October 30, 2009

Mr. Craig R. Eckberg
Alternate CAIR Representative
NRG Texas Power, L.L.C.
1301 McKinney, Suite 2300
Houston, TX 77010

Re: April 17, 2009 Letter Regarding the PEMS Approval for Units THW31 through THW34 and THW41 through THW44 at the T.H. Wharton Station (Facility ID (ORISPL) 3469)

Dear Mr. Eckberg:

The United States Environmental Protection Agency (EPA) has reviewed the April 17, 2009 letter in which NRG Texas Power L.L.C. (NRG) requested a change to the quality assurance (QA) requirements for the predictive emission monitoring systems (PEMS) installed on Units THW31 through THW34 and Units THW41 through THW44 at NRG's T.H. Wharton Station. EPA denies the request, for the reasons discussed below.

In the April 17, 2009 letter, NRG asked EPA to consider revising the frequency of the 3-run relative accuracy audits (RAA) required by the Agency's December 30, 2008 approval letter for the PEMS on the eight units at the T.H. Wharton Station. Specifically, NRG requested reducing the frequency of these tests from monthly to quarterly. Alternatively, NRG proposed to perform monthly RAAs for the first year and to reduce the frequency to quarterly if all RAAs are passed during the first year and if the annual 9-run relative accuracy test audits (RATAs) are passed without reworking the PEMS models.

A NO_x PEMS is a piece of software that provides an indirect determination of NO_x emissions. It can provide an accurate indication of NO_x levels if it is properly developed, trained, and quality-assured. Normally, a PEMS is trained over a one week (or longer) time period and over a wide range of source operating conditions so that the PEMS accurately predicts NO_x as operating conditions change. However, even the best training regimen cannot include all possible operating conditions, e.g., upsets, sticky valves, or other unforeseen events, that can affect emissions but may not be accurately reflected in the PEMS output.

One safeguard against this is to implement a PEMS algorithm that identifies potentially failed sensors, and PEMS input parameters outside of the expected range of values, by comparing the readings from each sensor to several other sensors and determining expected sensor values based on the historical sensor relationships developed during PEMS training. When unacceptable sensor values are identified, an alarm is activated, the PEMS is considered to be out-of-control, and the maximum potential NO_x emission rate must be reported until either the sensor is fixed or the PEMS is retrained. Reporting standard missing data values or allowing a substitute sensor value calculated by the PEMS is not adequate because the PEMS cannot determine whether the abnormal input parameter value is caused by a failed sensor or by some new region of operation not represented in the PEMS training data.

An additional safeguard against unforeseen events that can affect NO_x emissions, but that may not be accurately reflected in the PEMS output, is to periodically compare the PEMS output to a quality assured, direct measurement of stack emissions, e.g., by performing a RATA. However, RATAs are costly and are generally performed only once or twice a year. Therefore, other less expensive accuracy checks are required between the RATAs to provide ongoing assurance of data quality. For continuous emission monitoring systems (CEMS), the RATAs are supplemented by daily calibration error checks and quarterly linearity checks, which use calibration gases. However, these tests cannot be done on a PEMS because calibration gas cannot be injected into a PEMS. Therefore, some other type of periodic accuracy check suitable for a PEMS is needed to supplement the RATAs in order to adequately quality assure the PEMS data. For PEMS, a monthly 3-run RAA, which can be performed using a portable analyzer, is used in lieu of daily calibration error tests and quarterly linearity checks using calibration gas.

Paragraph (f) of EPA's December 30, 2008 PEMS approval for T.H. Wharton Station requires monthly 3-run RAAs to be performed in every calendar month in which the unit operates for at least 56 hours, except for a month in which a full 9-run RATA or PEMS recertification is performed. Paragraph (f) also requires, to the extent practicable, that each RAA be done at different operating conditions from the previous one. For example, because the new dry-low-NOx (DLN) combustors at T.H. Wharton Station don't operate during unit startup and shutdown or other non-stable operating conditions when emissions may be higher, it is important to perform some RAAs under non-DLN operating conditions.

In the April 17, 2009 letter, NRG expressed concern that a requirement to perform monthly RAAs does not make sense because of the low NO_x emission levels (5 ppmv or 0.015 lb/mmBtu) at Units THW31 through THW34 and Units THW41 through THW44. The low emitter relative accuracy specification of $\pm$ 0.020 lb/mmBtu of the reference mean value is higher than the base load emission level for these units. EPA agrees that effectively this means that the RAA is passed if the NO_x ppm reading is between 0 and approximately 10 ppmv. While the NO_x ppm readings should be in this range during base load operation, monthly RAAs are used to check whether the readings actually are in this range. The main purpose of performing monthly RAAs on PEMS-equipped units, including low emitting units, is to uncover in a timely manner malfunctions of or incorrect adjustments on the combustion unit, the PEMS, or the input sensors that might result in significant increases in NO_x emissions that are not accounted for by the PEMS and that might warrant recertification of the PEMS.

NRG questioned whether a portable analyzer used to perform the monthly RAAs would be accurate enough at low NO_x emission levels to be used to determine whether the PEMS needs to be re-trained. NRG also expressed concern that the monthly RAA frequency is burdensome and may not have any impact on the ongoing PEMS quality assurance program. In 2004, EPA completed a field study[1] of portable electrochemical analyzers and a portable chemiluminescence analyzer. For the two natural gas-fired combustion turbines tested, the accuracy of the portable analyzers at NO_x concentration levels of 3.5 ppm and higher was found to be comparable to a certified Part 75 CEMS and to EPA Reference Method 7E. The EPA study found that for NO_x concentrations as low as 3.5 ppm, portable analyzers could be accurate

[1] "Evaluation of Portable Analyzers for Use in Quality Assuring Predictive Emission Monitoring Systems for NO_x," The Cadmus Group, Inc., September 8, 2004.

to 0.5 ppm of a Part 75 certified NO_x CEMS. Thus, portable analyzers are suitable for periodic 3-run RAAs of a PEMS, even at low NO_x emission levels. Because there are no good daily checks of PEMS accuracy, EPA balanced the need for relatively frequent accuracy testing of the PEMS and the burden of conducting 3-run RAAs and determined that performance of 3-run RAAs on a monthly basis is a reasonable approach for quality assuring data from the PEMS installed on Units THW31 through THW34 and Units THW41 through THW44. EPA took into consideration, among other things, the fact that the burden (including staff time required) of performing 3-run RAAs is significantly reduced under the EPA-approved option of conducting 3-run RAAs using a portable electrochemical analyzer and ASTM D6522-00 (as modified by EPA), rather than a standard chemiluminescence analyzer and Methods 3A and 7E in 40 CFR part 60, appendices A-2 and A-4.[2] In view of this and the reasons previously discussed, EPA believes that performing monthly 3-run RAAs on the PEMS at T.H. Wharton Station is an appropriate level of quality assurance. Therefore, the Agency denies NRG's request for a reduced RAA frequency, and the monthly RAA provisions in paragraph (f) of the December 30, 2008 PEMS approval remain in effect.

If you have any questions about this determination, please contact John Schakenbach of my staff at (202) 343-9158. Thank you for your continued cooperation.

Sincerely,

/s/

Sam Napolitano, Director
Clean Air Markets Division

cc: John Schakenbach, CAMD
Travis Johnson, CAMD
Joyce Johnson, EPA Region VI
Marie Conroy, EPA Region VI
John Smith, Texas CEQ

[2] EPA also considered that the approved option of using a portable chemiluminescence analyzer also reduces the burden, as compared using a standard chemiluminescence analyzer.