DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Scheduled Inspection

N497554780

FACILITY: Michigan Power Limited Partnership		SRN / ID: N4975
LOCATION: 5795 W. 6th Street, LUDINGTON		DISTRICT: Cadillac
CITY: LUDINGTON		COUNTY: MASON
CONTACT: Daniel Cox , Compliance Manager		ACTIVITY DATE: 08/19/2020
STAFF: Caryn Owens	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Scheduled Inspection and Records Review.		
RESOLVED COMPLAINTS:		

– Air Quality Division (AQD) conducted a scheduled and announced field inspection and records review of Michigan Power Limited Partnership (Michigan Power) (SRN: N4975) located at 5795 West Sixth Street, Ludington, Mason County, Michigan. The site is located on the south side of West 6th Street, approximately 2/5 miles west of the West 6th Street and South Pere Marquette Highway intersection. The site is located in an industrial area, approximately ¼ mile north of the Pere Marquette Lake and River, and approximately ¼ mile west of the facility is a residential area.

The field inspection and records review were to determine compliance with the Renewable Operating Permit (ROP) MI-ROP-N4975-2014. The site is currently an area source for hazardous air pollutants (HAPs), and is subject to the following New Source Performance Standards (NSPS): Standards of Performance for Electric Utility Steam Generating Units promulgated in 40 CFR, Part 60, Subpart Da; Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units in 40 CFR, Part 60 Subpart Db; and Standards of Performance for Stationary Gas Turbines in 40 CFR, Part 60, Subpart GG. The site is currently subject to the National Emission Standard for Hazardous Air Pollutants (NESHAP): for Stationary Reciprocating Internal Combustion Engines for area sources in 40 CFR, Part 63, Subpart ZZZZ (RICE MACT).

Additionally, the facility is subject to the federal Acid Rain Program in 40 CFR Part 72 and the Cross-State Air Pollution Control Rule (CSAPR) in 40 CFR Part 97; however, EGLE does not have delegation of the Acid Rain program, and CSAPR, so these areas were not reviewed during the field inspection and records review.

Summary:

The activities covered during the field inspection and records review for the facility indicates the facility was in compliance with ROP MI-ROP-N4975-2014 and no additional actions are necessary at this time. Specific permit conditions that were reviewed are discussed below.

On-site Inspection:

At the time of the inspection, I met with Mr. Dan Cox, the Compliance Manager and Ms. Becky Sparks, the Senior IC&E Technician, of Michigan Power who escorted me throughout the facility. When I first entered, I signed in and my temperature was taken as a COVID-19 protocol. Michigan Power is a cogeneration utility plant that produces electricity and steam. The main portion of the facility consists of a natural gas fired turbine equipped with a heat recovery system generator (HRSG) and low NOx burners. Air pollution control equipment on the turbine and HRSG includes a Carbon Monoxide Oxidation System. The facility also contains two natural gas fired boilers for steam generation. The boilers are equipped with low NOx burners and a flue gas recirculation system. Other sources of emissions at the facility include an emergency diesel fired generator and diesel fired emergency fire pump. The emissions from these engines are uncontrolled.

During the inspection, the weather conditions were clear, with calm winds from the northeast about 0-5 miles per hour, and approximately 70 degrees Fahrenheit. During the inspection I observed the raw data from the continuous emission monitoring systems for the turbine and two boilers. Only Boiler A was operating during the inspection, and Boiler B was on standby. The following was read from the Continuous Emission Monitoring Systems (CEMS):

Turbine	CEMS Reading
NOx:	7.85 ppmv
CO:	1.83 ppmv
O2:	14.33%
Combustion Turbine load:	75.89 MW
Combustion Turbine gas flow:	921.08 kscf
Duct Turbine gas flow:	86.49 kscf

Boiler A	CEMS Reading
NOx:	6.66 ppmv
O2:	78.71%

Boiler B	
NOx:	Standby
O2:	Standby

Steam Turbine load:	48.90 MW

The CEMS operating parameters during the last stack test were as follows:

Turbine	CEMS Re ading
NOx:	9.00 ppmv
CO:	2.23 ppmv
O2:	13.69%
Combustion Turbine load:	78.46 MW
Combustion Turbine gas flow:	927.44 kscf
Duct Turbine gas flow:	188.56 kscf
Steam Turbine load:	46.54 MW

Boiler A	CEMS Reading
NOx:	7.59 ppmv
O2:	18.73%

Boiler B	
NOx:	7.17 ppmv
O2:	18.75%

The parameters appeared to be similar between the field inspection and what was recorded during the previous stack testing at the facility. Additionally, I observed the emergency fire pump and emergency generator during the inspection. They were both not operating, but the hours from the engines were recorded and discussed below.

