



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

JUN 10 2002

OFFICE OF
AIR AND RADIATION

Daniel V. Steen
Designated Representative
FirstEnergy Corporation
76 South Main Street
Akron, Ohio 44308

Re: Petition to Use Alternative Methods of Accounting for Sulfur Dioxide, Carbon Dioxide Mass Emissions, Heat Input, and Volumetric Flow Rate Before CEMS Certification at FirstEnergy's Bay Shore Station, Unit 1

Dear Mr. Steen:

EPA has reviewed your November 2, 2001 petition under §75.66 to use alternative methods of substituting data for sulfur dioxide (SO₂), carbon dioxide (CO₂) mass emissions, heat input, and volumetric flow before completion of certification testing of the SO₂, CO₂, and flow continuous emissions monitors (CEMS) at FirstEnergy (FirstEnergy) Corporation's Bay Shore Power Company, Bay Shore Station (Bay Shore), Unit 1. FirstEnergy also petitioned for an alternative missing data procedure to be used until the monitor availability as calculated under §75.32 of the SO₂ CEMS reaches 90 percent. As discussed below, EPA approves the petition for Unit 1 with modifications.

Background

Bay Shore, Unit 1 is a repowering project that replaced a vertically-fired coal unit (also called Unit 1), which did not have SO₂ controls, with a circulating fluidized-bed boiler combusting petroleum-coke (pet-coke) as the primary fuel. Unit 1 was subject to the Acid Rain Program prior to being repowered. The repowered Unit 1 is also subject to the Acid Rain Program. The SO₂ emissions from the repowered Unit 1 are controlled by limestone that is injected into the circulating fluidized-bed.

The repowered Unit 1 commenced commercial operation on October 21, 2000. The SO₂ and NO_x CEMS were certified on March 28, 2001. The CO₂ CEMS was certified on March 31, 2001. The flow CEMS was certified on May 4, 2001. FirstEnergy states in the petition that it was not able to complete certification testing of the SO₂, NO_x, CO₂, and flow CEMS prior to the end of the 90-day period (i.e., January 19, 2001) after commencement of commercial operation,

as required by §75.4, because Unit 1 was not able to maintain stable operation on its primary fuel long enough to complete testing. Section 6.5(a) of Appendix A of Part 75 requires that the relative accuracy test audit (RATA) be conducted while the unit is combusting the fuel that is normal for that unit. FirstEnergy maintains that Unit 1 combusted fuel oil for flame stabilization, instead of the normal fuel (pet-coke), for 762 of the 1044 hours that Unit 1 operated prior to March 28, 2001 and that, during an additional 148 hours, fuel oil was combusted for startup. The RATA to certify the SO₂ CEMS commenced less than 50 hours after the unit ceased combusting fuel oil and started combusting only petcoke.

Under §75.66, a designated representative may petition for alternative requirements for monitoring, e.g., for accounting for SO₂ and CO₂ mass emissions during the CEMS certification deadline and the completion of certification testing. Under §75.66(j), the designated representative must (1) identify the unit, (2) submit a detailed explanation of the alternative method to account for emissions of SO₂ mass emissions and CO₂ mass emissions, and (3) demonstrate that the proposed alternative does not underestimate emissions. FirstEnergy petitioned for the following:

- 1) To substitute a maximum controlled SO₂ concentration instead of the maximum potential concentration (MPC), as required by Part 75, during the period between the CEMS certification deadline and the certification of the SO₂ CEMS. FirstEnergy performed an analysis of 720 hours of post-certification CEMS data to determine a maximum controlled emission rate (MCER) for SO₂ of 0.99 lb/mmBtu. FirstEnergy used the MCER to determine a maximum expected concentration (MEC) for SO₂ of 388 ppm. The MEC was then substituted for SO₂ concentration in Equation F-1 from Appendix F to provide an alternative SO₂ mass emission value. FirstEnergy submitted a demonstration indicating that, if several boiler and control parameters are met, there is reasonable assurance that the SO₂ controls are operating at normal efficiency. These parameters are (1) bed temperature above 1540 degrees Fahrenheit, (2) limestone to fuel feed ratios greater than 1:4 (1 part limestone to 4 or less parts fuel), and (3) fuel flow rates greater than 20 tons per hour. FirstEnergy proposed to substitute 388 ppm for each hour that the unit met these parameters from January 19, 2001 until the completion of SO₂ CEMS certification testing on March 28, 2001. Any hour in which Unit 1 operated and these parameters were not met, FirstEnergy would substitute the MPC of 3500 ppm for the SO₂ concentration in Equation F-1.
- 2) To determine substitute data for CO₂ mass emissions using: the total daily fuel usage of pet-coke, as measured by fuel flow metering devices; the highest recorded carbon content measured for pet-coke and Equation G-1 from Appendix G; the hourly heat input from fuel oil, as measured by oil flow meters, and Equation G-4 from Appendix G; and the total daily usage of limestone, as measured by limestone flow metering devices, and Equation G-5 from Appendix G.
- 3) To determine substitute data for hourly heat input by measuring fuel usage (from fuel flow metering devices), measuring the gross calorific value of the fuel (by fuel sampling and analysis), and substituting the values into Equation F-21 of Appendix F when

combusting pet-coke and into Equation F-19 from Appendix F when combusting fuel oil.

- 4) To determine substitute data for volumetric flow rate by developing a correlation between heat input and volumetric flow rate. The volumetric flow rate is to be plotted versus the heat input. The heat input is to be divided into 10 heat input ranges and the average volumetric flow rate is determined for that heat input range. Fuel usage is measured using the fuel flow metering devices, and heat input is determined using Equations F-19 and F-21. Then the heat input is compared to the 10 ranges. The average volumetric flow for that range is then to be used for the volumetric flow rate.
- 5) To establish guidelines for data substitution for SO₂ mass emissions until the SO₂ CEMS monitor availability exceeds 90%. For any hour in which data from the SO₂ CEMS are not available, FirstEnergy requests to substitute the MCER if Unit 1 is operating controlled and the MPC (3500 ppm) if Unit 1 is not operating controlled.

