

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

B648072140

FACILITY: DTE Gas Company - Columbus Compressor Station		SRN / ID: B6480
LOCATION: 1647 CAUGHILL Road, COLUMBUS		DISTRICT: Warren
CITY: COLUMBUS		COUNTY: SAINT CLAIR
CONTACT: Joe Neruda , Environmental Specialist		ACTIVITY DATE: 06/12/2024
STAFF: Marie Reid	COMPLIANCE STATUS: Non Compliance	SOURCE CLASS: MAJOR
SUBJECT: FY24 Scheduled Inspection.		
RESOLVED COMPLAINTS:		

On June 12, 2024, I (Marie Reid), Michigan Department of Environment, Great Lakes, and Energy – Air Quality Division (EGLE-AQD), conducted a scheduled inspection of DTE Gas Company – Columbus Compressor Station (SRN: B6480) located at 1647 Caughill Rd, Columbus, MI. The purpose of this inspection was to determine the facility's compliance with the requirements of the Federal Clean Air Act; Article II, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451); Michigan Administrative Rules; 40 CFR Part 63 Subpart ZZZZ – National Emissions Standards for Stationary Reciprocating Internal Combustion Engines; 40 CFR Part 60 Subpart JJJJ – Performance Standards for Stationary Spark Ignition Internal Combustion Engines; and the conditions of Renewable Operating Permit (ROP) No. MI-ROP-B6480-2024.

Joe Neruda, Environmental Specialist provided records via email before the inspection. The records are stored on the S drive (S:\Air Quality Division\STAFF\Marie Reid\FY24\B6480 - DTE Columbus Compressor Station\Columbus Records).

I arrived at the front gate of the facility at 10:20 am. Joe opened the gate and escorted me to the main office where we met with Joshua Kesner and Joseph Anderson, Technicians. I entered the office, showed ID, and signed in. DTE staff answered questions and escorted me during the facility walk through. All emission units listed in the ROP were observed during the inspection.

Safety Equipment: Flame resistant clothing, hard hat, safety glasses, hearing protection, and work boots/shoes.

Facility Overview

DTE Gas Company operates a natural gas compressor station in southwestern St. Clair County approximately one mile north of Gratiot Avenue on Caughill Road. The area surrounding Columbus Compressor Station is rural, and sparsely populated with residential properties. The nearest residence is approximately one-quarter of a mile south of Columbus Compressor Station.

The function of Columbus Compressor Station is to maintain pressure in pipelines transporting sweet natural gas between gas storage fields in southern Michigan and to inject natural gas into geological formations for storage. Natural gas typically is injected into the storage field during the spring and summer months and is ready for withdraw starting in November each year. The Columbus Compressor Station consists of two 2,000 horsepower reciprocating compressor engines (EU007 and EU008) which fire sweet natural gas and are used to increase the natural gas pressure, one emergency generator (EUEMERGEN), two glycol dehydrators (EUDEHY1 and EUDEHY2) used to remove impurities from withdrawn natural gas, various auxiliary equipment, several organic liquid storage vessels, and one cold cleaner (EUCOLDCLEANER).

While natural gas is stored, it absorbs hydrocarbons and moisture from the storage field. Columbus Compressor Station has two glycol dehydration systems to remove moisture and hydrocarbons from the gas before sending it to the pipeline system. No gas was being withdrawn from the storage field at the time of the inspection.

During the glycol dehydration process, water and hydrocarbons are removed from the natural gas in a glycol contact tower and then the glycol is regenerated. EUDEHY1 has one contact tower and EUDEHY2 has two contact towers. The wet gas enters the contact tower where it comes into contact with the glycol. The glycol absorbs the moisture and hydrocarbons in the natural gas and the dry gas is delivered to customers. The rich glycol exits the contactor and is sent to a flash tank (3-phase separator) to remove hydrocarbons and gases. Gases from the flash tank exhaust to the enclosed flare (thermal oxidizer) or the reboiler burner for fuel. The glycol is then routed to the reboiler to drive off the moisture in the glycol at around 375° F to regenerate the glycol for reuse. The lean glycol is then recirculated back to the contact towers.

