-Line
5/31/2024 07:15	20	0.00	-0.12	-0.12	1.00	17.98	17.98	-0.01	1.00	On-Line
6/1/2024 07:15	20	0.00	-0.10	-0.10	1.00	17.98	17.90	-0.08	1.00	On-Line
6/2/2024 07:15	20	0.00	-0.40	-0.40	1.00	17.98	17.71	-0.27	1.00	On-Line
6/3/2024 07:15	20	0.00	-0.50	-0.50	1.00	17.98	17.58	-0.40	1.00	On-Line
6/4/2024 07:15	20	0.00	-0.48	-0.48	1.00	17.98	17.54	-0.44	1.00	On-Line
6/5/2024 07:15	20	0.00	-0.76	-0.76	1.00	17.98	17.49	-0.49	1.00	On-Line

The 7-Day Drift Test has been passed.

Michigan Power Limited Partnership

7-Day Drift Test

Turbine HRB-001 CO ppm/H

Time	Instrument Span	Zero Reference	Zero Measured	Zero Drift	Zero Drift Limit	Span Reference	Span Measured	Span Drift	Span Drift Limit	Status
5/30/2024 07:15	1000	0.00	0.00	0.00	50.00	893.40	883.00	-10.40	50.00	On-Line
5/31/2024 07:15	1000	0.00	0.10	0.10	50.00	893.40	884.10	-9.30	50.00	On-Line
6/1/2024 07:15	1000	0.00	0.10	0.10	50.00	893.40	883.90	-9.50	50.00	On-Line
6/2/2024 07:15	1000	0.00	-0.20	-0.20	50.00	893.40	883.90	-9.50	50.00	On-Line
6/3/2024 07:15	1000	0.00	-0.30	-0.30	50.00	893.40	883.30	-10.10	50.00	On-Line
6/4/2024 07:15	1000	0.00	-0.30	-0.30	50.00	893.40	883.60	-9.80	50.00	On-Line
6/5/2024 07:15	1000	0.00	-0.60	-0.60	50.00	893.40	887.00	-6.40	50.00	On-Line

The 7-Day Drift Test has been passed.

Michigan Power Limited Partnership

7-Day Drift Test

Turbine HRB-001 75-O2%

Time	Instrument Span	Zero Reference	Zero Measured	Zero Drift	Zero Drift Limit	Span Reference	Span Measured	Span Drift	Span Drift Limit	Status
5/30/2024 07:15	25	0.00	-0.09	-0.09	0.50	22.52	22.47	-0.05	0.50	On-Line
5/31/2024 07:15	25	0.00	-0.09	-0.09	0.50	22.52	22.48	-0.04	0.50	On-Line
6/1/2024 07:15	25	0.00	-0.10	-0.10	0.50	22.52	22.48	-0.05	0.50	On-Line
6/2/2024 07:15	25	0.00	-0.09	-0.09	0.50	22.52	22.48	-0.04	0.50	On-Line
6/3/2024 07:15	25	0.00	-0.08	-0.08	0.50	22.52	22.49	-0.03	0.50	On-Line
6/4/2024 07:15	25	0.00	-0.08	-0.08	0.50	22.52	22.48	-0.04	0.50	On-Line
6/5/2024 07:15	25	0.00	-0.09	-0.09	0.50	22.52	22.49	-0.03	0.50	On-Line

The 7-Day Drift Test has been passed.

Michigan Power Limited Partnership

7-Day Drift Test

Turbine HRB-001 75-NOx ppm/L

Time	Instrument Span	Zero Reference	Zero Measured	Zero Drift	Zero Drift Limit	Span Reference	Span Measured	Span Drift	Span Drift Limit	Status
5/30/2024 07:15	20	0.00	0.09	0.09	0.50	18.17	18.11	-0.06	0.50	On-Line
5/31/2024 07:15	20	0.00	0.04	0.04	0.50	18.17	18.08	-0.09	0.50	On-Line
6/1/2024 07:15	20	0.00	-0.04	-0.04	0.50	18.17	18.08	-0.09	0.50	On-Line
6/2/2024 07:15	20	0.00	0.05	0.05	0.50	18.17	18.00	-0.17	0.50	On-Line
6/3/2024 07:15	20	0.00	-0.07	-0.07	0.50	18.17	18.01	-0.16	0.50	On-Line
6/4/2024 07:15	20	0.00	-0.11	-0.11	0.50	18.17	17.99	-0.18	0.50	On-Line
6/5/2024 07:15	20	0.00	-0.10	-0.10	0.50	18.17	17.94	-0.23	0.50	On-Line

The 7-Day Drift Test has been passed.