The facility submitted an ROP Renewal Application in on June 7, 2018. AQD will be submitting the Draft ROP Renewal to Michigan Power for Company Review soon. One change that is relevant, is that Compliance Assurance Monitoring Conditions have been removed, since CAM is exempt due to the emission limits for FGTURBINES/HRSG are monitored on a continuous basis, meeting the CAM exemption for a continuous compliance determination method. Carbon Monoxide (CO) is directly measured in parts per million (ppm) from the CEMS, and the tons per year emission rate for CO is calculated using the ppm measurement and the gas flow rate, thus meeting the continuous compliance determination method.

The facility is claiming the following exemptions at the facility:
The Water-cooling towers on the eastern portion of the site meets exemption 336.1280(2)(d).
One small cold cleaner that meet exemption Rules 336.1281(h) and 336.1285(r)(iv), but these exemptions have reporting requirements and contains a small paragraph discussed below.

Records Review:

Source-Wide Conditions: No Source-Wide Conditions are applicable for the facility.

EUFIREPUMP: A less than 500 horsepower diesel engine (Caterpillar 3406) used to power the emergency fire water pump. The diesel engine is uncontrolled and is subject to 40 CFR Part 63, Subpart ZZZZ.

I. Emission Limits:
EUFIREPUMP was not operating at the time of the field inspection. EUFIREPUMP is limited to 10 percent opacity based on a six-minute average when operating. Based on the records I reviewed, Visible emission (VE) checks are completed daily and indicate compliance with the 10% opacity limit.

II. Material Limits:
Sulfur and BTU content of the diesel fuel is limited to 0.05% sulfur. The most recent fuel analysis (attached) from May 22, 2019 indicated a sulfur content of 0.0066%.

III. Process/Operational Restrictions:
At the time of the inspection EUFIREPUMP was equipped with a non-resettable hour meter and had operated for a total of 676 hours since it was installed. According to Mr. Cox, EUFIREPUMP is operated about 30 minutes per week to test the engine. The usage is well below the permit limit of 500 hours per 12-month rolling time period.

AQD received an updated Malfunction Abatement Plan (MAP) & Preventative Maintenance Plan for Gas Turbine Generator, HRSG Duct Burner, Fire Pump, Emergency Generator and Boilers A and B included with the June 7, 2018 ROP Renewal application. The facility is following the MAP for EUFIREPUMP.

IV. Design/Equipment Parameters:
Design/Equipment Parameters are not applicable for EUFIREPUMP.

V. Testing/Sampling:
Testing/Sampling is not applicable for EUFIREPUMP.

VI. Monitoring/Recordkeeping:
Records of sulfur content in the fuel, hours of operation, and VE readings are maintained as required.

VII. Reporting:
The semi-annual reports and annual compliance reports for ROP certification were submitted to AQD in a timely manner. During the reporting period the permittee reported all monitoring and associated recordkeeping requirements.

VIII. Stack/Vent Restrictions:
Stack parameters for EUFIREPUMP have not changed from the previous inspection and appear to be accurate.

IX. Other Requirements:
As previously stated, the facility is following the MAP for EUFIREPUMP.

EUGENERATOR: A Diesel engine (Caterpillar 3526 DITA) powered emergency generator. The facility does not operate the emergency generator and FGTURBINES/HRSG at the same time except during maintenance, weekly testing, and required regulatory purposes. The diesel engine is uncontrolled and is subject to 40 CFR Part 63, Subpart ZZZZ.

I. Emission Limits:
EUGENERATOR was not operating at the time of the field inspection. EUGENERATOR is limited to 10 percent opacity based on a six-minute average when operating. Based on the records I reviewed, VE checks are completed daily and indicate compliance with the 10% opacity limit.

II. Material Limits:
Sulfur and BTU content of the diesel fuel is limited to 0.05% sulfur. The most recent fuel analysis (attached) from May 22, 2019 indicated a sulfur content of 0.0066%.

III. Process/Operational Restrictions:
At the time of the inspection EUGENERATOR was equipped with a non-resettable hour meter and had operated for a total of 785 hours since it was installed. According to Mr. Cox, EUGENERATOR is operated about 15-20 minutes per week to test the engine. The usage is well below the permit limit of 500 hours per 12-month rolling time period.

AQD received an updated Malfunction Abatement Plan (MAP) & Preventative Maintenance Plan for Gas Turbine Generator, HRSG Duct Burner, Fire Pump, Emergency Generator and Boilers A and B included with the June 7, 2018 ROP Renewal application. The facility is following the MAP for EUFIREPUMP.

