

B2808 - FCE - 20170619

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

B280840443

FACILITY: DTE Electric Company - Northeast Peaking Facility		SRN / ID: B2808
LOCATION: 6401 E EIGHT MILE RD, WARREN		DISTRICT: Southeast Michigan
CITY: WARREN		COUNTY: MACOMB
CONTACT: Joe Neruda , Environmental Specialist		ACTIVITY DATE: 06/19/2017
STAFF: Francis Lim	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Inspection		
RESOLVED COMPLAINTS:		

**On June 19, 2017, I conducted an inspection at DTE Electric Company Northeast Peaker Station located at 6401 Eight Mile Road, Warren. The purpose of this inspection was to determine the facility's compliance with Michigan's Air Pollution Control Rules, the Federal Clean Air Act Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act of 1994, PA 451, as amended, and the facility's Renewable Operating Permit, ROP No. MI-ROP-B2808-20012.**

I met with Joe Neruda, Environmental Specialist (810- 326-6356, Cell: 313-212-3949, E-mail: [nerudaj@dteenergy.com](mailto:nerudaj@dteenergy.com)) and David James (313-283-2451), Substation Operator at the gated site. To gain access, a site operator has to let you inside.

The DTE Northeast Peaker Station is designed to generate electricity for sale during peak demand: usually during the summer months or during emergencies (outages). The peaker station is located inside the ITC station. ITC is an electricity transmission company that owns and operates DTE's transmission system. At this station, ITC's high voltage transmission lines feed approximately 15 substations, which include four distribution stations.

The DTE Peaker station consists of one fuel oil/natural gas-fired combustion turbine generator, four natural gas-fired combustion turbine generators, and two fuel oil-fired jet turbine generators. The facility's Renewable Operating Permit (ROP), ROP No. MI-ROP-B2808-20012 was issued on January 7, 2012.

In 2010, DTE upgraded the control system for the turbine generators. The new system allows the turbines to be operated off-site and allows DTE to diagnose operational issues more quickly.

Below is a description of the turbine generators onsite:

Emission Unit ID	Emission Unit Description	Installation Date
EU CTG 12-1	No. 2 oil or natural gas fired combustion turbine generator with a 24 MW capacity at a temperature of 20°F	6/26/1971
EU CTG 11-1	Natural gas fired combustion turbine generator with a 20 MW capacity at a temperature of 20°F	9/9/1967

<b>EU CTG 11-2</b>	<b>Natural gas fired combustion turbine generator with a 20 MW capacity at a temperature of 20°F</b>	<b>6/17/1966</b>
<b>EU CTG 11-3</b>	<b>Natural gas fired combustion turbine generator with a 20 MW capacity at a temperature of 20°F</b>	<b>5/31/1966</b>
<b>EU CTG 11-4</b>	<b>Natural gas fired combustion turbine generator with a 20 MW capacity at a temperature of 20°F</b>	<b>5/31/1966</b>
<b>EU CTG 13-1</b>	<b>No. 2 oil fired jet turbine generator with a 23 MW capacity at a temperature of 20°F</b>	<b>5/15/1971</b>
<b>EU CTG 13-2</b>	<b>No. 2 oil fired jet turbine generator with a 23 MW capacity at a temperature of 20°F</b>	<b>5/15/1971</b>

In a jet turbine generator, the high pressure exhaust of an actual jet engine spins the turbine connected to the electrical generator. The jet engine generators are capable of a black start – outside electrical power is not necessary to startup the jet turbine generators. A battery bank (DC source) supplies alternate power to essential equipment.

In a combustion turbine generator, fuel is added to the high pressure combustion air and gets ignited in the combustor. The heated gas expands and moves at high velocity and spins the turbine connected to the electrical generator. The combustion turbo generators are not capable of a black start. A 480 volt motor is needed to initially spin the turbine. A battery bank (DC source) supplies alternate power to essential equipment.

