

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

N683838013

FACILITY: Vector Pipeline L.P., Highland Compressor Station		SRN / ID: N6838
LOCATION: 2282 South Duck Lake Road, HIGHLAND		DISTRICT: Southeast Michigan
CITY: HIGHLAND		COUNTY: OAKLAND
CONTACT: Matt DiPaola, Technical Supervisor		ACTIVITY DATE: 12/21/2016
STAFF: Sebastian Kallumkal	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Onsite Inspection		
RESOLVED COMPLAINTS:		

On Wednesday, December 21, 2016, I conducted a targeted annual inspection at the Vector Pipeline L. P. – Highland Compressor Station located at 2282 South Duck Lake Road, Highland, Michigan. The purpose of the inspection was to verify facility's compliance with requirements of Article II, Air Pollution Control, Part 55 of Act 451 of 1994, United States Environmental Protection Agency (USEPA) Consent Agreement and Final Order (CAFO)-Docket No. CAA-05-2005-0014, and with the requirements of the Renewable Operating Permit No.: MI-ROP-N6838-2014.

I arrived at the facility about 10:25 AM. I met with Mr. Matt DiPaola, Operations Coordinator, Enbridge (U.S.) Inc. (219 218 4807). I introduced myself and stated the purpose of the inspection. This facility is usually unmanned, but Mr. John Wojcik, I & O Technician (cell: 248 245 3447) and Mr. Terry Barckholts, I & O Technician (248 245 9676) would be available upon request.

Prior to the inspection Terry provided me the safety instructions. During the pre-inspection meeting, we discussed the facility operations and reviewed various records including operations (NGP), emissions, Preventive Maintenance records, for the emergency generator, and the turbines. The facility is currently keeping all operations and emissions data online.

Facility is keeping records of the blow downs (BLOWDOWN TRACKER) and emergency generator operating hours. The facility has installed BAM system to the control panel to detect and report the condition of the burner. The facility had also installed an electronic fuel system for both turbines which reduced the shutdown incidents of the turbines tremendously. They had installed a "MAXIMO" recordkeeping system which would keep all records (maintenance, performance, etc.) of any equipment at the facility. He stated that they did not have any other process change at the facility since the last annual inspection.

Terry showed me how the monthly data (array) for each turbine is uploaded to the system for cooperate review and to make necessary reports. Before uploading he reviews the data (NGP, Fuel usage, Hours of operation, blowdowns, SoloNOx on/off, etc.) for compliance, especially NGP to determine the turbines were operated outside the range (SOLONOX OUT) established during most recent stack tests. The ESD testing is done annually. If the turbines operate below the SoloNOx mode, audible and visual alarms are generated in control room in Houston, Texas.

Facility recently upgraded the control panel for Unit 200 (EUTURBINE2). He informed me that during the testing of the new panel, Unit 200 ran below 92% NGP (11/19/2016). The control panel for Unit 100 (EUTURBINE1) would be replaced in January 2017.

He also explained that both turbine engines were replaced with like-kind.

August 21, 2016- Unit 100 30836 hours, 264 starts

August 14, 2016- Unit 200 30375 hours, 252 starts

I collected the test reports and replaced engines specifications (see attached).

He informed me that the emergency generator was not operated any other purpose than emergency power generation and testing. The facility conducted oil analysis on 8/11/2015 (hours = 1069) and again on 10/5/2016 (hours = 1073). Previously Terry McMillan informed AQD that they missed 12-month oil analysis, but conducted it (10/5/2016) at 14 month. Oil was previously changed on 10/24/2014.

I reviewed the data for both turbines for the period of December 2015 through November 2016. The turbines were operated above the minimum NGP except during start up, or shut down. The records showed Unit 200 operated for "SoloNOx = OUT" at 91.73 NGP during an hour on 12/30/2015 and on 5/17/2016 (8 PM, 91.45% NGP, SoloNOx =OUT).

The facility is a true minor for HAP emissions and hence not subject to the National Emission Standard for Hazardous Air Pollutant (NESHAP) for turbines. Based on the annual emissions reporting (MAERS) the facility's 2015 VOC emissions were 1.14 tons per year. The facility-wide potential to emit for HAP emissions was 2.454 TPY per Permit to Install Application for PTI 166-00A.

At the time of my inspection Unit 200 was operating. He accompanied me for the inspection of the turbines.

