



November 14, 2025

Transmitted via Email

Frank Albrecht
Manager, US Gas Operations
TC Energy
400 East Kaliste Saloom Road
Lafayette, LA 70508
frank_albrecht@tcenergy.com

RE: Alternative Monitoring Plan - 40 Code of Federal Regulations (CFR) Part 63, National Emission Standards for Hazardous Air Pollutants (NESHAPS)-Subpart YYYYY-Stationary Combustion Turbines – Two (2) Stationary Combustion Turbines without Oxidation Catalyst-TC Energy-Columbia Gulf Rayne Compressor Station-Rayne, Louisiana

Dear Mr. Albrecht:

This letter is in response to the Alternative Monitoring Plan ("AMP") request to the U.S. Environmental Protection Agency (EPA) Region 6, dated June 21, 2022, to petition for operating limitations that will be monitored to demonstrate compliance with the formaldehyde emission limitations for stationary turbines that are not equipped with an oxidation catalyst. Columbia Gulf Rayne Compressor Station (Rayne) provided additional information on December 19, 2022; January 20, 2023; January 25, 2023; and July 18, 2025, in support of the original AMP request. Based on the EPA's review of the information provided, and as discussed in this response, we are approving your request.

Columbia Gulf Transmission Company, a subsidiary of TC Energy, owns and operates a compressor station called Rayne located in Rayne, Louisiana. Rayne has two (2) Solar Mars 100 natural gas-fired combustion turbines (Mars). The 2 turbines are not equipped with an oxidation catalyst; therefore, per 40 CFR §63.6120(e) Rayne is required to submit an Operational Parameter Monitoring Petition to EPA for approval¹. A summary of the EPA's analysis of Rayne's Operational Parameter Monitoring Petition is discussed in the Enclosure A.

This response has been coordinated with EPA's Office of Air Quality Planning and Standards (OAQPS) and Office of Enforcement and Compliance Assurance (OECA). A copy of the AMP and EPA's response will be sent to Louisiana Department of Environmental Quality to attach to the facility's air permit for

¹ Although the Louisiana Department of Environmental Quality (LDEQ) is delegated authority for NESHAP YYYYY, EPA headquarters has determined that the Agency should approve operating parameter petitions to ensure consistency across all states and EPA Regions.

federal enforceability. If representations made in the request or supporting information change, the rules changes, or process unit operations change, this determination may become void, and a new determination will be necessary. Please address questions or concerns about this determination to Cassandra Lowder of my staff at lowder.cassandra@epa.gov or at (214) 665-8545.

Sincerely,

Steve Thompson
Manager
Air Enforcement Branch

Enclosure

Ecc: Melanie King, king.melanie@epa.gov
Eura DeHart Jr., aura.dehart@la.gov
Brian Tusa, brian.tusa@la.gov
Cynthia Hicks, cynthia_hicks@tcenergy.com

Enclosure

Rayne operates 2 turbines equipped with lean premix (LPM) combustion technology. Since these turbines are not equipped with an oxidation catalyst, Rayne has submitted a petition to approve operating parameters to monitor. The petition was submitted under 40 Code of Federal Regulations (“C.F.R.”) § 63.6120(e) for justifying the required information under 40 C.F.R. § 63.6120(f)(1) through (5).

EPA Analysis

EPA made the following determinations under 40 C.F.R. 63, Subpart YYYY regarding the Mars turbines with LPM combustion technology operating without an oxidation catalyst, and outlines the following emission and operating limitations based on representations made in Rayne’s petition.

EPA received the following documents from Rayne during the review process to ensure it was complete:

- Rayne 40 C.F.R. 63, Subpart YYYY Petition
- Initial Stack Test and Annual Stack Testing
- Source Control Drawing for the following:
 - Probe, Resistance Temperature Detector (RTD) - Drawing No. 2105288, Revision A
 - Sensor, Speed, Magnetic - Drawing No. 1470281, Revision C
- Allen Bradley - Maintenance of Industrial Control Equipment
- Rayne Piping & Instrumentation Diagrams

63.6120(f)(1) Identification of the specific parameters Rayne proposes to use as additional operating limitations.

Rayne’s petition proposed monitoring LPM operation to meet requirements for ensuring compliance with the formaldehyde emission standards in 40 CFR 63, Subpart YYYY. Solar Turbines is the original equipment manufacturer (OEM) for the 2 Solar Mars 100 turbines, and LPM combustion is referred to as “SoLoNOx” mode for Solar units. The following are associated operating parameters for monitoring SoLoNOx mode: gas producer turbine speed (% NGP); and inlet ambient air temperature (T₁).