IV. Design/Equipment Parameters:
Design/Equipment Parameters are not applicable for EUGENERATOR.

V. Testing/Sampling:
Testing/Sampling is not applicable for EUGENERATOR.

VI. Monitoring/Recordkeeping:
Records of sulfur content in the fuel, hours of operation, and VE readings are maintained as required.

VII. Reporting:
The semi-annual reports and annual compliance reports for ROP certification were submitted to AQD in a timely manner. During the reporting period the permittee reported all monitoring and associated recordkeeping requirements.

VIII. Stack/Vent Restrictions:
Stack parameters for EUGENERATOR have not changed from the previous inspection and appear to be accurate.

IX. Other Requirements:
As previously stated, the facility is following the MAP for EUGENERATOR.

FGTURBINE/HRSG: A 1136.5 MMBtu per hour natural gas fired turbine equipped with Dry Low NOx (DLN) combustors, 341 MMBtu per hour natural gas fired low NOx Duct Burners and a Heat Recovery Steam Generator (HRSG) equipped with

a Carbon Monoxide Catalytic Oxidation System for control. This flexible group covers EUTURBINE and EUHRSG.

I. Emission Limits:
Compliance with the NOx, CO, VOC, and PM-10 emissions from the FGTURBINE/HRSG are demonstrated by CEMS and stack testing (see limits below). The most recent performance testing for PM and VOC was completed October 16, 2017. Records of this are kept electronically and calculated through the source Data Acquisition System (DAS). The emissions identified below were within the permitted emission limits. Opacity from the FGTURBINE/HRSG is limited to 10%. VEs are checked twice daily and logged on the "Auxiliary Log Sheet". Based on the records I reviewed, no VEs were observed.

Pollutant	Limit	Highest reported record	Equipment
NOx	9 ppmv @ 15% Oxygen, dry 24-hour rolling average determined each hour	6.56 ppmv	EUTURBINE
NOx	13.6 ppmv @ 15% Oxygen, dry 24-hour rolling average determined each hour	7.7 ppmv	FGTURBINE/HRSG
NOx	303.5 tons/yr based on a 12-month rolling time period determined at the end of each calendar month	133.5 tons/yr	FGTURBINE/HRSG
CO	10 ppmv @ 15% Oxygen, dry based on a 3-hour rolling average determined each hour	2.5 ppmv	EUTURBINE
CO	10.7 ppmv @ 15% Oxygen, dry based on a 3-hour rolling average determined each hour	2.5 ppmv	FGTURBINE/HRSG
CO	150.3 tons/yr based on a 12-month rolling time period determined at the end of each calendar month	21.2 tons/yr	FGTURBINE/HRSG
VOCs	2.0 pounds/hr	0.0 pounds/hr	EUTURBINE
VOCs	11.9 pounds/hr	0.3 pounds/hr	FGTURBINE/HRSG
VOCs	52.1 tons/yr based on 12-month rolling time period determined at the end of each calendar month	0.76 tons/yr	FGTURBINE/HRSG
PM-10	7.0 pounds/hr	2.8 pounds/hr	EUTURBINE
PM-10	10.4 pounds/hr	3.9 pounds/hr	FGTURBINE/HRSG
PM-10	45.6 tons/yr based on a 12-month rolling time period determined at the end of each calendar month	2.1 tons/yr	FGTURBINE/HRSG

II. Material Limits:
The sulfur content of the natural gas is not to exceed 2.5 grains sulfur per 100 cubic feet of gas. This is confirmed by testing from the supplier and the facility has a new 5 year contract with the suppliers to deliver gas of this quality.

III. Process/Operational Restrictions:
According to Michigan Power, the HRSG cannot operate unless the turbine is operating. During the inspection, the HRSG and oxidation catalyst appeared to be operating properly. The CO concentrations before and after the catalyst are measured to determine the efficiency of the catalyst. Alarms are built into the DAS to ensure that start-up and shut-down do not exceed 5 hours and 1 hour respectively. The hourly operation is recorded in the daily reports.

Additionally, AQD received an updated Malfunction Abatement Plan (MAP) & Preventative Maintenance Plan for Gas Turbine Generator, HRSG Duct Burner, Fire Pump, Emergency Generator, and Boilers A and B; and a Start-up/Shutdown Plan for Gas Turbine Generator and HRSG Duct Burner were included with the June 7, 2018 ROP Renewal application. The plans were approved by AQD on September 20, 2018, and the facility is following the MAP for and Start-up/Shutdown Plan.

