

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

N290161651

FACILITY: Consumers Energy - Muskegon River Compressor Stat		SRN / ID: N2901
LOCATION: 8613 Pine Rd., CHURCH BRIDGE		DISTRICT: Bay City
CITY: CHURCH BRIDGE		COUNTY: CLARE
CONTACT: Amy Kapuga , Sr. Environmental Engineer		ACTIVITY DATE: 01/13/2022
STAFF: Nathanael Gentle	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Scheduled Onsite Inspection FY2022		
RESOLVED COMPLAINTS:		

On January 13, 2022, AQD staff conducted a scheduled onsite inspection at Consumers Energy – Muskegon River Compressor Station, SRN N2901. Staff arrived onsite at 10:26 AM and departed at 12:36 PM. The purpose of the inspection was to determine compliance with the Federal Clean Air Act; Article II, Part 55, Air Pollution Control of Natural Resources and Environmental Protection Act, 1994 Public Act 451; Michigan Department of Environment Great Lakes and Energy, Air Quality Division (AQD) Administrative Rules; and to evaluate compliance with the facilities Renewable Operating Permit (ROP), MI-ROP-N2901-2020. EGLE staff were assisted onsite by Mr. Parish Geers, and Ms. Janet Zondlak. Records were provided by Ms. Amy Kapuga. At the time of inspection, the facility was found to be in compliance.

Facility Description and History

The Consumers Energy – Muskegon River Compressor Station is a manned compressor station located at 8613 Pine Road, Marion, Clare County, MI 49665. The facility is primarily used to compress natural gas into storage reservoirs during injection, typically during warmer months, and to pull gas out of storage reservoirs during withdrawal, typically during the colder months. Compression of gas is accomplished utilizing natural gas-fired reciprocating internal combustion engines (RICE) and a natural gas-fired turbine. Gas that is removed from the storage formations using the compression engines or turbine is passed through aerial coolers to cool down the temperature of the gas stream. The gas then travels to a lube oil extractor (LOE) where lube oil is filtered out of the gas stream. After the LOE, the gas is sent through dehydration towers as part of a glycol dehydration process unit to remove water. Once water is removed, the gas is sent to distribution pipelines.

The Consumers Energy – Muskegon River Compressor Station is a major source for nitrogen oxides (NOx), carbon monoxide (CO), and hazardous air pollutants (HAPs). The primary HAP is formaldehyde. As a major source with a ROP, the facility is required to submit annual and semi-annual compliance reports. The facility has historically submitted these reports on time and complete to the AQD. Emission reporting to MAERS by the facility has also historically been submitted on time and complete. No recent complaints are on file for the facility. The Consumers Energy – Muskegon River Compressor Station was last inspected on June 17, 2020. At the time of the 2020 inspection the facility was found to be in compliance.

Since the previous inspection, equipment changes have occurred at the facility. Six engines have been retired and disconnected. These engines were part of FGCOMPRESSORS and include: EUENGINE306, EUENGINE316, EUENGINE319, EUENGINE320, EUENGINE3-1 and EUENGINE3-2. Notification of the change with the appropriate documentation and request for removal of the

units from the facilities ROP, was received by the AQD on December 6, 2021. The facility is currently in the process of installing a second natural gas-fired turbine, EUTURBINE2-2, that will be used for natural gas compression. Prior to commencing construction, the facility obtained Permit to Install (PTI) No. 16-21. The new turbine is a natural gas-fired Solar Taurus 70 turbine rated at 11,419 hp with a maximum design heat input capacity of 96.5 MMBtu/Hr.

Compliance Evaluation

EUTURBINE2-2

As previously mentioned, The Consumer Energy – Muskegon River Compressor Station is in the process of installing a new turbine at the facility. EUTURBINE2-2 is a natural gas-fired Solar Taurus 70 turbine rated at 11,419 hp with a maximum design heat input capacity of 96.5 MMBtu/Hr, permitted under PTI No. 16-21. The unit is equipped with SoLoNOx dry-low-NOx combustion control. At the time of inspection, installation of the unit was still in progress and the unit had not yet undergone initial startup. Staff said it is currently anticipated that an initial startup will occur sometime towards the end of winter into the beginning of spring. Staff were reminded to provide AQD with notification of the completion of construction and startup. In addition, AQD staff reminded facility personnel of additional documents required to be submitted to the AQD after initial startup, including the following. Within 180 days of initial startup, the permittee shall submit, implement, and maintain a malfunction abatement plan (MAP), S.C. III. 1. Additionally, within 180 days of initial startup, the permittee shall submit, implement, and maintain a plan that describes how emissions will be minimized during startup and shutdown, S.C. III. 2.

