



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 4  
ATLANTA FEDERAL CENTER  
61 FORSYTH STREET  
ATLANTA, GEORGIA 30303-8960

August 30, 2022

Ms. Deborah Saxton  
Environmental Services Manager  
Entergy Services, LLC  
2107 Research Forest Drive, T-LFN-6  
The Woodlands, Texas 77382

Dear Ms. Saxton:

This is in response to your letter dated July 22, 2022, submitting a revision to your May 24, 2022, continuous monitoring system (CMS) plan petition for Title 40, Code of Federal Regulation (CFR), Part 63, Subpart YYYY - National Emission Standards for Hazardous Air Pollutants (NESHAP) for Stationary Combustion Turbines, as it applies to Entergy's combustion turbine AA-001 located at Entergy's Choctaw County Generating Plant in French Camp, Mississippi.

On May 27, 2022, Entergy electronically submitted the May 24, 2022, CMS plan petition to the Environmental Protection Agency. On June 6, 2022, the EPA requested additional information from your contact, Mr. Akinbayo Akintola, Senior Environmental Analyst. On July 18, 2022, Entergy and the EPA engaged in a WebEx meeting to discuss the CMS plan petition, the EPA's request for additional information, and standards in effect for CMS plan petition submissions/reviews. On July 25, 2022, Entergy electronically submitted a revised CMS plan petition (dated July 22, 2022) to the EPA. The EPA requested additional information on July 26, 2022, July 29, 2022, and August 16, 2022, and received information on July 28, 2022, August 1, 2022, and August 16, 2022. Based on our review of all available information, including additional information provided by Entergy, your CMS plan is acceptable, subject to specific requirements. Details regarding the CMS plan and the basis for our determination are provided in the remainder of this letter.

Description of Combustion Turbine Unit Emission Point AA-001 (CTG1)

CTG1 is a 208 Megawatt (MW) General Electric Model 7FB natural gas-fired lean premix combustion turbine using low NO<sub>x</sub> burners and a selective catalytic reduction (SCR) system to control emissions of NO<sub>x</sub>. The turbine is equipped with a heat recovery steam generator and supplemental duct burners rated at a maximum heat input of 258.9 million British Thermal Units per hour. Because the turbine was reconstructed in 2017, it is categorized as a reconstructed affected source (reconstructed after January 14, 2003) under Subpart YYYY. The unit is not equipped with an oxidation catalyst to control emissions of formaldehyde.

## Description of Entergy's CMS Petition

Entergy proposes to continuously monitor and record turbine power output (MW) and indication of lean-premix mode operation to ensure compliance with the formaldehyde emission standard. To establish the operating limit's range for turbine power output, Entergy proposes to conduct formaldehyde emission standard compliance testing (four one-hour runs) at two turbine operating power output levels to determine the operating limit range for power output: maximum operating power output (high-power output) (100% capacity,  $\pm 10\%$ ) and low-power output (Entergy's discretion but anticipated at 50-60% of maximum power output).

Entergy notes that ambient air temperature, pressure, and humidity affects turbine power output, but the turbine operates to maintain flame temperature in the combustion zone. Entergy proposes to monitor the turbine system's lean-premix mode indication sensor which indicates that the turbine is operating in the lean-premix mode. The lean-premix mode of operation ensures good combustion practices are being achieved during operation of the turbine and is only indicated during normal operations. Entergy has identified the relevant operation and maintenance procedures for the power output meter, which describes the recommended operation and maintenance procedures, to include meter verification procedures. SEL, the manufacturer of the power output meter, verified that the instrument is factory calibrated and does not require yearly calibration, only periodic accuracy verification. On-site testing using a test block and portable test station reduces meter downtime and technician site time to approximately less than 20 minutes.

Entergy proposes to: 1) monitor turbine power output and lean-premix mode indication at a minimum frequency of at least once every 15 minutes during formaldehyde emission standard compliance demonstration testing at low-power output and high-power output operations, and 2) determine the power output hourly average of the 15-minute readings and four-hour rolling-averages from the hourly averages, to establish the power-output range operating limits to indicate compliance with the formaldehyde emission standard during non-testing period. After testing, Entergy proposes to continuously monitor and record the rolling four-hour average turbine power output to indicate compliance with the operating limit range established by the formaldehyde emission standard testing. Also, following testing, Entergy proposes to monitor and record lean-premix mode of operation at a minimum frequency of at least once every 15-minutes to verify the turbine's lean premix mode of operation.

