



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

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FEB 3 2016

Mr. Robert J. Trussoni  
Designated Representative  
General Manager  
Marshfield Utilities  
2000 South Central Avenue  
P.O. Box 670  
Marshfield, WI 54449

OFFICE OF  
AIR AND RADIATION

Re: Petition to Use an Alternative Fuel Flowmeter Calibration Procedure for Units 1A and 1B at the Marshfield Utilities Combustion Turbine Power Plant (Facility ID (ORISPL) 56480)

Dear Mr. Trussoni:

The United States Environmental Protection Agency (EPA) has reviewed the December 12, 2014 petition submitted by Marshfield Utilities (MU) under 40 CFR 75.66(c), together with supporting e-mails,<sup>1</sup> requesting approval of an alternative calibration procedure for fuel flowmeters that will be used to measure natural gas and fuel oil flow rates at the Marshfield Utilities Combustion Turbine Power Plant. EPA approves the petition, with conditions, as discussed below.

#### Background

MU owns and operates two combustion turbines (Units 1A and 1B) at its Marshfield Utilities Combustion Turbine power plant (Marshfield). The units combust natural gas and diesel oil and serve a common generator with a capacity rating of 55 MW. According to MU, the units are subject to the Acid Rain Program, the Cross-State Air Pollution Interstate Rule (CSAPR) annual trading programs for sulfur dioxide (SO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>), and the CSAPR ozone season trading program for NO<sub>x</sub>. MU is therefore required to continuously monitor and report SO<sub>2</sub>, NO<sub>x</sub>, and carbon dioxide emissions and heat input for Units 1A and 1B in accordance with 40 CFR part 75.

To meet the SO<sub>2</sub> emissions and heat input monitoring requirements, MU has elected to use the monitoring methodology in appendix D to part 75. Section 2.1 of appendix D requires continuous monitoring of the fuel flow rate to each affected unit using a fuel flowmeter that meets initial certification requirements set forth in section 2.1.5 and ongoing quality assurance requirements set forth in section 2.1.6.

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<sup>1</sup> MU sent additional supporting information in e-mails dated 7/15/2015, 7/27/2015, and 12/20/2015 .

Section 2.1.5 of appendix D specifies three acceptable ways to initially certify a fuel flowmeter: (1) by design (this option is available for orifice, nozzle, and venturi flowmeters only); (2) by measurement under laboratory conditions using a method listed in section 2.1.5.1; or (3) by in-line comparison against a reference meter that either meets the design criteria in (1) above or that within the previous 365 days has met the accuracy requirements of appendix D using a method listed in section 2.1.5.1. However, section 2.1.5.1 also provides that unlisted methods using equipment traceable to National Institute of Standards and Technology (NIST) standards may be used to certify the flowmeter, subject to EPA approval of a petition submitted under 40 CFR 75.66(c). Section 2.1.6 of appendix D generally allows the ongoing quality assurance tests to be carried out using the same methods as section 2.1.5.

The Coriolis flowmeters that are used to measure fuel flow rates at Marshfield Units 1A and 1B were manufactured by Emerson Process Management-Micro Motion, Inc. (Emerson MMI). Emerson MMI has developed a calibration procedure known as the Transfer Standard Method (TSM). According to Emerson MMI, the TSM uses equipment that is traceable to NIST standards. According to the MU petition, the flowmeters have already been tested for initial certification using the TSM and will be calibrated for ongoing quality assurance purposes using the same method.

The Coriolis flowmeters are not orifice, nozzle, or venturi flowmeters, and therefore do not qualify to be certified based on their design. Further, the TSM is not listed in section 2.1.5.1 of appendix D as an approved method. In view of these circumstances, MU submitted a petition to EPA under §75.66(c) requesting approval of the TSM as an alternative certification and quality assurance testing method for the Coriolis flowmeters used at Marshfield Units 1A and 1B. MU requests that approval to use the TSM process not only for the flowmeters identified by serial number below but also for additional like-kind Coriolis fuel flowmeters that MU expects to use at Marshfield Units 1A and 1B in the future and/or as backup and replacement flowmeters.

#### EPA's Determination

EPA has reviewed the information provided by MU in the December 12, 2014 petition and subsequent e-mails describing the alternative calibration procedure that MU requests approval to use to verify the accuracy of the fuel flowmeters to be used at Marshfield Units 1A and 1B.

