

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

P015239935

FACILITY: MICHIGAN DEPT OF TECHNOLOGY, MANAGEMENT AND BUDGET		SRN / ID: P0152
LOCATION: 7432 PARSONS RD, LANSING		DISTRICT: Lansing
CITY: LANSING		COUNTY: EATON
CONTACT: Scott Davis , Facilities Supervisor		ACTIVITY DATE: 04/28/2017
STAFF: Michelle Luplow	COMPLIANCE STATUS: Non Compliance	SOURCE CLASS: MINOR
SUBJECT: Scheduled compliance inspection to determine compliance with PTI No. 156-10A and 296-73		
RESOLVED COMPLAINTS:		

Inspected by: Michelle Luplow

Personnel Present: Scott Davis, Facilities Supervisor (daviss2@michigan.gov)

Heath Miller, Building Trades Supervisor (millerh11@michigan.gov)

Purpose: Conduct an announced, self-initiated compliance inspection by determining compliance with DTMB Energy Center's (DTMB's) Permit to Install (PTI) Nos. 156-10A and 296-73. I first attempted to inspect this facility when I found a permit (PTI 296-73) for two 60,000 lb/hr boilers and one 300 hp steam boiler: no address was provided on the permit application, but did note that it was located in the Secondary Complex. On 3/23/17 I learned that PTI 296-73 was associated with the DTMB Energy Center located at 7423 Parsons Rd in Dimondale and proceeded to conduct an inspection until I learned that PTI 156-10A was also associated with this address. The 3/23/17 inspection was postponed until I prepared myself for inspecting under PTI 156-10A as well.

Facility Background/Regulatory Overview: This facility was last inspected in August 2012 as part of a performance test (required by NSPS Subpart KKKK) on the cogenerator units.

Scott Davis, Facilities Supervisor, said that the DTMB Energy Center provides steam and chilled water (heating and cooling) to multiple DTMB properties throughout the Secondary Complex (see attached map for a list of facilities); all but the Michigan State Police Post is serviced by the Energy Center.

NSPS for Compression Ignition Internal Combustion Engines, Subpart IIII

The 2206 HP emergency engine is subject to NSPS Subpart IIII. NSPS Subpart IIII requirements were incorporated into the PTI. According to the permit this engine is certified and therefore does not have NSPS testing requirements.

Boiler MACT NESHAP JJJJJ for area sources of HAPs

The 60,000 lb/hr boiler is exempt from the Boiler MACT NESHAP Subpart JJJJJ because it is classified as a "gas-fired boiler" as defined in 40 CFR 63.11237. To be considered a gas-fired boiler, the boiler must burn gaseous fuels not combined with any solid fuels and burn liquid fuel only during periods of gas curtailment, gas supply interruption, startups, or periodic testing on liquid fuel. The periodic testing of liquid fuel should not exceed a combined total of 48 hours during any calendar year.

<u>EU</u>	<u>Description</u>	<u>PTI No.</u>	<u>Installation Date</u>	<u>Federal Regulation</u>
Boiler	60,000 lb/hr boiler (90 MMBtu/hr); natural gas-fired with diesel fuel backup	296-73	1973	Area Source Boiler MACT JJJJJ does not apply.
EUENGINE1	Compression Ignition, diesel fuel-fired 2206 hp emergency backup generator, manufactured August 2010	156-10A	2/2012	NSPS Subpart IIII
EUTURBINE1	A nominally rated 19.0 MMBtu/hr natural gas-fired turbine with an electrical generator	156-10A	2/2012	NSPS Subpart KKKK
EUTURBINE2		156-10A	2/2012	NSPS Subpart KKKK

	A nominally rated 19.0 MMBtu/hr natural gas-fired turbine with an electrical generator			
EUHRSG1	A heat recovery steam generator (HRSG) with a nominally rated 20.0 MMBtu/hr natural gas-fired duct burner	156-10A	2/2012	NSPS Subpart KKKK
EUHRSG2	A heat recovery steam generator (HRSG) with a nominally rated 20.0 MMBtu/hr natural gas-fired duct burner	156-10A	2/2012	NSPS Subpart KKKK

Inspection: This was an announced, scheduled compliance inspection. At approximately 8:00 a.m. on April 28, 2017 I met with Scott Davis, Facilities Supervisor and Health Miller, Building Trades Supervisor. During the March 23, 2017 "inspection" I provided S. Davis with a January 2017 Permit to Install Exemption Handbook, as well as a copy of PTI No. 296-73 for the 3 boilers.

PTI No. 156-10A: EUENGINE1, FGTURB/HRSG1, FGTURBHRSG2

EUENGINE1

EUENGINE1 is an emergency backup generator. S. Davis said it is used to power pumps, the permitted (PTI 296-73) 60,000 lb/hr boiler, and chillers in order to maintain steam to the complex.

