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

B280540290

FACILITY: DTE - Electric Company Hancock Peaker Station		**SRN / ID:** B2805
LOCATION: 1781 HAGGERTY, COMMERCE TWP		**DISTRICT:** Southeast Michigan
CITY: COMMERCE TWP		**COUNTY:** OAKLAND
CONTACT: Joseph Neruda , Environmental Specialist		**ACTIVITY DATE:** 06/14/2017
STAFF: Francis Lim	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MAJOR
SUBJECT:		
RESOLVED COMPLAINTS:		

On June 14, 2017, I conducted an inspection at DTE Electric Company Hancock Peaking Facility located at 1781 Haggerty Road, Commerce Township. The purpose of this inspection was to determine the facility's compliance with the requirements of the Federal Clean Air Act; Article II, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451); the administrative rules; and the conditions of Renewable Operating Permit (ROP) No. MI-ROP-B2805-2017. The ROP renewal was issued on April 12, 2017.

I met with DTE environmental staff Joe Neruda, Stephanie Zanke, and Scott Eisenmann at the gated site. To gain access, a site operator has to let you inside. Felix Fesili is the DTE Combustion Turbine Specialist at this station.

The Hancock Peaking Facility is designed to generate electricity for sale under conditions of peak demand. Peak demand conditions typically occur from July through August. Generators are activated by staff on site although remote generator start up may be asked by MISO (Midwest Independent System Operator).

The Hancock Peaking Station consists of four natural gas fired combustion turbine electric generators and two natural gas fired jet engine turbine electric generators. All of the turbine generators were installed prior to state requirements to obtain a permit to install and are considered "grandfathered" units with respect to R 336.1201. The combustion turbine generators were manufactured by Westinghouse. The jet engines were manufactured by Pratt & Whitney. None of the engines were operating during the inspection.

Below is a description of the turbine generators onsite:

Emission Unit ID	Emission Unit Description (Including Process Equipment & Control Device(s))	Installation Date/ Modification Date	
CTG 11-1	**Natural gas-fired combustion turbo-generator with 18.5 MW capacity.**	**09-21-1967 / NA**	
CTG 11-2	**Natural gas-fired combustion turbo-generator with 18.5 MW capacity.**	**10-26-1967 / NA**	
CTG 11-3	**Natural gas-fired combustion turbo-generator with 18.5 MW capacity.**	**11-28-1967 / NA**	
CTG 11-4	**Natural gas-fired combustion**	**04-25-1969 / NA**	

	turbo-generator with 21.5 MW capacity.	
JTG 12-1	**Natural gas-fired jet turbo-generator with 41.27 MW capacity.**	**05-21-1970 / NA**
JTG 12-2	**Natural gas-fired jet turbo-generator with 41.27 MW capacity.**	**04-30-1967 / NA**

The jet turbo-generator JTG 12-1 and JTG 12-2 consist of paired jet engines. Each jet turbo-generator consists of an A and B engine connected to a single turbine electric generator. Usually, the A and B engines run simultaneously but can be decoupled if necessary. The combustion turbo generators are single engine-single turbine set up. 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) and it rotates around the copper conductor (referred to as stator) to produce the electric current.

In a jet turbo-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 power is not necessary to startup the jet turbine generators. A battery bank (DC source) supplies alternate power to essential equipment.

In a combustion turbo 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.

The facility-wide natural gas meter is located outside at the southwest corner of the property. The engines are only fired with pipeline quality natural gas. I noted a reading of 402,685 thousand cubic feet. The last reading taken by Chris Ethridge on August 12, 2015 was 262,167 thousand cubic feet. This makes sense since this facility consumes approximately 100,000 thousand cubic feet per year.

In general, amount of natural gas consumed at the site is generally low. The renewable operating permit requires DTE to record the natural gas consumption rate for each calendar month. Consumption records for 2015, 2016 and 2017 are attached. Gas usage is broken down (and prorated since there are no individual gas meters) between the CTG11's (CTG 11-1, 11-2, 11-3, 11-4) and the CTG12's (JTG12-1 and JTG12-2).

I visually inspected the control panels for each turbine. Since the control panels for the CTG 11's have been recently upgraded, the hour meters were reset. I noted the following readings from the hour meters:

EGCTG 11-1	52 hours	19765 hours (August 12, 2015)
EGCTG 11-2	22 hours	19295 hours (August 12, 2015)
EGCTG 11-3	81 hours	18544 hours (August 12, 2015)
EGCTG 11-4	95 hours	16423 hours (August 12, 2015)
EGJTG 12-1A	18931 hours	18833 hours (August 12, 2015)
EGJTG 12-1B	19143 hours	19046 hours (August 12, 2015)

EGJTG 12-2A	20110 hours	20020 hours (August 12, 2015)
EGJTG 12-2B	20328 hours	20242 hours (August 12, 2015)

DTE Hancock operating hours record for 2015, 2016 and 2017 is attached. Hancock Peaking Station is one of the last stations to be utilized among the local network of peaking stations mainly because of the relative age of the engines. In 2016, this facility operated a total of 563 engine-hours. The engines are tested for operational readiness once per month for about 15 to 30 minutes.

Unit JTG 12-1 and JTG 12-2 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 are subject to the Cross-State Air Pollution Rule (CSAPR). The two units are subject to the transport rule NOx Annual Trading Program, NOx Ozone Season Trading Program, and SO2 Group 1 Trading Program. Instead of CEMS, low mass emissions (LME) excepted methodology may be used to report emissions (40 CFR 75.19). To estimate emissions reported to EPA Clean Air Markets Program, a default NOx emission rate of 0.7 lb/MM BTU is used. Heat input is calculated by using the Long Term Fuel Flow (LTFF) feature in the ECMPS LME Emissions Data Utility. To estimate SO2 emissions the default SO2 emission rate for pipeline quality natural gas is used.

The turbine generators are not subject to Part 8 (NOx) of the AQD administrative rules. In accordance with Rule 801(14)(c), peaking units and units that are subject to a federal regulation that is equally stringent or more stringent are not subject to Part 8 rules.

The Hancock Peaking engines are not equipped with low-Nox burners. To reduce NOx, the following steps/modes are taken in other DTE combustion turbines: normal startup, lean-lean mode, secondary mode, and pre mode. Felix said he is not aware if the Hancock engines follow this normal startup mode. For calendar year 2016, DTE reported 42,004 pounds of NOx in MAERS.

NAME _____ DATE 06-28-17 SUPERVISOR _____