

December 11, 2007

Barry E. Pulskamp
Designated Representative
Duke Energy Corporation
526 South Church St.
P.O. Box 1006
Charlotte, NC 28201-1006

Re: Petition to Use an Alternative Missing Data Procedure for Unit 3 at the Marshall Steam Station (Facility ID (ORISPL) 2727)

Dear Mr. Pulskamp:

The United States Environmental Protection Agency (EPA) has reviewed the July 16, 2007, petition under 40 CFR 75.66(f), in which Duke Energy Carolinas LLC (Duke) requested to use an alternative missing data procedure for Unit 3 at the Marshall Steam Station. EPA approves the petition, with conditions, as discussed below.

Background

Duke owns and operates a coal-fired boiler, Unit 3, at its Marshall Steam Station (Marshall). Unit 3 is a 755 MW tangential-fired boiler that is subject to the Acid Rain Program. Therefore, Duke is required to continuously monitor and report sulfur dioxide (SO₂), nitrogen oxides (NO_x), and carbon dioxide (CO₂) emissions and heat input data for the unit, in accordance with 40 CFR Part 75. Unit 3 is also subject to the NO_x Budget Trading Program under Title 15A, Chapter 2, Subchapter D of the North Carolina Administrative Code (15A NCAC 2D.1400), which requires Duke to monitor and report NO_x mass emissions in accordance with Subpart H of Part 75. In order to satisfy the emission monitoring requirements of Part 75, Duke has installed, certified, operated, and maintained continuous emission monitoring systems (CEMS) for SO₂, NO_x, CO₂, and stack gas volumetric gas flow rate.

The July 16, 2007 petition indicates that a new flue gas desulfurization (FGD) system was recently installed on Unit 3. The FGD project involved the construction of a new stack and installation of new CEMS, which had to be certified before quality-assured data could be reported from them. The new FGD unit was brought into service on March 15, 2007, hour 10. Immediately, it was noticed that the CO₂ concentrations measured by the new CEMS were lower than expected. When the plant's maintenance personnel were unable to detect any obvious problem with the CEMS, Duke hired a stack testing firm to compare the CEMS data to measurements made with an EPA reference test method. The results of the reference method testing confirmed that the CEMS readings were biased low. Upon further investigation, it was discovered that the CEMS dilution probe had a

leak. Inward leakage of ambient air was diluting the gas sample, resulting in the lower-than-expected gas concentrations. The dilution probe was replaced on March 31, 2007, hour 18, whereupon the emissions data recorded by the CEMS returned to the expected levels. All of the required CEMS certification tests were then performed and passed.

Duke invalidated all the data recorded by the gas monitors in the time period extending from the startup of the FGD unit until the probe was replaced, i.e., from March 15, 2007, hour 10, until March 31, 2007, hour 17. At the time of FGD startup, no prior quality-assured data had been recorded at the new stack location, and the pre-FGD data recorded at the old stack location were considered unrepresentative of the new process conditions and therefore unsuitable for missing data lookbacks. Therefore, Duke restarted the initial missing data procedures of §75.31 and reported the maximum potential concentrations for SO₂ and CO₂ and the maximum potential emission rate for NO_x from the hour of FGD startup until the faulty probe was replaced. According to Duke, these maximum potential values grossly overstate the emissions from Unit 3 during the time period in question, because SO₂ was being reduced by the new FGD and NO_x was being controlled by a selective non-catalytic reduction (SNCR) unit. In view of this, Duke submitted a petition on July 16, 2007, requesting to use alternative substitute data values for SO₂ and NO_x during the missing data period.

According to §75.34(a)(3), the owner or operator of a unit with add-on emission controls may, if certain conditions are met, submit a petition under §75.66(f), requesting to use the maximum controlled emission rate recorded during the previous 720 quality-assured monitor operating hours for missing data purposes. Section 75.66(f) directs the owner or operator to provide the following information with the petition for alternative missing data substitution:

- Data demonstrating that the affected unit's monitor data availability for the time period under petition was less than 90.0 percent;
- Data demonstrating that the add-on emission controls were operating properly during the time period under petition (i.e., operating parameters were within the ranges specified for proper operation of the add-on emission controls in the quality assurance/quality control program for the unit);
- A list of the average hourly values for the previous 720 quality-assured monitor operating hours, highlighting both the maximum recorded value and the value corresponding to the maximum controlled emission rate; and
- An explanation of, and information on, operation of the add-on emission controls demonstrating that the selected historical SO₂ concentration or NO_x emission rate does not underestimate the SO₂ concentration or NO_x emission rate during the missing data period.

With one exception, all of the above information was provided with Duke's petition. Since the FGD was not in operation prior to the missing data incident, no controlled SO₂ concentrations were recorded prior to the incident. Duke therefore provided a list of the SO₂ concentrations recorded in the 720 quality-assured monitor operating hours immediately following the missing data period, and proposed to use those data as the basis for determining the maximum controlled SO₂ concentration.