IV. Design/Equipment Parameters:
During the inspection, the dry low-NOx combustors, the oxidation catalyst, and the CEMS for NOx, CO, and O2 appeared to be properly installed and operating properly. The natural gas usage is continuously monitored at the facility.

V. Testing/Sampling:
VOC and PM-10 emission tests were conducted October 16, 2017. The results of the performance testing indicated VOC and PM-10 emissions were within the permitted limits and discussed further above under emission limits. The CEMS for FGTURBINE/HRSG have quarterly Quality Assurance tests to determine the accuracy of the CEMS. No problems with the quarterly Quality Assurance tests have been reported to the AQD.

VI. Monitoring/Recordkeeping:
Records of natural gas to FGTURBINE/HRSG are being kept by the facility. All required hourly rolling data, monthly data, and 12-month rolling time period CEMS data is collected and retained appropriately at the site. CEMS are calibrated and logged daily.

VII. Reporting:
The semi-annual reports and annual compliance reports for ROP certification were submitted to AQD in a timely manner. During the reporting period the permittee reported all monitoring and associated recordkeeping requirements. Exceedances of the limit, when they occur are reported throughout the year and in quarterly excess emission reports (EERs). No excess emissions were reported during the last year.

Semi-annual reporting of CAM excursion/exceedances, and monitor downtime were submitted to the AQD in a timely manner. During the reporting period the permittee reported no CAM excursion/exceedances and 2 incidents where monitor downtime was reported due to calibration drift and sample line replacement. Testing protocols and test reports, established in the ROP, were submitted within appropriate time frames. The permittee appears in compliance with the NSPS Subpart GG and Subpart Da reporting requirements.

VIII. Stack/Vent Restrictions:
Stack parameters for FGTURBINE/HRSG have not changed from the previous inspection and appear to be accurate.

IX. Other Requirements:
The facility appears to comply with CAM, the NSPS 40 CFR Part 60, Subpart Da, and NSPS 40 CFR Part 60, Subpart GG requirements for FGTURBINE/HRSG. The facility is subject to Acid Rain (40 CFR Part 72), and CSAPR (40 CFR Part 96). However, the state of Michigan does not have delegation over these programs, and therefore, these portions of the ROP were not reviewed at this time.

FGBOILERS: Two 265 MMBtu/hr natural gas fired auxiliary boilers, equipped with low NOx burners and flue gas recirculation system. This flexible group covers EUBOILERA and EUBOILERB.

I. Emission Limits:
Compliance with the NOx, CO, VOC, and PM-10 emissions from FGBOILERS are demonstrated by CEMS and stack testing (see limits below). The PM-10, VOCs, and CO emissions are reported below are from the most recent relative accuracy test audit (RATA) of the CEMS, dated December 4, 2019. Records of this are kept electronically and calculated through the source Data Acquisition System (DAS). Typically, only one boiler operates at a time, and due to the RATA testing, both boilers were on pilot. The emissions identified below were within the permitted emission limits. Opacity from FGBOILERS is limited to 10%. VEs are checked twice daily and logged on the "Auxiliary Log Sheet". At the time of the inspection and the records I reviewed, no VEs were observed from the boiler stacks.

Pollutant	Limit	Highest reported record
NOx (firing rate of 25% to 100% of the maximum heat input rate)	0.06 pounds/MMBtu heat input Hourly, determined on a 30-day rolling average.	0.039 pounds/MMBtu (EUBOILERA) 0.055 pounds/MMBtu (EUBOILERB)

NOx (firing rate less than 25% of the maximum heat input rate)	0.2 pounds/MMBtu heat input Hourly, determined on a 30-day rolling average	0.080 pounds/MMBtu (EUBOILERA) 0.076 pounds/MMBtu (EUBOILERB)
PM-10	2.65 pounds/hr	0.332 pounds/hr - EUBOILERA 0.497 pounds/hr - EUBOILERB
VOCs	1.1 pounds/hr	0.97 pounds/hr - EUBOILERA 0.9 pounds/hr - EUBOILERB
CO	19.9 pounds/hr	1.4 pounds/hr - EUBOILERA 0.5 pounds/hr - EUBOILERB

II. Material Limits:
The sulfur content of the natural gas is not to exceed 2.5 grains sulfur per 100 cubic feet of gas. This is confirmed by testing from the supplier and the facility has a new 5 year contract with the suppliers to deliver gas of this quality.

III. Process/Operational Restrictions:
Michigan Power has an approved MAP that covers the entire source including the boilers. There were no malfunctions of the boilers during the review period.