Michigan Power Limited Partnership

7-Day Drift Test

Turbine HRB-001 75-NOx ppm/H

Time	Instrument Span	Zero Reference	Zero Measured	Zero Drift	Zero Drift Limit	Span Reference	Span Measured	Span Drift	Span Drift Limit	Status
5/30/2024 07:15	100	0.00	-0.05	-0.05	2.50	90.69	90.77	0.08	2.50	On-Line
5/31/2024 07:15	100	0.00	-0.10	-0.10	2.50	90.69	90.68	-0.01	2.50	On-Line
6/1/2024 07:15	100	0.00	-0.17	-0.17	2.50	90.69	90.68	-0.01	2.50	On-Line
6/2/2024 07:15	100	0.00	-0.09	-0.09	2.50	90.69	90.33	-0.36	2.50	On-Line
6/3/2024 07:15	100	0.00	-0.21	-0.21	2.50	90.69	90.36	-0.33	2.50	On-Line
6/4/2024 07:15	100	0.00	-0.26	-0.26	2.50	90.69	90.26	-0.43	2.50	On-Line
6/5/2024 07:15	100	0.00	-0.25	-0.25	2.50	90.69	90.41	-0.28	2.50	On-Line

The 7-Day Drift Test has been passed.

Michigan Power Limited Partnership

7-Day Drift Test

Turbine HRB-001 60-O2%

Time	Instrument Span	Zero Reference	Zero Measured	Zero Drift	Zero Drift Limit	Span Reference	Span Measured	Span Drift	Span Drift Limit	Status
5/30/2024 07:15	25	0.00	-0.09	-0.09	0.50	22.52	22.47	-0.05	0.50	On-Line
5/31/2024 07:15	25	0.00	-0.09	-0.09	0.50	22.52	22.48	-0.04	0.50	On-Line
6/1/2024 07:15	25	0.00	-0.10	-0.10	0.50	22.52	22.48	-0.05	0.50	On-Line
6/2/2024 07:15	25	0.00	-0.09	-0.09	0.50	22.52	22.48	-0.04	0.50	On-Line
6/3/2024 07:15	25	0.00	-0.08	-0.08	0.50	22.52	22.49	-0.03	0.50	On-Line
6/4/2024 07:15	25	0.00	-0.08	-0.08	0.50	22.52	22.48	-0.04	0.50	On-Line
6/5/2024 07:15	25	0.00	-0.09	-0.09	0.50	22.52	22.49	-0.03	0.50	On-Line

The 7-Day Drift Test has been passed.

Michigan Power Limited Partnership

7-Day Drift Test

Turbine HRB-001 60-NOx ppm/L

Time	Instrument Span	Zero Reference	Zero Measured	Zero Drift	Zero Drift Limit	Span Reference	Span Measured	Span Drift	Span Drift Limit	Status
5/30/2024 07:15	20	0.00	0.09	0.09	0.50	18.17	18.11	-0.06	0.50	On-Line
5/31/2024 07:15	20	0.00	0.04	0.04	0.50	18.17	18.08	-0.09	0.50	On-Line
6/1/2024 07:15	20	0.00	-0.04	-0.04	0.50	18.17	18.08	-0.09	0.50	On-Line
6/2/2024 07:15	20	0.00	0.05	0.05	0.50	18.17	18.00	-0.17	0.50	On-Line
6/3/2024 07:15	20	0.00	-0.07	-0.07	0.50	18.17	18.01	-0.16	0.50	On-Line
6/4/2024 07:15	20	0.00	-0.11	-0.11	0.50	18.17	17.99	-0.18	0.50	On-Line
6/5/2024 07:15	20	0.00	-0.10	-0.10	0.50	18.17	17.94	-0.23	0.50	On-Line

The 7-Day Drift Test has been passed.

Michigan Power Limited Partnership

7-Day Drift Test

Turbine HRB-001 60-NOx ppm/H

Time	Instrument Span	Zero Reference	Zero Measured	Zero Drift	Zero Drift Limit	Span Reference	Span Measured	Span Drift	Span Drift Limit	Status
5/30/2024 07:15	100	0.00	-0.05	-0.05	2.50	90.69	90.77	0.08	2.50	On-Line
5/31/2024 07:15	100	0.00	-0.10	-0.10	2.50	90.69	90.68	-0.01	2.50	On-Line
6/1/2024 07:15	100	0.00	-0.17	-0.17	2.50	90.69	90.68	-0.01	2.50	On-Line
6/2/2024 07:15	100	0.00	-0.09	-0.09	2.50	90.69	90.33	-0.36	2.50	On-Line
6/3/2024 07:15	100	0.00	-0.21	-0.21	2.50	90.69	90.36	-0.33	2.50	On-Line
6/4/2024 07:15	100	0.00	-0.26	-0.26	2.50	90.69	90.26	-0.43	2.50	On-Line
6/5/2024 07:15	100	0.00	-0.25	-0.25	2.50	90.69	90.41	-0.28	2.50	On-Line

The 7-Day Drift Test has been passed.