Data collected for Unit 200

NGP: 95.6% (Turbine Speed)

On Load

NTP: 81.5% (Compressor Speed)

T5 Topping (temperature of the combustor of the engine, monitored all around it) =1311°F

HP = 11233; 1236 hours

He explained that the engines are operated sporadically. Unit 100 only operated 7 days in December (Total Hours = 1227 hours).

Highland Compressor Station aids in the transportation of natural gas in the pipeline system from Joliet, Illinois to Dawn Township, Ontario, Canada. This facility is operated 24 hours and all year around. It operates two Solar Turbines Incorporated (Solar) Mars 100S natural gas fired turbines. These turbines are operated in parallel and operate independent to each other. Each turbine is rated at 15,000 Horse Power with a maximum heat input rate of 112.35 MMBTU/hr. These turbines are designed with nitrogen oxides (NOx) emission control referred to as dry low NOx (DLN) or SoLoNOx. The facility also has one natural gas-fired internal combustion engine, 9.654 MMBTU/hr, emergency generator. The turbine operations can also be controlled by office in Houston, Texas.

Turbine maintenance includes washing and emergency testing. The natural gas from the turbine testing and from the annual full station ESD testing is vented to the atmosphere through a muffler. Emergency shut down and natural gas venting need to be reported to the Michigan Public Service Commission. The wash water from turbine cleaning and spent oil (from filters) are stored in tank and hauled away by Usher Oil, Inc. Detroit, MI.

The facility has a gas chromatography which analyses natural gas composition continuously. The sulfur in the gas is analyzed at Athens, Belle River, Highland, Milford Junction, Joliet, and Washington compressor stations. All analyses on 12/21/2016 show H2S concentration as "NULL". The website (www.vector-pipeline.com, Informational Postings; Gas Quality, Gas Quality Report) provides gas analyses for each day from each station. The gas Tariff is also available from the website. The facility recently updated its recordkeeping of the hourly emissions data and operations data are available online. This makes review of the data easier.

Inspection:

Source-Wide Conditions:

The Carbon Monoxide emissions are limited to 224 tons per year based on a rolling 12-month time period. The calculated total CO emission rate as of November 2016 was 3.93 Tons.

The facility is monitoring and keeping records of the natural gas fired in FGTURBINES during each calendar day.

Based on the information from Tariff (copy of gas quality section attached) the facility is burning natural gas, as defined in 40 CFR Part 72.2. Facility is monitoring and recording the usage of natural gas in FGTURBINES and EUSPU3 on a daily basis.

EUSPU3

As of November 2016, the annual NOx emissions are 0.89 TPY (Permit Limit = 9.85 Tons) based on a rolling 12-month time period as determined at the end of each calendar month. The hourly NOx emissions are limited to 39.4 pounds. The hourly emissions calculated based on monthly emissions from 12-month rolling period emissions and monthly hours of operation appears to be in compliance with the emission limit.

The 12 month rolling CO emissions were 0.007 tons as of November 2016. The permit limits the hourly CO emissions to 3.06 pounds. The hourly emissions calculated based on monthly emissions from 12-month rolling period emissions and monthly hours of operation appears to be in compliance with the emission limit.

Under the quality of gas section in the Tariff (posted in Vector-Pipeline.com), the sulfur content is limited to 20 grains per 100 cubic feet (1/4 grain H₂S per 100 cubic feet of gas) which is in compliance with 40 CFR Part 72.2 which defines that natural gas contains 20.0 grains or less of total sulfur per 100 standard cubic feet. The Vector Gas Quality Report from the Vector-Pipeline.com shows that the sulfur content is "NULL" as of December 21, 2016.

The records show that the emergency generator was operated 1073 hours as of 10/5/2016 since installation and 4.5 hours based on a 12-month rolling time period as of November 2016. Facility is keeping daily hours of operation for emergency and non-emergency purposes. The permit limits the operating hours to 500 hours per calendar year.

The permittee keeps records for each calendar month and based on 12-month rolling time period the hours of engine operation, fuel usage, and also calculates NOX and CO emissions in tons as required. The 12-month rolling fuel consumption as of November 2016 was 12.4 MCF. The stack dimensions of the SPU were not verified.

Facility is maintaining a preventive maintenance plan (PMP) per Section IX, Condition 1. I reviewed PMP records during the inspection.

