

February 14, 2019

Mr. Thomas A. Grace  
Designated Representative  
Moxie Freedom LLC  
565 Fifth Avenue, 29<sup>th</sup> floor  
New York, NY 10017

Re: Petition to use an alternative fuel flowmeter calibration procedure for units 201 and 202 at the Moxie Freedom power plant (facility ID (ORISPL) 59906)

Dear Mr. Grace:

The United States Environmental Protection Agency (EPA) has reviewed the July 21, 2018 petition and subsequent emails dated 9/25, 10/18, 10/31 and 11/1/2018 submitted by Caithness Freedom, LLC (Caithness) on behalf of Moxie Freedom LLC under 40 CFR 75.66(c), requesting approval of an alternative calibration procedure for fuel flowmeters that are being or may be used to measure pipeline natural gas flow rates at units 201 and 202 at the Moxie Freedom power plant (Moxie Freedom). EPA approves the petition, with conditions, as discussed below.

### Background

Moxie Freedom LLC owns and operates the Moxie Freedom power plant in Luzerne County, Pennsylvania. Moxie Freedom units 201 and 202 are pipeline natural gas-fired, single shaft design, combined cycle combustion turbines, each serving electricity generators with reported nameplate capacities of 535.5 megawatts. According to Caithness, the units are subject to the Acid Rain Program and the Cross-State Air Pollution Rule. Moxie Freedom LLC 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 the units in accordance with 40 CFR part 75.

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

Moxie Freedom units 201 and 202 are equipped with Coriolis fuel flowmeters manufactured by Emerson Process Management – Micro Motion, Inc. (Emerson MMI) to measure pipeline natural gas usage. The flowmeters are model 5700R12ABAAZZZ fuel flowmeters (sensor serial numbers 12137436 and 12138480). Moxie Freedom also anticipates the possibility of using additional like-kind fuel flowmeters at units 201 or 202 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 Moxie Freedom 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 for certification 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, Caithness 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 Moxie Freedom facility. Caithness requests approval to use the TSM process not only for the flowmeters identified by the serial numbers above but also for additional like-kind Coriolis fuel flowmeters that may be used at the Moxie Freedom facility in the future.

### EPA's Determination

EPA has reviewed the information provided by Caithness in the July 21, 2018 petition. The petition describes the alternative calibration procedure that Caithness requests approval to use to verify the accuracy of the pipeline natural gas fuel flowmeters installed at units 201 and 202 and any other Coriolis fuel flowmeters to be installed at the Moxie Freedom facility.

EPA approves use of the Emerson MMI TSM calibration procedure for initial certification of Moxie Freedom's fuel flowmeters (Serial Numbers 12137436 and 12138480) installed on unit 201 and 202. The basis for this approval is as follows:

1. 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 Moxie Freedom's flowmeters had fully traceable calibrations through an accredited path back to NIST standards.

2. The calibration procedure followed for initial certification of Moxie Freedom’s flowmeters met the requirements of section 2.1.5.2(a) of appendix D to part 75 for in-line testing of candidate flowmeter by comparison against a reference flowmeter. Specifically:
  - a. The reference flowmeter and secondary elements (i.e. temperature transmitters and pressure transducers) used to test Moxie Freedom’s flowmeter had been calibrated within 365 days prior to the comparison testing;
  - b. The comparison testing was performed in a laboratory 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.
3. 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 Table 1 below.

**Table 1 – Average three-run fuel flowmeter accuracy results**

Flow rate level	Flowmeter s/n 12137436 Accuracy (% of URV)	Flowmeter s/n 12138480 Accuracy (% of URV)
Low (12.5% of URV)	0.085%	0.021%
Mid (50% of URV)	0.058%	0.057%
High (100% of URV)	0.020%	0.084%

EPA also approves the use of the TSM calibration procedure to meet the applicable on-going quality assurance requirements for the unit 201 and 202 fuel flowmeters under section 2.1.6 of appendix D, subject to the following conditions:

1. The application of the TSM for each future accuracy test must meet the requirements of section 2.1.5.2(a) of appendix D described above as part of the basis for EPA’s approval of use of the TSM for the initial certification of the fuel flowmeter; and
2. 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 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 Moxie Freedom facility subject to the satisfaction, for each such like-kind fuel flowmeter, of all approval conditions set forth above for the fuel flowmeters identified by serial number.

EPA's determination relies on the accuracy and completeness of the information provided by Caithness 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](mailto:frushour.charles@epa.gov). Thank you for your continued cooperation.

Sincerely,

/s/

Reid P. Harvey, Director  
Clean Air Markets Division

cc: Charles Frushour, CAMD  
Paul Arnold, EPA Region 3  
Charles Zadakis, Pennsylvania Department of Environmental Protection (PADEP)