



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

MAY 14 2012

OFFICE OF
AIR AND RADIATION

Dominic Scardino
Alternate Designated Representative
Kansas City Power & Light Company
Hawthorn Station
8700 E. Front Street
Kansas City, MO 64120-2302

Re: Petition for Alternative Substitute Data for Unit 9 at the Hawthorn Generating Station
(Facility ID (ORISPL) 2079)

Dear Mr. Scardino:

The United States Environmental Protection Agency (EPA) has reviewed the February 27, 2012 petition submitted under 40 CFR 75.66 by the Kansas City Power & Light Company (KCP & L), in which KCP & L requested to use alternative substitute data for fuel flow rate for Unit 9 at the Hawthorn, Missouri Generating Facility. EPA approves the petition, with conditions, as discussed below.

Background

Kansas City Power & Light owns and operates the Hawthorn Generating Station (Hawthorn) in Kansas City, Missouri. Unit 9 at the Hawthorn Station is a natural gas-fired combined-cycle turbine¹, equipped with auxiliary firing (i.e., a duct burner). The unit typically operates on a seasonal basis, from April to October, depending on ambient conditions and power demands.

Unit 9 is subject to both the Acid Rain Program and the Clean Air Interstate Rule (CAIR). Therefore, KCP & L is required to continuously monitor and report sulfur dioxide (SO₂), nitrogen oxides (NO_x), and carbon dioxide (CO₂) emissions and heat input for Unit 9, in accordance with 40 CFR Part 75. To meet the SO₂ and heat input monitoring and reporting requirements of Part 75, KCP & L uses the excepted method in Appendix D to Part 75.

Section 2.1 of Appendix D requires hourly measurement of the fuel flow rate. Generally, these measurements are made with a certified fuel flow meter that meets an accuracy

¹ Note that the company's electronic monitoring plan incorrectly represents this combined-cycle turbine as two separate units (i.e., Units 6 and 9), where Unit 6 is listed as a simple cycle turbine and Unit 9 is listed as a combined-cycle unit. Apparently, when the unit was first built it was a simple cycle turbine, known as Unit 6. Later, when a heat recovery steam generator (HRSG) was added, a new unit ID (i.e., Unit 9) was assigned to the combined-cycle turbine. For the purposes of Part 75, the combustion turbine-HRSG combination is considered to be a single unit, referred to as Unit 9 in this petition response. KCP & L must work with EPA to resolve these unit ID and monitoring plan issues.

specification of 2.0 percent of full-scale. However, section 2.1.4.2 of Appendix D allows the use of a fuel billing meter as an alternative, provided that: (a) the company providing the fuel and the unit combusting the fuel do not have any common owners and are not subsidiaries of the same company; and (b) hourly records of fuel flow rate are obtained directly from the billing meter and reported to EPA electronically. KCP & L uses a gas billing meter that conforms to section 2.1.4.2 of Appendix D to continuously monitor and report hourly natural gas flow rates to the Unit 9 combustion turbine (CT). A separate, certified fuel flow meter measures the natural gas flow rates to the duct burner.

Recently, as part of routine data validation procedures, KCP & L discovered that the recorded fuel flow rate data for the combustion turbine in 2011 did not correlate well with the load levels at which Unit 9 operated during the year. Upon further investigation, KCP & L determined that the following events occurred. The Southern Star Gas Company had disabled the gas billing meter that interfaces with the Unit 9 CT, to protect it from possible damage due to the Missouri River flooding, and re-routed the natural gas to another billing meter outside the flood plain. This resulted in a loss of signal from the original billing meter to Unit 9's data acquisition and handling system (DAHS). The loss in signal was not immediately apparent due to electrical line noise, which simulated the billing meter signal but did not represent the actual natural gas flow rate to the CT. In view of this, KCP & L concluded that the natural gas flow rates to the CT recorded by the DAHS in the time interval from June 9 through November 22, 2011 (when the natural gas was re-routed) are inaccurate. The gas flow rates measured by the duct burner flow meter during this time period were unaffected by the Missouri River flooding.

Part 75 requires substitute data to be reported when, through use of sound engineering judgment, data recorded by a monitoring system are found to be suspect and are invalidated. For missing or invalid fuel flow rate data, section 2.4.2.2 of Appendix D requires the appropriate substitute data values to be drawn from a "lookback" through 720 hours of quality-assured flow rate data. The 720 hours of data in the lookback are separated into load ranges ("bins") and the average value in each bin is calculated. The substitute data value for a particular hour of the missing data period is the average flow rate from the lookback, at the corresponding load bin.

