

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

B291835409

FACILITY: Consumers Energy Theford Combustion Turbine Plant		SRN / ID: B2918
LOCATION: 10500 N Genesee Rd, MOUNT MORRIS		DISTRICT: Lansing
CITY: MOUNT MORRIS		COUNTY: GENESEE
CONTACT: George Eurich , Environmental Lead - Air Quality		ACTIVITY DATE: 07/07/2016
STAFF: Daniel McGeen	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Partial Compliance Evaluation (PCE) activities, conducted as part of a Full Compliance Evaluation (FCE): 1.) scheduled inspection and 2.) review of recordkeeping and operational logs.		
RESOLVED COMPLAINTS:		

Facility environmental contact: George Eurich; geeurich@cmsenergy.com

Emission unit ID	Emission unit description	Installation date	Operating status
EUCOMBTURB1	Unit 1 combustion turbine, heat input rating of 555 million BTU/hr Can be fueled by natural gas or fuel oil	7/1/67	Mothballed; would require work to return to operation
EUCOMBTURB2	Unit 2 combustion turbine, heat input rating of 555 million BTU/hr Can be fueled by natural gas or fuel oil	7/1/67	Operational
EUCOMBTURB3	Unit 3 combustion turbine, heat input rating of 555 million BTU/hr Can be fueled by natural gas or fuel oil	7/1/67	Operational
EUCOMBTURB4	Unit 4 combustion turbine, heat input rating of 555 million BTU/hr Can be fueled by natural gas or fuel oil	7/1/67	Operational
EUCOMBTURB5	Unit 5 combustion turbine, heat input rating of 265 million BTU/hr Fueled by natural gas Unit 5 startup engine, heat input rating of 2.12 million BTU/hr	7/1/67	Permanently shut down; startup engine physically disconnected from fuel line
EUCOMBTURB6	Unit 6 combustion turbine, heat input rating of 265 million BTU/hr Fueled by natural gas Unit 6 startup engine, heat input rating of 2.12 million BTU/hr	7/1/67	Permanently shut down; startup engine physically disconnected from fuel line
EUCOMBTURB7	Unit 7 combustion turbine, heat input rating of 265 million BTU/hr Fueled by natural gas Unit 7 startup engine Heat input rating of 2.12 million BTU/hr	7/1/67	Permanently shut down, startup engine physically disconnected from fuel line
EUCOMBTURB8	Unit 8 combustion turbine Heat input rating of 265 million BTU/hr Fueled by natural gas Unit 8 startup engine Heat input rating of 2.12 million BTU/hr	7/1/67	Permanently shut down; startup engine physically disconnected from fuel line
EUCOMBTURB9	Unit 9 combustion turbine Heat input rating of 265 million BTU/hr Fueled by natural gas Unit 9 startup engine Heat input rating of 2.12 million BTU per hour	7/1/67	Permanently shut down; startup engine physically disconnected from fuel line

Introduction:

On 7/7/2016, the Department of Environmental Quality (DEQ), Air Quality Division (AQD) conducted the following PCE activities, which are part of a FCE, at the Consumers Energy Thetford Combustion Turbine Plant:

- 1.) a scheduled inspection, and
- 2.) review of records and operational logs.

Facility description:

This facility is a peaking station, with nine generators and associated turbines.

Regulatory overview:

The nine generators and associated turbines may be placed into two groups, as follows:

Group No. 1 has four 36 MW generators, each operated by a single turbine. Each turbine is operated by the exhaust from two jet engines. The jet engines in Group No. 1 are started using blasts of compressed air. Once the units have started rotating, continuing operation is done by compressing cool air into the unit, and then rapidly heating it to expand it, and forcing it through a venturi-style opening. This causes a high speed exhaust stream to rotate the turbine. The air is heated in each jet engine by eight canister style burners, which are fueled by sweetened natural gas. The generators can run up to 3600 rpm.

Group No. 2 has five 20 MW generators, each associated with a single turbine. All the Group 2 units have been permanently shut down, as will be explained later in this report. These units were started using low speed diesel engines using a clutch mechanism. Canister style burners were then lit, and exhaust from the burners would turn the turbines.

The facility's ROP allows units 1-4 to be operated burning fuel oil, as well as natural gas, although in actual practice Consumers has run 1-4 only on natural gas, in recent years. There was once a large oil storage tank at the site, but that was removed years ago.

Regulatory overview:

The current ROP was approved on 7/31/2015, and expires on 7/31/2020. A renewal application is due between 1/31/2019 and 1/31/2020, and a renewal reminder letter will be sent to the company in January 2019, to schedule a pre-application meeting to discuss the ROP renewal.

