

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

N687329808

FACILITY: DTE Electric Company - Renaissance Power Plant		SRN / ID: N6873
LOCATION: 950 N. Division, CARSON CITY		DISTRICT: Grand Rapids
CITY: CARSON CITY		COUNTY: MONTCALM
CONTACT: Matt Kaleyta, Plant Supervisor		ACTIVITY DATE: 06/11/2015
STAFF: April Lazzaro	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Unannounced, scheduled inspection.		
RESOLVED COMPLAINTS:		

This was an unannounced unscheduled inspection. Staff, April Lazzaro arrived at the facility at approximately 10:00 AM. An off-site evaluation did not identify any odors or visible emissions. Staff met with Matt Kaleyta, Plant Manager who was presented with the DEQ Environmental Inspections: Rights and Responsibilities brochure which was briefly discussed.

FACILITY DESCRIPTION

The DTE Renaissance Power Plant power plant is located in Carson City, Montcalm County, Michigan. The plant is a natural gas fired electrical generation facility with a total of four units consisting of four combustion turbines operating in simple cycle mode. Total output for the facility is about 860 megawatts. Support equipment for the facility includes a diesel-fired emergency backup engine, a diesel-fired pump for fire control; a natural gas-fired heating unit to condition natural gas for the combustion turbines, and a small cold cleaner for maintenance activities. The facility operates pursuant to Renewable Operating Permit No. MI-ROP-N6873-2015.

Each of the four Westinghouse 501F combustion turbines is equipped with dry low-NOx combustor systems.

The stationary source is subject to 40 CFR Part 70 because the potential to emit (PTE) for carbon monoxide (CO) and nitrogen oxides (NOx) exceeds 100 tons.

The stationary source is not considered a major source of Hazardous Air Pollutants (HAPs) emissions because the PTE of any single HAP is less than 10 tons and the PTE of all HAPs combined are less than 25 tons per year.

The stationary source is subject to Prevention of Significant Deterioration (PSD) (40 CFR 52.21) regulations because the stationary source has the potential to emit of carbon monoxide and nitrogen oxides greater than 250 tons per year. In addition, PTE of PM-10 and VOC also exceed the significant levels defined by 40 CFR 52.21 (b) (2), and so were also subject to best available control technology (BACT).

VOC emissions were evaluated relative to Rule 702. Emissions of individual toxic air contaminants were evaluated pursuant to Michigan's Air Toxic regulations per Rule 224 and 225.

The stationary source is subject to Standards of Performance for New Stationary Sources (New Source Performance Standards (NSPS)) for the gas turbines and duct burners promulgated in 40 CFR Part 60 Subparts A, and GG. Certain requirements (monitoring for nitrogen content of natural gas, NOx monitoring method, NOx emission limit, sulfur content of gas) were streamlined in MI-ROP-N6873-2015, based on other, more stringent applicable requirements (i.e. BACT, CEMS, use of pipeline quality natural gas). Streamlined requirements have been identified in Table FGTURBINE1-4SC of the Renewable Operating Permit (ROP) and clearly defined in the ROP Staff Report. Testing requirements in the ROP pertain to ongoing and future testing.

The stationary source is subject to National Emission Standards for Hazardous Air Pollutants (NESHAP) for the diesel-fired emergency backup engine and the fire protection pump as promulgated in 40 CFR Part 63 Subparts A and ZZZZ. The engine is designed to keep the turbines on slow crank in the event of a power outage.

The stationary source will comply with the sulfur dioxide emission requirements of Rule 401 through the use of natural gas in the combustion turbines; and compliant low sulfur diesel fuel in the ancillary support equipment.

The stationary source has several emission units (each turbine) subject to the federal Acid Rain program promulgated in 40 CFR Part 72. The facility's Acid Rain Permit is attached to the ROP as Appendix 9.

The stationary source has several emission units (each turbine) subject to the NOx Budget Trading program pursuant to Rule 802 through 816. The applicable requirements are included in a NOx Budget Trading Permit, attached to the ROP as Appendix 10.

The stationary source is currently not subject to Compliance Assurance Monitoring (CAM) as no post-combustion control device is used to limit emissions. The dry low-NOx burners on each combustion turbine has been determined to be integral to the fuel firing, and while responsible for the low NOx emissions, are not considered to be a control device by the CAM rule.

COMPLIANCE EVALUATION

Staff arrived at the facility and received assistance on facility operations from Mr. Kaleyta who provided staff with information and a print outs from the control room detailing current operating conditions and all requested emissions records. (attached) The printouts indicate current megawatts and pollutant levels as an instantaneous reading as provided by the CEMS for CO and NOx.

The facility conducts a weekly calibration of each of the CEMS on all units whether or not the units have operated that week. In addition to that, when running the unit will conduct an automatic calibration within the first hour of operation. No problems have occurred with the automatic calibration at this facility.

Water is injected into the unit(s) at a rate of 5-7 gallons per minute to keep NOx emissions down. A slight increase in megawatt can be achieved by increasing the water through a process called fogging.

