DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: On-site Inspection

N742173092

FACILITY: DTE Gas Company - Willow Run Compressor Station		**SRN / ID:** N7421
LOCATION: 3020 East Michigan Avenue, YPSILANTI		**DISTRICT:** Jackson
CITY: YPSILANTI		**COUNTY:** WASHTENAW
CONTACT: John Leonard , Senior Environmental Specialist		**ACTIVITY DATE:** 08/07/2024
STAFF: Mike Kovalchick	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: Inspection of a natural gas compressor station. The inspection included use of methane detectors to check for leaks.		
RESOLVED COMPLAINTS:		

Major / ROP Subject Source. Full Compliance Evaluation (FCE) and Partial Compliance Inspections (PCEs) SRN N7421

Contact

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Purpose

On August 7, 2024, AQD conducted an announced compliance inspection of the Willow Compressor facility owned and operated by DTE Energy (Company) located at 3020 East Michigan Ave in Ypsilanti, Michigan. The purpose of this inspection was to determine if this facility was in compliance with the requirements of the federal Clean Air Act; Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451); the conditions of Renewable Operating Permit (ROP) MI-ROP-N7421-2022; the federal National Emission Standards for Hazardous Air Pollutants (NESHAP): Stationary Reciprocating Internal Combustion Engines 40 CFR Subpart ZZZZ; NESHAP Industrial, Commercial, and Institutional Boilers and Process Heaters (Gas 1 Fuel Subcategory) 40 CFR Subpart DDDDD(Boiler MACT); federal New Source Performance Standard (NSPS): Stationary Spark Ignition Internal Combustion Engines 40 CFR Subpart JJJJ and NSPS Stationary Combustion Turbines 40 CFR Subpart KKKK.

Background

This facility has become subject to Title V of the Clean Air Act (CAA) for Hazardous Air Pollutants (HAP). Per Rule 210(4) DTE was required to apply for a Renewable Operating Permit (ROP) not more than 12 months after commencing operation as a major source. A Title V application was received by AQD on March 20, 2019. The ROP was issued on April 6, 2022.

The mostly recently installed equipment is a part of a larger project that handles natural gas moving operations in conjunction with the relatively new Nexus pipeline. The equipment previously on site was projected to not be sufficient to handle the increased volume of natural gas.

The last inspection was conducted on June 29, 2022. The facility was found to be in compliance.

Compliance Evaluation

Inspection Observations/Comments:

Inspection consisted of conducting a survey of the facility/facility yard looking for methane leaks using a SEM5000 Methane detector and Methane Smart Laser device and visiting the control room to real time for any engines/turbines that were active. The methane survey was conducted for informational purposes only and was not used as a compliance tool during the inspection.

Upwind reading was determined to be around 2.5 ppm methane (natural methane background). Little to no difference was noted downwind. The areas outside of Plant 1 and Plant 2 were surveyed. No meaningful methane was detected. Inside Plant 1 building, very little methane was detected. (Plant 1 had no engines/turbines running.) Inside Plant 2 building, also very little methane was detected. (One engine was operating.) Overall, everything was tight as would be expected with relatively new piping etc.

A visit to control room confirmed that only one engine (Unit 2300) was operating. (The engine was probably EURICE3 rated at 5000 HP.) The fuel flow into the engine was 7366 SCFM and was processing 4 MMSCFM of natural gas through the pipeline. The compressor station is only operating at a fraction of capacity. The recent large increase in pumping capacity is mostly not being utilized. To date, the Nexus pipeline has not generated the level of gas pressure that was expected and also not expected to further increase in the future. Therefore, the gas pressure from the ANR/Panhandle lines that go through the facility do not have to be significantly increased to match the Nexus pipeline to be added into that piping system. Only small increases in engine usage have occurred since the Nexus pipeline went online.

Catalyst bed temperature for the one engine that was operating was 850 Degrees F. (Normal operation is between 825 to 900 F.) Pressure drop across the bed was measured to be 0.9". (Acceptable is having at least some pressure drop.)

The catalyst material is cleaned once a year with deionized water. The catalyst is rated to last 40,000 to 50,000 hours of operation. The current catalyst beds have between 5000 to 10,000 hours of operation.

Note: To date, the turbine has not been operated in 2024.

There has been one natural gas venting episode this year that occurred in early July due to a power outage. About 300,000 SCF was released.

