

November 19, 2009

Mr. Richard E Hohlman  
National Grid  
Vice President  
175 East Old Country Road  
Hicksville, NY 11801

Re: Audit Decertification of the V-Cone Fuel Flow Meters Installed on: Units 10 and 20 at EF Barrett (Facility ID (ORISPL) 2511); Units 40 and 50 at Glenwood (Facility ID (ORISPL) 2514); Units 1, 2, 3, and 4 at Northport (Facility ID (ORISPL) 2516); and Units 3 and 4 at Port Jefferson (Facility ID (ORISPL) 2517)

Dear Mr.Hohlman:

This is to inform you that the United States Environmental Protection Agency (EPA), by means of an electronic audit of 1<sup>st</sup> quarter, 2009 emissions data from the EF Barrett, Glenwood, Northport, and Port Jefferson, New York facilities, has become aware that: (1) the V-cone fuel flow meters installed on ten boilers at these facilities failed to meet the initial certification requirements of 40 CFR Part 75; and (2) the data from these flow meters have not been properly quality-assured since then. Therefore, in accordance with §§75.20(a)(5) and 75.21(e)(1), the Agency is issuing this notice of disapproval of the certification status of the ten fuel flow meter monitoring systems listed in Table 1, below.

**TABLE 1**  
**Fuel Flow Monitoring Systems Identified for Audit Decertification**

<b>Facility ID (ORIS)</b>	<b>Facility Name</b>	<b>Unit ID</b>	<b>System ID</b>
2511	EF Barrett	10	S1G
2511	EF Barrett	20	S2G
2514	Glenwood	40	S4G
2514	Glenwood	50	S5G
2516	Northport	1	S1G
2516	Northport	2	S2G
2516	Northport	3	S3G
2516	Northport	4	S4G
2517	Port Jefferson	3	S3G
2517	Port Jefferson	4	S4G

Background

National Grid owns and operates ten tangential-fired boilers, i.e., Units 10 and 20 at the EF Barrett facility, Units 40 and 50 at the Glenwood facility, Units 1, 2, 3, and 4 at the Northport facility, and Units 3 and 4 at the Port Jefferson facility. These units commenced operation between 1952 and 1977

and combust oil and/or pipeline natural gas. The units are regulated under the Acid Rain Program, the Clean Air Interstate Rule (CAIR), and, from 1999 through 2008, the Ozone Transport Commission (OTC) and NO<sub>x</sub> Budget trading programs. National Grid has elected to quantify the heat input to these units using the fuel flow rate monitoring provisions of Appendix D to Part 75. The heat input value is used to calculate the units' SO<sub>2</sub>, CO<sub>2</sub>, and NO<sub>x</sub> mass emissions.

All ten of the units in question use V-cone fuel flow meters manufactured by McCrometer to continuously monitor the flow rate of pipeline natural gas. A V-cone meter operates on a principle similar to that of an orifice, nozzle, or venturi meter, in that the flow through the meter is constricted, creating a difference in pressure before and after the constriction. This differential pressure, or "delta-P", is directly proportional to the flow rate of the fluid being monitored. However, V-cone meters have a different design geometry than orifice, nozzle, or venturi meters, and there are no consensus design specifications indicating that the specific design of V-cone meters has been independently reviewed and approved as accurate for fuel flow measurement so long as the meter installed continues to meet the geometric design standard and the calibration of the meter's transmitters are maintained.

In contrast, such consensus standard design specifications have been developed for orifice, nozzle, and venturi meters and are found in American Gas Association (AGA) Report No. 3 and ASME Method MFC-3M. EPA has incorporated these specifications by reference into Part 75 and allows them to be used in the initial fuel flow meter certification process. To certify an orifice, nozzle, or venturi flow meter that is documented to meet the design specifications of AGA Report No. 3 or ASME MFC-3M, Appendix D to Part 75 requires only a visual inspection of the primary element (e.g., orifice plate) and calibration of the temperature, pressure, and delta-P transmitters. Ongoing quality assurance (QA) for these flow meters consists of an annual transmitter recalibration and a primary element inspection once every 12 calendar quarters to ensure that the geometry of the meter remains intact. However, for all other types of fuel flow meters, Appendix D requires an accuracy test with a flowing fluid for initial certification, and, for QA purposes, the accuracy test must be repeated annually.<sup>1</sup>

