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

N687357769

FACILITY: DTE Electric Company - Renaissance Power Plant		**SRN / ID:** N6873
LOCATION: 950 N. Division Street, CARSON CITY		**DISTRICT:** Grand Rapids
CITY: CARSON CITY		**COUNTY:** MONTCALM
CONTACT: Matt Kaleyta , Plant Supervisor		**ACTIVITY DATE:** 03/17/2021
STAFF: Kaitlyn DeVries	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: The purpose of this inspection was to determine compliance with MI-ROP-N6873-2020 and any other applicable rules and regulations.		
RESOLVED COMPLAINTS:		

On Wednesday March 17, 2021 Department of Environment, Great Lakes, and Energy (EGLE) Air Quality Division (AQD) staff Kaitlyn DeVries (KD) conducted an announced, scheduled inspection of DTE Electric Company – Renaissance Power Plant located at 950 N. Division, Carson City, Michigan. The inspection was announced in order to ensure that proper safety precautions could be taken to prevent the spread of COVID-19. The purpose of this inspection was to determine compliance with MI-ROP-N6873-2020 and any other applicable rules and regulations. This inspection was done in conjunction with required stack testing, which was also occurring that day.

Upon arrival at the facility, KD checked in with Mr. Mark Grigereit, Principal Engineer, who was in charge of the testing that was being conducted that day. KD and Mr. Grigereit discussed testing prior to KD meeting with Mr. Matt Kaleyta, Plant Manager, who accompanied, KD into the control room and provided KD with all of the information pertinent to the inspection. Social Distancing, and proper PPE, including facial coverings, were donned throughout the inspection.

Units 2 and 3 were in service at the time of the inspection. Unit 2 was being tested on the day of the inspection with testing for Unit 3 expected to commence the following day.

Facility Description

DTE Electric Company – Renaissance Power Plant (RPP) is a natural gas-fired electric generating facility comprised of four (4) simple cycle combustion turbines. It was intended at one point for these units to become combined cycle units, but this change did not occur. Each of the four (4) turbines are equipped with low-NOx burners and are nominally rated at 1,900 MMBTU/hr heat input and can produce 215 megawatts (MW) of electrical power, each. The facility has some other ancillary equipment located on site, consisting of a diesel -fired backup emergency generator, a diesel-fired fire pump for fire control, and a natural gas fired heating unit to condition the natural gas prior to being combusted in the turbines.

RPP was previously issued Violation Notices for exceedances of the PM10 emission limit for FG-TURBINE1-4SC. The testing that was occurring on the day of the inspection was a re-test as a result of the failure on Unit 2. Further discussion of the PM emissions and associated testing can be found in the Compliance Evaluation Section of this report, below.

Regulatory Analysis

RPP is a major source for Nitrogen Oxides (NOx) and Carbon Monoxide (CO) and is subject to the Title V Program. Currently RPP is a minor source of Hazardous Air Pollutants. RPP is currently operating under MI-ROP-N6873-2020. In addition to being

subject to the Title V program, RPP is subject to the Acid Rain Program and the Cross-State Air Pollution Rules (CSAPR). Other emission units located at the facility are subject to the New Source Performance Standards (NSPS) provisions of 40 CFR Part 60 Subpart Dc, 40 CFR Part 60 Subpart GG, and the National Emission Standards for Hazardous Air Pollutants provision of 40 CFR Part 63 Subpart ZZZZ.

Compliance Evaluation

The facility has a source-wide Sulfur Dioxide (SO_2) emission limit of 43.7 tons per year (tpy) based upon a 12-month rolling time period. This limit applies to all combustion equipment located on site, including permitted, exempt, and grandfathered equipment. As of February 2021, the 12-month rolling SO_2 emissions were 2.1 tons. The highest 12-month rolling emission during the previous year was in July 2020 with SO_2 emissions of 4.9 tons.

EU-HEATERSC

This emission unit consists of a 13 MMBtu/hr in-line natural gas-fired heater for heating natural gas prior to use in the turbines. This emission unit is subject to the provision of 40 CFR Part 60 Subpart Dc for Small Industrial-Commercial-Institutional Steam Generating Units. An Initial Notification was received on September 27, 2017. This emission unit was included in the original permitting since the project during New Source Review permitting was subject to review under the Prevention of Significant Deterioration regulations. RPP is properly tracking the natural gas usage in the heater, and in February 2021 a total of 1,677.6 MCF of natural gas was used in this emission unit.