Special Condition III. 3. limits the facility to 100 startup and 100 shutdown events per 12-month rolling time period as determined at the end of each calendar month. Discussion was had with facility personnel as to what is classified as a start-up event. AQD Rule 336.1119 (p) defines start-up as the following, “Start-up means the setting in operation of a process or process equipment for any purpose.”

Facility staff report EUTURBINE2-2 will be equipped with a device to monitor and record natural gas usage on a continuous basis, S.C. IV. 3. EUTURBINE2-2 will also be equipped with a device to monitor and record the operating load, S.C. IV. 4.

EUTURBINE2-2 shall operate within the NOx emission limits established by PTI 16-21. Compliance with the NOx emission limits can be established through reoccurring stack testing, or by equipping the unit with a continuous emission monitoring system (CEMS), S.C. V. 1. At the time of the onsite inspection, a final decision had not yet been made by the facility as to how compliance with NOx emissions would be demonstrated.

EUGLYCDEHY

A natural gas triethylene glycol (TEG) dehydrator is onsite and used to remove water from natural gas, once the gas is removed from storage formations. The glycol dehydrator is equipped with a thermal oxidizer to control VOC emissions, S.C. III. 2. The thermal oxidizer shall be operated at the site-specific minimum operating temperature established during the most recent compliance demonstration, S.C. III. 5. A minimum temperature of 1,115°F was established on December 3, 2019. The temperature setpoint for the thermal oxidizer is 1,500°F. An alarm is set to sound if the

unit drops to 1,300°F or below; this ensures the unit is operated above the minimum required temperature. The thermal oxidizer is equipped with a device to continuously monitor and record the combustion chamber temperature, S.C. IV. 1. The device records temperature values every 15 minutes which are tabulated in block averages every hour, S.C. IV. 3. The 1-hour block averages are then used to calculate 24-hour daily averages.

Records of the thermal oxidizer daily average temperature for the months of January 2020, April 2020, July 2020 and November 2020 were requested and provided. The unit was not operated during the months of April and July, 2020. During the month of January 2020, the highest 24-hour daily average temperature was 1514°F. The lowest 24-hour daily average temperature was 1435°F at the end of 1/17/2020. Records show a power outage resulting in a pause of natural gas processing caused the dip in daily operating temperature on 1/17/2020. During the month of November 2020, the highest 24-hour daily average temperature was 1514°F. The lowest 24-hour daily average temperature was 1476°F at the end of 11/25/2020. Records show a power outage resulting in a pause in natural gas processing caused the dip in daily operating temperature on 11/25/2020. Appropriate records are maintained demonstrating the operating temperature of the thermal oxidizer. Records reviewed show the unit is operated well above the minimum required temperature. Facility personnel report system accuracy checks are performed annually to ensure temperature data is accurate, S.C. VI.

12.

EUGLYCDEHY is equipped with a flash tank that exhausts to the thermal oxidizer. The system is a closed-vent system with no bypass devices that could divert emissions from the thermal oxidizer. No portions of the closed vent system are designated as unsafe to inspect, S.C. VI. 10. Additionally, no portions of the closed vent system are designated as difficult to inspect, S.C. VI. 11. The closed vent system is inspected annually to ensure there are no detectable emissions in the system, S.C. V. 4. Records of the most recent no detectable emissions survey were requested and provided, S.C. VI. 25. Records provided show the most recent survey was completed on 8/13/2021. As part of the survey, personnel inspected valves, piping flanges and other potential emission points. No visual defects were detected, and no instrument readings occurred. No leaks were detected during the survey. Records were requested documenting any malfunctions that may have occurred over the past 12 months, S.C. VI. 27. Facility personnel reported that no malfunctions had occurred during the 12-month period requested.

Determination of actual average BTEX emissions from the glycol dehydration unit are made using GRI-GLYCalc. Records and calculations of annual BTEX emissions for the years 2020 and 2021 were requested and received, S.C. VI. 28. Monthly and 12-month rolling time period records were provided. BTEX emissions are calculated using hours of operation and an emission factor. Emission factors are determined based on emission analyses which are conducted monthly while the unit is operated. During the 12-month period of records reviewed, the highest monthly emissions was 0.0115 tons for the month of January 2020. Twelve-month rolling emissions are calculated in both tpy and Mg/yr. The highest 12-month rolling period occurred at the end of January 2020. At the end of January 2020, the 12-month rolling emissions was calculated to be 0.0503 tpy, well below the limit of 3.527 tpy. The 12-month rolling time period emissions in MG/yr at the end of January 2020 was calculated to be 0.05 Mg/yr, well below the limit of 3.2 Mg/yr.