An alarm sounds in the control room when the instantaneous averages for NOx and CO hit the 15 ppm emissions limit. (because the limit is based on a calendar day average, one instantaneous reading is not an immediate issue) While in the control room, the following information was received from the instantaneous read out:

CT-1 154 MW, NOx 11.78 ppm, CO 1.28 ppm
CT-2 10 (in startup) MW, NOx was not written down, CO 1996 ppm
CT-3 153 MW, NOx 12.27 ppm, CO 0.09 ppm
CT-4 152 MW, NOx 11.88 ppm, CO 0.52 ppm

The information presented above indicates compliance at the time of the observation. As CT-2 increased MW and achieved baseload, the NOx and CO were at compliant levels. Emissions during startup are not included in the daily emission limit calculation, however they are included in the annual mass emissions data.

Staff requested emissions data for random operating days.(see attached data) No issues were identified based on a review of these records.

Emission limits include NOx, CO, SO2, VOC, PM-10, HCOH and opacity. Staff received emissions records for monthly emissions (see attached data) including 12-month rolling. No deviation or violations of the calendar day average emission limits were identified.

SOURCEWIDE CONDITIONS

Special Condition (S.C.) I.1: Limits facility SO2 emissions to 47.3 tons per 12-month rolling time period for all combustion sources at the facility. Reported emissions through May 2015 are at 0.5 tons.

II-V: NA

S.C.VI.1: Records are available upon request.

S.C.VII.1-3: Reporting requirements are being met.

S.C.VIII & IX: NA

EMISSION UNIT CONDITIONS

EU-HEATERS

This is an in-line natural gas fired heater for heating natural gas prior to the turbines. It appears as though 40 CFR 52.21 is being met.

FLEXIBLE GROUP CONDITIONS

The permit was recently re-issued as of May 15, 2015. No significant changes to the ROP were made, however the AQD approved a change to the frequency of stack testing at the facility as detailed in FGTURBINE1-4SC.

FGTURBINE1-4SC

S.C.I: 1-11 Emission limits

NOx emission limit is 189.2 tons per 12-month rolling time period for each turbine. Unit 1 (CT-1) emissions through May 2015 were 9.5 tons. Unit 2 (CT-2) emissions were 9.9 tons. Unit 3 (CT-3) were 10.2 tons. Unit 4 (CT-4) emissions were 9.7 tons.

CO emission limit is 115.2 tons per 12-month rolling time period. CT-1 emissions through May 2015 were 11.2 tons. CT-2 emissions were 21.8 tons. CT-3 emissions were 19.09 tons. CT-4 emissions were 24.3 tons.

VOC emission limit is 8.1 tons per 12-month rolling time period for each turbine. CT-1 emissions through May 2015 were 0.9 tons. CT-2 emissions were 0.8 tons. CT-3 emissions were 1.2 tons. CT-4 emissions were 1.2 tons.

PM-10 emission limit is 14.6 tons per 12-month rolling time period for each turbine. CT-1 emissions through May 2015 were 1.2 tons. CT-2 emissions were 1.2 tons. CT-3 emissions were 1.2 tons. CT-4 emissions were 1.0 tons.

HCHO emission limit is 6.5 tons per 12-month rolling time period for each turbine. CT-1 emissions through May 2015 were 0.1 tons. CT-2 emissions were 0.1 tons. CT-3 emissions were 0.1 tons. CT-4 emissions were 0.2 tons.

S.C.II.1: Sulfur content of fuel is limited to 0.5 grain per 100 standard cubic feet. Based the most recent Custom Fuel Monitoring Program (CFMP) natural gas analysis report results dating May 27, 2014 the sulfur content of the fuel is 0.098 grain per 100 standard cubic feet.

S.C.II.2: The permittee only burns pipeline quality natural gas.

S.C.III.1: This is standard operating procedure.

S.C.III.2: Turbine operation is limited to 3,250 hours, per unit, per 12-month rolling time period. Current hours of operation through May 2015 are as follows per unit: CT1 310 hours, CT2 271 hours, CT3 278 hours, CT4 296 hours.

S.C.III.3: It appears as though 40 CFR 52.21 is being met.

S.C.III.4: It appears as though 40 CFR Part 60, Subparts A and GG are being met.

S.C.III.5: The permittee has reported that they are in compliance with the Acid Rain Permit.

S.C.III.6: The most recent version of the MAP is on file and is dated September 2009. According to Mr. Kaleyta, it has not been updated per the new ownership, but he expects it to be soon. He will resubmit it at that time.

S.C.IV.1: Each turbine is equipped with a low NOx burner- the unit can not operate without it.

S.C.V.1: The facility last conducted VE testing on September 19, 2013 and is required to be conducted every 1,624 hours of operation. CT1 is at 671 hours, CT2 is at 1154 hours, CT3 is at 1119 hours and CT4 is at 928 hours.