Electricity is generated by movement of a conductor relative to a magnetic field. The turbine provides the rotational power. Typically, in a power plant generator, the magnet is an electromagnet (referred to as rotor) that rotates around the copper conductor (referred to as stator) to produce electric current.

The CTG 11's (CTG 11-1, 11-2, 11-3, 11-4) and CTG 12-1 are fired with pipeline quality natural gas. Natural gas is delivered to each unit underground. CTG 12-1 can also be fired with diesel fuel oil. However, CTG 12-1 has been out of service for several years due to a turbine problem. The turbine blades have to be replaced, but the manufacturer has stopped producing them. The jet turbine generators CTG 13-1 and CTG 13-2 are fired with diesel fuel oil only. Fuel oil used for the turbine generators is a 15 ppm sulfur ULSD fuel oil. The fuel for EU CTG 13-1 and 13-2 is heated to 100°F. The renewable operating permit requires DTE to record the natural gas and diesel fuel oil consumption rate for each calendar month. Consumption records for 2015, 2016 and 2017 are attached. In general, amount of natural gas and fuel oil consumed at the site is low. In 2016, facility used only 4.5 MM cubic feet of natural gas and 117 thousand gallons of diesel oil. There is a gas meter for the entire facility – no individual unit gas meters. Gas usage is prorated between the CTG 11's and CTG 12-1.

A 100,000-gallon above-ground tank is used for diesel fuel oil storage. A fuel meter indicates amount of oil in the tank.

Yellow colored pipes indicate natural gas - red pipes represent fuel oil.

I visually inspected the control panels for each turbine. I noted the following readings from the hour meters: (NOTE: My hour-meter readings are for baseline purposes only.)

CTG 11-1	21451 hours	
CTG 11-2	21191 hours	
CTG 11-3	19921 hours	
CTG 11-4	20924 hours	
CTG 12-1	14446 hours	
CTG 13-1	2 days 14 hours	was reset
CTG 13-2	10 days 8 hours	was reset

DTE Northeast operating hours record for 2015, 2016 and 2017 is attached. CTG 12-1 has been out of service for several years. The turbine generators were not operating during the inspection. In 2016, the facility operated for a total of only 102.8 turbine-hours.

The Northeast peaking engines are not equipped with low-Nox burners. For calendar year 2016, DTE reported 18,303 pounds of NOx in MAERS. Since facility uses ULSD fuel oil, reported SO2 emissions are 32 pounds.

Attached is a record of a summary of the maintenance/repairs conducted on the turbine generators from 2016 and 2017.

CTG11-2, CTG11-3, and CTG11-4 were installed prior to August 15, 1967. As a result, this equipment is considered "grandfathered" and not subject to New Source Review (NSR) permitting requirements.

Although CTG12-1, CTG11-1, CTG13-1, and CTG13-2 were installed after August 15, 1967, the equipment were exempt from NSR permitting requirements at the time it was installed.

None of the turbine engine generators meet the definition of an electric generating unit (a unit with a nameplate capacity of more than 25 megawatts and which produces electricity for sale) and therefore none are subject to the Cross-State Air Pollution Rule (CSAPR).

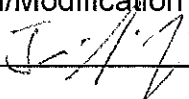
The turbine generators are not subject to Part 8 (NOx) of the AQD administrative rules. In accordance with Rule 801(14)(c), peaking units are not subject to Part 8 rules.

The oil-fired turbine generators are subject to Part 4 (SO2) of the AQD administrative rules.

The NE Peaker station is not subject to 40 CFR Part 60 Subpart GG, Standards of Performance for Stationary Gas Turbines, because records indicate the last Install/Modification date was before October 3, 1977.

The NE Peaker station is not subject to 40 CFR Part 60 Subpart KKKK, Standards of Performance for Stationary Combustion Turbines, because records indicate the last Install/Modification date was not after February 18, 2005.

NAME



DATE

06-30-17

SUPERVISOR