The two reciprocating internal combustion engines (RICE) (FGDELAVALS) are used to compress natural gas for storage during the summer months and transmission throughout the pipeline transmission system to customers during the winter months. At the time of the inspection, both engines were injecting natural gas into the storage field.

Regulatory Analysis

A portion of St. Clair County is currently designated by the U.S Environmental Protection Agency (USEPA) as a nonattainment area with respect to the SO₂ standard.

DTE Columbus Compressor Station is a major source of nitrogen oxides (NO_x) and an area source of hazardous air pollutants (HAPs).

EUEMERGEN at the stationary source is subject to the Standards of Performance for Stationary Spark Ignition Internal Combustion Engines promulgated in 40 CFR Part 60, Subparts A and JJJJ.

EUEMERGEN, and EU007 and EU008 (FGDELAVALS) at the stationary source are subject to the National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines promulgated in 40 CFR Part 63, Subparts A and ZZZZ. For EUEMERGEN, compliance with 40 CFR Part 63, Subpart ZZZZ is demonstrated through compliance with 40 CFR Part 60, Subpart JJJJ.

EUDEHY1 and EUDEHY2 (FGDEHY) are not subject to the National Emissions Standards for Hazardous Air Pollutants from Natural Gas Transmission and Storage Facilities promulgated in 40 CFR Part 63, Subparts A and HHH because the facility is not a major source of hazardous air pollutants (HAP) based on emission calculations provided by DTE. Enforceable emission limits, process, operational, design, and equipment parameters included in the ROP for FGDEHY restrict HAP emissions to below major source thresholds.

The facility has nine exempt emission units that are listed in the 2024 ROP Application and ROP Staff report. These exempt emission units consist of boilers, heaters, and furnaces. All nine of these emission units are exempt from the requirement to be permitted as stated in Rule 201 pursuant to Rule 282(2)(b)(i).

Annual Air Emissions Report (AER)

Columbus Compressor Station submitted their 2023 AER to SLEIS on time. The emissions and throughput values reported to SLEIS are consistent with records provided during this inspection.

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FGDEHY

EUDEHY1 is limited to 6.2 tons/year of VOC emissions and EUDEHY2 is limited to 1.9 tons/year of VOC emissions (SC I.1 and II.1 respectively). Joe provided monthly and 12-month rolling emission records for January 2022 through May 2024 as required in SC VI.5. The emission records also included amount of natural gas processed on a monthly basis and hours of natural gas processing on monthly and 12-month rolling basis for each dehydrator as required in SC VI.2 and SC VI.6, respectively. Based on the records, the highest 12-month rolling VOC emissions for EUDEHY1 and EUDEHY2 was 86.29 lbs reported for the 12-month period ending February 2024, and 337.39 lbs reported for the 12-month period ending February 2022, respectively. These VOC emissions are below the limits in SC I.1 & SC I.2.

SC VI.5 also states that if GRI-GLYCalc (Version 3.0 or higher) is used to calculate the emission rates, the inputs to the model shall be representative of actual operating conditions of each dehydrator and shall include the most recent gas analysis data. Joe stated that the VOC emissions records are calculated using the GlyCalc software (GRI-GLYCalc VERSION 3.0) and the hours of natural gas processing and natural gas volume processed by each dehydration unit is entered into GlyCalc to calculate the VOC emissions. Joe sent me a screenshot from GLYCalc showing the current gas values used to calculate emissions. Based on this screenshot, it appears that the gas values used to calculate emissions are from the 2022 gas analysis report, and not the most recent gas analysis report completed in 2024, as required by SC VI.5. I requested Joe to send me VOC emissions calculated using the gas values from the most recent gas analysis report completed in 2024. Based on the records provided, the VOC emission values appeared to be around eight times higher using the 2024 gas values than while using the 2022 gas values. This is a violation of MI-ROP-B6480-2024, FGDEHY SC VI.5. A violation notice will be issued for this non-compliance.