EPA's Determination

Under §75.4, Unit 1 was required to complete certification testing on the SO₂, NO_x, CO₂ and volumetric flow CEMS within 90 days after commencing commercial operation. FirstEnergy was unable to complete certification testing due to technical problems with Unit 1 as discussed above and under §75.31 must substitute the MPC for SO₂ and CO₂, the maximum potential NO_x emission rate, and the maximum potential volumetric flow rate for any hour the unit operates after the 90-day compliance date and before completion of the certification testing unless the Administrator has approved alternative methods. FirstEnergy proposed to use a MCER under §75.66(f) to calculate a MEC for SO₂ concentration. To qualify under this section, FirstEnergy must be able to provide a list of average hourly values for the previous 720 quality-assured monitor operating hours prior to the missing data period. However, FirstEnergy cannot provide the quality-assured data since the monitors were not certified prior to the missing data period. In addition, Equation F-1 from Appendix F requires the SO₂ concentration, not the SO₂ emission rate to calculate the SO₂ mass emissions. Therefore, FirstEnergy's request to use a MCER to calculate a MEC is denied. However, the request to use a MEC is granted and shall be determined as described below.

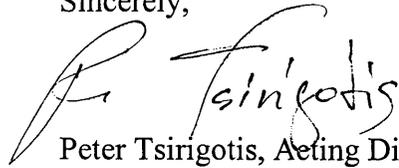
- 1) The demonstration data that FirstEnergy submitted indicated that on June 28, 2001 Unit 1 CEMS recorded a SO₂ concentration of 413 ppm. The parameters that FirstEnergy established indicated that Unit 1 was operating in a controlled manner. The bed temperature was above 1540 degrees Fahrenheit, the limestone to fuel ratio was greater than 1:4, and the fuel feed rate was above 20 ton per hour. FirstEnergy must use an MEC equal to the maximum controlled value observed in the demonstration, which is 413 ppm (not 388 ppm). From January 19, 2001 until the completion of SO₂ CEMS certification testing on March 28, 2001, FirstEnergy must substitute 413 ppm for the SO₂ concentration in Equation F-1 for any hour in which Unit 1 operated and met the parameters for controlled operation. For the same period, FirstEnergy must substitute the MPC of 3500 ppm for the SO₂ concentration in Equation F-1 for any hour in which Unit 1 operated and did not meet the parameters.

- 2) FirstEnergy shall determine substitute data for CO₂ mass emissions using: the total daily fuel usage of pet-coke, as measured by fuel flow metering devices; the highest recorded carbon content measured for pet-coke and Equation G-1 from Appendix G; the hourly heat input from fuel oil, as measured by oil flow meters, and Equation G-4 from Appendix G; and the total daily usage of limestone, as measured by limestone flow metering devices, and Equation G-5 from Appendix G. This is consistent with FirstEnergy's request in its petition.
- 3) FirstEnergy shall determine substitute data for hourly heat input by measuring fuel usage, (from fuel flow metering devices), measuring the gross calorific value of the fuel (by fuel sampling and analysis), and substituting the values into Equation F-21 of Appendix F when combusting pet-coke and into Equation F-19 from Appendix F when combusting fuel oil. This is consistent with FirstEnergy's request in its petition.
- 4) FirstEnergy's method of determining substitute data for the volumetric flow rate before the completion of certification testing shall be modified because of the uncertainties of measuring fuel flow rates using this method. As discussed in FirstEnergy's petition, the volumetric flow rate is to be plotted versus the heat input. Fuel usage is measured using the fuel flow metering devices, and a heat input is determined using Equations F-19 and F-21. The heat input is to be divided into 10 heat input ranges, and the highest volumetric flow rate is to be determined for that heat input range. The unit's actual heat input for a given hour is then compared to the 10 ranges. FirstEnergy requested to use the average volumetric flow rate for the relevant range as substitute data for volumetric flow rate. However, EPA requires that the highest volumetric flow for each range be used instead because the plotted relationship between volumetric flow rate and heat input does not reflect the normal operating conditions of the unit and this creates uncertainties about the accuracy of measuring fuel flow in this way. For example, during the period for which the relationship between volumetric flow rate and heat input is developed, the unit was not operating in a stable manner and was combusting fuel oil, rather than its normal fuel. EPA also notes that, because of the uncertainties of using this method, the Agency is approving this method only for limited, temporary use until certification of the flow CEMS.
- 5) For data substitution for SO₂ mass emissions until the SO₂ CEMS monitor availability exceeds 90%, under §75.34(a)(3), FirstEnergy shall substitute for any hour in which data from the SO₂ CEMS are not available, the MEC of 413 ppm for the SO₂ concentration if Unit 1 meets the parameters listed above indicating that Unit 1 is operating controlled and the MPC of 3500 ppm if Unit 1 is not operating controlled.

EPA's determinations in this letter rely on the accuracy and completeness of

FirstEnergy's submission on November 2, 2001 and are appealable under Part 78. If you have any questions regarding this correspondence, please contact Louis Nichols at (202) 564-0161.

Sincerely,

A handwritten signature in black ink, appearing to read "P. Tsigotis". The signature is fluid and cursive, with a large initial "P" and a long, sweeping underline.

Peter Tsigotis, Acting Director
Clean Air Markets Division

cc: Cecelia Mijares, Region 5
Todd Brown, OEPA