In the February 27, 2012 petition, KCP & L requested a variance from the standard Appendix D substitute data procedures for Unit 9. The Southern Star Gas Company provided KCP & L with daily records of the quantity of natural gas that was re-routed to Unit 9 through the alternate billing meter, for the entire time period extending from June 9 through November 22, 2011. KCP & L proposed to determine alternative substitute data values for fuel flow rate in the time period, by apportioning the measured natural gas flow for each day to the unit operating hours in that day, based on the hourly electrical generation (in megawatt-hours).

KCP & L provided an hour-by-hour summary of the proposed substitute data values as an attachment to the petition. A graph of gas flow rate versus unit load was also provided, showing the reported fuel flow rates for 2011, the proposed substitute data values, and quality-assured data from 2010, recorded at similar operating conditions.

EPA's Determination

EPA reviewed KCP & L's proposed alternative substitute data methodology for Hawthorn Unit 9. The Agency finds the methodology to be technically sound and approves it for use in the time period extending from June 9 through November 22, 2011. The basis for this approval is as follows:

- First, the proposed methodology is based on actual measurements of natural gas flow to Unit 9 during the missing data period, using a billing meter owned and operated by the same company that owns and operates the approved billing meter in Unit 9's monitoring plan. In contrast, the standard Part 75 missing data procedures derive substitute data values for fuel flow rate from historical data recorded prior to the missing data period.
- Second, apportioning the measured daily gas flow to each operating hour based on measured electrical generation (MWh) provides a reasonable estimate of the actual gas flow rate for each hour. The Part 75 substitute data value for a given hour is less precise; it is an average flow rate that represents a range of operating loads (corresponding to a particular load bin), rather than the specific electrical load for that hour.
- Third, the graph of natural gas flow versus electrical load provided by KCP & L shows that: (a) the fuel flow rates reported in 2011 (represented by red dots) are clearly inaccurate; and (b) the majority of the proposed substitute data values (orange dots), when compared to the quality-assured data from 2010 (blue dots), are equal to or above the 2010 values in the most frequently-used load range (i.e., 100 to 200 MW), thus ensuring that use of the proposed alternative substitute data methodology will not result in emissions being underreported.

Conditions of Approval

The conditions of this petition approval are as follows:

- (1) Within 30 days after the date of this approval, KCP & L shall resubmit the 2nd, 3rd, and 4th quarter 2011 electronic data reports for Hawthorn Unit 9, using the ECMPS Client Tool.
- (2) In the missing data period extending from June 9, 2011, hour 06 through November 22, 2011, hour 23, KCP & L shall report hourly natural gas flow rates using the approved alternative substitute values, as shown in Table 2-2 of the attachment 2 to the February 27, 2012 petition.
- (3) KCP & L shall report a "Source of Data Code" (SODC) of "0" for fuel flow rate in each hour of the missing data period.²

² Since the substitute data values are based on actual measurements of natural gas flow rate, the best available choice for the SODC is "0" (measured data). Code "1" is not appropriate because it only applies to the standard Part 75 missing data routines, which are not being used in this case.

- (4) KCP & L shall include a comment in each resubmitted quarterly report, indicating that the reported gas flow rates are alternative substitute data values approved by EPA through the petition process in §75.66.³
- (5) KCP & L shall contact Kenon Smith at (202) 343-9164 or at smith.kenon@epa.gov to address any 2011 Acid Rain Program or CAIR allowance accounting issues pertaining to Hawthorn Unit 9 that arise as a result of the resubmitted quarterly reports.

EPA's determination relies on the accuracy and completeness of KCP & L's February 27, 2012 petition and the data provided in the accompanying attachments, and is appealable under Part 78. If you have any questions regarding this correspondence, please contact Robert Vollaro at (202) 343-9116. Thank you for your continued cooperation.

Sincerely,



Richard Haeuber, Acting Director
Clean Air Markets Division

cc: Jon Knodel, EPA Region VII
Peter Yronwode, Missouri DNR
Craig Hillock, CAMD
Kenon Smith, CAMD
Robert Vollaro, CAMD

³ In the 2nd quarter, 2011 report, indicate that only the gas flow rates recorded on and after June 9, 2011 are alternative substitute data values.