SC III.1 requires that the average glycol recirculation rate for EUDEHY2 shall not exceed 14 gallons/minute, calculated on a calendar month basis. Joe provided records for the monthly average glycol recirculation rate, as required in SC VI.3 and SC VI.7. Joe stated that the glycol recirculation rate is logged in a computer software (PI) every 15 minutes and averaged on a daily and monthly basis. The records indicate that the average glycol recirculation rate for EUDEHY2 was below 14 gallons/minute between January 2022 and May 2024. The highest average glycol recirculation rate recorded for EUDEHY2 was 12.70 gallons/minute in February 2024.

SC III.2 requires a pilot flame at each enclosed flare (thermal oxidizer or TO) to reach 1400° F before the operation of the dehydrators begin. Joe provided the daily flare operating temperature records as required in SC VI.4. The temperature records indicate that the flare temperature reached a minimum of 1400°F for all days the dehydrators were operating between January 2022 and May 2024. The lowest flare temperature recorded was 1400°F in EUDEHY2 on February 20, 2022. During the inspection, DTE staff said that if the flare temperature falls below 1400°F, the system shuts down.

SC IV.1 and SC IV.2 requires the dehydrators to be equipped with a properly operating flash tank and associated enclosed flare. Satisfactory operation includes routing the flash tank exhaust gas to the reboiler burner, the enclosed flare, or equivalent control device for destruction. I observed both dehydrators and their associated flares during this inspection. FGDEHY was not operating. The dehydrators are located in an enclosed building and the associated flares are located ~ 20ft north of this building. I observed the flash tank that separates hydrocarbons from the glycol. The exhaust gases from each flash tank are routed to the reboiler burner and flare.

SC IV.3 and SC IV.4 requires the facility to equip and maintain an operating temperature monitor and flame detector on the enclosed flares. I observed that each flare is equipped with a temperature monitor and flame detector.

SC V.1 requires an analysis of the wet gas stream at least once each withdrawal season. The permittee shall analyze the sample for nitrogen, carbon dioxide, hydrogen sulfide, C1 through C6 series hydrocarbons, benzene, toluene, xylene, ethylbenzene, and heptanes plus heavies. Joe sent me the annual natural gas analysis reports as required in SC VI.8 from January 2022 through May 2024. Below are the dates each sample was analyzed by DTE Gas Laboratory Services:

EUDEHY1: 1/7/2022, 1/30/2023, and 3/21/2024

EUDEHY2: 1/13/2022, 1/25/2023, and 2/2/2024

Based on these gas analysis reports, I confirmed that the facility analyzed the natural gas as required in SC V.1.

FGDELAVALS (EU007 & EU008)

FGDELAVALS has an emission limit for CO: 47 ppmvd at 15% oxygen or a minimum reduction of 93% over a 15-minute time period (SC I.1). This emission limit is verified by annual performance testing as required in SC V.1. The most recent performance testing was conducted on June 13-14, 2023. The results of the testing indicate that the average CO Reduction Efficiency for EU007 and EU008 are 98.4% and 97.9% respectively. The results of this performance testing verifies that FGDELAVALS meet the CO emission limit in SC I.1.

SC III.1 requires proper operation and maintenance of the engines and associated air pollution control equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions. Based on my observations during this inspection and the records provided I determined the facility is in compliance with this condition.

SC III.2 requires the permittee to minimize the engine's time spent at idle during startup and minimize the engine's startup time, not to exceed 30 minutes. Joe provided the facility's Startup, Shutdown, & Malfunction Plan (SSMP). The SSMP states that if engine start-up exceeds 30 minutes, the operator must shut down the engine, notify the Environmental Representative, and document the event. Joe said they have not had any start-ups exceed 30 minutes.

SC III.3 requires a site-specific monitoring plan that addresses the Continuous Parameter Monitoring System (CPMS) design, data collection, and the quality assurance and quality control elements outlined in this condition. I reviewed the facility's SSMP dated January 13, 2020. Upon review, the plan contains all required information.

SC IV.1 requires the permittee to install an oxidation catalyst to reduce HAP emissions from each engine in FGDELAVALS. I observed each engine in FGDELAVALS and their associated oxidation catalysts during this inspection.