S.C.V.2: The facility conducted emissions testing on September 19, 2013. The stack test results indicated compliance with emission limits.

S.C.V.3: This condition has not been required during this 5 year cycle.

S.C.V.4: The permittee has been submitting acceptable quarterly EER's, however the 1st Quarter 2015 EER was submitted late. Staff will look for this to be included in the deviation report.

S.C.VI.1: The permittee is monitoring and recording natural gas use.

S.C.VI.2: The permittee is keeping daily, monthly and 12-month NOx calculations.

S.C.VI.3: The permittee is keeping daily, monthly and 12-month CO calculations.

S.C.VI.4: The permittee is keeping daily, monthly and 12-month VOC calculations.

S.C.VI.5: The permittee is keeping daily, monthly and 12-month PM-10 calculations.

S.C.VI.6: The permittee is keeping daily, monthly and 12-month HCOH calculations.

S.C.VI.7: The permittee is recording hours of startup and shutdown for each turbine.

S.C.VI.8: The permittee is keeping emissions for each startup and shutdown for each turbine. These are maintained on the daily emissions sheets which were provided upon request and are identified based on startup and shutdown operating hours. As previously indicated, these emissions are included in the annual mass calculation.

S.C.VI.9: The permittee has been keeping the visible emission readings records.

S.C.VI.10: The permittee is keeping monthly hours of operation for each turbine.

S.C.VI.11: The permittee is monitoring and recording NOx and O₂ emissions continuously and in an acceptable manner using CEMS.

S.C.VI.12: The permittee is monitoring and recording CO emissions continuously and in an acceptable manner using CEMS.

S.C.VI.13: The CEMS appear to be installed, calibrated, maintained and operated in accordance with 40 CFR 60.13, and 40 CFR Part 75.

S.C.VI.14: The next CEMS RATA is scheduled for July 27, 2015. A brief review of the info located in the CEMS shack was conducted.

S.C.VI.15: QA of CEMS has been performed as required.

S.C.VI.16: QA/QC of CEMS of NOx, CO and O₂ are being conducted on the same schedule.

S.C.VI.17: The Custom Fuel Monitoring program as detailed in App. 3.1 is being adequately followed. See attached Gas Analysis Report dated May 29, 2015.

S.C.VII.1: The permittee reports deviations as required by the permit.

S.C.VII.2: The permittee submits semiannual reports as required.

S.C.VII.3: The permittee submits annual certification of compliance reports as required.

S.C.VII.4: During this FCE the company has not had reason to submit a stack testing plan.

S.C.VII.5: This has been done correctly in the past.

S.C.VII.6: All EER summary reports have been received timely in the past 2 years, except for 1st Quarter 2015.

S.C.VIII.1-4: The stacks have not changed since installation.

S.C.IX.1: The permittee appears to be compliant with the Phase II Acid Rain Permit.

S.C.IX.2: The emission of an air contaminant has not exceeded that of the emission allowance.

S.C.IX.3: The permittee has complied with the CAIR SO₂ trading program as required.

S.C.IX.4: The permittee currently holds appropriate SO₂ allowances.

S.C.IX.5: The permittee appears to be compliant with the CAIR NOx trading program as required.
S.C.IX.6: The permittee currently holds appropriate NOx allowances.
S.C.IX.7: The permittee appears to be compliant with the CAIR Ozone NOx Trading Program as required.
S.C.IX.8: The permittee currently holds appropriate allowances not less than total NOx emissions.

FGENGINEESC

S.C.I: NA

S.C.II.1: Diesel fuel is limited to 21,000 gallons per 12-month rolling time period. Rolling gallons used through May 2015 is 294.2.

S.C.III: Conditions have been added based on the equipment being subject to 40 CFR Part 63 Subpart ZZZZ. The permittee provided the maintenance report conducted on April 29, 2014. They are not currently utilizing the oil analysis program option. The requirement for oil change on these units is required to be conducted annually. This is interpreted as once per calendar year, not once per 12-month rolling time period.

S.C.IV.1: The permittee is operating the equipment pursuant to specifications. SO2 emissions are minimal at 0.001 tons per 12-month rolling time period. This does not appear to prohibitively impact PSD.

S.C.V: NA

S.C.VI.1: The permittee is keeping monthly and 12-month rolling diesel fuel usage records.

S.C.VII.1-3: Reporting is being conducted at the proper frequencies.

S.C.VIII: NA

S.C.IX: NA

FGCOLDCLEANERS

This flexible group contains one cold cleaner currently. It is rarely used, and no changes have occurred. Required posting detailing proper use was present.

EVALUATION SUMMARY

All information as discussed or reviewed indicated that the facility was operating within acceptable parameters. All monitoring and recordkeeping requirements appear to be met based on the inspection review. No issues with the CEMS equipment or reporting are of concern at this time based on a brief review of the CEMS shack daily operating logs.

Based on the information received and data reviewed, the facility appeared to be in compliance at the time of the inspection.

NAME 

DATE 6-23-15

SUPERVISOR PMB

