

January 16, 2020

Mr. Tim Leary  
Designated Representative  
Footprint Power Salem Harbor Development LP  
24 Fort Ave.  
Salem, MA 01970

Re: Petition to use an alternative fuel flowmeter calibration procedure for units 1 and 2 at the Salem Harbor Station NGCC (facility ID (ORISPL) 60903)

Dear Mr. Leary,

The United States Environmental Protection Agency (EPA) has reviewed the May 20, 2018 petition submitted by Footprint Power Salem Harbor Development LP (Footprint 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 1 and 2 at the Salem Harbor Station NGCC. EPA approves this petition, with conditions, as discussed below.

## **Background**

Footprint Power owns and operates the Salem Harbor Station NGCC (Salem Harbor) in Salem, Massachusetts. Salem Harbor units 1 and 2 are natural gas-fired combined cycle combustion turbines each serving an electricity generator with a nominal design rating of 240.7 MW as well as a heat recovery steam generator, a steam turbine, and a second electricity generator with a nominal design rating of 158.4 MW. According to Footprint Power, units 1 and 2 are subject to the Acid Rain Program. Footprint Power 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> and heat input monitoring requirements, Footprint 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.

Salem Harbor units 1 and 2 are equipped with Coriolis fuel flowmeters (model CMFHC2M452 and serial numbers 12122767 and 12122720) manufactured by Emerson Process Management – Micro Motion, Inc. (Emerson MMI) to measure PNG fuel flow. Footprint Power also anticipates the possibility of using additional like-kind fuel flowmeters at units 1 and 2 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 Footprint Power petition, each flowmeter identified above has been tested for initial certification 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, Footprint 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 Salem Harbor. Footprint Power 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 Footprint Power may use at the facility in the future.

## **EPA's Determination**

EPA reviewed the information provided by Footprint Power in the May 20, 2018 petition. The petition describes the alternative calibration procedure that Footprint Power requests approval to use to verify the accuracy of the PNG fuel flowmeters installed at units 1 and 2 and any other like-kind Coriolis fuel flowmeters to be installed at Salem Harbor.

EPA approves use of the Emerson MMI TSM calibration procedure for initial certification of the fuel flowmeters (serial numbers 12122767 and 12122720) installed on Salem Harbor units 1 and 2. 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 meters used to test Salem Harbor’s flowmeters had fully traceable calibrations through an accredited path back to NIST standards.<sup>1</sup>

A2. The calibration procedure followed for initial certification of Salem Harbor’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 Salem Harbor’s flowmeters 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.

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 Table 1 below.

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

<b>Flow rate level</b>	<b>Flowmeter s/n 12122767 Accuracy (% of URV)</b>	<b>Flowmeter s/n 12122720 Accuracy (% of URV)</b>
<b>Low – 20% of full unit operating load (minimum operating load)</b>	0.002%	0.001%
<b>Mid – 60% of full unit operating load</b>	0.002%	0.001%
<b>High – 100% of full unit operating load</b>	0.004%	0.004%

EPA also approves the use of the TSM calibration procedure to meet the applicable on-going quality assurance requirements for the fuel flowmeters installed on Salem Harbor units 1 and 2 under section 2.1.6 of appendix D, subject to the following conditions:

- B1. The application of the 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 the TSM for the initial certification of the 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.

<sup>1</sup> The Primary Flow Stand calibration system is equipment that has been accredited by NVLAP according to ISO/IEC 17025.

EPA further approves the use of the Emerson MMI 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 Salem Harbor 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 Footprint 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](mailto:sobocinski.ron@epa.gov). Thank you for your continued cooperation.

Sincerely,

/s/

Reid P. Harvey, Director  
Clean Air Markets Division

cc: Ron Sobocinski, CAMD  
Jenny Jachim, CAMD  
Susan Lancey, EPA Region I  
Todd H. Wheeler, Massachusetts DEP