FGTURBINES

Nitrogen oxides (NOx) emissions are limited to 37.9 pounds per hour and 126.7 tons per year based on a 12-month rolling time period. The December 2015 through November 2016 records show that hourly NOx emissions are less than the permit limit. The 12-month rolling NOx emissions, as of November 2016 were 16.97 tons for both engines combined.

The Carbon monoxide emissions are limited to 800 pounds per hour while the natural gas producer speed (NGP) is between 86 to 92% and 25.14 pounds per hour while operating above

92%. The facility is calculating and keeping hourly emissions data for each engine on a monthly basis and the annual emissions on a 12-month rolling time period basis. At the facility I reviewed the December 2015 through November 2016 data. The records show that the turbines did not run below 92% during these times except for startup and shutdown and one hour in 2015 (Turbine 2, 12/30/2015) and 1 hour in 2016 (Turbine 2, 5/17/2016). The facility appears to be in compliance with these emission limits. From the reviewed records from December 2015 through November 2016 data at the facility, the turbines were run in SoloNOx Mode "ENABLED". Unit 200 ran "SoLoNOX Out and below 92% NGP during control panel installation for few hours. The NOx emissions were less than 12 pounds per hour and CO emissions were less than 5 pounds per hour while the SoloNOX is enabled.

He informed me that the hourly emissions which are calculated based on stack results and the NGP for that hour.

Sulfur dioxide emissions are limited to an instantaneous concentration of 150 ppm by volume at 15% oxygen and dry gas basis and 100% load, 13.52 pounds per hour and 59.21 tons per year based on 12-month rolling time period. The facility is limited to burn only natural gas with sulfur content of 20 grains per CCF and the gas analysis shows that the H₂S content was below detectable (NULL). As of November 2016 the SO₂ emissions for both turbines were 0.14 Tons based on a 12-month rolling time period. The records show that the total SO₂ emissions from EUTURBINE1 were 0.0750 tons and EUTURBINE2 was 0.0662. Based on these emissions the facility is expected to be in compliance with the emission limits.

Section III, Condition 1 prohibits the facility to operate the turbines at loads less than 86% NGP, except during start up and shut down. Based on the records review, the facility did not operate the turbines below 86% NGP except for shut down/start up. Facility keeps operational records by hour. The facility is in compliance with this condition.

Section III, Condition 2 and Condition 3 require the facility to burn natural gas, defined in 40 CFR Part 72.2 and limits the sulfur content to 0.8 per cent by weight. Facility uses the natural gas they transport as fuel in the turbines. The approved Custom Fuel Monitoring Program (CFMP) allows the facility exempt from sulfur content monitoring required by 40 CFR Part 60, Subpart GG if the facility maintains a valid tariff in place with the Federal Energy Regulatory Commission (FERC) that limits the sulfur content of natural gas combusted in the turbines to not more than 20 grains of total sulfur per 100 standard cubic feet of natural gas. 40 CFR 72.2 specifies that natural gas contains 20.0 grains or less of total sulfur per 100 standard cubic feet. Facility's tariff (under Quality of Gas) requires that the gas to be received by the facility (Transporter) shall conform to the following specifications:

"Shall contain no more than 1/4 grain of hydrogen sulfide per 100 cubic feet of Gas nor more than 20 grains of total sulfur per 100 cubic feet of Gas". The natural gas analysis results detailed in company's website shows that sulfur content is 0.03 grains per CCF.

Facility records show that the turbines operated at all times in compliance with the NOx and CO emission limits. AQD has not requested emission testing recently (Section V).

Permittee conducted tests to verify NOx and CO emissions from the EUTURBINE1 and EUTURBINE2 on July 1 & 2, 2014. The testing complied with the requirements of Section V, Conditions 1-6. The report showed that the engine emissions were in compliance with the emission limits.

Facility is keeping records specified in Section VI, Condition 1 (hourly % NGP, SoloNOx Indicator, CO & NOx hourly and annual emission calculations, and the Tariff). Facility appears to be in compliance with the 40 CFR 60, Subpart GG requirements.

The stack dimensions were not verified. Facility keeps records of the start up/shut down/malfunction operations and maintains and implements a Preventive Maintenance Plan (PMP). Copies of data received during inspection are attached for review.

Conclusion: From the facility inspection, records and reports review, this facility appears to be in compliance with the applicable requirements. Records are attached for review.

NAME Sebastiany Kallimka

DATE 1/24/2017

SUPERVISOR Joyce B.