EUTURBINERT248

EUTURBINERT248 is used to compress natural gas at the facility. Originally installed in January 1963, the unit operates as a grandfathered unit. Records of monthly natural gas consumption for EUTURBINERT248 for the last 12 months were requested and provided, S.C. VI.1. The facility maintains up to date monthly records of fuel usage. During the 12-month period of records reviewed, EUTURBINERT248 was operated in the months of January, February, November, and December 2021. The month with the highest fuel usage was January 2021 with 52430 MCF of natural gas used. The month with the lowest fuel consumption was February 2021 with 5.8 MCF of natural gas used. Facility personnel report routine maintenance is conducted on the unit, including annual inspections of the equipment.

EUAUXGEN3

EUAUXGEN3 is a natural gas fired spark ignition emergency reciprocating internal combustion engine (RICE). The unit is rated at 4.8 MMBtu/hr (greater than 500hp) and is subject to 40 CFR Part 63, Subpart ZZZZ – National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines.

As an emergency stationary RICE, EUAUXGEN3 is limited in the number of hours the unit may be operated outside of emergency operation. To be considered an emergency stationary RICE, EUAUXGEN3 may be operated no more than 100 hours per calendar year for maintenance checks and readiness testing, S.C. III. 3. In addition, the unit may be operated for up to 50 hours per calendar year in non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance and readiness testing, 40 CFR 63.6640(f).

EUAUXGEN3 is equipped with a non-resettable hour meter, S.C. IV. 1. At the time of the onsite inspection, the hour meter read 1399.1 hours. EUAUXGEN3 is operated once a week for readiness testing. The unit is used in emergency situations when the local power grid is down. Hours in which the unit is operated and the purpose for which the unit is operated, including whether for emergency purposes or maintenance, are tracked by facility personnel, S.C. VI. 1. Spreadsheets are maintained by the unit for operators to document the hours of operation. The sheets document the date the unit was operated and contain separate columns to document the hours operated for maintenance purposes versus hours operated for emergency use. There is also a column for operators to write comments about each operation period. Records of hours of operation for the past 12 months were requested and provided. Records provided were for the period of January 2021 to December 2021. During the 12-month period reviewed, the unit was operated for a total of 40.9 hours. Of those 40.9 hours, 1.5 hours were for maintenance purposes and 39.4 hours were for emergency purposes. Routine maintenance is conducted on EUAUXGEN3. The unit is inspected annually. Maintenance is tracked using the facilities work order system.

EURULE285(2)(mm)

EURULE285(2)(mm) applies to any emission unit that emits air contaminants and is exempt from the requirements of Rule 201 pursuant to Rule 278, 278a, and Rule 285(2)(mm). In the event

natural gas in excess of 1,000,000 standard cubic feet is vented, facility staff report site procedures are followed. Proper documentation and notification of events is provided to the AQD. The volume of gas vented is determined based on the pipeline capacity and the duration of the venting event.

EUDEGREASER1

EUDEGREASER1 is a cold cleaner located within the maintenance building onsite. The air/vapor interface of the unit is less than 10 square feet, S.C. IV. 1. Written operating procedures are posted on the wall behind the cold cleaner, S.C. VI. 3. Zep Dyna 143 is the solvent used in the cold cleaner. The facility maintains a copy of the solvent sds posted by the unit. The solvent used in the cold cleaner is not heated, S.C. VI. 1. The cold cleaner is equipped with a mechanically assisted cover and remains closed whenever parts are not being handled in the unit, S.C. IV. 3. The cold cleaner is equipped with a device for draining cleaned parts, S.C. IV. 2. Routine maintenance is conducted on the cold cleaner, including changing the solvent, S.C. III. 2. These activities are contracted out to the company that provides the solvent product.