The turbine engines at this facility are not subject to 40 CFR Part 60 Subpart GG, Standards of Performance for Stationary Gas Turbines. This is because they were constructed before 10/3/1977, and Subpart GG applies to certain stationary gas turbines which were constructed, modified, or reconstructed after 10/3/1977. It should be noted that the periodic repair or replacement of gas turbine components, including the gas generator, for overhaul or repair, using like kind units, does not subject the facility to the requirements of Subpart GG unless the periodic replacement does meet the definition of "modification" as defined in 40 CFR 60.14 or "reconstruction" as defined in 40 CFR 60.15. Future modification and/or installation may be subject to this subpart.

When all 9 turbines were operational, in years past, the turbines were considered subject to the MACT, 40 CFR Part 63, Subpart YYYY, National Emissions Standards for Hazardous Air Pollutants for Stationary Combustion Turbines. This is because the facility was a major source of Hazardous Air Pollutant (HAP) emissions, as the Potential to Emit (PTE) for formaldehyde was 11.2 tons per year (actual emissions were much smaller). Because the units are considered existing they were not subject to the emission and operating limitations, and testing was not required. With the permanent shutdown of the Group 2 turbines and the remaining units no longer burning fuel oil the PTE for formaldehyde has been reduced significantly.

When all 9 turbines were capable of operating, Consumers staff believe that this facility was subject to the RICE MACT, 40 CFR Part 63 Subpart ZZZZ, for Stationary Reciprocating Internal Combustion Engines (RICE). The 5 diesel startup engines were considered an affected source, because they had a site rating of less than or equal to 500 brake horsepower (HP) each, were located at a major source of HAP emissions, and were built before 6/12/2006. This classified them as existing stationary RICE, under Section 63.6590(a)(1)(ii). Under Section 63.6590(c), compression ignition stationary RICE with a site rating of less than or equal to 500 HP must meet the requirements of ZZZZ by meeting the requirements of 40 CFR Part 60 Subpart IIII, which is the NSPS for CI engines. However, review of Subpart IIII shows that they were not subject. Essentially, although the facility was subject to ZZZZ, there were no requirements that applied. Now that the diesel startup engines are not capable of operating, the facility is no longer subject to the RICE MACT.

Note: Permit to Install (PTI) No. 191-12 was issued on 7/25/2013, for a natural gas-fired combined cycle power generating station proposed to be built at this site. Construction of the project has not begun, at this time. An extension to the permit's existence was granted on 1/22/2015, but expired on 7/25/2016, not long after this inspection. This is discussed later in this activity report.

Fee status:

This facility is classified as a category I fee-subject source, because it is a major source for formaldehyde. The facility is required to report to the Michigan Air Emission Reporting System (MAERS), on an annual basis.

Location:

This facility is located in a rural, agricultural area. The nearest residences are about 1,800 feet to the east, 2,500 feet to the north, 2,400 feet to the west, and 1,900 feet to the south, as measured from the buildings of the combustion turbine plant itself, in ArcGIS.

Recent history:

PTI No. 191-12 was issued on 7/25/2013, for a natural gas-fired combined cycle power generating station proposed to be built at this site. Construction of the project did not take place. The permit was originally to become void on 1/25/2015, if construction had not commenced. On 1/22/2015, then Acting Chief Lynn Fiedler of the AQD sent a letter to Consumers Energy Company, granting an 18-month extension to PTI No. 191-12. Her letter indicated that the 18-month extension would expire on 7/25/2016.

Arrival:

I arrived at the site at 9:43 AM. This inspection had been arranged in advance, as Consumers Energy environmental staff needed to travel to the site, for this meeting. The Thetford plant rarely operates, and staff are not onsite, on a daily basis. I met with Mr. George Eurich, Environmental Lead - Air Quality.

Mr. Eurich has previously received the DEQ brochure *Environmental Inspections: Rights and Responsibilities*, he indicated, and so did not need the copy I brought with me. The boiler NESHAP card I brought was also not needed, because there is no boiler onsite. There is only a hot water heater for the office restrooms, which has a hot water capacity of about 30 gallons, he estimated. He showed me the hot water heater, and I concurred with his assessment.

Mr. Eurich indicated that the natural gas-fired combined cycle power generating station proposed to be built at this site has been put on hold. He informed me that the PTI, No. 191-12 would soon become void, following 18 months without any construction.