On November 12, 1996, National Grid (then known as the Long Island Lighting Company (LILCO)) petitioned EPA to allow the use of McCrometer V-Cone gas fuel flow meters to replace the originally certified orifice meters on Units 3 and 4 at its Port Jefferson power station. The petition did not request to use alternative procedures to those required by Part 75 for the initial certification or for ongoing QA. A McCrometer brochure outlining the principle of operation and various features of V-cone meters was included as an attachment to the petition, along with certificates of calibration for the two Port Jefferson flow meters and copies of the methods used to perform the initial calibrations (i.e., PROC-10 and MIL-STD 45662A). However, Part 75 does not limit the types of fuel flow meters that can be used and instead prescribes the initial certification and ongoing QA procedures that must be followed, depending on the type of fuel flow meter

Since the replacement of the originally certified orifice meters with V-cone meters, National Grid has been "quality assuring" data from the Port Jefferson V-cone flow meters and the other V-cone meters listed in Table 1, using procedures (i.e., annual transmitter accuracy tests and primary element inspections once every 12 calendar quarters) that Part 75, Appendix D allows only for orifice, nozzle, and venturi meters that meet the design specifications of AGA Report No. 3 or ASME MFC-3M. Therefore, the

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<sup>1</sup> The interval between the ongoing QA tests may be extended (up to 20 calendar quarters in some cases) for units that either operate infrequently or that perform and pass quarterly fuel flow-to-load ratio tests. See 40 CFR part 75, appendix D, sections 2.1.6 and 2.1.7.

Appendix D initial certification and QA requirement to perform annual accuracy tests of these V-cone meters with a flowing fluid has not been met.

EPA first discovered that annual transmitter calibrations and periodic visual inspections, rather than annual flow meter accuracy tests, were being performed for ongoing QA of the V-cone flow meters listed in Table 1 through an electronic audit of the 1<sup>st</sup> quarter, 2009 emissions data reported by National Grid for the EF Barrett, Glenwood, Northport, and Port Jefferson facilities. First quarter 2009 was the first calendar quarter in which sources were required to use the Agency's improved data checking software (i.e., the Emissions Collection and Monitoring Plan System (ECMPS) Client Tool) to validate the emissions data. The ECMPS Client Tool checks Appendix D data (particularly fuel flow meter quality assurance information) much more thoroughly than the previous EPA audit software, which was unable to detect that an improper QA methodology was being used for the V-cone flow meters.

To date, no final copy of an EPA response to the November 12, 1996 petition has been identified. However, on July 17, 2009, National Grid forwarded by email a digital copy of a March 26, 1997 facsimile of a draft response that the Agency was apparently considering at that time. This draft response, if finalized, would have allowed the use of the V-cone Gas Fuel Flowmeters at Port Jefferson Power Station Units 3 and 4 and any additional units owned and operated by Long Island Lighting Company so long as the fuel flowmeters met the ongoing quality assurance requirements for an orifice type fuel flowmeter as found in Appendix D of 30 CFR Part 75. It is not known whether in fact this response was ever finalized. Regardless, this draft response was incorrect because it is not possible for a V-cone type meter to meet the ongoing quality assurance requirements for an orifice type fuel flowmeter as found in Appendix D of 40 CFR Part 75. This is because the referenced standards used for this quality assurance are applicable only to orifice, nozzle, and venturi-type meters. Furthermore, EPA has formally denied such requests in recent years on the grounds that there is not an existing consensus standard for the V-cone type meter that is equivalent to AGA Report No. 3 or ASME MFC-3M, which are applicable only to orifice, nozzle, and venturi meters.

#### EPA's Determination

EPA has determined that the V-cone fuel flow monitoring systems installed on Port Jefferson Units 3 and 4 should not have been accepted as certified because they did not meet certification requirements at the time of submission of their certification applications. Neither PROC-10 nor MIL-STD 45662A is listed in Part 75, Appendix D, Section 2.1.5.1 as an acceptable method for certification of a fuel flow meter. Moreover, PROC-10 is a lab-specific quality assurance plan, used by the lab that performed the initial calibrations, that includes chain of custody and recordkeeping procedures conforming to MIL-STD 45662A. MIL-STD 45662A is a military standard that defines basic recordkeeping and quality assurance requirements for the establishment and maintenance of calibration systems. Neither of these are actually calibration methods for fuel flow meters.

In conversations with National Grid subsequent to the first quarter 2009 electronic audit, EPA learned that the other eight V-cone fuel flow meters listed in Table 1 (i.e., the flow meters installed at EF Barrett, Glenwood, and Northport) also failed to meet the initial certification requirements of Part 75, Appendix D and should also not have been accepted as certified. In addition, the ongoing quality assurance based on periodic inspections of the primary element and annual transmitter calibrations for all ten of the V-cone meters is not acceptable. The procedures used apply only to orifice, nozzle and venturi meters designed according to AGA Report No. 3 or ASME MFC-3M. Neither of these design specifications applies to V-cone meters, which have a distinctly different geometry than orifice, nozzle,

and venturi meters.<sup>2</sup> In summary, National Grid's use of the periodic primary element inspection (PEI) and annual transmitter calibrations does not satisfy the Part 75 initial certification and ongoing QA requirements for fuel flow meters.