Emission Limits and Associated Recordkeeping

DTMB is limited to 2.73 tpy NOx per 12-month rolling period, as determined at the end of each calendar month. They are also required to record the NOx emissions on a monthly and 12-month rolling basis. DTMB has not been calculating or recording the NOx emissions from this unit and is therefore in non-compliance with the recordkeeping portion of this requirement. Because they only operated 7.5 hours for the 12-month rolling period April 2016 – March 2017, they are likely in compliance with their NOx emission limits, but do not have the calculations to demonstrate this.

Process/Operational Restrictions and Associated Recordkeeping

The engine is allowed to be operated up to 300 hours (which includes hours operating for maintenance and readiness testing) per 12-month rolling time period and allowed up to 100 hours per 12-month rolling time period for maintenance and readiness testing alone. The records for the hours of operation on a 12-month rolling basis must be kept, in addition to recording the reason why the engine was operated.

H. Miller sent me a log containing start and stop times (see attached) which I converted to minutes operated. While they did not document the reason for the operations they told me that all hours were for maintenance/readiness testing (conducted once per month). I informed them that in the future the reason for the operation of the engine should be documented.

Using the time stamps they reported for when the unit was turned on and shut off, the total number of operating hours for April 2016 – March 2017 was approximately 7.5 hours. DTMB is in compliance with the 300 hour limitation as well as the 100 hour limitation. I recommended that for future compliance demonstrations, DTMB calculate how much time the engine operated on a monthly basis.

DTMB is also required to maintain the engine according to manufacturer's written instructions. H. Miller provided me with a copy of their Work Order printout (see attached) for their generator maintenance to demonstrate typical activities conducted during monthly maintenance checks; this includes checking antifreeze, oil, and fuel levels and leaks, inspecting the generator for loose, broken, or missing fasteners, and verifying that the generator space heater is functioning properly. Future inspections conducted will include review of the manufacturer's maintenance instructions and determining whether these practices are in accordance with what the manufacturer requires.

Design/Equipment Parameters

The EUENGINE1 is required not to exceed a nameplate capacity of 1,662 brake horsepower. According to the nameplate which H. Miller took a photograph of the nameplate which reads 1645 kW at 1800 RPM. Using the conversion factor 1 hp = 0.745699872 kW, the bhp of the unit is 2206 hp. Additionally, H. Miller provided me with the monthly NOx emissions testing on the engine which also indicates that the bhp at 100% load is 2206 (with a

NOx emission rate of 6.58 g/hp-hr). At 75% load the engine is operated at 1,662 hp. The engine installed exceeds the nameplate capacity of 1,662 bhp and therefore is in violation of this condition.

The unit is also required to have a non-resettable hours meter. I verified that they had one and recorded the total number of hours operated at 50.8 hours. DTMB is in compliance with this condition.

FGTURB/HRSG1 and FGTURB/HRSG2 (Cogenerators)

These two flexible groups have the exact same permitted requirements, and will therefore be reviewed for compliance together. These each TURB/HRSG is a nominally rated 19.0 MMBtu/hr natural gas-fired turbine with an associated heat recovery system (HRS) nominally rated at 20.0 MMBtu/hr using a natural gas-fired duct burner and electrical generator operating in combined-cycle mode.

S. Davis explained that the cogenerators burn natural gas to power the turbine; the heat from these is sent to the heat recovery system where it is transferred to water in the boiler to produce steam for the secondary complex.

Process/Operational Restrictions

DTMB is required to implement and maintain a malfunction abatement plan (MAP) for both cogenerator sets. During the August 3, 2012 inspection, Brad Myott documented that DTMB was out of compliance for not having this MAP within 180 days after initial startup. On October 12, 2012, the MAP was received; the current version is the October 12, 2012 MAP.

I have reviewed the MAP and it appears to contain the minimum requirements established in the permit. The MAP contains the frequency of inspection for various maintenance activities on the units. H. Miller provided me with logs of the monthly maintenance that is conducted on the units. It appears that some of the monthly inspections required in the MAP are being conducted. I will remind S. Davis and H. Miller that maintenance and inspections must be conducted on the equipment specified in the MAP, at the frequencies specified in the MAP.

The permit also requires that DTMB develop a plan that will describe how the emissions will be minimized during startup and shutdown events, based on procedures recommended by the equipment manufacturer. The 2012 violation letter included non-compliance with this condition. In the 2012 violation response letter, Keith Paasch of DTMB explained that startup and shutdown cycles on the two cogenerators are fully automated and cannot be altered. He also said that the system is configured in such a way that if a malfunction occurs the system will not start.

DTMB is in compliance with Process/Operational Restrictions at this time.

