

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

N687367339

<b>FACILITY:</b> DTE Electric Company - Renaissance Power Plant		<b>SRN / ID:</b> N6873
<b>LOCATION:</b> 950 N. Division Street, CARSON CITY		<b>DISTRICT:</b> Grand Rapids
<b>CITY:</b> CARSON CITY		<b>COUNTY:</b> MONTCALM
<b>CONTACT:</b> Matt Kaleyta , Plant Supervisor		<b>ACTIVITY DATE:</b> 05/04/2023
<b>STAFF:</b> Kaitlyn DeVries	<b>COMPLIANCE STATUS:</b> Compliance	<b>SOURCE CLASS:</b> MAJOR
<b>SUBJECT:</b>		
<b>RESOLVED COMPLAINTS:</b>		

On Thursday May 4, 2023 Department of Environment, Great Lakes, and Energy (EGLE) Air Quality Division (AQD) staff Kaitlyn DeVries (KD) and Michael Cox (MC) conducted a scheduled inspection of DTE Electric Company – Renaissance Power Plant located at 950 N. Division, Carson City, Michigan. The purpose of this inspection was to determine compliance with MI-ROP-N6873-2020 and recently issued Permit to Install (PTI) No. 44-23 and any other applicable rules and regulations.

Upon arrival at the facility, KD and MC met with Mr. Matt Kaleyta, Plant Manager, and Mr. Zachary Josefiak, environmental Engineer both of whom accompanied, KD and MC on the inspection. Units 1 and 2 were in service at the time of the inspection.

### **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. Additionally, RPP had PTI No. 44-23 issued, which is for three (3) diesel fired black start emergency engines.

### **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, and PTI No. 44-23m which has not yet been incorporated into the ROP. 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.

KD reminded Mr. Kaleyta and Mr. Josefiak about rolling the PTI into the ROP. The PTI was issued in March 2023, and Mr. Josefiak indicated that RPP would be working on that soon.

### **Compliance Evaluation**



The facility has a source-wide Sulfur Dioxide (SO<sub>2</sub>) 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 April 2023, the 12-month rolling SO<sub>2</sub> emissions were 1.4 tons. The highest 12-month rolling emission during the previous year was in April 2022 with SO<sub>2</sub> emissions of 2.3 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 May 2023 a total of 14,251.7 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 1 and 2 were in operation during the time of the inspection. Unit 1 was operating at a load of 178 MW (94% load), and Unit 2 was also operating at a load of 178 MW (94% 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 April 2023 unless otherwise specified.

Pollutant	Limit	Actual Emissions			
		Unit 1	Unit 2	Unit 3	Unit 4
Nitrogen Oxides (NOx)	15 ppmv at 15% Oxygen, dry <sup>A</sup>	12.04 ppm	12.48 ppm	13.4 ppm	13.7 ppm
NOx	189.2 tons per year (tpy)	15.8 tpy	30.7 tpy	29.9 tpy	14.2 tpy
Carbon Monoxide (CO)	15 ppmv at 15% oxygen, dry <sup>A</sup>	0.23 ppm	0.4 ppm	0.23 ppm	3.2 ppm
CO	115.2 tpy	0.1 tpy	18.2 tpy	18.2 tpy	13.5 tpy
VOC	8.1 tpy	0.2 tpy <sup>B</sup>	0.3 tpy <sup>B</sup>	0.1 tpy <sup>B</sup>	0.4 tpy <sup>B</sup>



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	2.1 tpy <sup>B</sup>	2.2 tpy <sup>B</sup>	1.5 tpy <sup>B</sup>	1.0 tpy <sup>B</sup>
Formaldehyde	6.5 tpy <sup>C</sup>	0.3 tpy			

<sup>A</sup> The limit is based upon an average of all operating hours in a calendar day; Units 1 and 2 values are from May 5. Units 3 and 4 are historic data for NOx, CO, PM10, and VOC – see attached records.

<sup>B</sup> Emissions data is through March 2023.

<sup>C</sup> This limit is applicable to all of the turbines combined.

It should be noted that in November 2022 Unit 3 had a malfunction during routine maintenance and a pump failed. RPP fix the pump, resulting in several startups and shutdowns of the unit prior to the unit completely ceasing operations of the unit for repair. This malfunction did result in some excess emissions. RPP properly reported this malfunction.

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. 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 <sup>A</sup>	Unit 2 <sup>C</sup>	Unit 3 <sup>B</sup>	Unit 4 <sup>E</sup>
VOC (2.0 ppmv at 15% O <sub>2</sub> )	0.06 ppmvd	0.08 ppmvd	0.00	0.438
PM10 (9.0 pph)	8.67 pph	5.01 pph	4.80	6.77 pph
Formaldehyde (no limit)	0.1143 ppmvw	0.1757 ppmvw	0.264	0.23 ppmvw

<sup>A</sup> Most recent testing conducted in January 2021. The results indicated are a mixture of the worst-case emissions from the 70% and 100% load testing.

<sup>B</sup> Testing was conducted in March 2021. The results indicated are a mixture of the worst-case emissions from the 70% and 100% load testing.

<sup>C</sup> Testing was conducted in January 2021 and a May 2021 Re-test. The results indicated are a mixture of the worst-case emissions from the 70% and 100% load testing.

<sup>E</sup> 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.

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 November 21, 2022, for all four units. No opacity was recorded for any of the units. No opacity was noted during the inspection.



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 March 2023 for each of the turbines (1 – 4, respectively) is 408 hours, 796 hours, 717 hours, and 368 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 March 2023, the 12-month rolling hours of startup/shutdown for each of the four (4) units (Units 1 – 4, respectively) were 26 hours, 35 hours, 39 hours, and 22 hours.

All four (4) stacks are identical, and MC utilized the Nikon Forestry Pro II to verify stack height. He measured a stack height of 58.4 feet, which is within the margin of error the 60 ft stack height requirements for each unit.

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 2023 MAERS.

#### *FG-ENGINESC*

This flexible group is 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 May 2023, the 12-month rolling diesel fuel usage was 374.4 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.

#### *FG-BLKSTRTEG*





This flexible group is for three (3) 1,839 bhp diesel fired black start emergency engines with a model year of 2011 or later and a displacement of less than 30 liters/cylinder. As previously mentioned, this flexible group from PTI 44-23, has not yet been incorporated into ROP. Mr. Kaleyta showed KD and MC where the engines were planned to be installed, and there was much discussion during the closing meeting surrounding the blackstart component of these engines and what that means in the regulations. All parties indicated more research would be done into blackstart in the regulations.

These engines also have not yet been installed. Since these engines have not been installed, they will not be further evaluated.

### 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, PTI No. 44-23 and other applicable rules and regulations.

NAME

Katelyn Rubin

DATE

5/9/23

SUPERVISOR

[Signature]