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

March 17, 2023

Mr. Theodore King
Superintendent Maintenance
Citrus Combined Cycle Station
Duke Energy Florida, LLC
14385 N. Access Rd
Crystal River, Florida 34429

Dear Mr. King:

This is in response to your letter dated July 21, 2022, requesting approval of a continuous monitoring system (CMS) plan petition for Title 40, Code of Federal Regulation (C.F.R.), Part 63, Subpart YYYY - National Emission Standards for Hazardous Air Pollutants (NESHAP) for Stationary Combustion Turbines, as it applies to four combustion turbines operated by Duke Energy Florida, LLC (DEF), Citrus Combined Cycle Station, in Crystal River, Florida. The U.S. Environmental Protection Agency (EPA) requested additional information from you on October 5, 2022, October 26, 2022, and November 2, 2022, and received information on October 25, 2022, November 2, 2022, and December 15, 2022. Based on our review of available information, your CMS plan is acceptable, subject to specific conditions. 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 Points (1GTA, 1GTB, 2GTA, and 2GTB)

DEF operates four lean premix gas-fired Mitsubishi Model M501GAC combustion turbines (units 1GTA, 1GTB, 2GTA, and 2GTB). Each combustion turbine is rated at a nominal capacity of 275 megawatt (MW). The turbines are configured to operate as two two-on-one combined cycle power blocks. Each block contains two combustion turbines, one steam turbine, and one heat recovery steam generator. Since the turbines were constructed after January 14, 2003, they are new affected sources under Subpart YYYY. None of the units are equipped with an oxidation catalyst to control emissions of formaldehyde.

Description of DEF's CMS Petition

DEF proposes to continuously monitor and record combustion turbine gross loads (MW) to indicate compliance with the formaldehyde emission standard during normal operation. Based on the results obtained from engineering stack tests conducted on the four turbines, DEF states that operation of the turbines at or above a gross load of 140 MW will ensure compliance with the formaldehyde emission standard. DEF proposes to monitor and record the gross load and determine the four-hour rolling averages of gross load to indicate compliance with the formaldehyde emission limitation during normal

operation. DEF seeks EPA's approval of the previous engineering stack tests as the initial demonstration of compliance.

DEF also presented information related to cold and warm startup periods. For purposes of the continuous parameter monitoring during startup periods, DEF proposes to use a 12-hour block average of the gross load for warm startup events and a 16-hour block average of the gross load for cold startup events. The 12-hour or 16-hour block averaging will begin following the conclusion of any startup exclusion period otherwise allowed by the rule. Following the conclusion of the 12-hour or 16-hour block average period, continuous monitoring of normal operation (four-hour rolling average) will begin.

DEF uses JEMSTAR Digital Multifunction Electricity Meters (model JS-05R6020-B6-DNP) to measure gross load and they are calibrated and tested according to procedures contained in the JEMSTAR owner's manual. DEF currently monitors gross load and reports the information to the EPA's Clean Air Market Database under 40 C.F.R. Part 75 since the turbines are regulated affected sources under the program.

EPA's Review of Subpart YYYY Standards and CMS Petition Requirements

Under 40 C.F.R. § 63.6085, owners and operators are subject to Subpart YYYY if they own or operate a stationary combustion turbine located at a major source of hazardous air pollutant (HAP) emissions. Under 40 C.F.R. § 63.6090(a)(2), a stationary combustion turbine is a new source if construction commenced after January 14, 2003. Under 40 C.F.R. § 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 Subpart YYYY no later than March 9, 2022. Under 40 C.F.R. § 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 YYYY, respectively. Regarding the emissions standard, Table 1 of Subpart YYYY limits the concentration of formaldehyde to 91 parts-per-billion by volume, dry basis (ppbvd), or less, at 15-percent O_2 for new lean premix gas-fired stationary combustion turbines, except during the period of turbine startup excluded by the rule (*e.g.*, first hour of startup for single cycle operation and first three hours of startup for combined cycle operation). Table 2 of Subpart YYYY requires owners/operators to maintain the turbines within operating limitations approved by the EPA Administrator to continuously demonstrate compliance with the emission limit during non-testing periods.