IV. Design/Equipment Parameters:
The boilers are equipped with low NOx burners, a device to record natural gas usage, and NOx and O2 CEMS to monitor emissions.

V. Testing/Sampling:
CO, VOCs and PM-10 emission tests were conducted October 16, 2017. The results of the performance test indicated CO, VOC and PM-10 emissions were within the permitted limits and discussed further above under emission limits. The CEMS for FGBOILERS have quarterly Quality Assurance tests to determine the accuracy of the CEMS. No problems with the quarterly Quality Assurance tests have been reported to the AQD.

VI. Monitoring/Recordkeeping:
As previously stated, VEs are checked twice daily and logged on the "Auxiliary Log Sheet". Records of natural gas to the boilers are kept by the source on a continuous basis. CEMS are installed, operated and tested in accordance with the applicable requirements. This is verified through quarterly audits and annual RATA. NSPS Subpart Db recordkeeping is submitted quarterly with EER. No excess emissions were reported during the last year.

VII. Reporting:
The semi-annual reports and annual compliance reports for ROP certification were submitted to AQD in a timely manner. During the reporting period the permittee reported all monitoring and associated recordkeeping requirements. Exceedances of the limit, when they occur are reported throughout the year and in quarterly EERs. No excess emissions were reported during the last year.

Testing protocols and test reports, established in the ROP, were submitted within appropriate time frames.

VIII. Stack/Vent Restrictions:
Stack parameters for FGBOILERS have not changed from the previous inspection and appear to be accurate.

IX. Other Requirements:
As previously stated, Michigan Power has an approved MAP that covers the entire source including the boilers. There were no malfunctions of the boilers during the review period. Additionally, although the ROP does not address FGBOILERS subject to the NSPS 40 CFR Part 60, Subpart Db under "Other Requirements", the facility appeared to comply with the NSPS requirements.

FG-MACT-ZZZZ-EMERGENCY RICE: A less than 500hp Caterpillar 3406 compression ignition (CI) emergency reciprocating internal combustion engine (RICE), stand by fire water pump and one less than 500hp Caterpillar 3516 DITA CI RICE emergency stand by diesel-fired generator as identified within 40 CFR, Part 63, Subpart ZZZZ, 63.6590(a)(1). EUFIREPUMP and EUGENERATOR are not connected to the public electrical grid and are only used to provide a backup water pumping capability and to supply power internally.

FGCOLDCLEANERS: This flexible group includes any cold cleaner that is grandfathered or exempt from Rule 201 pursuant to Rule 278 and Rule 281(2)(h) or Rule 285(2)(r)(iv), existing cold cleaners that were placed into operation prior to July 1, 1979, and new cold cleaners that were placed into operation on or after July 1, 1979.

I. Emission Limits:

Emission Limits are not applicable for FGCOLDCLEANERS.

II. Material Limits:
Cleaning Solvents containing more than 5 percent by weight of the following halogenated compounds: methylene chloride, perchloroethylene, trichloroethylene, 1,1,1-trichloroethane, carbon tetrachloride, chloroform, or any combination thereof shall not be used. Michigan Power keeps log right next to the cold cleaner at the facility. Vesco Oil services the cold cleaner and replaces any solution that is necessary approximately two times per year.

III. Process/Operational Restrictions:
The facilities parts cleaner appeared to be well maintained. According to Mr. Cox, the parts are dried appropriately, and as previously stated, routine maintenance is completed by an outside contract.

IV. Design/Equipment Parameters:
During the inspection, the cold cleaner appeared to in compliance with the listed design and equipment parameters. The solvent is not agitated or heated to clean the parts. AQD observed the lid closed and proper instructions on the parts cleaner.

V. Testing/Sampling:
Testing/Sampling requirements are not applicable for FGCOLDCLEANERS.

VI. Monitoring/Recordkeeping:
During the field inspection, I observed the file on the side of the cold cleaner that gave proper use instructions of the cold cleaner, and the file listed: the serial number; the date the unit was installed; the Reid vapor pressure of each solvent used. Additionally, monthly records showed the amount of solvent evaporated into the atmosphere, and what was replaced back into the container.

VII. Reporting:
Reporting of any semi-annual reports, and annual compliance reports for ROP certification were submitted to AQD in a timely manner. No deviations were reported for FGCOLDCLEANERS.

VIII. Stack/Vent Restrictions:
Stack/Vent Restrictions requirements are not applicable for FGCOLDCLEANERS.

IX. Other Requirements:
Other Requirements are not applicable for FGCOLDCLEANERS.

Caryn Owens 8/27/20 Shane Moxon