

**DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: On-site Inspection**

P066856326

FACILITY: Marquette Board of Light and Power		SRN / ID: P0668
LOCATION: 2200 Wright Street, MARQUETTE		DISTRICT: Marquette
CITY: MARQUETTE		COUNTY: MARQUETTE
CONTACT: Tom Skewis , Environmental Compliance		ACTIVITY DATE: 12/09/2020
STAFF: Sydney Hewson	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Onsite inspection to verify compliance with MI-ROP-P0668-2019 and all other applicable state and federal air quality regulations		
RESOLVED COMPLAINTS:		

On December 9, 2020 I (Sydney Hewson) performed an onsite inspection of Marquette Board of Light and Power—Marquette Energy Center (MEC) located at 2200 Wright Street Marquette Michigan. While onsite I met with Tom Skewis, Environmental Technician. Mr. Skewis was able to provide me with all required records and give me a tour of the facility.

Facility Description:

The Marquette Board of Light and Power—MEC consists of three dual-fired Wartsila 18V50DF, 4 stroke, Lean Burn, Nominal 17 MW Reciprocating Internal Combustion Engines (RICE), one 400 KW emergency diesel fired generator, and one Natural Gas/Propane Fired emergency generator. The Natural Gas emergency generator is subject to 40 CFR Part 60, Subpart JJJJ. The Wartsila engines primarily operate on natural gas, diesel fuel is only used as a back up fuel and for startup. SCR (Urea injection) is used to control NOx emissions and an oxidation catalyst is used to control VOC and CO emissions. Installation of the engines was completed on August 25, 2017. The facility submitted an initial Renewable Operating Permit (ROP) application on July 18, 2018, the ROP was issued October 1, 2019. The facility is a major source for NOx and is subject to Part 60 Subpart IIII and Subpart JJJJ, and Part 63 Subpart ZZZZ.

This inspection was completed to verify compliance with MI-ROP-P0668-2019. Below is a compliance evaluation summary for each emission unit and flexible group covered under the ROP.

SOURCEWIDE

Description: The following conditions apply source-wide to all process equipment including equipment covered by other permits, grand-fathered equipment and exempt equipment.

Emission Limits (SC I. 1-4):

Pollutant	Emission Limit	Actual Emissions (Through November 2020)
NOx	222 tpy	14.74 tpy
VOC	218 tpy	6.46 tpy
Individual HAP	8.9 tpy	3.91 tpy
Aggregate HAP	22.4 tpy	3.91 tpy

Process/Operational Restrictions (SC III. 1-3)

MBLP shall not operate EUENGINE01, EUENGINE02, and EUENGINE03 while firing fuel oil for more than 6,000 total hours combined per year on a 12-month rolling time period basis as determined at the end of each calendar

month. The 12 month rolling sum of hours of operation for EUENGINE01, EUENGINE02, and EUENGINE03 was 177 hours through November 2020.

Total startups for all units in FGNGOP and FGDIESELOP combined is limited to 4,380 startup events per year on a 12-month rolling time period basis as determined at the end of each calendar month. The facility had 984 starts through November 2020.

Startup for EUENGINE01, EUENGINE02, and EUENGINE03 combined is limited to 825 startup events while firing fuel oil per year on a 12-month rolling time period basis as determined at the end of each calendar month. Of the 825 events, the cold startups while firing fuel oil for EUENGINE01, EUENGINE02, and EUENGINE03 combined shall not exceed 375 cold startup events while firing fuel oil per year on a 12-month rolling time period basis as determined at the end of each calendar month, where a cold startup is defined as a startup following a minimum of 24 hours of non-operation of the engine. The 12 month rolling sum for cold and standard Fuel Oil starts were 12 starts and 2 cold starts through November 2020

Monitoring/Recordkeeping (SC VI. 1-6):

MBLP monitors and records the total hours of operation when firing fuel oil in EUENGINE01, EUENGINE02, and EUENGINE03 monthly. The facility calculates the total hours of operation when firing fuel oil for EUENGINE01, EUENGINE02, and EUENGINE03 combined on a monthly and 12 month rolling time period basis. The facility monitors and records the number of total startup events when firing fuel oil and the number of total cold startup events when firing fuel oil in EUENGINE01, EUENGINE02, and EUENGINE03 on a monthly basis. MBLP calculates the total number of startup events for EUENGINE01, EUENGINE02, and EUENGINE03 combined and the total number of cold startup events for EUENGINE01, EUENGINE02, and EUENGINE03 combined on a monthly and 12-month rolling time period basis. The facility also calculates facility wide NOx, VOC, and individual HAP calculations on an monthly and 12 month rolling basis.

