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

B280361943

FACILITY: DTE Electric Company - Placid Peaking Facility		**SRN / ID:** B2803
LOCATION: 4912 EDGAR ROAD, CLARKSTON		**DISTRICT:** Warren
CITY: CLARKSTON		**COUNTY:** OAKLAND
CONTACT: Amanda Kosch , Technical Supervisor, Environmental M & S		**ACTIVITY DATE:** 01/11/2022
STAFF: Shamim Ahammod	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: Conducted a scheduled on-site inspection of the DTE Electric Company-Placid Peaking Facility (B2803) to determine the company's compliance with the requirements ROP No. MI-ROP-B2803-2018a.		
RESOLVED COMPLAINTS:		

On January 11, 2021, at about 11:00 AM, I (Shamim Ahammod), Michigan Department of Environmental Great lakes and Energy (EGLE-AQD) staff, I, Shamim Ahammod, conducted a scheduled on-site inspection of the DTE Electric Company-Placid Peaking Facility (B2803) located at 4812 Edgar Road, Clarkston, Michigan. The purpose of the inspection was to determine the company's compliance with the requirements of the federal Clean Air Act; Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451); the Air Pollution Control Rules; and the conditions of ROP No. MI-ROP-B2803-2018a. Flame-resistant clothing, hard hats, safety glasses, N-95 Mask, hearing protection, and hard soled boots are required to be worn when on-site.

Source Description

There are five diesel/No. 2 fuel oil-fired generator sets, each equipped with a diesel oxidation catalyst, and one 30,000 gallons (114 cubic meters) fuel tank on-site. These engines are used to generate additional electricity during periods of high customer demand. The five diesel-fired compression-ignition reciprocating internal combustion engines (RICE) are rated at 3,600 horsepower and have a 2.75-megawatt electrical generator connected to each engine. The engines were installed in 1970. The oxidation catalysts were installed on each engine in 2012. At the time of engine installation, fuel-oil burning equipment used for electric power generation was exempt from permitting under Rule 336.33(f) and Rule 336.36(c). The facility is bordered on the north side by Foster Lake and undeveloped land to the east. Nearby residential properties are located to the west and south of the facility. The nearest residents are located ~400 feet to the west and south.

Regulatory Analysis

The stationary source is located in Oakland County, which is currently designated by the U.S. Environmental Protection Agency (USEPA) as a non-attainment area with respect to the 8-hour ozone standard.

The stationary source is subject to Title 40 of the Code of Federal Regulations (CFR) Part 70 because the potential to emit NOx, SO_2, and CO exceeds 100 tons per year.

No emissions units at the stationary source are currently subject to the Prevention of Significant Deterioration (PSD) regulations of The Michigan Air Pollution Control Rules Part 18, Prevention of Significant Deterioration of Air Quality or 40 CFR 52.21 because the process equipment was constructed/installed prior to June 19, 1978, the promulgation date of the PSD regulations.

The emission limitation(s) or standard(s) for carbon monoxide from EU00001, EU00002, EU00003, EU00004, and EU00005 at the stationary source is exempt from the federal Compliance Assurance Monitoring (CAM) regulation under 40 CFR 64.2(b)(1)(i) because carbon monoxide is addressed by 40 CFR Part 63, Subparts ZZZZ. Therefore, EU00001, EU00002, EU00003, EU00004, and EU00005 are exempt from CAM requirements for carbon monoxide.

Onsite Inspection

At 11:10 AM, I arrived at the facility and met with Mr. Tom Anderson, DTE Energy Technical Staff, and Amanda Kosch, Technical Supervisor, DTE Energy, Environmental Management & Safety. I introduced myself and explained the reason for my visit. Mr. Anderson instructed us on the safety guidelines and procedures during the visit. I wore PPE and FR clothes that are required in the Peaking facility.

During my onsite inspection, I observed the digital monitoring screen of each engine and recorded the total operating hours as of January 11, 2022.

