

March 11, 2009

Susan Flash
Director of Environmental Affairs
PurEnergy Operating Services
490 Capital Avenue, Hartford,
Connecticut, 06106

Re: Petition for an Alternative to Standard Missing Data Substitution for Unit GT at Capitol District Energy Center Cogeneration Associates' Hartford, CT facility (Facility ID (ORISPL) 50498)

Dear Ms Flash:

The United States Environmental Protection Agency (EPA) has reviewed the December 19, 2008 petition under 40 CFR 75.66, in which Capitol District Energy Center Cogeneration Associates (CDECCA) requested acceptance of nitrogen oxides (NO_x) emissions data from Unit GT at the Hartford, Connecticut facility that were not quality-assured with on-line calibration error checks. EPA approves the petition in part, with conditions, as discussed below.

Background

CDECCA owns, and PurEnergy Operating Services, LLC operates, a combined cycle cogeneration unit, Unit GT, in Hartford, Connecticut. Unit GT is subject to the NO_x Budget Trading Program. Therefore, CDECCA is required to continuously monitor and report NO_x mass emissions and unit heat input data, in accordance with 40 CFR Part 75. To meet the Part 75 monitoring requirements, CDECCA has installed and certified an extractive-type NO_x-diluent continuous emission monitoring system (CEMS) and uses the heat input methodology in Appendix D to Part 75. Unit GT was acquired by CDECCA late in 2006.

According to CDECCA, a routine review of the third quarter 2008 electronic data report (EDR) for Unit GT showed that the facility had performed the required daily calibration error (CE) checks of the NO_x and CO₂ analyzers at a fixed time each day, and that the vast majority of the calibrations were performed when the unit was off-line. Section 2.1.1.1 of Appendix B to Part 75 requires that daily CE checks be performed when the unit is combusting fuel, except for limited situations where off-line calibrations may be used for data validation, as described in section 2.1.5.1 of Appendix B.

Further review of Unit GT's historical emissions data, from the fourth quarter of 2006 (when CDECCA acquired the unit) through the third quarter of 2008, showed that Unit GT operated on 84 days during that period and a total of 793 daily CE checks were performed, of which 786 were done off-line. In view of this, the quality-assured status of the NO_x emission data recorded during that time period has been brought into question. Ordinarily, for any unit operating hour in which valid, quality-assured data are not obtained with a certified monitor, the standard missing data provisions in §75.33 are used to determine appropriate substitute data values.

The use of substitute data tends to overstate emissions, particularly for long periods of missing data. In the case of Unit GT, a missing data period nearly two years in length would result if the NO_x emissions data that were not quality-assured with on-line calibration error checks were invalidated. This would quickly reduce the percent monitor data availability (PMA) of the NO_x monitoring system below 80.0 percent, and would require the maximum potential NO_x emission rate (MER) to be reported for an extended period of time.

Believing that using standard CEMS missing data substitution would grossly overstate Unit GT's NO_x mass emissions, CDECCA, in consultation with EPA, first considered the possibility of resubmitting the emissions data for the time period in question by generating replacement EDRs based on the low mass emissions (LME) methodology in §75.19. The LME methodology, which is not CEMS-based (and therefore does not depend upon the quality-assurance procedures in Appendix B of Part 75), uses default emission factors to make conservative estimates of NO_x mass emissions. However, after recalculating Unit GT's NO_x mass emissions according to §75.19, CDECCA concluded that the LME method would also result in a significant overestimation of the NO_x emissions and would not improve the accuracy of the data already reported.