Under 40 C.F.R. § 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 C.F.R. § 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 C.F.R. § 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 5, 2022) for affected source stationary combustion turbines according to the provisions in 40 C.F.R. § 63.7(a)(2), unless a historical test may be accepted according to the provisions of 40 C.F.R. § 63.6110(b). Under 40 C.F.R. § 63.6115, subsequent performance tests must be performed on an annual basis as specified in Table 3 to Subpart YYYY.

Under 40 C.F.R. § 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 a petition approved by the Administrator to comply with the operating limitations in Table 2 to Subpart YYYY, as specified in Table 5 to Subpart YYYY.

Under 40 C.F.R. § 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 C.F.R. § 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 C.F.R. § 63.8(d)(1) through (2). Additionally, a program of corrective action should be included in the plan required under 40 C.F.R. § 63.8(d)(2).

Under 40 C.F.R. § 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 C.F.R. § 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 DEF's CMS Plan Petition

The EPA has reviewed the engineering stack test report submitted by DEF. The results suggest that the turbines will comply with the formaldehyde emission standard at or above 150 MW gross load, which is also indicative of lean premix mode operation. Lean premix mode of operation, based on EPA's understanding, may be used to indicate compliance status with the formaldehyde emission standard. Based on supporting and available information, the following CMS plan is acceptable to the EPA:

i.) To demonstrate compliance with the formaldehyde emission standard, DEF must conduct initial and subsequent periodic compliance demonstration testing using procedures of 40 C.F.R. § 63.6120 at high load, defined as 100 percent plus or minus 10 percent.

ii.) Gross load must be continuously monitored and recorded at least once every 15 minutes during the formaldehyde emission standard compliance demonstration testing, and continuously thereafter, to successfully demonstrate compliance with the formaldehyde emission standard promulgated in 40 C.F.R. § 63.6100 and Table 1 of Subpart YYYY. An hourly averaged gross load shall be determined by using all readings taken at least once every 15 minutes during that hour.

iii.) For the formaldehyde emission standard compliance demonstration testing event, four separate test runs for each testing event must be conducted. Each test run must last at least 1 hour. The four-hour average gross load shall be determined by computing the four-hour average using all hourly averaged readings taken during the event.

iv.) Following the formaldehyde emission compliance demonstration testing, the four-hour rolling average gross load must be continuously monitored and recorded to indicate compliance with the formaldehyde emission standard. The four-hour rolling average gross load shall be determined by computing the four-hour average using all hourly averaged readings for the current hour and preceding three hours of operation.

v.) Data collected during periods of startup (*e.g.*, before achieving 150 MW), shutdown, or malfunction may not be included in the four-hour average for the formaldehyde emission compliance demonstration testing and four-hour rolling averages used to indicate compliance with the formaldehyde emission standard. Startup times must not extend longer than the times specified by the manufacturer's standard operating procedure for startups. Startups must be conducted, to the extent possible, in a manner consistent with ensuring that safety and good air pollution control practices for minimizing emissions are followed.

vi.) During normal operation, the turbine must be operated at or above 150 MW, which is indicative of lean premix mode of operation to ensure compliance with this approval.

vii.) DEF must verify the gross load meter's accuracy once annually according to the manufacturer's recommended procedures and maintain records of the annual verifications for inspection purposes.

The EPA's approval of the DEF's CMS plan is based on information provided in the DEF's submission and research conducted by the EPA. The EPA's approval is contingent on a successful demonstration of formaldehyde emission standard compliance resulting from a testing event. Should DEF 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, DEF 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 DEF discovers an additional parameter(s), which indicates additional parametric monitoring operating limits are necessary to assure compliance with the formaldehyde emission standard, DEF 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 DEF recognizes an opportunity to revise the CMS plan based on other CMS plan approvals issued by the EPA, or new information is obtained by DEF which may reduce the burden of tasks necessary for compliance assurance but still effectively assure compliance with the formaldehyde emission standard, DEF may file a petition to the EPA referencing that information to revise this CMS plan.

Please note that our approval does not alter DEF'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 40 C.F.R. § 63.6, 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 40 C.F.R. § 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 Henian Zhang at (404) 562-8123, or by email at zhang.henian@epa.gov.

Sincerely,

CAROLINE FREEMAN

Digitally signed by CAROLINE FREEMAN
Date: 2023.03.17 13:19:27 -04'00'

Caroline Y. Freeman
Director
Air and Radiation Division

cc: Hastings Read, FDEP
Melanie King, EPA OAQPS
Sara Ayres, EPA OECA