Therefore, in accordance with §75.21(e)(1) EPA is decertifying, as of the date of issuance of this letter, the fuel flow meter monitoring systems listed in Table 1. Data recorded by each of these monitoring systems shall be considered invalid, beginning on the issuance date of this letter, and continuing until National Grid has performed and passed an accuracy test with a flowing fluid, using one of the methods listed in 40 CFR Part 75, Appendix D, section 2.1.5.1. During the period of data invalidation, National Grid shall, for every hour of natural gas combustion, either (1) report the maximum fuel flow rate recorded between January 1, 2008 and the date of this letter for the corresponding unit operating load range or (2) report the maximum potential fuel flow rate for the unit (as defined in Part 75, Appendix D, section 2.4.2). EPA is allowing the use of maximum recorded fuel flow rate as an alternative to standard substitute data (i.e., maximum potential fuel flow rate.) for the following reasons. First the use of standard substitute data would grossly overstate the units' fuel flow and thus their emissions. EPA estimates that the emissions using maximum fuel flow by load range will be about 25% higher than what may otherwise be recorded by a quality assured meter. In comparison, EPA estimates that using the maximum potential fuel flow rate as defined in Part 75 would result in emissions that are about 300% higher than what may otherwise be recorded by a quality assured gas fuel flow meter because these units are run primarily at lower load levels. Second, although it has been determined that the historical data from the V-cone meters were not properly quality assured, EPA believes that the data are of sufficient quality to be used for determining a maximum fuel flow rate for each unit operating load range. Therefore, as requested by National Grid, the Agency is allowing the use of maximum fuel flow (in option (1) above) as a reasonably conservative alternative to the standard substitute data specified in Appendix D, section 2.4.2, which requires the use of the maximum potential fuel flow for a unit where no quality-assured data from any load range is available. This is consistent with the general purpose of the substitute data provisions, i.e., to ensure no understatement of emissions and to provide a strong incentive for owners and operators to properly operate and maintain their monitoring systems.<sup>3</sup>

Further, for ongoing quality assurance of each V-cone meter listed in Table 1, National Grid shall, after performing and passing initially the above described fuel flowmeter accuracy test, repeat such fuel flow meter accuracy test once every four "fuel flow meter QA operating quarters", as specified in Part 75, Appendix D, section 2.1.6(a). Note that the optional fuel flow-to-load ratio test described in section 2.1.7 of Appendix D may be used to extend the interval between successive accuracy tests, up to a maximum of 20 calendar quarters.

On September 16, 2009, National Grid sent an additional request in writing for EPA to consider allowing National Grid until the end of 2010 to: (1) send each V-cone meter for the required annual accuracy test as specified in Part 75, Appendix D, section 2.1.6(a); (2) replace the V-cone meter with an orifice, nozzle, or venturi or other approved meter; or (3) otherwise comply with applicable calibration requirements as may be developed, amended, or adopted by the Agency in the future. EPA understands that it may take some time for National Grid to bring all ten units into compliance with the calibration requirements of Part 75. However, National Grid is essentially requesting that its unadjusted, non-quality assured data be used as substitute for another 14 months. EPA denies National Grids request to allow its

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<sup>2</sup> See, LILCO's November 12, 1996 petition at 1 (stating that "the V-Cone flow metering device operates under the same basic principles as other differential pressure-type flow meters. The differences lie in the geometry of the meter.").

<sup>3</sup> See 58 Fed. Reg. 3590, 3634-35 (January 16, 1993)

non-quality assured V-cone meters to continue to be used through 2010 without any consequence. Rather, as noted above, EPA is providing the option to report the maximum fuel flow rate recorded between January 1, 2008 and the date of this letter for the corresponding unit operating load range as an alternative to the Part 75 requirement to report the maximum potential fuel flow rate for the unit. This option will ensure that the National Grid unit's emissions are neither understated nor grossly overstated and will provide a strong incentive for operation and maintenance of the unit's monitoring systems in compliance with the requirements of Part 75.

If you have any questions regarding this correspondence, please contact Matthew Boze at (202) 343-9211. Thank you for your continued cooperation.

Sincerely,

/s/

Sam Napolitano, Director  
Clean Air Markets Division

cc: Robert Teetz, Director of Environmental Management, National Grid  
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