## EPA's Review of Subpart YYY Standards and CMS Petition Requirements

Under 40 CFR § 63.6085, owners and operators are subject to Subpart YYYYY if they own or operate a stationary combustion turbine located at a major source of hazardous air pollutant (HAP) emissions. Under 40 CFR § 63.6090(a)(2), a stationary combustion turbine is a new source if construction commenced after January 14, 2003. Under 40 CFR § 63.6095(a)(3), new lean-premix gas-fired stationary combustion turbines which start operation on or before March 9, 2022, must comply with the emissions limitations and operating limitations in this subpart no later than March 9, 2022. Under 40 CFR § 63.6100, each new lean-premix gas-fired stationary combustion turbine must comply with the emission limitations and operating limitations in Table 1 and Table 2 of Subpart YYYYY, respectively. Table 1 of Subpart YYYYY limits the concentration of formaldehyde to 91 parts-per-billion by volume, dry basis (ppbvd) or less at 15-percent O<sub>2</sub> for new lean-premix gas-fired stationary combustion turbines, except during turbine startup, shutdown, and malfunction events. Table 2 of Subpart YYYYY requires

owners/operators to maintain operating limitations approved by the EPA Administrator to continuously demonstrate compliance with the emission limit during non-testing periods.

Under 40 CFR § 63.6105(a), after September 8, 2020, owners/operators must comply with the applicable emission limitations, operating limitations, and other requirements of Subpart YYYY. Under 40 CFR § 63.6105(c), after September 8, 2020, owners/operators must always operate and maintain any affected source in a manner consistent with safety and good air pollution control practices for minimizing emissions.

Under 40 CFR § 63.6110(a), owners/operators must conduct the initial performance tests or other initial compliance demonstrations in Table 4 to Subpart YYYY that apply within 180 calendar days after the compliance date specified (*e.g.*, by September 8, 2022) for affected source stationary combustion turbines according to the provisions in 40 CFR § 63.7(a)(2) unless a historical test may be accepted according to the provisions of 40 CFR § 63.6110(b). Under 40 CFR § 63.6115, subsequent performance tests must be performed on an annual basis as specified in Table 3 to Subpart YYYY.

Under 40 CFR § 63.6125(b), for a stationary combustion turbine not using an oxidation catalyst to comply with the formaldehyde emission limit, owners/operators must continuously monitor any parameters specified in your approved petition to the Administrator, to comply with the operating limitations in Table 2 to Subpart YYYY, and as specified in Table 5 to Subpart YYYY.

Under 40 CFR § 63.6120(f), for a stationary combustion turbine not equipped with an oxidation catalyst, owners/operators may petition the Administrator for approval of operating limitations to demonstrate compliance with the formaldehyde emission limitation during non-testing periods. In these cases, the petition must include:

- (1) Identification of the specific parameters you propose to use as additional operating limitations;
- (2) A discussion of the relationship between these parameters and HAP emissions, identifying how HAP emissions change with changes in these parameters and how limitations on these parameters will serve to limit HAP emissions;
- (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;
- (4) A discussion identifying the methods you will use to measure and the instruments you will use to monitor these parameters, as well as the relative accuracy and precision of these methods and instruments; and
- (5) A discussion identifying the frequency and methods for recalibrating the instruments you will use for monitoring these parameters.

Under 40 CFR § 63.6125(e), after September 8, 2020, for owners/operators using a CMS to indicate compliance with the formaldehyde emissions standard during non-testing periods, a CMS quality control program must be developed and implemented which includes written procedures for the CMS according to § 40 CFR § 63.8(d)(1-2). Additionally, a program of corrective action should be included in the plan required under 40 CFR § 63.8(d)(2).

Under 40 CFR § 63.6135(a), except for monitor malfunctions, associated repairs, and required applicable quality assurance or quality control activities, owners/operators must always conduct all parametric monitoring when the stationary combustion turbine is operating.

Under 40 CFR § 63.6120(e), when a CMS petition is required to be submitted to the Administrator, owners/operators must not conduct the initial performance test until after the petition has been approved or disapproved by the Administrator.

#### The EPA's Determination for Entergy's CMS Plan Petition

Based on supporting and available information, the following CMS plan is acceptable to the EPA:

