

January 9, 2016

Mr. Edwin Much  
Alternate Designated Representative  
Perryman Power Plant  
Exelon Generation  
300 Exelon Way, Suite 320  
Kennett Square, PA 19348

Re: Petition to Use an Alternative Fuel Flowmeter Calibration Procedure for Units 6-1 and 6-2 at the Perryman Power Plant (Facility ID (ORISPL) 1556)

Dear Mr. Much:

The United States Environmental Protection Agency (EPA) has reviewed the September 24, 2015 petition submitted by Constellation Power Services Generation LLC (owned by Exelon Generation) under 40 CFR 75.66(c), together with supporting e-mails from Exelon,<sup>1</sup> requesting approval of an alternative calibration procedure for fuel flowmeters that will be used to measure natural gas and diesel oil flow rates at the Perryman Power Plant. EPA approves the petition, with conditions, as discussed below.

### Background

Exelon owns and operates a Pratt and Whitney FT4000 SWIFTPAC that commenced operation in the second quarter of 2015 at its Perryman facility in Perryman, Maryland. The SWIFTPAC comprises two 60 MW combustion turbines designated as Units 6-1 and 6-2, each of which fires natural gas and diesel oil. The engines serve a common electric generator and emit through a common stack. According to Exelon, Units 6-1 and 6-2 are subject to the Acid Rain Program, the Cross-State Air Pollution Rule, and the Regional Greenhouse Gas Initiative. Exelon is therefore required to continuously monitor and report sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), and carbon dioxide (CO<sub>2</sub>) emissions and heat input for Units 6-1 and 6-2 in accordance with 40 CFR Part 75.

To meet the SO<sub>2</sub> emissions and heat input monitoring requirements, Exelon 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.

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<sup>1</sup> Exelon sent additional supporting information in emails dated October 7, October 8, November 9, and December 9, 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 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 of Appendix D. 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 40 CFR 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.

Units 6-1 and 6-2 will together have four Coriolis fuel flowmeters manufactured by Emerson Process Management – Micro Motion, Inc. (Emerson MMI). Two of the flowmeters will measure fuel oil using F100 series meters (Serial Numbers 14399711 and 14414189) while the other two flowmeters will measure natural gas using F2000 series meters (Serial Numbers 14395974 and 14398494). Each individual flowmeter must meet the initial certification requirements set forth in Appendix D, Section 2.1.5, and the ongoing quality assurance requirements set forth in Appendix D, 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 Exelon 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. However, EPA has previously evaluated and approved the use of the TSM as an alternative certification and quality assurance testing method for Coriolis flowmeters at other facilities. In view of these circumstances, Exelon submitted a petition to EPA under §75.66(c) requesting approval of the use of the TSM as an alternative certification and quality assurance testing method for Coriolis flowmeters at the Perryman facility. Exelon requests that approval to use the TSM process not only for the flowmeters identified by serial number above but also for additional like-kind Coriolis fuel flowmeters that Exelon expects to use at the Perryman facility in the future at other units at the facility and/or as backup and replacement flowmeters.

#### EPA's Determination

EPA has reviewed the information provided by Exelon in the September 24, 2015 petition and subsequent e-mails describing the alternative calibration procedure that Exelon requests approval to use to verify the accuracy of the gas and oil fuel flowmeters to be used at the Perryman facility.

1. The Agency approves use of the Emerson MMI Transfer Standard Method (TSM) calibration procedure for initial certification of the Perryman Unit 6-1 and 6-2 fuel flowmeters (Serial Numbers 14395974, 14398494, 14399711, and 14414189). 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 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 Exelon's flowmeters have fully traceable calibrations through an accredited path back to NIST standards.
  - b. The calibration procedure followed for initial certification of Exelon's four 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 Exelon'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 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.

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<sup>2</sup> See Emerson MMI Calibration Procedure and Results found in Attachments C and D of Exelon's request.

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

Flow Rate Level	Accuracy (% of Upper Range Value)			
	Serial No. 14395974	Serial No. 14398494	Serial No. 14399711	Serial No. 14414189
<b>Low</b> (10% of URV)	0.000%	0.001%	0.000%	0.006%
<b>Mid</b> (50% of URV)	0.046%	0.012%	0.023%	0.037%
<b>High</b> (100% of URV)	0.002%	0.023%	0.011%	0.013%

2. EPA also approves the use of the TSM calibration procedure to meet the applicable on-going quality assurance requirements for the Perryman Unit 6-1 and 6-2 fuel flowmeters under Section 2.1.6 of Appendix D, subject to the following conditions:
  - a. 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; and
  - b. 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 Perryman facility 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.

EPA’s determination relies on the accuracy and completeness of the information provided by Exelon and is appealable under 40 CFR Part 78. If you have any questions regarding this determination, please contact Charles Frushour at (202) 343-9847 or by e-mail at frushour.charles@epa.gov. Thank you for your continued cooperation.

Sincerely,

/s/

Reid P. Harvey, Director  
Clean Air Markets Division

cc: Charles Frushour, CAMD  
Edward Gerst, EPA Region III  
Ralph Hall, Maryland Department of the Environment (MDE)