

April 16, 2010

Jason M. Goodwin, P.E.  
Director - Environmental, Health & Safety  
East Region Operations  
Alternate Designated Representative  
CALPINE  
717 Texas Avenue  
Houston TX 77002

Re: Petition to Use Alternative Missing Data Substitution for Unit CT-1 at the Santa Rosa Energy Center (Facility ID (ORISPL) 55242)

Dear Mr. Goodwin:

The United States Environmental Protection Agency (EPA) has reviewed the January 20, 2010 petition submitted under 40 CFR 75.66(l) by Calpine Operating Services Company, Inc. (Calpine) requesting an alternative to the requirement to use standard missing data substitution for Santa Rosa Energy Center (SREC) Unit CT-1. EPA approves the petition, as discussed below.

#### Background

The Santa Rosa Energy Center (SREC), located in Pace, Florida, is owned by Santa Rosa Energy, LLC and operated by Calpine. The SREC is an electricity generating facility that consists of a natural gas-fired combined-cycle unit, known as Unit CT-1. The nameplate capacity of Unit CT-1's combustion turbine is 166.5 megawatts (MW), and the heat recovery steam generator (HRSG) is capable of providing an additional 74.5 MW. To control emissions of nitrogen oxides (NO<sub>x</sub>), Unit CT-1 uses dry low-NO<sub>x</sub> burners.

According to Calpine, Unit CT-1 is subject to both the Acid Rain Program and the Clean Air Interstate Rule (CAIR) trading programs. Therefore, Calpine is required to continuously monitor and report sulfur dioxide (SO<sub>2</sub>), NO<sub>x</sub>, and carbon dioxide (CO<sub>2</sub>) emissions and heat input for the unit in accordance with 40 CFR Part 75. To meet these monitoring requirements, Calpine has installed and certified a dry-extractive continuous emission monitoring system (CEMS) for NO<sub>x</sub>, consisting of a NO<sub>x</sub>

concentration monitor and an O<sub>2</sub> monitor. To determine unit heat input, SO<sub>2</sub> emissions, and CO<sub>2</sub> emissions, Calpine uses the procedures in Appendices D and G to Part 75.

Sections 2.2.1(a) and 2.2.3(f) of Appendix B to Part 75 require linearity checks of gas monitors in all “QA operating quarters” (i.e., calendar quarters in which there are at least 168 unit operating hours) and allow limited exemptions from performing linearity checks in quarters with less than 168 operating hours. At least one linearity check of each gas monitor is required every four calendar quarters, regardless of the number of unit operating hours. When a required linearity check is not performed in the quarter in which it is due, section 2.2.4 of Appendix B provides a 168 operating hour grace period in which the test can be performed without loss of emissions data.

Unit CT-1’s O<sub>2</sub> monitor passed a linearity check in the second quarter of 2008. According to Calpine, the unit subsequently had four consecutive calendar quarters with less than 168 operating hours (i.e., 72 operating hours in the third quarter of 2008, zero operating hours in the fourth quarter of 2008, seven operating hours in the first quarter of 2009, and 154 operating hours in the second quarter of 2009). In view of this, Calpine was exempt from performing linearity checks in the 3rd quarter of 2008, the 4<sup>th</sup> quarter of 2008, and the 1<sup>st</sup> quarter of 2009, all of which were not QA operating quarters. However, despite the fact that Unit CT-1 operated for less than 168 hours in the 2<sup>nd</sup> quarter of 2009, a linearity check was required in that quarter (or within a 168 hour grace period following that quarter) because the 2<sup>nd</sup> quarter of 2009 was the fourth calendar quarter since the previous linearity check.

However, Calpine did not perform the required linearity check of the O<sub>2</sub> analyzer in either the 2<sup>nd</sup> quarter of 2009 or in the subsequent 168 operating hour grace period. The next successful linearity check of the O<sub>2</sub> monitor was completed on September 2, 2009, hour 06, long after the grace period had expired. Operational data submitted by Calpine to EPA’s Emissions Collection and Monitoring Plan System (ECMPS) show that the grace period ended on July 12, 2009, hour 03.

According to section 2.2.4(b) of Appendix B to Part 75, when a required linearity check is not completed in the quarter in which it is due or within a grace period following that quarter, data from the monitor become invalid, beginning with the first operating hour following expiration of the grace period, and remain invalid until a linearity check is performed and passed. Therefore, data from Unit CT-1’s O<sub>2</sub> monitor became invalid on July 12, 2009, hour 04 and remained invalid until September 2, 2009, hour 06. During that time period, Unit CT-1 had 259 operating hours.