Michigan Power Limited Partnership

7-Day Drift Test

Boiler FB-001A NOx ppm

Time	Instrument Span	Zero Reference	Zero Measured	Zero Drift	Zero Drift Limit	Span Reference	Span Measured	Span Drift	Span Drift Limit	Status
6/3/2024 07:45	100	0.00	0.62	0.62	2.50	91.04	90.52	-0.52	2.50	On-Line
6/4/2024 07:45	100	0.00	0.49	0.49	2.50	91.04	89.93	-1.11	2.50	On-Line
6/5/2024 07:45	100	0.00	0.37	0.37	2.50	91.04	89.83	-1.21	2.50	On-Line
6/6/2024 07:45	100	0.00	0.25	0.25	2.50	91.04	89.50	-1.54	2.50	On-Line
6/7/2024 07:45	100	0.00	0.25	0.25	2.50	91.04	89.45	-1.59	2.50	On-Line
6/8/2024 07:45	100	0.00	0.23	0.23	2.50	91.04	89.14	-1.90	2.50	On-Line
6/9/2024 07:45	100	0.00	0.22	0.22	2.50	91.04	88.99	-2.05	2.50	On-Line

The 7-Day Drift Test has been passed.

Michigan Power Limited Partnership

7-Day Drift Test

Boiler FB-001A 60-O2%

Time	Instrument Span	Zero Reference	Zero Measured	Zero Drift	Zero Drift Limit	Span Reference	Span Measured	Span Drift	Span Drift Limit	Status
6/3/2024 07:45	25	0.00	0.00	0.00	0.50	22.47	22.51	0.04	0.50	On-Line
6/4/2024 07:45	25	0.00	0.01	0.01	0.50	22.47	22.50	0.03	0.50	On-Line
6/5/2024 07:45	25	0.00	0.03	0.03	0.50	22.47	22.52	0.05	0.50	On-Line
6/6/2024 07:45	25	0.00	0.03	0.03	0.50	22.47	22.52	0.05	0.50	On-Line
6/7/2024 07:45	25	0.00	0.01	0.01	0.50	22.47	22.51	0.04	0.50	On-Line
6/8/2024 07:45	25	0.00	0.01	0.01	0.50	22.47	22.50	0.03	0.50	On-Line
6/9/2024 07:45	25	0.00	0.00	0.00	0.50	22.47	22.51	0.04	0.50	On-Line

The 7-Day Drift Test has been passed.

Michigan Power Limited Partnership

7-Day Drift Test

Boiler FB-001B 60-O2%

Time	Instrument Span	Zero Reference	Zero Measured	Zero Drift	Zero Drift Limit	Span Reference	Span Measured	Span Drift	Span Drift Limit	Status
5/26/2024 06:48	25	0.00	0.00	0.00	0.50	22.47	22.48	0.01	0.50	On-Line
5/27/2024 06:48	25	0.00	0.02	0.02	0.50	22.47	22.52	0.05	0.50	On-Line
5/28/2024 06:48	25	0.00	0.01	0.01	0.50	22.47	22.49	0.02	0.50	On-Line
5/29/2024 06:48	25	0.00	-0.02	-0.02	0.50	22.47	22.49	0.02	0.50	On-Line
5/30/2024 06:48	25	0.00	-0.02	-0.02	0.50	22.47	22.49	0.02	0.50	On-Line
5/31/2024 06:48	25	0.00	-0.01	-0.01	0.50	22.47	22.49	0.02	0.50	On-Line
6/1/2024 06:48	25	0.00	0.00	0.00	0.50	22.47	22.49	0.02	0.50	On-Line

The 7-Day Drift Test has been passed.

Michigan Power Limited Partnership

7-Day Drift Test

Boiler FB-001B NOx ppm

Time	Instrument Span	Zero Reference	Zero Measured	Zero Drift	Zero Drift Limit	Span Reference	Span Measured	Span Drift	Span Drift Limit	Status
5/26/2024 06:48	100	0.00	0.67	0.67	2.50	91.04	91.98	0.94	2.50	On-Line
5/27/2024 06:48	100	0.00	0.65	0.65	2.50	91.04	91.85	0.81	2.50	On-Line
5/28/2024 06:48	100	0.00	0.55	0.55	2.50	91.04	91.20	0.16	2.50	On-Line
5/29/2024 06:48	100	0.00	0.47	0.47	2.50	91.04	90.94	-0.10	2.50	On-Line
5/30/2024 06:48	100	0.00	0.44	0.44	2.50	91.04	90.71	-0.33	2.50	On-Line
5/31/2024 06:48	100	0.00	0.39	0.39	2.50	91.04	90.54	-0.50	2.50	On-Line
6/1/2024 06:48	100	0.00	0.37	0.37	2.50	91.04	90.43	-0.61	2.50	On-Line

The 7-Day Drift Test has been passed.