EPA's Determination

EPA conditionally approves Duke's petition to use alternative missing data substitution for Marshall Unit 3 during the time period extending from March 15, 2007, hour 10 through March 31, 2007, hour 17. The approved value of the maximum controlled SO₂ concentration is 60.6 ppm, and the approved value of the maximum controlled NO_x emission rate is 0.265 lb/mmBtu. The basis of this approval is as follows:

- Reporting the maximum potential SO₂ concentration (1,323 ppm) and the maximum potential NO_x emission rate (0.553 lb/mmBtu) for hours in which the add-on emission controls are working properly grossly overstates the emissions from Unit 3 and is inappropriate;
- Unit 3's add-on emission controls (i.e., the SNCR and FGD units) were documented to be operating properly during the missing data period;
- The coal consumed prior, during, and after the probe leak incident was of similar heat input and ash, moisture, and sulfur content;
- The approved value of the maximum controlled SO₂ concentration, although based on quality-assured data recorded after the missing data period (i.e., from April 1 to May 4, 2007), appears to be sufficiently conservative to ensure that emissions are not under-reported. For the 720 hours of data used in the determination, the SO₂ concentrations consistently ranged from about 25 to 45 ppm, with only a handful of readings above 50 ppm;
- The approved value of the maximum controlled NO_x emission rate, although based on prior quality-assured data recorded at the old stack location, is also considered to be sufficiently conservative to ensure that emissions are not under-reported. A review of the 2nd quarter, 2007 electronic data report (EDR) for Unit 3 showed that for the 720 hours of quality-assured NO_x emission rate data recorded immediately after the missing data incident, the controlled NO_x emission rate was consistently between 0.190 and 0.230 lb/mmBtu, with only a few higher readings.

Conditions of Approval

The conditions of this approval are as follows:

- (1) Duke shall resubmit the 1st and 2nd quarter, 2007 EDRs for Marshall Unit 3, no later than December 31, 2007;
- (2) In the missing data period extending from March 15, 2007, hour 10 through March 31, 2007, hour 17, Duke shall report substitute data as follows for each unit operating hour in which the add-on emission controls were documented to be operating properly:
 - In EDR record type 200, leave column 29 blank and report the SO₂ concentration as 60.6 ppm in column 35. In column 41, report a Method of Determination Code (MODC) of “55”;
 - In EDR record type 320, leave column 36 blank and report the NO_x emission rate as 0.265 lb/mmBtu in column 42. In column 53, report a Method of Determination Code (MODC) of “55”; and
 - In EDR record type 202, column 24, report the CO₂ concentration as 14.0% CO₂ (i.e., the maximum potential value). In column 30, report a Method of Determination Code (MODC) of “12”.
- (3) For each hour of the missing data period in which the FGD is not documented to be working properly, Duke shall report the maximum potential SO₂ concentration, i.e., 1,323 ppm. Similarly, for each hour in which the SNCR is not documented to be working properly, Duke shall report the maximum potential NO_x emission rate, i.e., 0.553 lb/mmBtu.
- (4) In the resubmitted 1st quarter, 2007 EDR, Duke shall revise EDR record types (RTs) 510 and 556 as follows:
 - The continuous monitoring systems that were installed at the old stack location shall be shown in RT 510, exactly as they were represented in the 4th quarter, 2006 report. Change the status code in column 16 from “U” to “C” for all of the components of these systems and add the appropriate closeout date in column 108 of each RT 510;
 - The new monitoring systems shall be shown in RT 510 with new, unique system and component ID numbers. Only the DAHS component of each system may retain the same ID number that was used in the old monitoring systems. Report a status code of “A” in column 16 and the appropriate system activation date in column 100;
 - Revise the RT 556 information as follows. Report the system and component IDs of the new monitoring systems. Report an event code of “20” in column 16 for all systems. For the gas monitors,

revise the conditional data validation (CDV) start date/hour in columns 31 and 39. The March 15, 2007, hour 10 values are not appropriate. CDV cannot start sooner than the end of the probe leak incident, i.e., March 31, 2007, hour 18.

- (5) In the resubmitted 1st quarter, 2007 EDR, Duke shall ensure that all hourly emissions data and quality-assurance test data recorded while the old monitoring systems were still in service are reported under the system and component IDs of the old monitoring systems. Similarly, Duke shall ensure that all emissions and quality-assurance test data recorded with the new monitoring systems are reported under the system and component IDs of the new monitoring systems;
- (6) In the resubmitted 2nd quarter, 2007 EDR:
- The continuous monitoring systems that were installed at the old stack location shall be shown in RT 510, exactly as they were represented in the 1st quarter, 2007 report. Change the status code in column 16 from “C” to “D” for all of the components of these systems;
 - Include RTs 556 for the new monitoring systems. These records will contain the same basic information as the 556 records from 1st quarter, 2007, except that the certification test completion dates and hours must be added to columns 41 and 49, and the “C” flags must be removed from column 51; and
 - Ensure that all emissions and quality-assurance test data are reported under the system and component IDs of the new monitoring systems.

EPA’s determination relies on the accuracy and completeness of the information provided by Duke in the July 16, 2007 petition, and is appealable under Part 78. If you have any questions or concerns about this determination, please contact Venu G. Ghanta, at (202) 343-9009.

Sincerely,

/s/

Sam Napolitano, Director
Clean Air Markets Division

cc: David McNeal, Region 4

Dennis Igboko, NCDENR
Venu Ghanta, CAMD