Section 75.10(d)(3) states that for a NO<sub>x</sub>-diluent monitoring system, an hourly NO<sub>x</sub> emission rate, in pounds per million British Thermal Units (lb/mmBtu), is valid only if both the NO<sub>x</sub> monitor and the diluent (CO<sub>2</sub> or O<sub>2</sub>) monitor provide quality-assured data for the hour. Otherwise, missing data substitution is required for NO<sub>x</sub> emission rate, in accordance with §§75.31-75.33. In view of these rule provisions, Calpine is required to report substitute data for NO<sub>x</sub> emission rate in the 259 unit operating hours between July

12, 2009, hour 04 and September 2, 2009, hour 06, because the O<sub>2</sub> monitor was not able to provide valid data during that time period.

The standard missing data routines for NO<sub>x</sub> emission rate in §75.33(c)(4) require the maximum potential NO<sub>x</sub> emission rate (MER) to be reported when the percent monitor data availability (PMA) drops below 80.0 percent. For most units, the hourly PMA is an annual “rolling” value, based on the number of hours of valid CEMS data recorded in the previous 8,760 unit operating hours (see 40 CFR 75.32(a)). However, if there are fewer than 8,760 operating hours in the previous three years, the PMA is calculated using only data from the past three years. For a unit such as Unit CT-1, which operated infrequently and generally had only a few hundred operating hours in the previous three years, the PMA decreases rapidly when there is a missing data incident and may drop below 80.0 percent even for a relatively short missing data period. The PMA of Unit CT-1’s NO<sub>x</sub> emission rate CEMS was, in fact, less than 80.0 percent for a significant portion of the 259 hour missing data incident.

Believing that use of standard Part 75 missing data substitution would grossly overstate Unit CT-1’s NO<sub>x</sub> emissions during the time period in question, Calpine submitted a petition to EPA on January 20, 2010, requesting to use an alternative missing data routine. Calpine proposed to calculate substitute NO<sub>x</sub> emission rate values hour-by-hour, using the equation in Unit CT-1’s electronic monitoring plan (i.e., Equation F-5 in Appendix F to Part 75). For each hour of the missing data period, the substitute NO<sub>x</sub> emission rate value would be calculated using the actual parts per million (ppm) data from the NO<sub>x</sub> monitor (which was up to date on all of its required quality assurance tests) together with a conservatively high default O<sub>2</sub> value of 19.0 percent O<sub>2</sub>.

#### EPA’s Determination

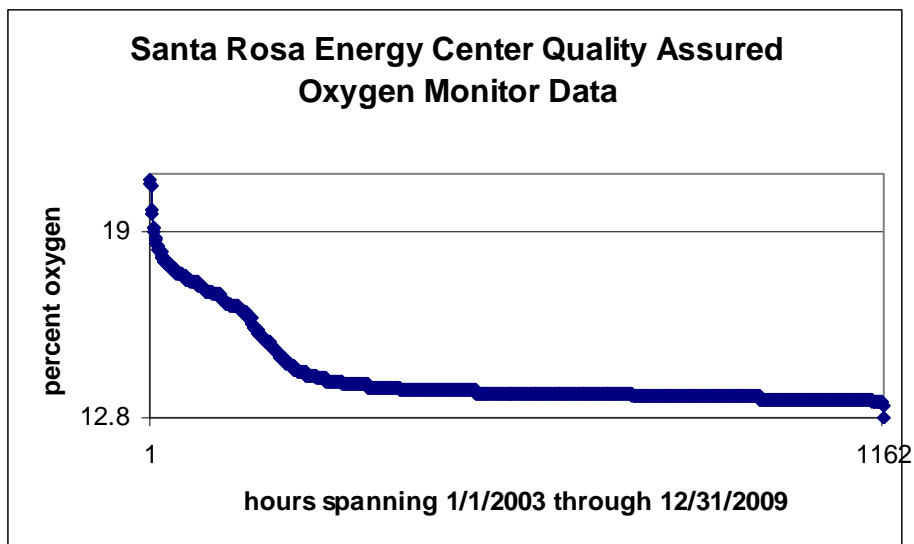
For the reasons given below, EPA approves the alternative missing data routine proposed in the January 20, 2010 petition. Therefore, Calpine may use the approved methodology to calculate Unit CT-1’s hourly NO<sub>x</sub> emission rates in the time period extending from July 12, 2009, hour 04 through September 2, 2009, hour 05.