1. The Agency approves use of the Emerson MMI Transfer Standard Method (TSM) calibration procedure for initial certification of the Unit 1A and 1B flowmeters (Serial Numbers 14140823, 14141259, 14192367, and 14255132). The basis for this approval is as follows:
  - a. The alternative calibration methodology uses equipment traceable to NIST standards. In Emerson MMI's Transfer Standard Method,<sup>2</sup> the candidate fuel flowmeters to be tested for accuracy are calibrated against reference meters that

<sup>2</sup> See Emerson MMI Control Procedure 79 (CP 79).

have been calibrated against a “Global Reference Meter” which, in turn, has been calibrated using Micro Motion’s “Primary Flow Stand.” The Primary Flow Stand is an ISO 17025-accredited calibration system that uses equipment traceable to NIST standards. Thus, the reference meters used to test MU’s flowmeters have fully traceable calibrations through an accredited path back to NIST standards.

- b. The calibration procedure followed for initial certification of MU’s flowmeters met the requirements of part 75, appendix D, section 2.1.5.2(a) for in-line testing of candidate flowmeters by comparison against reference flowmeters. Specifically:
  - The reference flowmeters and secondary elements (i.e. temperature transmitters and pressure transducers) used to test MU’s flowmeters had been calibrated within 365 days prior to the comparison testing;
  - The comparison testing was performed in a laboratory over a period of less than seven operating days;
  - For each flowmeter, three test runs were conducted at each of three flow rate levels with each test run lasting more than 20 minutes in duration.
- c. At each tested flow rate level, each fuel flowmeter demonstrated accuracy better than the accuracy requirement specified in section 2.1.5 of appendix D, which is 2.0 percent of the flowmeter’s Upper Range Value (URV). The test results are summarized in Table 1 below.

**Table 1 – Average Three Run Fuel Flowmeter Accuracy Results**

| <b>Flow Rate Level</b>          | <b>Accuracy<br/>(% of Upper<br/>Range<br/>Value)<br/>Serial No.<br/>14255132</b> | <b>Flow Rate Level</b>          | <b>Accuracy<br/>(% of Upper<br/>Range<br/>Value)<br/>Serial No.<br/>14140823</b> |
|---------------------------------|----------------------------------------------------------------------------------|---------------------------------|----------------------------------------------------------------------------------|
| <b>Low</b><br>(10% of<br>URV)   | 0.003%                                                                           | <b>Low</b><br>(10% of<br>URV)   | 0.001%                                                                           |
| <b>Mid</b><br>(50% of<br>URV)   | 0.006%                                                                           | <b>Mid</b><br>(50% of<br>URV)   | 0.014%                                                                           |
| <b>High</b><br>(100% of<br>URV) | 0.011%                                                                           | <b>High</b><br>(100% of<br>URV) | 0.014%                                                                           |

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**Table 1 - (continued)**

| <b>Flow Rate Level</b>      | <b>Accuracy<br/>(% of Upper Range Value)<br/>Serial No. 14141259</b> | <b>Flow Rate Level</b>       | <b>Accuracy<br/>(% of Upper Range Value)<br/>Serial No. 14192367</b> |
|-----------------------------|----------------------------------------------------------------------|------------------------------|----------------------------------------------------------------------|
| <b>Low</b><br>(33% of URV)  | 0.007%                                                               | <b>Low</b><br>(10% of URV)   | 0.001%                                                               |
| <b>Mid</b><br>(55% of URV)  | 0.013%                                                               | <b>Mid</b><br>(50% of URV)   | 0.017%                                                               |
| <b>High</b><br>(77% of URV) | 0.027%                                                               | <b>High</b><br>(100% of URV) | 0.023%                                                               |

2. EPA also approves the use of the TSM calibration procedure to meet the applicable on-going quality assurance requirements for the Unit 1A and 1B fuel flowmeters under section 2.1.6 of appendix D, subject to the following conditions:
  - The application of the TSM for each future accuracy test must meet the requirements of part 75, appendix D, section 2.1.5.2(a) listed above as part of the basis for EPA's approval of use of the TSM for the initial certification of the fuel flowmeters;
  - The three flow rate levels tested in each future accuracy test must correspond to: (1) normal full unit operating load; (2) normal minimum unit operating load, and (3) a load point approximately equally spaced between the full and minimum unit operating loads.
3. EPA further approves the use of the TSM calibration procedure to meet the applicable initial certification and on-going quality assurance requirements for like-kind Coriolis fuel flowmeters used in the future at the Marshfield Unit 1A and 1B subject to the satisfaction, for each such like-kind fuel flowmeter, of all approval conditions set forth in paragraphs (1) and (2), respectively, of this approval for the fuel flowmeters identified by serial number above.

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EPA's determination relies on the accuracy and completeness of the information provided by MU and is appealable under 40 CFR part 78. If you have any questions regarding this determination, please contact Louis Nichols at (202) 343-9008 or by e-mail at [Nichols.Louis@epa.gov](mailto:Nichols.Louis@epa.gov). Thank you for your continued cooperation.

Sincerely,



Reid P. Harvey, Director  
Clean Air Markets Division

cc: Louis Nichols, CAMD  
Michael Compher, EPA Region 5  
Andrew Seeber, WDNR

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