SC IV.2 - SC IV.4 requires the installation of a CPMS to continuously monitor and maintain the catalyst inlet temperature so the 4-hour rolling averages are within the limitation of greater than 450°F and less than or equal to 1350°F. If the engines exceed 1350°F, the permittee must shutdown the engine. Joe provided the engines' continuous catalyst inlet temperature data records as required in SC VI.2. Based on the records, the catalyst inlet temperature is continuously monitored while the engines are operating. The facility does not track four hour rolling averages. Instead, the catalyst system is set to automatically shut down the engine if the catalyst inlet temperature falls below 650°F or exceeds 950°F. This does not include catalyst temperature during normal startup/shutdown of the engine (first 30 minutes after startup). This satisfies the requirements in SC IV.3 and SC IV.4.

EU007 and EU008 were both operating during this inspection to inject natural gas into the underground storage fields. I observed the control panel on both engines. For EU007, I noted a catalyst inlet temperature of 788.1 °F and 106,169 total engine run hours. DTE staff informed me that this engine was currently in shutdown mode. For EU008 I noted a catalyst inlet temperature of 852.6°F and 48,485 total engine run hours. Both engine's catalyst inlet temperature was within the limit in SC IV.3.

SC IV.5 requires the permittee to ensure the following for each engine:

- a) The CPMS collects data at least once every 15 minutes. Based on the provided CPMS records, the CPMS is collecting data every 15 minutes.
- b) The temperature sensor must have a minimum tolerance of 2.8 °C (5 °F) or 1 percent of the measurement range, whichever is larger. Joe provided the accuracy audits performed in 2022 and 2023 on the engine's catalyst inlet thermocouple. The audits performed on June 6, 2022, and September 13, 2023, show the thermocouples are within tolerance. Joe said they do not calibrate the thermocouple, instead they annually verify accuracy and replace as needed.
- c) Conduct the CPMS equipment performance evaluation, system accuracy audits, or other audit procedures specified in the site-specific monitoring plan at least annually; and d) Conduct a performance evaluation of each CPMS in accordance with the site-specific monitoring plan. According to the SSM plan, performance evaluations, system accuracy audits, and other audits are conducted annually.

SC VI.2.a requires continuous monitoring of the catalyst parameters at all times except for monitor malfunctions, associated repairs, required performance evaluations, and required quality assurance or control activities. Based on the provided CPMS records and speaking with staff, DTE monitors the catalyst parameters continuously, except for the times listed in this condition.

SC VI.2.b prevents the use of data records during monitoring malfunctions, associated repairs, and required quality assurance or control activities in data averages and calculations used to report emission or operating levels. Based on the provided CPMS records and speaking with staff, DTE does not use data records for any of the reasons listed in this condition.

Per SC VI.3, the permittee must keep the following records:

- a) Records described in 40 CFR 63.10(b)(2)(vi) through (xi), and b) Previous (i.e., superseded) versions of the performance evaluation plan, and c) Requests for alternatives

to the relative accuracy test for CPMS. I was provided all of the records required by this condition and the previous performance evaluation plan. Upon review, these records are acceptable. According to staff, DTE has not made requests for alternatives to the relative accuracy test.

SC VI.4 requires the permittee to keep records to demonstrate continuous compliance with the operating limitations in SC IV.3 by a) Collecting the catalyst inlet temperature data; b) reducing these data to 4-hour rolling averages; and c) maintaining the 4-hour rolling averages within the limitation of greater than 450 °F and less than or equal to 1350 °F for the catalyst inlet temperature. As previously stated, this permit condition is satisfied by the catalyst system's controls which are set to automatically shut down the engine if the catalyst inlet temperature falls below 650°F or exceeds 950°F.

SC VI.5 requires the permittee to keep records of maintenance conducted on each engine in FGDELAVALS. Joe said EU007's catalyst was replaced in November 2021, in conjunction with replacement of the silencer and muffler. Performance testing on the catalyst was then completed January 26, 2022, as required in SC V.3. The results of the testing indicate that the average CO Reduction Efficiency for EU007 was 99.99%, which meets the CO emission limit in SC I.1. The facility did not complete any maintenance on the EU008 catalyst from January 2022 – May 2024.

SC VI.6-8 requires all records are maintained in a form suitable and readily available and kept on file for 5-years. Joe provided all requested records in a suitable form and in a timely manner.

