



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

SEP 20 2004

OFFICE OF
AIR AND RADIATION

Robert M. Matty, Jr.
Alternate Designated Representative
Exelon Power
200 Exelon Way
Suite 140
Kennett Square, PA 19348

Re: Petition to Use an Alternative Fuel Flowmeter Calibration Procedure at the Southeast Chicago Energy Project (Facility ID (ORISPL) 55281)

Dear Mr. Matty:

This is in response to your October 28, 2002 letter in which Exelon Power (Exelon) requested to use an alternative procedure to certify an ultrasonic fuel flowmeter at the Southeast Chicago Energy Project. EPA approves the petition, for the reasons discussed below.

Background

Exelon owns and operates eight combustion turbines (Units CTG5 through CTG12) at the Southeast Chicago Energy Project in Illinois. The turbines are subject to the Acid Rain Program, which requires Exelon to continuously monitor and report sulfur dioxide (SO₂), nitrogen oxides (NO_x), and carbon dioxide (CO₂) emissions and heat input for Units CTG5 through CTG12, in accordance with 40 CFR Part 75. The units combust only pipeline natural gas, which is supplied through a common fuel pipe (CP1).

To comply with the monitoring and reporting requirements of Part 75, Exelon has elected to use the low mass emissions (LME) methodology in §75.19. The LME method may only be used by oil and gas-fired units having annual SO₂ emissions of 25 tons or less and annual NO_x emissions less than 100 tons. Units CTG5 through CTG12 qualify as LME units because they operate very infrequently. In 2003, for example, none of the units operated for more than 57 hours.

The LME methodology allows two options for determining the quarterly heat input to an affected unit. The owner or operator may either report the maximum rated heat input for each unit operating hour or may use long-term fuel flow (see 40 CFR §§75.19(c)(3)(i) and (c)(3)(ii)). For long-term fuel flow, when gaseous fuel is combusted, §75.19(c)(3)(ii)(B) specifies two ways

of quantifying the amount of gas combusted each quarter: (1) by using gas billing records; or (2) by using a fuel flowmeter which is certified and maintained according to Appendix D of Part 75. For Units CTG5 through CTG12, Exelon has selected long-term fuel flow option (2) and has installed a fuel flowmeter on the common fuel pipe CP1.

Section 2.1.5 in Appendix D of Part 75 requires each fuel flowmeter used in the Acid Rain Program to meet an accuracy specification of 2.0% of the "upper range value" (i.e., the full-scale) of the instrument. The fuel flowmeter installed on CP1 is an ultrasonic type manufactured by Daniel Measurement & Control. The serial numbers of the flowmeter and its associated electronics are 01-490001 and 916931, respectively. Part 75 requires this type of flowmeter to be calibrated with a flowing fluid, at a minimum of 3 evenly-spaced flow rates covering its normal operating range.

Section 2.1.5.1 of Appendix D lists several acceptable methods for calibrating fuel flowmeters. To obtain permission to use a method other than those listed, the owner or operator may petition EPA under §75.66(c). Any such alternative calibration procedures must use equipment that is traceable to National Institute of Standards and Technology (NIST) standards.

The Daniel ultrasonic fuel flowmeter installed on CP1 was calibrated on January 14, 2002 by the Colorado Engineering Experiment Station, Inc. (CEESI). The calibrations were performed at CEESI's Ventura, Iowa facility in a test medium of natural gas, at 8 different flow rates covering the full-scale range of the flowmeter. CEESI used turbine-type reference flowmeters to calibrate the ultrasonic flowmeter. The turbine flowmeters had been previously calibrated against a primary flow system using NIST-traceable standards for mass and time. The calibrations of the ultrasonic flowmeter were done according to the procedures outlined in American Gas Association (AGA) Report No. 9. All properties of the natural gas were calculated in accordance with AGA Report No. 8. The reported results of the calibrations indicated an uncertainty in the flowmeter readings of 0.3%, at the 95 percent confidence level.

Since the calibration method used by CEESI is not one of those listed in Appendix D of Part 75, Exelon submitted a petition to EPA under §75.66(c) on October 28, 2002, requesting approval of the alternative methodology.

EPA's Determination

EPA reviewed the protocol used by CEESI to calibrate the ultrasonic fuel flowmeter. The protocol is well-conceived, commencing with an inspection of the flowmeter for any external or internal damage that may have occurred during shipping. The protocol provides a detailed outline of the procedures used for: (1) installing the flowmeter in the test section; (2) verifying that the flowmeter and its electronics are communicating appropriately; (3) performing pre-flow checks of the data acquisition system; (4) performing the actual calibrations against the reference turbine flowmeters; (5) processing the data; and (6) reviewing the test results.

The ultrasonic flowmeter was calibrated at 8 flow rates, which exceeds the minimum of 3 flow rates required by section 2.1.5 of Appendix D. The calibration medium was natural gas,

which is appropriate, since the intended use of the meter is to measure the flow rate of pipeline natural gas through CP1 to Units CTG5 through CTG 12 at the Southeast Chicago facility. The results of the calibrations show an uncertainty of 0.3% in the readings at the individual calibration points. This far exceeds the Part 75 accuracy specification of 2.0% of the flowmeter's upper range (full-scale) value. CEESI also provided a Certificate of Calibration along with the test results, stating that the calibrations were performed in accordance with AGA Reports No. 8 and 9 and that the calibration standards used are traceable to NIST.

In view of these considerations, EPA approves the alternative calibration procedures that were used to calibrate the ultrasonic fuel flowmeter. Therefore, the Daniel Measurement & Control flowmeter, serial number 01-490001 (and its associated electronics, serial number 916931) has met the certification requirements of Part 75, Appendix D, section 2.1.5, and is approved for use on the common fuel pipe CP1 at the Southeast Chicago facility. Exelon shall use this flowmeter to quantify the total amount of natural gas combusted by Units CTG5 through CTG12 each quarter, in order to meet the long-term fuel flow requirements of §75.19(c)(3)(ii).

EPA's determination in this letter relies on the accuracy and completeness of the information provided by Exelon in the October 28, 2002 petition and is appealable under Part 78. If you have any questions about this determination, please contact Robert Vollaro, at (202) 343-9116. Thank you for your continued cooperation.

Sincerely,



Sam Napolitano, Director
Clean Air Markets Division

cc: Constantine Blathras, EPA Region V
Scott Owens, Illinois EPA
Robert Vollaro, CAMD
Louis Nichols, CAMD