Emission units	Operating hours of the engines as of January 11, 2022 (hours)
EU00001- PLACID DG 12 PEAKERS, 12-1	7730.6 hours
EU00002 PLACID DG 12 PEAKERS, 12-2	7565.3 hours
EU00003 PLACID DG 12 PEAKERS, 12-3	7178.5 hours
EU00004 PLACID DG 12 PEAKERS, 12-4	7539.2 hours
EU00005 PLACID DG 12 PEAKERS, 12-5	7332 hours

At the time of the inspection, no emission units were in operation. I was informed that these engines only need to be operated when the electricity demand is high and to check the engines. The engines run mainly in summer and during really cold winter weather. The oxidation catalysts were installed on each engine.

FGPEAKERS
FLEXIBLE GROUP CONDITIONS

FGPEAKERS consists of five Peaker engines. These emissions units are identified as EU00001, EU00002, EU00003, EU00004, and EU00005, each with emissions controlled by a diesel oxidation catalyst. The FGPEAKERS table in the ROP contains conditions from the National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines promulgated in 40 CFR Part 63, Subparts A and ZZZZ (RICE Area Source MACT).

Emission Limits

Pollutant	**Limit**	**Equipment**
1. CO	23 ppmv dry at 15% oxygen-OR-70% reduction or more.	Each engine in FGPEAKERS

Per SC I.1, on June 01-04, 2021, emission tests were performed on Units 12-1 to 12-5 for carbon monoxide (CO) destruction efficiency. The results of the emissions testing are given below:

Unit	Source Unit	Test Date	CO Reduction (%)	CO reduction limit (%)
1	DG 12-1	6/4/2021	90.9	70% or more
2	DG 12-2	6/3/2021	90.0* 17.2@15% O2	70% or more
3	DG 12-3	6/2/2021	90.3	70% or more
4	DG 12-4	6/1/2021	93.5	70% or more

5	DG 12-5	6/1/2021	90.4	70% or more

***Unit 12-2 Inlet Run 2 – Results indicate an O2 leak. Compliance based on outlet CO Emissions.** FGPEAKERS SC I.1 allows DTE to show compliance by complying with a carbon monoxide (CO) limit of 23 ppmvd @15% O2 OR 70% CO reduction. Therefore, DTE chose to not show compliance based on the CO % reduction (which relies on the inlet O2 results). DTE chose to show compliance based on the CO outlet emission concentration, whose measurements did not experience any issues. The average outlet CO concentration results were 17.2 ppmvd @ 15% O2 which were below the permitted 23 ppmvd @15% O2 limit. The results of the testing indicate that Units 12-1 to 12-5 comply with 40 CFR part 63 Subpart ZZZZ requirements of reducing CO emissions by 70% or more.

Material Limits

In my last inspection on January 21, 2021, per SC II.1, a copy of the Fuel Oil Supply Agreement between Marathon Petroleum Company and DTE was provided via email for Ultra Low Sulfur No. 2 Diesel (No. 2 MV15). The term of this agreement is from January 1, 2021, to December 31, 2023. It lists by wt. as 15 ppm (0.0015% by wt) which is below the limit of 1.5% sulfur by weight as specified in SC II.1.

Process/Operational Restrictions

Per SC III.2, the permittee shall not operate an engine in FGPEAKERS unless the pressure drop across the catalyst does not change by more than two inches of water from the pressure drop across the catalyst that was measured during the initial performance test of the oxidation catalyst.
I reviewed the CPMS data from September 2017 through October 2021 and found the pressure drop was less than two inches of water across the catalyst.

Placid 1
Based on June 1-4, 2021 Compliance Test Report, Placid 1, performance test pressure was 0.003 in. H2O. During the review of CPMS data from September 2017 through October 2021, I found the maximum pressure drop in EU00001 (PLACID DG 12 PEAKERS, 12-1) was 0.949 in H2O on January 30, 2019.