FGTURBINE1-4SC

This flexible group is comprised of four (4) Westinghouse (now Siemens) natural gas fired combustion turbines that operate in the simple cycle mode. Each of the four (4) units are equipped with dry low-NOx combustors that are integral to the firing process and are not considered to be control devices. These turbines are subject to the Standards of Performance for Stationary Gas Turbines promulgated under 40 CFR Part 60 Subpart GG. Some of the requirements of Subpart GG are incorporated into the permit requirements while others have been subsumed due to more stringent permit requirements and the use of CEMS.

As previously mentioned, only Units 2 and 3 were in operation during the time of the inspection. Unit 2 was operating at a load of 185 MW (100% load), and Unit 3 was operating at a load of 173 MW (93% load).

All of the units have individual Continuous Emission Monitoring Systems (CEMS) for NOx, and CO. The units have several emission limits and are each applied individually per turbine. The emission limits are outlined in Table 1.

Table 1: Emission Limits applicable to each turbine individually. All emission data is through January 2021 unless otherwise specified.

Pollutant	Limit	Actual Emissions			
		Unit 1	Unit 2	Unit 3	Unit 4
Nitrogen Oxides (NOx)	15 ppmv at 15% Oxygen, dry[A]	14.7 ppm	11.93 ppm	12.72 ppm	14.1 ppm
NOx	189.2 tons per year (tpy)	76.7 tpy	58.3 tpy	54.6 tpy	59.0 tpy
Carbon Monoxide (CO)	15 ppmv at 15% oxygen, dry[A]	5.8 ppm	0.47 ppm	0.98 ppm	3.2 ppm
CO	115.2 tpy	14.7 tpy	8.6 tpy	4.6 tpy	6.9 tpy
VOC	8.1 tpy	2.8 tpy[B]	2.4 tpy[B]	2.4 tpy[B]	2.5 tpy[B]
Particulate Matter less than 10 microns in diameter (PM10)	9 pounds per hour (pph)	6.5 pph	6.7 pph	6.1 pph	6.2 pph
PM10	14.6 tpy	5.7 tpy[B]	4.4 tpy[B]	4.1 tpy[B]	4.5 tpy[B]
Formaldehyde	6.5 tpy[C]	2.4 tpy			

[A] The limit is based upon an average of all operating hours in a calendar day; Units 2 and 3 values are from March 17, 2021 for NOx and CO. Units 1 and 4 are historic data for NOx, CO, PM10, and VOC – see attached records.
[B] Emissions data is through January 2021.
[C] This limit is applicable to all of the turbines combined.

RPP is properly tracking the daily, and monthly emissions for NOx, CO, VOC, PM10, and the monthly records for formaldehyde, as required. RPP is also properly tracking emissions during startup and shutdown for each of the units. As previously mentioned, RPP was conducting testing as required by FG-TURBINE1-4SC Special Condition V.2. Testing for VOC, PM10, and Formaldehyde is required for each turbine in FG-TURBINE1-4SC at 70% and 100% load at a minimum of every five (5) years from the date of the last testing. The most recent test results for each of the units are outlined in table 2, below.

Table 2: Emissions Test Data

Parameter (limit)	**Unit 1[A]**	**Unit 2[A]**	**Unit 3[C]**	**Unit 4[D]**
VOC (2.0 ppmv at 15% O2)	0.06 ppmvd	0.08 ppmvd	NA[C]	0.438
PM10 (9.0 pph)	8.67 pph	10.60 pph[B,C]	NA[C]	6.77 pph[E]
Formaldehyde (no limit)	0.1143 ppmvw	0.1757 ppmvw	NA[C]	0.23 ppmvw

[A] Most recent testing conducted in November 2020. The results indicated are a mixture of the worst-case emissions from the 70% and 100% load testing.
[B] Testing indicated a failing result at 100% load.
[C] Testing was being conducted on this unit during the March 17, 2021 inspection.
[D] Most recent testing was done in September 2019. The results indicated are a mixture of the worst-case emissions from the 70% and 100% load testing.
[E] Initial testing resulted in a failed test. This result is from the subsequent re-test.