EUEDG

Description: 400 KW emergency diesel fired generator. This engine is used to supply power to the Wartsila engine auxiliary equipment during an interruption of the electrical supply.

Emission Limits:

Pollutant	Emission Limit	Description of Compliance
NMHC + NOx	4.0 g/kW-hr	**The engine is certified by the manufacturer to meet the applicable emission standards
CO	3.5 g/kW-hr	**
PM	0.20 g/kW-hr	**

Material Limits (SC II. 1):

The facility only burns ultra-low diesel fuel in EUEDG with a maximum sulfur content of 15 ppm (0.0015 percent by weight) and a minimum cetane index of 40. Records for the most recent delivery (10-21-2020 is attached to the hard file of this report, The sulfur content was 3.2 ppm the cetane index was 43.

Process/Operational Restrictions (SC III. 1-5):

The 12-month rolling time period through November 2020 for EUEDG was 2.8 hours, this is compliant with the limit of 500 hours per 12-month time period. Maintenance records for EUEDG are attached to the hard file of this report.

Design/Equipment Parameters (SC IV. 1):

EUEDG is equipped with a non-resettable hour meter.

Testing/Sampling (SC V. 1):

EUEDG is a certified engine.

Monitoring/Record Keeping (SC VI. 1-3):

Fuel supplier certification records and fuel sample test data are maintained for each diesel fuel delivery. The facility monitors and records the hours of operation for EUEDG, for emergencies and non-emergencies.

Reporting (SC VII. 1-2):

The facility notified AQD within 30 days of completion of installation of EUEDG, this notification was received September 1, 2017, installation was completed/trial operation began August 25, 2017.

Other Requirements (SC IX. 1-2):

It appears the facility is meeting the requirements of 40 CFR Part 60 Subpart IIII and 40 CFR Part 63 Subpart ZZZZ.

EUNGENINE

Description: An existing emergency generator firing natural gas and propane, which is subject to the New Source Performance Standards for Stationary Spark Ignition Internal Combustion Engines, 40 CFR Part 60, Subpart JJJJ.

Process/Operational Restrictions (SC III. 1): The permittee shall operate the emergency generator EUNGENINE for emergency use only, except for 100 hours per calendar year for maintenance checks and readiness testing. MBLP operated EUNGENINE 22.6 hours in 2020.

Monitoring/Recordkeeping (SC VI. 1): MBLP monitors and records the hours of operation of EUNGENINE, on a monthly and 12-month rolling time period basis, including how many hours are spent for emergency operation, what classified the operation as emergency, and how many hours are spent for non-emergency operation.

Other Requirements (IX.1): It appears MBLP complies with all applicable provisions of the New Source Performance Standards for Stationary Spark Ignition Internal Combustion Engines, 40 CFR Part 60, Subpart JJJJ and National Emission Standards for Hazardous Air Pollutants, as specified in 40 CFR Part 63, Subpart A and Subpart ZZZZ, for Stationary Reciprocating Internal Combustion Engines.

FGNGOP

Description: This flexible group consists of the Wärtsilä 18V50DF Engines while firing natural gas as the primary fuel. The terms and conditions of FGNGOP are triggered only when less than 2 % of the fuel fired in each engine in FGNGOP on an annual average is fuel oil, such that the engines meet the definition of a spark ignition engine.

Emission Units: EU-ENGINE01, EU-ENGINE02, EU-ENGINE03

Pollution Control: SCR for NOx control and oxidation catalyst for VOC and CO control.

Emission Limits (SC I. 1-5):

Pollution	Emission Limits	Actual Emissions EUENGINES01	Actual Emissions EUENGINE02	Actual Emissions EUENGINE03	Record Reviewed/Stack Test
NOx	3.3 pph	0.7 pph	1.0 pph	1.6 pph	

					Stack test performed on EU-ENGINE03 (07/24/19), EUENGINE01 (March 19, 2019) EUENGINE02 (07/23/2019)
NOx	1.0 g/hp-hr	0.14 g/hp-hr	0.02 g/hp-hr	0.031 g/hp-hr	Stack test performed on EU-ENGINE03 (07/24/19), EUENGINE01 (March 19, 2019) EUENGINE02 (07/23/2019)
CO	5.0 pph	0.2 pph	0.2 pph	0.1 pph	Stack test performed on EU-ENGINE03 (07/24/19) EUENGINE01 (March 19, 2019) EUENGINE02 (07/23/2019)
CO	2.0 g/hp-hr	0.005 g/hp-hr	0.003 g/hp-hr	0.002 g/hp-hr	Stack test performed on EU-ENGINE03 (07/24/19) EUENGINE01 (March 19, 2019) EUENGINE02 (07/23/2019)
VOC	0.7 g/hp-hr	0.034 g/hp-hr	0.031 g/hp-hr	0.017 g/hp-hr	Stack test performed on EU-ENGINE03 (07/24/19) EUENGINE01 (March 19, 2019) EUENGINE02 (07/23/2019)

Process/Operational Restrictions (SC III. 1-5):

The facility has submitted a MAP for FGNGOP, weekly checks include checking the pressure drop over the reactor, the outlet temperatures, reactor inlet temperatures, and engine loads. The facility also inspects the piping, valves, and flow meters for leaks. These activities are continuously done by operators, findings are recorded weekly.

