

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

N375856700

FACILITY: GREAT LAKES GAS TRANSMISSION STATION #10		SRN / ID: N3758
LOCATION: NAUBINWAY ROAD, NAUBINWAY		DISTRICT: Marquette
CITY: NAUBINWAY		COUNTY: MACKINAC
CONTACT: Brad Stermer, Sr. Environmental Specialist		ACTIVITY DATE: 01/07/2021
STAFF: Michael Conklin	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Targeted inspection for FY 21.		
RESOLVED COMPLAINTS:		

Facility: Great Lakes Gas Transmission Station #10 (SRN: N3758)

Location: Naubinway Road, Naubinway, MI

Contacts: Brad Stermer, Environmental Specialist, 906-235-3712

Ruth Jensen, Air Quality Specialist, 402-639-2785

Regulatory Authority

Under the Authority of Section 5526 of Part 55 of NREPA, The Department of Environment, Great Lakes, and Energy may upon the presentation of their card, and stating the authority and purpose of the investigation, enter and inspect any property at reasonable times for the purpose of investigating either an actual or suspected source of air pollution or ascertaining compliance or noncompliance with NREPA, Rules promulgated thereunder, and the federal Clean Air Act.

Facility Description

Great Lakes Gas Transmission Limited Partnership (GLGT), headquartered in Houston, Texas, is a natural gas pipeline company that transports natural gas from Western Canada into Minnesota, Michigan, Wisconsin, and Eastern Canada. The pipeline system is 2,115 miles long and has an average design capacity of approximately 2,400 million cubic feet per day. The company has been in operation since 1967 and is currently owned by TC Energy, a North American energy company based out of Calgary, Alberta, Canada.

Compressor stations, or booster stations, are part of the natural gas utility process that transport natural gas from well sites, to processing facilities, to end users. They are utilized to maintain pressure and flow throughout the pipeline network. GLGT operates fourteen compressor stations, with five in the Upper Peninsula of Michigan, including the Naubinway Station #10 (GLGT Station #10) in Mackinac County, Michigan.

GLGT Station #10 is located 1.5 miles north of US-2 on Naubinway Road in Mackinac County, Michigan. The station operates two natural-gas-fired turbine/compressor units. Both units are

Rolls Royce Avon 76G turbines with a peak load rating of 16,000 HP at ISO conditions. The two turbines are housed in separate buildings, each with their own vertical stack for emissions. The station also has a service building that contains a natural gas-fired boiler, a natural gas-fired emergency engine, space heaters, and storage vessels. The facility operates 24 hours a day, 365 days per year and operates the two units on an as needed basis. The surrounding area of the facility is rural with woodlands. The facility does not operate a natural gas storage field or dehydration system.

The two units are composed of a simple cycle turbine connected to a natural gas pipeline compressor. In a simple cycle turbine, ambient air is drawn in and compressed. The hot high-pressure air is then ignited with fuel in the combustors and routed to the power section of the turbine. The hot exhaust gases expand through the power section providing rotational force to the power shaft. The power shaft is connected to a pipeline compressor where natural gas is fed through from an initial "suction" state to a more compressed "discharge" state at higher pressure. In a simple cycle system, the combustion emissions are exhausted to the atmosphere. The two units do not have air pollution control devices.

The table below summarizes the emission units at this source.

Emission Unit ID	Description
EUUNIT1001	Rolls Royce Avon 76G natural gas fired-turbine with a peak load rating of 16,000 HP installed in 1969
EUUNIT1002	Rolls Royce Avon 76G natural gas fired-turbine with a peak load rating of 16,000 HP installed in 1971
EUGENERATOR	Waukesha Model F1197G natural gas-fired four stroke rich burn emergency genset with an engine power output of 255 HP
EUBOILER	2.7 MMBtu/hr natural gas-fired boiler
EULUBETK1	Lubricating oil storage tank for EUUNIT1001
EULUBETK2	Lubricating oil storage tank for EUUNIT1002

EU COOLANT TK	Ambitrol propylene glycol-based coolant storage tank
FG SPACE HEATERS	4 natural gas-fired space heaters, each with a heat input less than 50 MMBtu/hr

Emissions

The primary pollutants emitted from the natural gas-fired turbines include nitrogen oxides (NO_x) and carbon monoxide (CO). Other pollutants emitted in lesser amounts include volatile organic compounds (VOCs), particulate matter (PM), hazardous air pollutants (HAPs) and sulfur dioxide (SO₂). Emissions from natural gas-fired turbines vary at different operating loads, inlet temperature, ambient pressure, and humidity. A turbine can operate at higher loads than ISO ratings during ambient conditions with cooler temperatures, higher pressure, and low humidity.

NO_x and CO emissions are a function of the combustion temperatures, pressure, and mass flows. The formation of nitrogen oxides is strongly related to the combustion temperature. At higher operating loads, the firing temperature increases resulting in higher NO_x emissions. NO_x is formed and emitted primarily through one of three mechanisms: thermal, fuel, and prompt. Thermal NO_x formation occurs in the high temperature zone by the reaction of nitrogen (N₂) and oxygen (O₂) molecules in the combustion air. This is the predominant NO_x formation mechanism for natural gas-fired turbines. Higher combustion temperatures, longer residence times, and well mixing of fuel and combustion air results in greater combustion efficiency and lower emissions of CO, VOCs, and HAPs, but higher emissions of NO_x. Lower ambient temperatures and the use of water or steam injection can decrease the firing temperature thereby lowering NO_x emissions.