- Pressure drop change from the initial performance test was, 0.949-0.003 = 0.946 in H2O

Placid 2
Based on June 1-4, 2021, Compliance Test Report, Placid 2, performance test pressure was 0.005 in. H2O. During the review of CPMS data from September 2017 through October 2021, I found the maximum pressure drop in EU00002 (PLACID DG 12 PEAKERS, 12-2) was 0.69 in H2O on January 30, 2019.

- Pressure drop change from the initial performance test was, 0.69-0.005 = 0.685 in H2O.

Placid 3
Based on June 1-4, 2021, Compliance Test Report, Placid 3, performance test pressure was -0.026 in. H2O. During the review of CPMS data from September 2017 through October 2021, I found the maximum pressure drop in EU00003 (PLACID DG 12 PEAKERS, 12-3) was 0.67 in H2O on July 13, 2018.

- Pressure drop change from the initial performance test was 0.67-(-0.026) = 0.696 in H2O.

Placid 4

Based on June 1-4, 2021, Compliance Test Report, Placid 4, performance test pressure was 0.006 in. H2O. During the review of CPMS data from September 2017 through October 2021, I found the maximum pressure drop in EU00004 (PLACID DG 12 PEAKERS, 12-4) was 0.787 in H2O on July 6, 2020.

- Pressure drop change from the initial performance test was 0.787-0.006 = 0.781 in H2O.

Placid 5
Based on June 1-4, 2021, Compliance Test Report, Placid 5, performance test pressure was -0.025 in. H2O. During the review of CPMS data from September 2017 through October 2021, I found the maximum pressure drop in EU00005 (PLACID DG 12 PEAKERS, 12-5) was 0.816 in H2O on July 8, 2020.

- Pressure drop change from the initial performance test was 0.816-(-0.025) = 0.841 in H2O.

Per SC III.3, the permittee shall not operate an engine in FGPEAKERS unless the oxidation catalyst inlet temperature is greater than or equal to 450°F and less than or equal to 1350°F.
Per SC III.3, and SC VI.10.a.

Via email, on January 14, 2022, Ms. Kosch, sent me CPMS data for FGPEAKERS from September 2017 to October 2021. I reviewed the CPMS data. The measurements were presented for every 15 minutes of operation. I found the oxidation catalyst inlet temperature (4 hour rolling average) of the engine in FGPEAKERS was greater than or equal to 450°F and less than or equal to 1350°F except for the following circumstance: On August 24, 2021, through August 25, 2021, on EU00002 at Placid Peaking Facility, the oxidation catalyst inlet temperature range (15-minute average instant temperature) was less than 450°F over 6 operating, quarter hours. As a result, the 4-hour rolling average oxidation catalyst inlet temperature range dropped below 450°F on October 5th, 2021 on EU00002 at Placid Peaking Facility.

According to the permittee record, “The unit ran in total 2 different times on 2 separate days on 8/24/2021 (from 15:50-16:50) and 8/25/2021 (from 16:18-16:48). During this time, there were six 15-minute instant readings (Event ID 4) on 8/24/2021 – 8/25/2021 ranging from 199.5842 to 231.5977 which excludes the two 15- minute instant readings from each startup”. More details are explained in the Monitoring/record-keeping section (SC VI.5 and VI.8).

Via email, on March 9, 2022, Mr. Ignatius A Fadanelli, DTE Staff, re-submitted CPMS data for FGPEAKERS from September 2017 to October 2021. Based on new data provided on March 9, 2022, by Mr. Fadanelli, it appears the 4-hour rolling average oxidation catalyst inlet temperature range was not less than 450°F on October 5th, 2021 for EU00002 at Placid Peaking Facility. In the calculations provided by Mr. Fadanelli, DTE added one 15-minute start-up data for 10/5/2021 at 12:42 (second 15-minute start-up data) to recalculate the 4-hour rolling average oxidation catalyst inlet temperature. In general, DTE does not include two 15-minutes start-up data to calculate the hourly and 4-hour rolling average temperature. Per SC III.5, the emission standards applicable to all times other than startup apply after the period needed for appropriate and safe loading of the engine, not to exceed 30 minutes. At this time, AQD will not evaluate DTE’s compliance with SC III.3 based on guidance from AQD upper management which states AQD will not verify compliance with RICE MACT at Area sources during inspections nor take any enforcement actions for these sources.