FGCOMPRESSORS

FGCOMPRESSORS is comprised of grandfathered natural gas fired reciprocating internal combustion engines. Six engines within the flexible group have been retired and disconnected. These engines include: EUENGINE306, EUENGINE316, EUENGINE319, EUENGINE320, EUENGINE3-1 and EUENGINE3-2. Notification of the change with the appropriate documentation and request for removal of the units from the facilities ROP, was received by the AQD on December 6, 2021. During the onsite inspection, EUENGINE306, EUENGINE316, EUENGINE319, and EUENGINE320 were verified to no longer be at the facility. EUENGINE3-1 and EUENGINE3-2 were in the process of being torn down and are permanently retired from operations at the facility. Six engines are still in operation at the facility, they include EUENGINEH9, EUENGINEH10, EUENGINEH11, EUENGINEH12, EUENGINET11, and EUENGINET12. All compressor engines are integral and equipped with a turbo. Routine maintenance is conducted annually to ensure the compressor engines continue to operate properly.

At the time of inspection, three engines were operating including EUENGINEH10, EUENGINEH11, and EUENGINEH12. No visible emissions were observed from the stacks of the operating engines. Operating parameters were observed for each of the running engines. EUENGINEH10 was observed to be operating at 90% for the engine and 74% for the turbo. EUENGINEH11 was observed to be operating at 92% for the engine and 78% for the turbo. EUENGINEH12 was observed to be operating at 88% for the engine and 78% for the turbo. At the time of inspection EUENGINEH9 was undergoing a rebuild.

Records of monthly natural gas consumption for each engine in FGCOMPRESSORS for the last 12 months were requested and provided, S.C. VI. 1. Records of natural gas consumption were provided for the time period of January 2021 through December 2021. EUENGINEH9 was not operated during the 12-month period. As previously mentioned, EUENGINEH9 is currently in the process of being rebuilt.

EUENGINEH10 operated during 10 months of the 12-month period. EUENGINEH10 was not operated during the months of May and October 2021. Of the months EUENGINEH10 was

operated, the highest fuel consumption occurred in January 2021 with 12918 MCF of natural gas consumed. Of the months EUENGINEH10 was operated, the lowest fuel consumption occurred in September 2021 with 53 MCF of natural gas consumed.

EUENGINEH11 operated during 10 months of the 12-month period. EUENGINEH11 was not operated during the months of May and June 2021. Of the months EUENGINEH11 was operated, the highest fuel consumption occurred in January 2021 with 13743 MCF of natural gas consumed. Of the months EUENGINEH11 was operated, the lowest fuel consumption occurred in September 2021 with 7 MCF of natural gas consumed.

EUENGINEH12 operated during 10 months of the 12-month period. EUENGINEH12 was not operated during the months of May and June 2021. Of the months EUENGINEH12 was operated, the highest fuel consumption occurred in December 2021 with 29253 MCF of natural gas consumed. Of the months EUENGINEH12 was operated, the lowest fuel consumption occurred in July 2021 with 117 MCF of natural gas consumed.

EUENGINET11 operated every month during the 12-month period. The highest fuel consumption occurred in December 2021 with 13152 MCF of natural gas consumed. The lowest fuel consumption occurred in February 2021 with 0.01 MCF of natural gas consumed.

EUENGINET12 operated during 8 months of the 12-month period. EUENGINET12 was not operated during the months of March, April, May, and June 2021. Of the months EUENGINET12 was operated, the highest fuel consumption occurred in November 2021 with 11135 MCF of natural gas consumed. Of the months EUENGINET12 was operated, the lowest fuel consumption occurred in October 2021 with 4 MCF of natural gas consumed.

FGAUXGENS

FGAUXGENS is comprised of two SI emergency RICE, EUAUXGEN1A and EUAUXGEN2A. Both engines were installed in 1999. As emergency stationary RICES, EUAUXGEN1A and EUAUXGEN2A are limited in the number of hours the units may be operated outside of emergency operation. To be considered an emergency stationary RICE, EUAUXGEN1A and EUAUXGEN2A may each be operated no more than 100 hours per calendar year for maintenance checks and readiness testing, S.C. III. 6. In addition, the units may be operated for up to 50 hours per calendar year in non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance and readiness testing, 40 CFR 63.6640(f). There is no limit to hours of operation for emergency use.

EUAUXGEN1A and EUAUXGEN2A are both equipped with a non-resettable hour meter, S.V. IV. At the time of inspection, the hour meter on EUAUXGEN1A read 4613.7 hours. The hour meter on EUAUXGEN2A read 00335.4 hours. Facility staff reported the hour meter on EUAUXGEN2A had to be changed approximately 3-4 years ago. Both units in FGAUXGENS are used for emergency purposes when the local grid is down. The engines are fired up weekly for maintenance purposes, to ensure they are running properly. Hours in which in the units are operated and the purpose for which the units are operated, including whether for emergency purposes or maintenance, is tracked by facility personnel, S.C. VI. 7. Spreadsheets are maintained by the units for operators to document the hours of operation. The sheets document the date each unit was operated and contain separate columns to document the hours operated for maintenance purposes versus

hours operated for emergency use. There is also a column for operators to write comments about each operation period. Records of hours of operation for calendar years 2020 and 2021 were requested and provided.

