

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460



OFFICE OF AIR AND RADIATION

June 23, 2020

Mr. Paul Skopnik
Primary Designated Representative
Plant Manager
Atlantic Power Corporation
8805 North Tabler Road
Morris, Illinois 60450

Re: Petition to use an alternative fuel flowmeter calibration procedure for units CTG1, CTG2, and CTG3 at the Morris Cogeneration Power Plant (facility ID (ORISPL) 55216)

Dear Mr. Skopnik,

The United States Environmental Protection Agency (EPA) has reviewed the July 28, 2016 petition submitted by Atlantic Power Corporation (Atlantic Power) under 40 CFR 75.66(c) requesting approval of an alternative calibration procedure for initial certification, ongoing quality assurance, and recertification of fuel flowmeters that are being or may be used to measure fuel flow rates at units CTG1, CTG2, and CTG3 at the Morris Cogeneration Power Plant. EPA approves this petition, with conditions, as discussed below.

Background

Through its subsidiary Morris Cogeneration, LLC, Atlantic Power owns and operates the Morris Cogeneration Power Plant (Morris Cogeneration) in Morris, Illinois. Morris Cogeneration units CTG1, CTG2, CTG3 are natural gas-fired combined cycle combustion turbines each serving an electricity generator with a reported nameplate capacity of 39 MW as well as a heat recovery steam generator and a combined steam turbine serving an electricity generator with a reported nameplate capacity of 83 MW. According to Atlantic Power, units CTG1, CTG2, and CTG3 are subject to Cross-State Air Pollution Rule (CSAPR) trading programs for sulfur dioxide (SO₂) and nitrogen oxides (NO_x). Atlantic Power is therefore required to continuously monitor and report SO₂ and NO_x mass emissions and heat input for the units in accordance with 40 CFR part 75.

To meet the SO₂ mass and heat input monitoring requirements, Atlantic Power 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 gas and/or oil fuel flowmeters that meet initial certification requirements set forth in section 2.1.5 and ongoing quality assurance requirements set forth in section 2.1.6.

Section 2.1.5 specifies three acceptable methods to 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 an approved method; 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 by measurement using an approved method under (2) above. Certain approved measurement methods are listed in section 2.1.5.1. However, the section provides that unlisted methods using equipment traceable to National Institute of Standards and Technology (NIST) standards may also be used, subject to EPA approval pursuant to a petition submitted under § 75.66(c). Section 2.1.6 generally allows ongoing quality assurance tests to be carried out using the same methods as section 2.1.5.

Morris Cogeneration units CTG1, CTG2, and CTG3 are each equipped with two Coriolis fuel flowmeters manufactured by Emerson Micro Motion, Inc. (Emerson MMI) to measure natural gas fuel flow, one model CMF200M419NQBAEZZZ flowmeter and one model CMF300M426NQBAEZZZ flowmeter (serial numbers 14029736 and 11033773, 14029732 and 11033771, and 14029516 and 11033765 for units CTG1, CTG2, and CTG3, respectively). Atlantic Power also anticipates the possibility of using additional like-kind fuel flowmeters at units CTG1, CTG2, and CTG3 in the future. Each individual flowmeter must meet the initial certification requirements set forth in section 2.1.5 of appendix D and the ongoing quality assurance requirements set forth in section 2.1.6.

Emerson MMI has developed a calibration procedure it calls the Transfer Standard Method (TSM). According to Emerson MMI, the TSM uses equipment that is traceable to NIST standards. According to the Atlantic Power petition, each flowmeter identified above has been tested for initial certification using equipment that has been tested using the Emerson MMI TSM and will be calibrated for ongoing quality assurance purposes using the same method.

Coriolis flowmeters are not orifice, nozzle, or venturi flowmeters and therefore do not qualify for certification based on their design. Further, the Emerson MMI TSM is not listed in section 2.1.5.1 of appendix D as an approved method. However, EPA has previously evaluated and approved the use of the Emerson MMI TSM as an alternative certification and quality assurance testing method for Coriolis flowmeters at other facilities. In view of these circumstances, Atlantic Power submitted a petition to EPA under § 75.66(c) requesting approval of the use of the Emerson MMI TSM as an alternative certification and quality assurance testing method for Coriolis flowmeters at Morris Cogeneration. Atlantic Power requests approval to use equipment that has been tested using the TSM process to test the flowmeters identified by the serial numbers above and also to test additional like-kind Coriolis fuel flowmeters that Atlantic Power may use at the facility in the future.

EPA's Determination

EPA reviewed the information provided by Atlantic Power in the July 28, 2016 petition and subsequent email correspondence.¹ The petition describes the alternative calibration procedure that Atlantic Power requests approval to use to verify the accuracy of the natural gas fuel flowmeters installed at CTG1, CTG2, CTG3, and any other like-kind Coriolis fuel flowmeters to be installed at Morris Cogeneration.