SC IX.1 requires the permittee to comply with the NESHAP Subpart ZZZZ rules and regulations. Based on the field inspection and records reviewed, the company is in compliance with the NESHAP Subpart ZZZZ.

FGEMERGEN

Joe provided a copy of the emergency engine's Specification Sheet and EPA certificate demonstrating that EUEMERGEN is an EPA SI NSPS Certified engine, as required in SC VI.2.c. The certification contains the following emission standards: CO (g/Hp-hr): 4, VOC (g/Hp-hr): 1, NOx (g/Hp-hr): 2, which satisfies the emission limits in SC I.1- SC I.3.

SC IV.1 requires EUEMERGEN be equipped with a non-resettable hour's meter. During this inspection I observed the control panel on the emergency engine. I noted that hour's meter read 1161.5 hours.

SC III.1 & SC III.2 limits EUEMERGEN's operation to 100 hours per calendar year for maintenance checks and readiness testing and 50 of these hours may be used to operate the engine in non-emergency situations. Joe provided monthly and annual records of the number of hours spent for emergency operation, including what classified the operation as emergency and how many hours were spent for non-emergency operation, as required in SC VI.2 - SC VI.3. See below for the annual summary from January 2022 – May 2024:

Year	Emergency Use (hours)	Emergency Classification	Non-Emergency Use (hours)
2022	104.5	Power Outages	6
2023	10.5	Power Outages	10.3
January 1 st , 2024 – May 31 st 2024	4	Power Outages	16.6

Joe provided the engine's annual maintenance inspection records from January 2022 – May 2024 as required in SC VI.1 and SC VI.2. The annual inspections Joe provided were completed on December 8, 2022, and November 11, 2023. Based on the records, these inspections note that they changed oil and filters and inspected hoses and belts. During the inspection, I observed a sticker on the emergency engine that said the most recent oil change was completed on November 11, 2023.

SC IX.1-2 requires the permittee to comply with the NSPS Subpart JJJJ and the NESHAP Subpart ZZZZ rules and regulations. Based on the field inspection and records reviewed, the company is in compliance with the NSPS Subpart JJJJ and NESHAP Subpart ZZZZ.

FGCOLDCLEANERS

SC II.1 states that the permittee shall not use cleaning solvents containing more than five percent by weight of the following halogenate compounds: methylene chloride, perchloroethylene, trichloroethylene, 1,1,1-trichloroethane, carbon tetrachloride, chloroform, or any combination thereof. I was provided a material safety data sheet (SDS) and I found the solvent used in the cold cleaner is ZEP DYNA 143 (SC IV.3). The MSDS does not list any halogenated solvents and therefore it complies with the permitted material limits.

I observed the cold cleaner during my inspection. The cold cleaner had an air/vapor interface less than 10 square feet, was equipped with a device for draining cleaned parts, the lid was closed, and proper operating instructions were posted (SC IV.1- SC IV.3 and SC VI.4).

As required in SC VI.2, Joe provided the following information:

Model	Serial	Interface Area	Install Date	Solvent	Reid Vapor Pressure	Rule 201 Exemption
906601	87765	7.96 sqft	8/1/2001	Zep Dyna 143 (not heated)	0.067 kPA	281(h)

Reporting

Semi-annual and annual deviation reports were received by AQD on time in 2022 and 2023 for DTE Gas Company - Columbus Compressor Station. No deviations were reported for DTE Gas Company - Columbus Compressor Station in the semi-annual and annual deviation reports submitted.

Exempt Emission Units

I observed two Columbus line heaters (EUHEATER1 & EUHEATER2) during this inspection. The descriptions and identification numbers of the heaters match the descriptions in the 2024 ROP application and Staff Report.

Conclusion

The facility did not use the most recent gas analysis data in GRI-GLYCalc to calculate emission rates. This is a violation of MI-ROP-B6480-2024, FGDEHY SC VI.5.

Based on the field inspection and the records provided, DTE Gas Company – Columbus Compressor Station is in compliance with all other requirements evaluated.

NAME Maui Rd

DATE 07/30/2024

SUPERVISOR K. Kelly