- i.) The normal power output operating limit range must be established by the conduct of formaldehyde emission standard compliance demonstration testing events. Entergy must conduct testing (four one-hour runs) at high-power output (regulatory requirement @ 100% power output capacity,  $\pm 10\%$ ) and minimum-power output (low-power output) (Entergy's discretion, subject to lean-premix mode of operation) to successfully demonstrate compliance with the emission standard at the low-power and high-power output production levels. Testing, for the purposes of this approval, must not include data from startup, shutdown, or malfunction events.
- ii.) Turbine power output and lean-premix mode indication shall be monitored and recorded at a minimum frequency of at least once every 15 minutes during testing conducted to successfully demonstrate compliance with the formaldehyde emission standard promulgated in 40 CFR § 63.6100 and Table 1 to Subpart YYYY.
- iii.) The hourly low-power output for the turbine shall be determined by computing hourly averages using all 15-minute readings taken during the low-power output formaldehyde emission standard compliance demonstration testing event. The four-hour, rolling-average, low-power output for the turbine shall be determined by computing the four-hour average using all hourly averaged readings taken during the low-power output formaldehyde emission standard compliance testing event. The four-hour, rolling-average, low-power output must be used to establish the low-power output operating limit for the turbine's power output operating range.
- iv.) The hourly high-power output for the turbine shall be determined by computing hourly averages using all 15-minute readings taken during the high-power output formaldehyde emission standard compliance demonstration testing event. The four-hour, rolling-average, high-power output for the turbine shall be determined by computing the four-hour average using all hourly averaged readings taken during the high-power output formaldehyde emission standard compliance testing event. The four-hour, rolling-average, high-power output must be used to establish the high-power output operating limit for the turbine's power output operating range.
- v.) Indication of lean-premix mode operation must be continuously monitored and recorded at a minimum frequency of at least once every 15 minutes during low-power output and high-power output formaldehyde emission standard compliance testing events, respectively, and continuously thereafter.
- vi.) The turbine power output operating limit range must be established by (iii) and (iv). The four-hour, rolling-average, turbine power output must be maintained within the operating range determined by testing which successfully demonstrates compliance with the formaldehyde emission standard.
- vii.) Except for startup, shutdown, and malfunction events, the turbine must be operated in the lean-premix mode of operation to ensure compliance with this approval.

- viii.) Following formaldehyde emission compliance demonstration testing, the four-hour, rolling-average, turbine power output must be continuously monitored and recorded. However, data collected during startup, shutdown, and malfunction events must not be included in the calculations for the four-hour, rolling-average, power output determination used to indicate compliance with the formaldehyde emission standard during normal operation (*e.g.*, lean-premix indication operation).
- ix.) Entergy must verify the turbine power output meter's accuracy once annually according to the manufacturer's recommend procedures and maintain records of the annual verifications for inspection purposes.
- x.) In addition to annual formaldehyde emission standard compliance demonstration testing required under 40 CFR § 63.6115 for the turbine high-power output operation, Entergy must also conduct testing for the turbine low-power output operation annually to verify, or adjust, the turbine power output limit range to assure Entergy maintains proper maintenance of the power output operating limits range for CMS plan purposes.

The EPA's approval of Entergy's CMS plan is based on information provided in the original submission, information provided by Entergy in response to EPA's additional information requests, discussions with Entergy, and research conducted by the EPA. The EPA's approval is contingent on successful demonstration of formaldehyde emission standard compliance demonstration testing events. Should Entergy change the operating conditions of the turbine to an operation which is different than the operating conditions represented in this approval such that formaldehyde emissions increase because of the change, Entergy must submit a revised CMS plan petition to address the change(s).

Nothing in this CMS plan approval excludes the EPA from reopening this CMS plan approval to adjust its conditions, if needed, for enhancement of emission standard compliance assurance. If Entergy discovers an additional parameter, or additional parameters, which indicate additional parametric monitoring operating limits are necessary to assure compliance with the formaldehyde emission standard, Entergy must submit a revised CMS plan petition to the EPA to revise the CMS plan and incorporate the additional operating limit(s) based on the discovery. Finally, if Entergy recognizes an opportunity to revise the CMS plan based on other CMS plan approvals issued by the EPA, or new information obtained by Entergy which may reduce the burden of tasks necessary for compliance assurance but still effectively assure compliance with the formaldehyde emission standard, Entergy may file a petition to the EPA referencing that information to revise this CMS plan.

Please note that our approval does not alter Entergy's obligations to meet all other applicable NESHAPs, including, but not limited to, the following NESHAP general provisions:

- The requirement to maintain and operate affected facilities and associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions, per § 63.453(q) and
- The prohibition against concealing emissions which would otherwise constitute a violation of an applicable standard, including the use of gaseous diluents to achieve compliance with a standard which is based on the concentration of a pollutant in the gases discharged to the atmosphere, per § 63.4.

This CMS petition approval was coordinated with the EPA's Office of Enforcement and Compliance Assurance and Office of Air Quality Planning and Standards. If you have any questions about this CMS petition conditional approval, please contact Tracy Watson at (404) 562-8998, or by email at [watson.marion@epa.gov](mailto:watson.marion@epa.gov).

Sincerely,

**CAROLINE  
FREEMAN**

Digitally signed by CAROLINE  
FREEMAN  
Date: 2022.08.30 14:55:55  
-04'00'

Caroline Y. Freeman  
Director  
Air and Radiation Division

cc: Sara Ayres, EPA OECA  
Melissa Fortenberry, MDEQ  
Melanie King, OAQPS