During the year 2020, EUAUXGEN1A was operated a total of 77.85 hours. Of the 77.85 hours the unit was operated, 15.65 hours were for maintenance purposes and 62.2 were hours for emergency purposes. During the year 2021, EUAUXGEN1A was operated a total of 40 hours. Of the 40 hours the unit was operated, 2.3 hours were for maintenance purposes and 37.7 hours were for emergency purposes.

During the year 2020, EUAUXGEN2A was operated a total of 66.75 hours. Of the 66.75 hours the unit was operated, 13.15 hours were for maintenance purposes and 57.1 hours were for emergency purposes. During the year 2021, EUAUXGEN2A was operated a total of 85.9 hours. Of the 85.9 hours the unit was operated, 10.1 hours were for maintenance purposes and 75.8 hours were for emergency purposes.

Routine maintenance is conducted on units in FGAUXGENS, including annual inspections, S.C. III. 1. Annual inspections are tracked using the facilities work order system. Records of maintenance conducted for the years 2020 and 2021 were requested and provided, S.C. VI. 6. During the year 2020, the annual inspections of both EUAUXGEN1A and EUAUXGEN2A were completed on 6/9/2020. As part of the annual inspections, filters were changed, and the air cleaners, spark plugs, hoses and belts were all inspected. In addition, oil samples were taken from both units and analyzed. Results from oil analysis showed the oil for EUAUXGEN1A could be reused. The oil analysis results for EUAUXGEN2A showed the oil in the unit needed to be changed.

During the year 2021, annual inspections for both units were completed on 6/14/2021. Records provided demonstrate filters were changed, and the air cleaners, spark plugs, hoses and belts were all inspected. In addition, oil samples were again taken from both units and analyzed. Results of the 2021 oil analysis for both units determined the oil did not need to be changed.

The facility utilizes an oil analysis program in order to extend the specified oil change requirement, S.C. III. 2. As previously discussed, the facility conducts the oil sampling and analysis annually in conjunction with the annual inspections of EUAUXGEN1A and EUAUXGEN2A. Oil samples are analyzed for the three parameters required by S.C. V. 1. Including, total base number, viscosity, and percent water content. Records of oil analysis for years 2020 and 2021 were provided. Laboratory analysis of the oil samples in completed by a 3rd party company. Oil changes are completed based on the results of the sampling analysis.

FGPROCESSHTRS

FGPROCESSHTRS is comprised of four units including EUFUELHTR (0.25 MMBTU/hr), EUFUELHTR1 (0.45 MMBTU/hr), EUBLR9 (3.35 MMBTU/hr), and EUREBOILER (1.00 MMBTU/hr). The units are subject to the requirements of 40 CFR Part 63, Subpart DDDDD for existing small (<10 MMBTU) industrial process heaters fired by natural gas at a major source of Hazardous Air Pollutants.

Tune-ups of units in FGPROCESSHTRS is completed by Consumers Energy personnel. The facility ensures tune-ups are completed on time using the facilities work order system. Records of the most recent tune-up for each unit in FGPROCESSHTRS were requested and provided, S.C. VI. 1.

The most recent tune-up on EUBLR9 was completed on 12/19/2020. Tune-ups of units EUFUELHTR and EUFUELHTR1 were completed on 1/19/2021. The tune-up for EUREBOILER was completed on 3/1/2021. For the tune ups, burners, flame patterns, and air-to-fuel ratio control systems were inspected. CO emissions were optimized and both CO and O2 levels were measured in the units' exhaust before and after the tune-ups.

Summary

The Consumers Energy – Muskegon River Compressor Station is a manned compressor station located in Marion, MI. The facility is primarily used to compress natural gas into storage reservoirs during injection and to pull gas out of storage reservoirs during withdrawal. The facility is a major source for nitrogen oxides (NOx), carbon monoxide (CO), and hazardous air pollutants (HAPs). Based on the records reviewed and the observed activities onsite, the facility appears to be operating in accordance with the requirements of MI-ROP-N2901-2020. At this time, the facility appears to be in compliance.

Nathanael Lentz

DATE 2/1/2022

SUPERVISOR *Chris Hare*

NAME