Annual ROP deviation report lists a bad thermocouple in one of the catalyst beds in the Fall of 2023. It took several months to find a replacement thermocouple due to the lack of availability. It appears that the catalyst bed in question operated normally during this time based on observed steady pressure drop across the bed and other normal operating parameters.

Review of MAERS 2023: Included on only emission units with emissions greater than 1 ton of pollutant:

EU0016(Heater) (3.3 Tons NOx)

EU0017(Heater) (1.5 Tons NOx)

EU0018(Heater) (2.4 Tons NOx)

EU0025(Engine with catalyst) (3.5 Tons NOx)

EU0022(Turbine) (1.2 Tons NOx)

Source Totals: 19.4 Tons of NOx, 3.6 Tons of CO, 0.86 Tons of VOC, 0.71 Tons of Formaldehyde, 76.6 Tons of methane which is somewhat lower than recent previous years.

Review of required records:

Required records by the ROP for 2024 were requested by AQD prior to the inspection. The Company provided the records electronically on August 12, 2024 and August 15, 2024. The following is a list of the records requested and the response received with any added AQD comments in brackets. [ ]

EUTURBINE1 [Compliance]

VI. MONITORING/RECORDKEEPING Conditions 1, 2. All required records for 2024. (Ending June 30)

EUEMGRICE1 [Compliance]

VI. MONITORING/RECORDKEEPING Conditions 1, 2, 3. All required records for 2024.

FGENGINES [Compliance]

VI. MONITORING/RECORDKEEPING Conditions 1, 2. All required records for 2024.

FGENGMACT4Z-EURICE1-3 [Compliance]

VI. MONITORING/RECORDKEEPING Conditions 3, 4, 5. All required records for 2024.

FGNOX [Compliance]

VI. MONITORING/RECORDKEEPING Conditions 1, 2. All required records for 2024.

FGBLRMACT-SM [Compliance]

VI. MONITORING/RECORDKEEPING Conditions 1, 3, 4. All required records for 2024.

FGBLRMACT-LG [Compliance]

VI. MONITORING/RECORDKEEPING Conditions 1, 3, 4. All required records for 2024.

EUENGINE1 [Compliance]

VI. MONITORING/RECORDKEEPING Conditions 3, 4, 5, 6, 7, 8. All required records for 2024.

FGENGMACT4Z-ENGINE1 [Compliance]

VI. MONITORING/RECORDKEEPING Conditions 3, 4, 5. All required records for 2024.

The list of documents reviewed included the following:

1. Willow Emissions Tracking Document
2. Thermocouple Data Engine1 and Rice1 (Calibration Report)
3. 2100 Maintenance records (Okay)
4. 2200 Maintenance records (Okay)
5. 2300 Maintenance records (Okay)
6. 1100 Maintenance records (Okay)
7. 2017 Willow NESHAP MACT Initial Notification of Startup (November 3, 2017)
8. 40 CFR 63 DDDDD NESHAP Compliance (Burner inspection January 2023)
9. 2016 NESHAP Initial Notification of Startup (November 18, 2016)
10. 2017 NESHAP initial Notification of Startup (December 14, 2016)
11. 2018 Notification of Startup and Operating Status
12. June 2024 EUEngine1 Compliance Report Subpart JJJJ & ZZZZ (CO Destruction Eff Test-Compliance)
13. 2018 Willow Turbine startup Notification (July 10, 2018)
14. Compliance Report Turbine 1 Feb 2024
15. Compliance Report Turbine YYYY (Formaldehyde Test-Compliance)
16. Euturbine1 Initial Performance Test (Compliance NOx and CO.)
17. 2017 Willow Emergency Engine Completion of Construction (September 12, 2017)
18. 2018 Willow Emergency Engine Non-Certified Status
19. Emergency Engine Construction Initial Notification (May 25, 2017)
20. Willow Emergency Engine Non-Certified Noticed Revised (Revised Startup Date)
21. Willow Catalyst Data Thru June 2024 (0.87 to 1.27” pressure drop range in 2024)
22. Solar Nameplate pic (7684 HP)
23. Nexus Sulfur Data (< .5 gr/ccf)

No compliance issues with records reviewed or compliance tests that were conducted since last inspection.

Compliance Determination

After onsite inspection and review of requested records, AQD has determined that this facility is in compliance with State of Michigan and Federal air quality rules and regulations and ROP MI-ROP-N7421-2022.

NAME Mike Kovalchick DATE 08/19/2024 SUPERVISOR