63.6120(f)(2) A discussion of the relationship between the monitored parameters and hazardous air pollutant (HAP) emissions, identifying how HAP emission rates change with changes in the operating parameters, and how limitations on these operating parameters will serve to limit HAP emissions of formaldehyde.

Rayne proposed that using SoLoNOx technology reduces the conversion of atmospheric nitrogen to NOx by reducing the combustor flame temperature. Lean combustion is enhanced by premixing the fuel and combustor airflow upstream of the combustor primary zone. This premixing prevents stoichiometric burning locally within the flame to ensure low NOx emissions, while also providing the mixing necessary to ensure complete combustion of the fuel and minimize emissions of CO and UHCs

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including formaldehyde. A gas turbine which operates with lean premix does not guarantee that emissions will be below the formaldehyde standard of 91 parts per billion by volume, dry basis (ppbvd) at 15 percent (%) oxygen (O₂). However, Rayne conducted initial emissions testing on August 30, 2022, which showed compliance with the NESHAP YYYY formaldehyde emission limit. Additionally, Rayne has also demonstrated compliance with subsequent annual performance testing for the formaldehyde standard in 2023 and 2024. The results from the initial and subsequent formaldehyde testing are summarized in Table 1.

Table 1: Initial & Annual Formaldehyde Performance Test Results

Unit Name	Unit ID	Performance Test Date	Test Results (ppbvd at 15% O ₂)
Solar Mars 100 Turbine/Compressor #1	EQT0021 (1013)	08/30/2022 (Initial)	16.3
		07/26/2023	14.2
		07/17/2024	47.05
		07/09/2025	61.4
Solar Mars 100 Turbine/Compressor #2	EQT0022 (1014)	08/30/2022 (Initial)	28.2
		07/25/2023	25.4
		07/17/2024	48.03
		07/08/2025	84.2

63.6120(f)(3) A discussion of how you will establish the upper and/or lower values for these parameters which will establish the limits on these parameters in the operating limitations.

In its petition and email dated January 20, 2023, Rayne states SoLoNO_x mode is enabled is enabled when the monitoring parameters are above T₁ and %NGP thresholds. The lower parameters values are indicated in Table 2. Rayne did not establish upper parameter values since the turbines will continue to operate in SoLoNO_x mode at any value of 93% NGP or greater.

Table 2: Minimum Setpoints to Operate in SoLoNO_x Mode

Unit Name	Unit ID	Minimum Temperature Fahrenheit (F)	Minimum %NGP Setpoint
Solar Mars 100 Turbine/Compressor #1	EQT0021 (1013)	0-140° F	90
Solar Mars 100 Turbine/Compressor #2	EQT0022 (1014)	0-140° F	90

63.6120(f)(4) A discussion identifying the methods Rayne will use to measure and the instruments Rayne will use to monitor the proposed parameters, as well as the relative accuracy and precision of these methods and instruments.

- a. Rayne will use the turbines' inherent PLC system to continuously monitor the specific parameters as indicated in the petition, email dated January 20, 2023, and Table 2. The PLC will

send the data to the control room's Human Machine Interface (HMI) at approximately one second intervals to display the status of the indicators. The PLC includes safety measure, fail safes, and redundancies to ensure integrity of instrumentation and operational control. If there control system or input/output faults, the turbines will automatically shutdown until an operators can inspection and conduct corrective actions.

- b. %NGP uses a Variable Reluctance (Magnetic) Speed Sensor that measures magnetic pickup of the speed at which the engine is running. %NGP is used to enable SoLoNOx mode and will automatically shutdown due to speed sensing system faults resulting in speed signals outside the defined parameters.
- c. T_1 is measured with a Platinum Resistance Temperature Detector (RTD) and used to compensate the speed set point. T_1 is used to disable SoLoNOx mode if the temperatures are less than zero degrees Fahrenheit. The turbine will automatically shutdown due to sensor faults that occur over a duration of two (2) hours and triggers the sensor fail alarm.
- d. Rayne uses PI Historian as their data gathering tool.

63.6120(f)(5) A discussion identifying the frequency and methods for recalibrating the instruments Rayne will use for monitoring the selected parameters.

The monitoring devices are installed and factory tested at the manufacturer. The Variable Reluctance Speed Sensor and RTD are not able to be calibrated, but are replaced once an alarm is triggered that the sensors are not working.