Design/Equipment Parameters (SC IV. 1):

The facility only operates FGNGOP with an SCR and Catalyst installed, maintained and operated.

Testing Sampling:

Emissions Testing for CO, NOx, and VOCs while operating on Natural Gas was last performed July 23-24, 2019.

Monitoring/ Recordkeeping (SC VI. 1-3):

The facility monitors and records hours of start up for each engine and the number of starts. They maintain testing and maintenance records, these were reviewed onsite during my inspection.

Reporting (SC VII. 1-3):

Marquette Board of Light and Power submits semi annual and annual ROP certifications, deviation reports, and CA< excursion/exceedance reports, the last reports were received August 19, 2020.

Other Requirements (SC. IX. 1-2):

The facility appears to meet the requirements of 40 CFR Part 60 Subpart JJJJ and 40 CFR Part 63 Subpart ZZZZ.

FGDIESELOP

Description: This flexible group consists of the Wärtsilä 18V50DF Engines while firing fuel oil as the primary fuel. The terms and conditions of FGDIESELOP are triggered only when equal to or greater than 2 % of the fuel fired in each engine in FGDIESELOP on an annual average is fuel oil, such that the engines meet the definition of a compression ignition engine.

Emission Units: EUENGINE02, EUENGINE02, EUENGINE03

Pollution Control: SCR for NOx control and oxidation catalyst for VOC and CO control

Emission Limits (SC I. 1-4):

Pollutant	Emission Limit	Actual Emissions EUENGINE01	Actual Emissions EUENGINE02	Actual Emissions EUENGINE03	Stack Test/Record Reviewed
NOx	21 pph	8.7 lb/hr	8.0lb/hr	8.1 lb/hr	EUENGINE01 was tested July 25,2019 EUENGINE02 was tested July 23, 2019 EUENGINE03 was tested July 24, 2019
NOx	2.58 g/HP-hr	0.174 g/HP-hr	0.161 g/HP-hr	0.164 g/HP-hr	Stack Test performed June 27-June 30, 2017
PM	0.15 g/kW-hr	0.011 g/kW-hr	0.032 g/kW-hr	0.024 g/kW-hr	Stack Test performed June 27-June 30, 2017
SO2	7.8 pph	The facility is only required to test SO2 emissions while operating on diesel fuel if requested by the AQD. The facility monitors the sulfur content of the diesel fuel in lieu of testing for SO2.			

Material Limits (SC II. 1):

The permittee burns diesel fuel containing less than 500 ppm sulfur (0.05 percent by weight). Fuel analysis sheets for the last fuel shipment is attached to the hard file of this report. The sulfur content 3.2 ppm.

Process/Operational Restrictions (SC III. 1-6):

The facility operates under an approved MAP as discussed under FGNGOP.

Non-Emergency operation of each engine is limited to less than 100 hours per calendar year.

Design/Equipment Parameters (SC IV. 1-2):

Each engine has a nonresettable hours meter installed to track the hours of operation. Each engine also has an SCR and an oxidation catalyst installed.

Testing/Sampling (SC V. 1-2):

The facility performed emissions testing for NOx, PM, and VOCs July 23-25, 2019. They plan to retest the engines summer 2021. Results are discussed above in the Emission Limits section.

Monitoring/Recordkeeping (SC VI. 1-5):

The facility monitors and records the total hours of start up when firing fuel. They maintain fuel supplier certification record and fuel sample test results for each delivery. Records from the last delivery is attached to the hard copy of this report.

Other Requirements (SC IX. 1-3):

The facility appears to be meeting the requirements of 40 CFR Part 60 Subpart IIII and Part 63 Subpart ZZZZ.

The facility is subject to 40 CFR Part 64 rules for Compliance Assurance Monitoring (CAM) but is not required to submit a CAM plan until the ROP is renewed in 2024.

Compliance Determination:

At the time of my inspection it appeared Marquette Board of Light and Power P0668 was in compliance with MI-ROP-P0668-2019 and all applicable state and federal air quality regulations.

NAME



DATE

01-06-20
~~12-18-20~~

SUPERVISOR