EPA approves use of equipment that has been tested using the Emerson MMI TSM calibration procedure for initial certification of the fuel flowmeters (serial numbers 14029736, 11033773,

¹ EPA received supporting information and clarification from Atlantic Power by email on Dec 12, 2017 and Feb 19, 2020.

14029732, 11033771, 14029516, and 11033765) installed on Morris Cogeneration units CTG1, CTG2, and CTG3. The basis for this approval is as follows:

- A1. The alternative calibration methodology used equipment traceable to NIST standards. In Emerson MMI’s TSM, the candidate fuel flowmeter to be tested for accuracy is calibrated against a reference meter that was calibrated against a “Global Reference Meter” which, in turn, was 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 meter used to test Morris Cogeneration’s flowmeters had fully traceable calibrations through an accredited path back to NIST standards.²
- A2. The calibration procedure followed for initial certification of Morris Cogeneration’s flowmeters met the requirements of section 2.1.5.2(a) of appendix D to part 75 for in-line testing of a candidate flowmeter by comparison against a reference flowmeter. Specifically:
 - a. The reference flowmeters and secondary elements (i.e. temperature transmitters and pressure transducers) used to test Morris Cogeneration’s flowmeters had been calibrated within 365 days prior to the comparison testing;
 - b. The comparison testing was performed over a period of less than seven operating days; and
 - c. For the candidate flowmeter, three test runs were conducted at each of three flow rate levels with each test run lasting 20 minutes in duration.
- A3. At each tested flow rate level, the fuel flowmeters demonstrated accuracy better than the accuracy requirement specified in section 2.1.5 of appendix D – 2.0 percent of the flowmeter’s upper range value (URV). The test results are summarized in Tables 1, 2, and 3 below.

Table 1 – Average three-run natural gas fuel flowmeter accuracy results for CTG1

Flow rate level	Flowmeter s/n 14029736 accuracy (% of URV)	Flowmeter s/n 11033773 accuracy (% of URV)
Normal minimum unit operating load	0.006%	0.004%
Mid unit operating load	0.010%	0.005%
Normal full unit operating load	0.012%	0.003%

² The Primary Flow Stand calibration system is equipment that has been accredited by NVLAP according to ISO/IEC 17025.

Table 2 – Average three-run natural gas fuel flowmeter accuracy results for CTG2

Flow rate level	Flowmeter s/n 14029732 accuracy (% of URV)	Flowmeter s/n 11033771 accuracy (% of URV)
Normal minimum unit operating load	0.027%	0.010%
Mid unit operating load	0.023%	0.012%
Normal full unit operating load	0.022%	0.013%

Table 3 – Average three-run natural gas fuel flowmeter accuracy results for CTG3

Flow rate level	Flowmeter s/n 14029516 accuracy (% of URV)	Flowmeter s/n 11033765 accuracy (% of URV)
Normal minimum unit operating load	0.003%	0.002%
Mid unit operating load	0.005%	0.002%
Normal full unit operating load	0.014%	0.002%

EPA also approves the use of equipment tested using the Emerson MMI TSM calibration procedure to meet the applicable ongoing quality assurance requirements for the fuel flowmeters installed on Morris Cogeneration units CTG1, CTG2, and CTG3 under section 2.1.6 of appendix D, subject to the following conditions:

- B1. The use of equipment tested using the Emerson MMI TSM for each future accuracy test must meet the requirements of section 2.1.5.2(a) of appendix D as part of the basis for EPA’s approval of use of equipment tested using the TSM for the initial certification of the reference and fuel flowmeters; and
- B2. 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.

EPA further approves the use of equipment tested using the Emerson MMI TSM calibration procedure to meet the applicable initial certification and ongoing quality assurance requirements for like-kind Coriolis fuel flowmeters used in the future at Morris Cogeneration subject to the satisfaction, for each such like-kind fuel flowmeter, of all approval conditions set forth in paragraphs (A1), (A2), (A3), (B1), and (B2) of this approval for the fuel flowmeters identified by serial numbers above.

EPA's determination relies on the accuracy and completeness of the information provided by Atlantic Power and is appealable under 40 CFR part 78. If you have any questions regarding this determination, please contact Ron Sobocinski at (202) 343-9722 or by e-mail at sobocinski.ron@epa.gov. Thank you for your continued cooperation.

Sincerely,

Reid P. Harvey

Reid P. Harvey
Director
Clean Air Markets Division

cc: Ron Sobocinski CAMD
Louis Nichols, CAMD
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Kevin Mattison, Illinois EPA