Emissions Reporting

The table below shows the facility's Michigan Air Emissions Reporting System (MAERS) 2019 submittal.

Pollutant	Pounds per Year (PPY)	Tons per Year (TPY)
CO	40748.64	20.37
NO _x	158721.58	79.36
PM ₁₀	3272.77	1.63

PM2.5	3272.77	1.63
SO2	46.62	<1
VOC	1041.98	<1

Compliance History

The facility has not received any violation notices in the past five years. The facility was last inspected in January 2019 and was found to be in compliance with all applicable air quality rules and regulations at that time.

Regulatory Analysis

GLGT Station #10 is currently subject to the Title V program and holds MI-ROP-N3758-2018 because the potential to emit (PTE) for nitrogen oxides and carbon monoxide exceeds 100 tpy. The facility is considered an area source for hazardous air pollutants (HAP) because the potential to emit of any single HAP is less than 10 tpy and aggregate HAP emissions are less than 25 tpy. EUUNIT1001 and EUUNIT1002 are not subject to 40 CFR Part 60 Subpart GG-NSPS for Stationary Gas Turbines because the turbines were constructed prior to October 3, 1977. EUUNIT1001 and EUUNIT1002 are not subject to the NESHAP Subpart YYYY for Stationary Combustion Turbines because the turbines are located at an area source for HAP emissions. EUGENERATOR is subject to 40 CFR Part 63 Subpart ZZZZ-NESHAP for Stationary Reciprocating Internal Combustion Engines because the emission unit is a stationary RICE at an area source of HAP emissions. EUGENERATOR is not subject to the NSPS Subpart JJJJ for Stationary Spark Ignition Internal Combustion Engines because the engine was constructed prior to June 12, 2006.

Inspection

On January 7, 2021, I (Michael Conklin) conducted a targeted inspection on the GLGT Station #10 in Naubinway, MI. I arrived at the facility and explained the purpose of the inspection was to ensure compliance with facility's ROP (MI-ROP-N3758-2018). We began by inspecting the permitted equipment held in the ROP and then reviewed equipment considered to be exempt from permitting. The station technician on-site stated that there have been no changes to the facility since the last inspection in 2019.

EUUNIT1001 and EUUNIT1002

These emission units were not operating during the time of the inspection. The serial number for Unit #1 was #37634 and Unit #2 was #37843. As stated in the ROP, they are required to burn only pipeline quality natural gas. During the inspection of these units, it was observed that the only source of fuel was piped gas from the main pipeline. This fulfills SC III.1 for both emission units. Records were requested for fuel usage in the turbines during the calendar years 2019 and 2020. Unit #1 burned 381,639 MCF during 2019 and 104,711 MCF during 2020. Unit #2 burned 104,476 MCF during 2019 and 326,202 MCF during 2020.

EUGENERATOR

The emergency generator is a Waukesha F1197G natural gas-fired four stroke rich burn engine with a rated power output of 201 HP. GLGT is required to keep records of operation of EUGENERATOR per calendar year. EUGENERATOR can operate up to 100 hours per calendar year for maintenance and readiness testing, and 50 of those hours can be used for non-emergency situations. Hours of operation are tracked through a non-resettable hour meter on the unit. For the calendar year 2019, the engine was operated 7.1 hours during a power outage and 7.6 hours for maintenance and readiness testing. For the calendar year 2020, the engine was operated 0.8 hours during a power outage and 3.6 hours for maintenance and readiness testing. As of 1/7/2021, the engine has a total of 878.6 hours of operation.

A RICE MACT maintenance record sheet was submitted that notes maintenance activity and completion date. Maintenance activities include inspecting spark plugs, air cleaner, belts, and hoses. The sheet also notes when an oil sample was taken and submitted for analysis or if the oil was changed. This unit utilizes the oil analysis program to extend the specified oil change requirement in the RICE MACT. For 2019 and 2020, oil samples were taken on 9/3/2019 and 9/23/2020. The samples were submitted to Fluid Life for an oil analysis. The report stated that all tests were within the RICE MACT specifications.

The following table lists equipment that is considered to be exempt at the source.

Emission Unit	Description	ROP Exemption	PTI Exemption
EUBOILER	2.7 MMBtu/hr natural gas-fired boiler	R 336.1212(4)(b)	R 336.1282(2)(b)(i)
EULUBETK1	Lubricating oil storage tank for EUUNIT1001	R 336.1212(4)(c)	R 336.1284(2)(c)
EULUBETK2		R 336.1212(4)(c)	R 336.1284(2)(c)

	Lubricating oil storage tank for EUUNIT1002		
EU-COOLANT TANK	Ambitrol propylene glycol-based coolant storage tank	R 336.1212(4)(c)	R 336.1284(2)(c)
FG-SPACE HEATERS	4 natural gas-fired space heaters, each with a heat input less than 50 MMBtu/hr	R 336.1212(4)(b)	R 336.1282(2)(b)(i)

GLGT has been prompt and complete in submitting semi-annual and annual report certifications.

Compliance

Based on this inspection, it appears that the Great Lakes Gas Transmission Station #10 is in compliance with MI-ROP-N3758-2018.

NAME

Michael Hillin

DATE

1/26/2021

SUPERVISOR

EDJ