Testing/Sampling Requirements

DTMB was required to test for CO and NOx from both cogenerators within 180 days of initial startup. Stack testing was conducted on August 3, 2012 and the test report was received September 21, 2012. CO is limited to 50 ppmv dry at 15% oxygen and 3.7 lb/hr; NOx is limited to 42 ppmv dry at 15% oxygen and 5.0 lb/hr. The following table shows results from the test report in compliance with emission limits:

	CO (ppmv dry @ 15% oxygen)	CO (lb/hr)	NOx (ppmv dry @15% oxygen)	NOx (lb/hr)
TURB/HRSG1	25	0.9	32	1.9
TURB/HRSG2	35	1.4	29	1.9

The operating parameters recorded by Brad Myott during the stack testing are as follows: 0.5 water:fuel ratio, 16 MMBtu/hr heat input capacity, and 17,000 scf/hr.

During the inspection the following operating parameters were recorded:

EUTURBINE1: 16,000 scf/hr, 0.5 water:fuel ratio, 16 MMBtu/hr
EUTURBINE2: 17,000 scf/hr, 0.4 water:fuel ratio, 17 MMBtu/hr

Both turbines appeared to be operating within the same parameters ranges as those established during the stack test. S. Davis explain that the water:fuel ratio is what regulates NOx emissions.

DTMB is in compliance with their emission limits and testing requirements at this time.

Monitoring/Recordkeeping

DTMB is required to perform and document non-certified visible emissions observations once per month when the two cogenerators are operating. If visible emissions are detected, Method 9-certified visible emissions observations are required to be conducted for a minimum of 15 minutes to determine actual opacity. Records of non-certified visible emissions observations, Method 9 observations and the reason for visible emissions observed, as well as corrective actions, are to be kept on file.

DTMB provided a screen shot of the monthly operator work order which includes a visual inspection of the stacks on a monthly basis, which demonstrates that an inspection is being conducted, but records of the visible emissions observations are not being kept. DTMB is not in compliance with this requirement

Not recording the visible emission observations was also documented as a violation during the 2012 inspection.

Monthly operating hours for each cogenerator set is also required to be recorded in a satisfactory manner. I requested monthly records from April 2016 – March 2017. H. Miller provided me with start and stop times for each of the cogenerator sets. While this provides some documentation as to the number of hours operated per month, it is unsatisfactory. Monthly total operating hours have not been calculated from the start and stop times. DTMB is in noncompliance with this condition. DTMB was also not in compliance with this condition during the 2012 inspection, and was documented as such in the 2012 violation notice.

H. Miller received a statement from Consumer's Energy that the last natural gas test conducted in the area had no sulfur content in it, but that it should not contain more than 0.3 grains of H₂S or more than 20 grains of total S per 100 ft³. DTMB is required to keep record of total sulfur content in the natural gas per 40 CFR 60.4365(a) and has met this requirement.

On a calendar-month basis DTMB is also required to identify the type and amounts of fuel combusted in both cogenerator sets. H. Miller provided me with monthly records of natural gas usage for April 2016 – March 2017, as requested by me (see attached). They are reported as monthly totals combined for both cogenerator sets; H. Miller said that there facility has one meter to measure gas consumption and at this time they are not able to meter the natural gas usage for the cogenerator sets on an individual basis. They only use natural gas, units are in mcf/month. DTMB is in compliance with this requirement.

The document provided for operating hour run-times for both cogenerator sets is also used to show startup and shutdown times. H. Miller and S. Davis explained that the units are shut down September 22 and restarted on September 24 each year. This period is used for the annual inspection and maintenance on the units. There are occasions where S. Davis explained that too much steam is being produced which trips the system into automatically shutdown. During these times the units are brought back online within an hour. These "trips" are not part of the documented shutdowns and startups.

PTI No. 296-73: Two 60,000 lb/hr steam boilers and one 300 hp steam boiler

S. Davis said that of the permitted equipment under PTI 296-73, only one 60,000 lb/hr steam boiler remains. The other 60,000 lb/hr boiler and the 300 hp steam boiler were removed and replaced with the two HRSG's in 2012. Attached is a photo of the remaining boiler's nameplate, indicating a capacity of 60,000 lb/hr. Assuming 80% efficiency and 12,000 Btu/hr, 60,000 lb/hr equates to 90 MMBtu/hr.

S. Davis said this unit operates primarily on natural gas with diesel fuel oil #2 as backup.

The stack height is required to be at least 70' above ground level, and emissions are required to be discharged unobstructed vertically upward. During the inspection it was my professional judgment that the stack height was at least 70' above ground level and was unobstructed vertically upwards.

DTMB is in compliance with the requirements of PTI No. 296-73 at this time.

Compliance Statement: DTMB is currently in non-compliance with permit conditions associated with PTI No 156-10A for EUENGINE1, FGTURB/HRSG1 and FGTURB/HRSG2 at this time. A Violation Notice will be sent documenting these violations.

NAME M. Williams

DATE 5/30/17

SUPERVISOR B.M.

