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

JUN 27 2005

OFFICE OF
AIR AND RADIATION

Jerry A. Walker
Designated Representative
Vice President, Environmental Services
Tri-State Generation and Transmission Association, Inc.
P.O. Box 33695
Denver, Colorado 80233-0695

Re: Petition to Use an Alternative Procedure to Calibrate the Oil Flowmeters Installed on Units 1, 2, 3, and 4 at the Pyramid Generating Station (Facility ID (ORISPL) 7975)

Dear Mr. Walker:

The United States Environmental Protection Agency (EPA) has reviewed the November 5, 2004 petition submitted by Tri-State Generation and Transmission Association, Inc. (Tri-State) under §75.66, in which Tri-State requested to use an alternative procedure to calibrate the fuel oil flowmeters installed on Units 1, 2, 3, and 4 at the Pyramid Generating Station. EPA approves the petition, for the reasons discussed below.

Background

Tri-State owns and operates four simple cycle combustion turbines, Units 1, 2, 3, and 4, at the Pyramid Generating Station (Pyramid) near Lordsburg, New Mexico. The units combust both natural gas and distillate oil and are subject to the Acid Rain Program. Therefore, Tri-State is required to continuously monitor and report sulfur dioxide (SO₂), nitrogen oxides (NO_x), and carbon dioxide (CO₂) emissions and heat input for Units 1 through 4, in accordance with 40 CFR Part 75.

In lieu of using continuous SO₂ and flow monitors to determine the hourly SO₂ mass emissions and heat input for these units, Tri-State uses the procedures in Appendix D of Part 75. Section 2.1 of Appendix D requires hourly measurement of the fuel flow rate, using a certified fuel flowmeter. Section 2.1.5.1 of Appendix D lists the acceptable certification methods for various types of fuel flowmeters. However, the method used by Tri-State to certify the oil flowmeters installed on Pyramid Units 1 through 4, i.e., a primary standard liquid calibration system manufactured by Flow Technology Incorporated (FTI), is not among those listed in Section 2.1.5.1.

Appendix D allows the owner or operator to petition EPA under §75.66(c) to use a fuel flowmeter calibration method other than those in section 2.1.5.1, provided that the alternative calibration procedure uses equipment that is traceable to National Institute of Standards and Technology (NIST) standards. Therefore, in the November 5, 2004 petition, Tri-State requested to use the FTI calibration methodology to satisfy the Part 75 certification requirements for Pyramid's oil flowmeters.

EPA's Determination

EPA reviewed the protocol that was used by FTI to calibrate the oil flowmeters installed on Pyramid Units 1 through 4. The Agency finds the protocol to be well-conceived, commencing with an inspection of the flowmeter and accompanying paperwork to verify that the paperwork matches the meter being calibrated. The protocol also provides detailed procedures 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; (5) processing the data; and (6) reviewing the test results.

FTI utilizes a primary standard, positive displacement calibrator to establish the accuracy of an oil flowmeter. The calibrator is a closed-loop laboratory grade device that has direct traceability to NIST standards. The displacement of a piston forces a calibration fluid of known kinematic viscosity (which is controlled to simulate the customer's operating conditions) through a precisely honed, chrome-plated stainless steel cylinder of known cross-sectional area and into the flowmeter being calibrated.

A precise optical technique is used to measure the piston displacement. As the piston moves downstream through the cylinder, a photoelectric sensor, which is attached to the shaft, passes by an etched glass rule. The photoelectric sensor produces an electrical pulse each time an etched line interrupts the light beam impinging on it. The frequency of the pulses (i.e., pulses per second) is measured, from which the piston velocity and the volumetric flow rate of the calibration fluid are calculated. This "reference" calibration fluid flow rate is then compared against the flow rate measured by the flowmeter being calibrated, and the accuracy of the meter is determined. A mathematical analysis provided to EPA by FTI on March 28, 2005 shows that the uncertainty of the reference volumetric flow rate measurements made with these calibrators is approximately $\pm 0.05\%$, at the 95 percent confidence level.

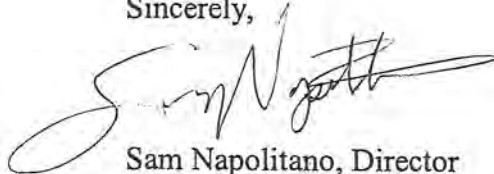
In an August 9, 2004 E-mail from FTI to Tri-State, FTI stated that its laboratory calibrators work on the same basic principle as a pipe prover. Several of the acceptable oil flowmeter calibration methods listed in section 2.1.5.1 of Appendix D utilize provers. Further, in the same August 9, 2004 E-mail, FTI stated that NIST traceability for its calibrators is maintained by performing a gravimetric water draw on each calibrator every six months. On May 24, 2005, FTI provided an explanation of the water draw procedure, upon request from EPA. The "K-factor" of the calibrator (pulses per unit volume) is determined by weighing the amount of water displaced by the piston over a given distance. The data needed to calculate K are obtained with four NIST-traceable instruments (i.e., temperature and pressure measurement devices, a scale to weigh the water, and a frequency counter).

In view of these considerations, EPA approves Tri-State's petition to use the FTI calibration procedures for the oil flowmeters installed on Units 1 through 4 at the Pyramid Generating Station. Each oil flowmeter that is calibrated according to these procedures and that meets the 2.0% accuracy specification of Appendix D, section 2.1.5 may be used for Part 75 reporting purposes. At present, there are six FT Series turbine-type oil flowmeters in use at the Pyramid Station that have been calibrated using the FTI procedures. Tri-State periodically rotates the meters among the four units. On May 19, 2005, Tri-State provided EPA with the serial numbers of the six flowmeters, along with a history of each meter's calibration dates and the units at which the meter has been installed.

On May 17, 2005, EPA requested documentation from FTI to show that the six Pyramid oil flowmeters meet the Part 75 accuracy specification. On May 17, 18, and 20, 2005, FTI provided EPA with data from the initial calibrations of these meters. The data clearly show that over the entire operating range, each of the flowmeters is accurate to within 0.4% of the upper range value (URV). Therefore, the six FT Series flowmeters with the serial numbers 2003167, 2003560, 2003562, 2003565, 2003925, and 2003927 meet the accuracy requirements of Part 75, Appendix D, section 2.1.5, and are approved for use at Pyramid Units 1 through 4.

EPA's determination relies on the accuracy and completeness of the information provided in Tri-State's November 5, 2004 petition, and in the supporting data and information provided by Tri-State and FTI on August 9, 2004, March 28, 2005, and May 17, 18, 19, 20, and 24, 2005. This determination is appealable under Part 78. If you have any questions regarding this correspondence, please contact Travis Johnson at (202) 343-9018. Thank you for your continued cooperation.

Sincerely,



Sam Napolitano, Director
Clean Air Markets Division

cc: Joyce Johnson, Region, EPA Region VI
Ned Jerabek, State of New Mexico Environmental Department
Travis Johnson, CAMD