Therefore, on December 19, 2008, CDECCA submitted a petition to EPA requesting that EPA accept as quality-assured the NO_x emissions data that were reported for Unit GT in the time period extending from 4th quarter 2006 through 3rd quarter 2008. CDECCA provided the following justification for accepting the data:

- Unit GT uses steam injection to control NO_x emissions. During normal unit operation (excluding startup and shutdown hours), while the unit is combusting its primary fuel (i.e., natural gas), the steam-to-fuel ratio varies from 1.15 to 1.40. Using only data from normal unit operating hours, CDECCA prepared two graphs of NO_x concentration versus steam-to-fuel ratio for the time period in question. One graph shows that the hourly NO_x concentrations recorded by the CEMS ranged from 12 ppm to 33 ppm on days where the daily calibrations were performed on-line (as required by Part 75), and the other graph shows that 94.4 percent of the measured NO_x concentrations fell within that same range when the daily calibrations were done off-line.
- A total of seven daily CE tests were performed and passed with the unit on-line

during the 84 operational days in the time period in question. In cases where no adjustments of the analyzers were made prior to the on-line tests, the results of these CE tests compare well to the results of off-line CE tests performed within 26 hours before or 26 hours after the on-line tests.

- The NO_x-diluent CEMS passed all of its other required on-line quality-assurance tests during the time period in question, including linearity checks in the 2nd and 3rd quarters of 2007 and in the 2nd quarter of 2008, and relative accuracy test audits (RATAs) in 2007 and 2008.
- According to CDECCA, these technical considerations provide a reasonable basis for EPA to accept all of the NO_x emissions data recorded by Unit GT's CEMS during the time period in question, including the data recorded on days when the CE checks were done with the unit off-line.

EPA's Determination

EPA denies CDECCA's request for unconditional acceptance of Unit GT's NO_x emissions data in the time period extending from the 4th quarter of 2006 through the 3rd quarter of 2008. However, the Agency is persuaded that the technical considerations presented by CDECCA in the December 19, 2008 petition have merit and demonstrate that the NO_x concentration data recorded during normal unit operation on days when off-line CE checks were done are of reasonably good quality. Therefore, EPA approves an upward adjustment factor of 1.22, to be applied to these data in lieu of using the standard Part 75 missing data routines. The basis for and the conditions of this approval are presented below.

Ordinarily, EPA would consider NO_x emission data that are not supported by on-line CE tests to be invalid, and missing data substitution would be required (see Part 75, Appendix B, section 2.1.5). However, for the following reasons, the Agency believes that Unit GT's reported NO_x emissions data for the time period in question are of sufficiently credible to warrant an alternative to the use of standard missing data procedures. First, the two graphs prepared by CDECCA show that the range of NO_x emissions measured by Unit GT's CEMS on days when the CE checks were done off-line is nearly identical to the range of NO_x emissions on days when CE tests were done on-line. Second, the off-line CE tests were consistently passed, and the results of the off-line tests compare favorably to the on-line CE test results. Third, Unit GT's NO_x-diluent CEMS consistently passed its other required quality-assurance tests, i.e., linearity checks and RATAs. Finally, standard missing data substitution would grossly overstate the unit's NO_x emissions. As previously noted, applying the Part 75 missing data routines in this case would require the maximum potential NO_x emission rate (MER) to be reported for an extended period of time. For Unit GT, the MER value listed in the electronic monitoring plan is 1.86 lb/mmBtu, which is roughly ten times higher than the unit's actual NO_x emissions (e.g., in 2008, CDECCA reported an annual average NO_x emission rate of 0.146 lb/mmBtu).

EPA used the two graphs provided by CDECCA in the December 19, 2008 petition to determine the appropriate correction factor for the NO_x concentration data that were recorded on the days when the CE tests were done off-line. As previously noted, the NO_x concentrations on the graph associated with the on-line CE tests range from 12 ppm to 33 ppm, and more than 90 percent of the NO_x data on the graph associated with the off-line CE tests are within that range. However, a few NO_x concentrations on the off-line CE graph are above 33 ppm, the highest reading being 40.3 ppm¹. Therefore, a data adjustment factor of 1.22 was calculated by taking the ratio of 40.3 to 33.