Per SC III.4, The permittee shall operate the CI RICE in compliance with the emission limitations and operating limitations SC I.1 and SC III.2 and III.3 at all times. More details are explained in SC I.1, SC III.2, and SC III.3.

Per SC III.5, The permittee shall minimize the time spent at idle during startup and minimize the startup time of an engine in FGPEAKERS to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the emission standards applicable to all times other than startup apply.

According to the SSP plan, "During a normal start, once initiated, the startup consists of a rolling unit start where each unit has a 90-second start and idle delay, then goes into a 10-second acceleration, 10-20 second synchronizing period, and then a 10-30 second loading period. The maximum total startup time for the units to come to loading is 180 seconds from the time of startup initiation". However, the permittee excludes the first two 15 minutes start-up data (catalyst inlet temperature) to calculate the hourly as well as 4 hours rolling average temperature.
Per SC III.6, I received a CPMS plan that addresses the equipment performance criteria and design specifications, sampling interface, operating & maintenance procedures, and reporting & recordkeeping.

Per SC III.7, If a CMPS is used to meet SC IV.2, the permittee shall:

a. Ensure that the continuous parameter monitoring system (CPMS) collects data at least once every 15 minutes. For a CPMS for measuring temperature range, the temperature sensor must have a minimum tolerance of 2.8°C (5°F) or one percent of the measurement range, whichever is larger.

- The requirement of SC III.7 has been explained in SC IV.1 (Design/Equipment parameters).

b. Conduct a performance evaluation of each CPMS in accordance with their site-specific monitoring plan. The permittee shall conduct the CPMS equipment performance evaluation, system accuracy audits, or other audit procedures specified in their site-specific monitoring plan at least annually.

- The requirement of SC III.7.b has been explained in SC VI.6 (Monitoring/Record-keeping) and SC I.1 (Emission Limit).

Design/Equipment Parameters
Per SC IV.1, the permittee shall not operate an engine in FGPEAKERS unless the catalytic oxidation system for that engine is installed, maintained, and operated satisfactory and according to the procedures in their site-specific monitoring plan (40 CFR 63.66039(a), 40 CFR 63.6625(b), 40 CFR 63.6640). I received the site-specific monitoring plan via email. The oxidation catalysts were installed on each engine.

Equipment Name	Type of Equipment	Permit Status (permitted /grandfathered/ exempt)	Date Installed
Peaking Unit DG11-1	Engine	permitted	11/21/1970 **8/28/2012** catalyst
Peaking Unit DG11-2	Engine	permitted	11/21/1970 **8/28/2012** catalyst

Peaking Unit DG11-3	Engine	permitted	11/21/1970 **8/28/2012** catalyst
Peaking Unit DG11-4	Engine	permitted	11/21/1970 **8/28/2012** catalyst
Peaking Unit DG11-5	Engine	permitted	11/21/1970 **8/28/2012** catalyst

I have attached a picture of the catalytic oxidation system at the end of this report. Each engine has a separate enclosure shed. The engines are vented on the roof of the shed and the catalyst is installed in a horizontal run of ductwork on the roof. A short elbow directs the exhaust gases upwards to the ambient air about 10 to 15 feet from ground level.

I reviewed the CPMS data from September 2017 through October 2021 for each of the five engines at Placid Peaking Station to verify the 4-hour rolling-averages temperature at the catalyst inlet and pressure drop (monthly) across the catalyst. It appears the permittee records the differential pressure (in. H2O) and instant temperature (deg. F) from Dynalco Monitor every 15-minute interval while the engines are running. The permittee has calculated hourly average as well as 4 hour rolling average temperature in MS excel sheet based on instant temperature.
According to CPMS plans, the Diesel oxidation Catalyst (DOC) monitor records the control device inlet gas temperature, pressure drop across the catalyst bed, and date/time stamps of all records.