As mentioned earlier in this report, a 1/22/2015 letter from AQD's L. Fiedler granted an extension until 7/25/2016 for construction to commence. 7/25/2016 passed, during the writing of this report, with no construction activity. AQD Permit Engineer David Riddle subsequently sent a permit void letter to the company, on 8/1/2016.

PCE activity No. 1.; Inspection:

Mr. Eurich informed me that this is a black start facility that serves as a support site for the Cardon - Weddock facility. This facility is not used for electric generation but in the event that the Cardon Weddock or other facilities need a black start. Then Thetford will start-up and send power to the desired facility. The plant only operates in this situation, or to run the units for operating and maintenance checks. Group 1 turbines are the only units available for use at this time and only units 2,3 and 4 are operational.

I was informed that the Group 2 turbines are no longer capable of operating, because the fuel lines which supplied fuel oil to the diesel startup engines have been physically disconnected. Also, the fuel tanks for storing fuel oil have been drained. The last delivery of fuel oil to the Thetford site was in 2011. A manifest/receipt for that shipment, was provided to AQD staff during the 9/7/2011 inspection of this site. The turbines themselves from Group 2 are still onsite, and they may eventually be sold, I was informed.

I was informed that unit 1 is still mothballed, and Mr. Eurich unlocked a door, so we could observe the unit itself. He also unlocked doors so I could see units 2-4 themselves, which were not running. Mr. Eurich informed me that the Group 1 operational units, 2, 3, and 4, have run even less this year than in the past.

It could be seen that the Group 2 turbines 5 through 9 were not running. Mr. Eurich showed me the diesel startup engine and turbine for Unit 9, in their non-operational state.

Fuel oil has not been used at the site in at least 4 years, I was informed. Units 2-4 are currently operated as natural gas-fired units. A crew from Gaylord typically is on site when the units are operated, Mr. Eurich explained.

PCE activity No. 2.; review of records and operational logs:

The monitoring and recordkeeping requirements of the ROP require that visible emission readings be done for each emission unit of the flexible group for Turbines 2 through 4 which are burning fuel oil, during peak operating conditions. Because Units 2-4 no longer burn any fuel oil, and because they never reach peak operating conditions, this condition is not applicable.

I inquired about their compliance status with 40 CFR Part 97, Subparts AAAAA, BBBBB, and CCCCC. Mr. Eurich informed me that since the turbines here rarely run, and therefore use minute amounts of fuel, they do not have any reportable quantities of emissions under those subparts. Subpart AAAAA is the Transport Rule NOx Annual trading Program, Subpart BBBBB is the Transport Rule NOx Ozone Trading Program, and Subpart CCCCC is the Transport Rule SO2 Group 1 Trading Program.

Units 2, 3 and 4 are the only units currently operational. Their dates of operation in 2016 are as follows:

Unit 2: 6/7 and 6/15, for testing purposes.

Unit 3 6/7 and 6/15, for testing purposes.

Unit 4: 6/14, for "Bl. start test" (testing purposes).

Natural gas usage in 2016 was reported, in units of one thousand cubic feet (mscf), as:

Unit 2: 53.21 mscf

Unit 3: 101.64 mscf

Unit 4: 0 mscf*

***Note:** Although Unit 4 was identified as operating on 6/14 for test purposes, no natural gas usage was identified for the turbine for the second quarter of 2016. Subsequent to the inspection, I called Mr. Eurich on 7/29/2016, and he indicated that he will contact a manager in Gaylord, to find out if the unit had operated on 6/14/2016, and what the natural gas usage was. On 8/24, Mr. Eurich confirmed via e-mail (please see attached) that Unit 4 did operate on 6/14/2016, as part of the black starts for Units 2-4. He was still tracking down the actual natural gas usage, he indicated, but he expected it to be minimal, because Unit 4 produced only 0.088 MW before being shut down.

MAERS reporting:

According to the most recent MAERS report, plant emissions in 2015 were as follows:

Pollutant	Emissions in lbs	Emissions in tons
CO	788.73	0.39
NOx	6,930.00	3.47
PM10, primary	63.48	0.03
PM2.5, primary	63.48	0.03
SO2	5.94	0.003
VOC	20.20	0.01

A spreadsheet provided to AQD as part of the MAERS documentation for the 2015 operating year is attached, for reference.

Conclusion:

I did not observe any instances of noncompliance. Mr. Eurich indicated on 8/24/2016 that he was still tracking down what natural gas usage was for unit 4 on 6/14/2016, during black start testing, as this was not identified in their recordkeeping. Future inspections will be arranged in advance with Consumers staff, as there most likely will not be personnel on site, on a daily basis.

NAME  DATE 8/26/2016 SUPERVISOR 