An increased frequency of testing was requested and incorporated into the ROP renewal that occurred in 2020 due to the PM10 emission testing failure that occurred in 2019. The exceedance of the PM10 emission limit at 100% load on Unit 4, resulted in a Violation Notice, and subsequent re-testing. After a second failure, the AQD requested that all four (4) units be tested. Testing has subsequently occurred on all four (4) of the units. During the inspection, Unit 2 was being re-tested due to a PM-10 failure on this unit. A Violation Notice was issued for the emissions exceedance and will be resolved pending a passing result during the re-test. Unit 3 was also being tested the week of the inspection. Neither of those results were available at the time this report was written. If either of the results from those tests indicated an emissions exceedance, appropriate actions will be taken at that time.

Each unit also has an individual opacity limit of 10%, excluding uncombined water vapor, per a 6-minute average. Federal Reference Method 9 readings are required to be conducted by a Certified reader at least once per 1,624 hours of operation. Method 9 records indicate the readings were last conducted on December 1, 2020 for Unit 1 and June 19, 2020 for Units 2, 3, and 4. No opacity was recorded for any of the units. No opacity was noted by KD during the inspection either.

Sulfur content in the natural gas is limited to 0.5 grains per 100 standard cubic feet. The facility only burns pipeline quality natural gas which has a sulfur content of less than 0.5 grains per 100 standard cubic feet. RPP is tracking the amount of natural gas that is used in each turbine on an hourly basis, as required, and the hours of operation for each of the turbines.

Each turbine in this flexible group is limited to a 12-month rolling operational time of 3,250 hours. Records indicate that the 12-month rolling operations as of January 2021 for each of the turbines (1 – 4, respectively) is 2,024 hours, 1,549 hours, 1,446 hours, and 1,580 hours. The facility has implemented and maintains a startup/shutdown/malfunction plan and follows it to minimize emissions during startup and shutdown. The facility is keeping records of the hours of startup and shutdown for each of the four (4) units and the emissions during startup and shutdown. As of January 2021, the 12-month rolling hours of startup/shutdown for each of the four (4) units (Units 1 – 4, respectively) were 21 hours, 14 hours, 12 hours, and 10 hours.

KD did not explicitly measure the stacks, but they appeared to be of correct dimensions.

RPP has successfully been submitting all required reports, including excess emissions reports, semi-annual and annual reports, and MAERS reports. The emissions data reported in this inspection appear to be consistent with that reported for the 2021 MAERS.

FG-ENGINESC

This flexible group ins comprised of two (2) emergency internal combustion engines. Both engines are subject to the provisions of 40 CFR Part 63 Subpart ZZZZ for Stationary Reciprocating Internal Combustion Engines. EU-EDG is a nominally rated 6,000,000 BTU/Hr diesel fired emergency engine; EU-DFP is a diesel fired emergency pump for fire control. Both of these units are equipped with hour meters and operate less than the allowed 500 hours per year, both having run less than 50 hours during the previous 12-month time period.

The engines are limited to 21,000 gallons of diesel fuel per 12-month rolling time period, combined. Based on the usage records, as of February 2021, the 12-month rolling diesel fuel usage was 1,002.9 gallons.

Both units require routine maintenance, such as oil and filter changes every 500 hours of operation, or annually, whichever comes first. Per Mr. Kaleyta, the manufacturer does the required maintenance on the units.

FG-COLDCLEANERS

This flexible group is for any new or existing cold-cleaning parts washers with an air/vapor interface of less than 2 square feet in area and is exempt from Rule 201 permitting under Rule 281(2)(h). Currently the facility has one (1) of these units and it is maintained by Safety Kleen.

Compliance Determination

Based upon the observations made during the inspection and a subsequent review of the records it appears that DTE Electric Company – Renaissance Power Plant is in compliance with MI-ROP-N6873-2020 and other applicable rules and regulations, pending passing results of the PM10 emission tests.

NAME Kaitlyn DeVries DATE 4/22/2021 SUPERVISOR HH