Per SC IV.2, The permittee shall install, operate, and maintain a CPMS or have installed equipment to automatically shut down the engine if the catalyst inlet temperature exceeds 1350 °F. It appears the CPMS is installed, operated, and maintained according to the procedures of the monitoring plan. According to the Monitoring plan, the permittee has set up the Catalyst monitor off an alarm when differential values are above or below the following limit:
Diesel Oxidation Catalysts alarm thresholds:

Monitored parameter	Malfunctioned Threshold
Pressure drop across the catalyst	Less than 2 inches of water
Engine exhaust temperature at catalyst inlet	1350 **?** ≥ Temperature >450 **?**

Testing/Sampling
Per SC V.1, on June 1-4, 2021, an emission test was conducted on five (5) 3,600 Brake-HP diesel engines to satisfy the requirements of 40 CFR Part 63 Subpart ZZZZ. The results of the emissions testing are described in Emission Limit section.

Monitoring/Recordkeeping
Per SC VI.1, the permittee shall maintain a complete record of fuel oil specification and/or a fuel oil analysis for each delivery, or storage tank of fuel oil. A copy of the Fuel Oil Supply Agreement between Marathon Petroleum Company and DTE was provided via email for Ultra Low Sulfur No. 2 Diesel (No. 2 MV15). The term of this agreement is from January 1, 2021, to December 31, 2023. It lists by wt. as 15 ppm (0.0015% by wt).

Per SC VI.2, The permittee shall continuously monitor the catalyst parameters at all times that the stationary RICE is operating. I reviewed the CPMS data from September 2017 through October 2021 for each of the five engines at Placid Peaking Station to verify the 4-hour rolling-averages temperature at the catalyst inlet and pressure drop (monthly) across the catalyst. It appears the permittee records the differential pressure (in. H2O) and instant temperature (deg. F) from Dynalco Monitor every 15-minute interval while the engines are running. The permittee has calculated hourly

average as well as 4 hours rolling average temperature in MS excel sheet based on instant temperature.
According to CPMS plans, the Diesel oxidation Catalyst (DOC) monitor records the control device inlet gas temperature, pressure drop across the catalyst bed, and date/time stamps of all records.

SC VI.3, The permittee shall not use data recorded during monitoring malfunctions, associated repairs, and required quality assurance or control activities in data averages and calculations used to report emission or operating levels. The permittee must, however, use all the valid data collected during all other periods. (40 CFR 63.6635(c))

- There was no malfunction in the monitor according to Ms. Kosch.

Per SC VI.5, the permittee shall maintain records of the occurrence and duration of each malfunction of operation (i.e., process equipment) or the air pollution control and monitoring equipment. Based on my requests, the permittee provided the records of the occurrence and duration of the malfunction that occurred in the oxidation catalyst. On August 24, 2021, through August 25, 2021, on EU00002 at Placid Peaking Facility, the oxidation catalyst inlet temperature range dropped below 450°F over the period of 6 operating, quarter hours. More details are explained in SC VI.8.

SC VI.6, The permittee shall maintain records of performance tests and performance evaluations. These records shall be kept on file and made available to the Department upon request. (40 CFR 63.6655(a)(3), 40 CFR 63.6660)
Per SC I.1(Emission Limits), on June 01-04, 2021, emission tests were performed on Units 12-1 to 12-5 for carbon monoxide (CO) destruction efficiency. Per SC VI.6, the permittee provided the performance test report via email. The performance evaluation was conducted during the performance test.

SC VI.7, The permittee shall maintain records of all required maintenance performed on the air pollution control and monitoring equipment. These records shall be kept on file and made available to the Department upon request.

According to Ms. Kosch, there wasn't any maintenance specific to the catalysts. The permittee conducted an annual performance evaluation during the CO test on June 1-4, 2021. More details are explained in the Testing/sampling and emission limit section.
According to SC VI.8, the permittee shall maintain records of action taken during periods of malfunction to minimize, including corrective actions to restore malfunction process and air pollution control and monitoring equipment to its normal manner of operation. Via email, the permittee provided a deviation report including records of action taken during periods of malfunction.