EPA is approving this alternative because standard Part 75 missing data substitution grossly overstates the unit’s NO<sub>x</sub> mass emissions and the alternative results in reasonably conservative substitute data, consistent with the purposes of missing data substitution. First, as shown in the table below, when standard missing data substitution is used, the unit’s calculated NO<sub>x</sub> emissions are more than 14 times greater than EPA’s estimate of the unit’s actual emissions. EPA estimated the unit’s actual emissions using quality-assured data from the unit’s NO<sub>x</sub> monitor and non-quality-assured data from the O<sub>2</sub> monitor. EPA believes that the O<sub>2</sub> monitor data, while not quality-assured and so not valid under Part 75, are sufficiently accurate to use in this estimate of the unit’s emissions because the O<sub>2</sub> monitor passed daily calibrations with no failed daily calibrations within the missing data period.

**Comparison of NO<sub>x</sub> Emissions Using Standard Missing Data Substitution  
and the Approved Alternative Missing Data Routine  
(Santa Rosa Unit CT-1)**

Time Period	NO <sub>x</sub> Mass Emissions (tons)		
	Standard Missing Data	Approved Alternative Substitute Data	Estimated Actual Emissions
7/12/09, hr 04 through 9/2/09, hour 05	74	23	5

Second, EPA finds that Calpine’s proposed default O<sub>2</sub> value of 19 percent is appropriately conservative for use in calculating alternative substitute data for Unit CT-1 and that Calpine’s proposed alternative missing data routine results in a more reasonable, yet conservatively high estimate of the unit’s NO<sub>x</sub> mass emissions than the standard missing data routine. In Equation F-5 in Appendix F to Part 75 (which is used for calculating NO<sub>x</sub> emission rate in the unit’s monitoring plan), a higher O<sub>2</sub> value results in a higher NO<sub>x</sub> emission rate value and a higher the NO<sub>x</sub> mass emission value. EPA examined all 1,162 hours of historical quality assured O<sub>2</sub> data for the unit and, as shown in the graph below, found that: the average oxygen concentration value was 14.2 %O<sub>2</sub>; 95 percent of all values were less than 17.4 %O<sub>2</sub>; 98 percent were less than 18.0 %O<sub>2</sub>; 99 percent were less than 18.5 %O<sub>2</sub>; and the highest recorded O<sub>2</sub> value was 20.7 %O<sub>2</sub>. Based on this historical data, 19% O<sub>2</sub>, representing the 99th percentile, is an appropriately conservative default value.



Further, as shown in the table above, applying Calpine’s proposed alternative missing data routine (including the 19% O<sub>2</sub> default value) results in a more reasonable, yet conservatively high estimate of Unit CT-1’s NO<sub>x</sub> mass emissions than using standard missing data substitution. The alternative missing data result in a NO<sub>x</sub> mass emissions

value for the period of about 4 times (rather than about 14 times) the unit's estimated actual emissions. The alternative missing data routine is therefore consistent with the purposes of missing data substitution, which are to ensure that: (1) continuous monitoring systems are well-maintained and have high data availability; and (2) emissions are not underreported.

In order to use the approved alternative missing data procedures described above, Calpine must resubmit the third and fourth quarter 2009 electronic data reports for Unit CT-1 by April 30, 2010. In the resubmitted third quarter report, Calpine must:

1. Calculate a substitute data value for NO<sub>x</sub> emission rate (in lb/mmBtu) using the approved methodology for each unit operating hour in the time period extending from July 12, 2009, hour 04 through September 2, 2009, hour 05;
2. Report each calculated substitute NO<sub>x</sub> emission rate in the "Adjusted Hourly Value" data field of a <Derived Hourly Value Data> record, leave the "Unadjusted Hourly Data" field blank, and report a "Method of Determination Code" (MODC) of "55".
3. Not report <Monitor Hourly Value Data> records for either NO<sub>x</sub> concentration or O<sub>2</sub> concentration, for any of the hours in the missing data period.

### Conclusion

EPA approves the alternative missing data substitution as described above. This determination relies on the accuracy and completeness of the information provided by Calpine in its January 20, 2010 petition and is appealable under Part 78. If you have any questions about this determination, please contact Art Diem at (202) 343-9340 or diem.art@epa.gov. Thank you for your continued cooperation.

Sincerely,

/s/

Sam Napolitano, Director  
Clean Air Markets Division

cc: A. Stanley Meiburg, EPA Region IV  
Carol M. Kemker, EPA Region IV  
David McNeal, EPA Region IV  
Michael Pacoine, Florida DEP  
Art Diem, CAMD