Adjusting the NO_x concentration data upward by a factor of 1.22 will provide a more reasonable, yet conservatively high, estimate of Unit GT's NO_x mass emissions in the time period extending from 4th quarter 2006 through 3rd quarter 2008. This is consistent with the purposes of the Part 75 standard missing data substitution procedures, which are to ensure that emissions are not underreported and to provide strong incentive for owners and operators to ensure that monitoring systems are properly operated and maintained². The increase in the reported NO_x mass emissions for Unit GT may affect compliance with the NO_x Budget Trading Program requirement to hold allowances equal to NO_x mass emissions for the 2007 and 2008 ozone seasons³.

Conditions of Approval

The conditions of this approval are as follows:

- (1) CDECCA shall resubmit all of the electronic data reports (EDRs) for Unit GT from the 4th quarter of 2006 through the 4th quarter of 2008, no later than March 31, 2009.
- (2) For the time period extending from the 4th quarter of 2006 through the 3rd quarter of 2008, CDECCA shall report alternative quality-assured values for NO_x concentration and NO_x emission rate for all hours in which natural gas was combusted, as follows:
 - (a) CDECCA shall multiply each NO_x concentration value originally reported as quality-assured in column 24 of EDR record type 201 (as indicated by a Method of Determination Code (MODC) of "01" in column 30 of record 201) by an adjustment factor of 1.22, and shall replace MODC "01" in column 30 of each RT 201 with a MODC of "53".

¹ Based on supplemental information provided by PurEnergy Operating Services via e-mail on January 26, 2009.

² In contrast, acceptance of Unit GT's NO_x emission data with no adjustment, as requested by CDECCA, would not be consistent with these purposes.

³ The ozone season extends from May 1st through September 30th.

- (b) CDECCA shall also replace MODC “01” with MODC “53” in column 53 of RT 320 for each hourly NO_x emission rate calculated from an adjusted NO_x concentration.
- (3) The hourly NO_x emission rates reported in RT 320 with a MODC of 53 shall:
- (a) Be treated as quality-assured data;
 - (b) Be used in missing data lookbacks; and
 - (c) Not lower the percent monitor data availability (PMA) of the NO_x-diluent CEM system.
- (4) The data acquisition and handling system shall recalculate the substitute data values for all missing data hours during the time period extending from the 4th quarter of 2006 through the 3rd quarter of 2008. Unadjusted, historical quality-assured data with a MODC of “01” and adjusted, quality-assured data with a MODC of “53” shall be used, as appropriate, to determine the substitute data values.
- (5) For all hours in the time period extending from the 4th quarter of 2006 through the 3rd quarter of 2008 in which fuel oil was combusted, CDECCA shall report the maximum potential NO_x emission rate (MER) value of 1.86 lb/mmBtu in column 42 of record type 320, and shall report a MODC of “12” in column 53.
- (6) CDECCA shall include EDR record type 910 in each of the resubmitted EDRs for Unit GT. Each RT 910 shall indicate the period(s) of time for which the NO_x emissions data have been adjusted in accordance with this approval.
- (7) CDECCA shall coordinate resubmission of the EDRs with Mr. Craig Hillock, who may be reached at (202) 343-9105, or by e-mail at hillock.craig@epa.gov
- (8) CDECCA shall address the NO_x allowance accounting issues for Unit GT with Mr. Kenon Smith, who may be reached at (202) 343-9164, or by e-mail at smith.kenon@epa.gov

EPA’s determination relies on the accuracy and completeness of the information provided by CDECCA in the December 19, 2008 petition and supplemental information provided by e-mail on January 26, 2009 and is appealable under Part 78. If you have any

questions or concerns about this determination, please contact Venu Ghanta at (202) 343-9009, or by e-mail at ghanta.venu@epa.gov . Thank you for your continued cooperation.

Sincerely,

/s/

Sam Napolitano, Director
Clean Air Markets Division

cc: Ian Cohen, EPA Region I
Keith Hill, Connecticut DEP
Venu Ghanta, CAMD
Craig Hillock, CAMD
Kenon Smith, CAMD