According to the permittee deviation report, the alarm on the CPMS was triggered on August 24, 2021, for EU00002, due to the temperature dropping below 450°F. The unit ran in total 2 different times on 2 separate days on 8/24/2021 (from 15:50-16:50) and 8/25/2021 (from 16:18-16:48). During this time, there were six 15-minute instant readings (Event ID 4) on 8/24/2021 – 8/25/2021 ranging from 199.5842 to 231.5977 which excludes the two 15- minute instant readings from each startup. According to a deviation report from the permittee, 'The total duration of the deviation during the reporting period was one 4-hour rolling average, which was 6% of the total source operating time (66.3 hours) during this ZZZZ reporting period 1/1/2021 – 12/31/2021." This caused 1 4-hour rolling averages on 10/5/2021 (at 14:57:19) to exceed the permit Operating Restrictions.
Per SC 9, The permittee shall maintain the following records for each CPMS on file and make them available to the Department upon request:

a. All required CMS measurements (including monitoring data recorded during unavoidable CMS breakdowns and out-of-control periods);
b. The date and time identifying each period during which the CMS was inoperative except for zero (low-level) and high-level checks;
c. The date and time identifying each period during which the CMS was out of control. A CMS is out of control if—(1) The zero (low-level), mid-level (if applicable), or high-level calibration drift (CD) exceeds two times the applicable CD specification in the applicable performance specification or the relevant standard; or (2) The CMS fails a performance test audit (e.g., cylinder gas audit), relative accuracy audit, relative accuracy test audit, or linearity test audit; or (3) The COMS CD exceeds two times the limit in the applicable performance specification in the relevant standard.
d. The specific identification (i.e., the date and time of commencement and completion) of each period of excess emissions and parameter monitoring exceedances, as defined in the relevant standard(s), that occurs during startups, shutdowns, and malfunctions of the affected source;
e. The specific identification (i.e., the date and time of commencement and completion) of *each time period of excess emissions and parameter monitoring exceedances*, as defined in the relevant standard(s), that occurs during periods other than startups, shutdowns, and malfunctions of the affected source;
f. Records required by the startup, shutdown, and malfunction plan.
g. Previous (i.e., superseded) versions of the performance evaluation plan for a period of five years after each revision of the plan.

h. Requests for alternatives to the relative accuracy test for CPMS, if applicable. (40 CFR 63.6655(b), 40 CFR 63.6660, 40 CFR 63.10(b)(2) and (c), 40 CFR 63.8(f)(6))

- There was no malfunction in the monitor according to Ms. Kosch.

Per SC VI.10(a) and SC VI.10(b), The permittee provided the CPMS (Continuous Parameter Monitoring Systems) data from September 2017 through October 2021 for each of the five engines at Placid Peaking Station. This includes 4-hour rolling-averages temperature at the catalyst inlet and pressure drop (monthly) across the catalyst. More details are explained in SC III.2 and III.3.

Reporting
Per SC VII.2 and SC VII.3, the last semi-annual report Certification and other report certifications (40 CFR Part 63 Subpart ZZZZ) was received on 9/16/2021 and no deviations were noticed on the last semi-annual report certification.

Stack/vent Restrictions: NA

Other Requirements
As mentioned in SC IX.1, the permittee shall comply with all applicable provisions of the 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. Emission testing on five (5) 3,600 Brake-HP diesel engines was conducted on June 1-4, 2021 to satisfy the requirements of 40 CFR Part 63 Subpart ZZZZ. More details are explained in the Monitoring/Recordkeeping section (SC VI.8).

CONCLUSION

Based on an onsite inspection, review of records, and discussion with the facility's staff, the facility appears to be in compliance with the conditions of ROP No. MI-ROP-B2803-2018a.

Figure: Catalytic Oxidation system (FGPEAKERS, Design/Equipment Parameters, SC IV.1)

NAME Shamim Ahammod DATE 03/17/2022 SUPERVISOR Joyce