



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF AIR AND RADIATION

June 6, 2024

Mr. Keith M. Stephens
Alternate Designated Representative
PowerSouth Energy Cooperative
P.O. Box 550
Andalusia, Alabama 36420

Re: Petition to use hourly gross calorific value analysis in calculation of hourly heat input at the Charles R. Lowman Power Plant (Facility ID (ORISPL) 56)

Dear Mr. Stephens:

The United States Environmental Protection Agency (EPA) has reviewed the November 30, 2023 petition submitted by PowerSouth Energy Cooperative (PowerSouth) under 40 CFR 75.66, and the subsequent emails received January 31, 2024 and June 5, 2024, requesting permission to use hourly average measurements, rather than monthly averages, of the gross calorific value (GCV) of pipeline natural gas or natural gas to perform emissions calculations for unit CC1, and any future unit utilizing Appendix D to part 75, located at the Charles R. Lowman Power Plant (Lowman). EPA approves the petition, with conditions, as discussed below.

Background

PowerSouth owns and operates Lowman, which is located in Washington County, Alabama. Lowman unit CC1 is combined cycle combustion turbine serving an electricity generator with a nominal design rating of 454.5 MW, as well as a heat recovery steam generator, a steam turbine, and a second electricity generator with a nominal design rating of 272.2 MW. The unit currently combusts pipeline natural gas.

According to PowerSouth, Lowman unit CC1 is subject to the Acid Rain Program and Cross-State Air Pollution Rule (CSAPR) trading programs for annual emissions of sulfur dioxide (SO₂) and annual and

ozone season emissions of nitrogen oxides (NO_x). PowerSouth is therefore required to continuously monitor and report SO₂, NO_x, and carbon dioxide (CO₂) mass emissions, NO_x emission rate, and heat input for this unit in accordance with 40 CFR part 75.

Acid Rain and CSAPR-affected units that meet the definition of “gas-fired” or “oil-fired” in 40 CFR 72.2 may use the excepted methodology in appendix D to part 75 to determine SO₂ mass emissions and unit heat input instead of installing continuous emission monitoring systems (CEMS). PowerSouth has elected to use the appendix D methodology for unit CC1.

The appendix D methodology requires continuous monitoring of the fuel flow rate and periodic sampling of the fuel characteristics, including sulfur content, GCV, and density (if needed). Under section 2.3.4.1 of appendix D, the GCV of pipeline natural gas must be determined at least once in every month in which the fuel is combusted for 48 hours or more (and at least once in each calendar quarter in which the unit operates). If multiple GCV samples are taken and analyzed in a particular month, section 2.3.4.1 provides that, “the GCV values from all samples shall be averaged arithmetically to obtain the monthly GCV.” Furthermore, section 2.3.7(c)(1) of appendix D states that, “[i]f multiple samples are taken and averaged, apply the monthly average GCV to the entire month.”

Thus, for a unit such as Lowman unit CC1 that combusts pipeline natural gas or natural gas, for each hour of unit operation in a given month, the measured hourly fuel flow rate and the average monthly GCV value are used to calculate the hourly unit heat input. The hourly heat input rate is then multiplied by a default SO₂ emission rate to calculate the hourly SO₂ mass emissions.

Lowman’s fuel supplier, NextEra, owns, operates, and maintains a continuous calorimeter which provides hour-by-hour measurements of the GCV of the fuel burned at the facility. PowerSouth believes the most accurate hourly heat input rates are obtained when hourly GCV values are coupled with hourly measurements of fuel flow rate. In view of this, PowerSouth submitted a petition to EPA requesting permission to use hourly GCV values, rather than monthly averages, in the emission calculations for unit CC1. PowerSouth also made the request for any other unit combusting pipeline natural gas that may be constructed at Lowman in the future. In addition, PowerSouth requested that EPA’s approval continue to apply in the event that the fuel combusted at Lowman in the future meets the criteria to qualify as natural gas but not as pipeline natural gas.

EPA’s Determination

EPA approves PowerSouth’s petition to use hourly measurements of the gross calorific value of pipeline natural gas, as an option in lieu of monthly arithmetic average GCV values, in the emissions calculations for Lowman unit CC1. The Agency concurs that using hourly, rather than monthly, GCV values together with hourly fuel flow rates is likely to provide more accurate hourly heat input rate data. Furthermore, hour-by-hour measurement of the GCV far exceeds the minimum sampling frequency for pipeline natural gas (i.e., once per month) specified in section 2.3.4.1 of appendix D. EPA notes that approval of the requested authorization to use hourly GCV measurements does not

preclude PowerSouth from alternatively continuing to use monthly average GCV values in accordance with the regulations. Further, for the same reasons stated above with respect to unit CC1 and pipeline natural gas, EPA's approval also applies to any other pipeline natural gas-fired unit that may be constructed at Lowman in the future, and also applies in the event that the fuel combusted at Lowman in the future meets the criteria to qualify under part 75 as natural gas but not as pipeline natural gas.

Conditions of Approval

As a condition of this approval, for periods of missing GCV data, PowerSouth shall use substitute data values in the calculations, as follows:

1. Provided that at least one valid GCV measurement is obtained in a given month, substitute, for each hour of the missing data period, the arithmetic average of the GCV values from the hour before and the hour after the missing data incident; or
2. In accordance with section 2.4.1 of appendix D to part 75, if no valid GCV values are obtained in a given month, substitute, for each hour of the missing data period, the maximum potential GCV value of 110,000 Btu per 100 standard cubic foot (scf) from table D-6 in appendix D.

Because Lowman's fuel supplier operates the calorimeter and has an economic incentive to ensure that the GCV measurements produced by the calorimeter are not biased low (while PowerSouth has an analogous economic incentive to ensure that the GCV measurements are not biased high), EPA considers it reasonable to treat the calorimeter for purposes of this petition in the same manner as gas billing meters are treated under the part 75 regulations. Accordingly, in these circumstances EPA believes it is reasonable to approve PowerSouth's petition without establishing conditions regarding the operation and maintenance of the calorimeter or related quality assurance/quality control procedures. This approval, and in particular the absence of conditions related to the calorimeter, specifically relies on PowerSouth's representation that the calorimeter is operated by Lowman's fuel supplier.

EPA's determination relies on the accuracy and completeness of the information provided by PowerSouth in the November 30, 2023 petition and subsequent e-mail communications (January 31, 2024 and June 5, 2024) and is appealable under 40 CFR part 78. If you have any questions regarding this determination, please contact Charles Frushour at frushour.charles@epa.gov or (202) 343-9847.

Sincerely,

Rona Birnbaum, Director
Clean Air and Power Division

cc: Tracey Watson, EPA Region 4
Natoshia Martin, Alabama Department of Environmental Management (ADEM)