

April 24, 2019

VIA HAND DELIVERY & ELECTRONIC MAIL

Luly E. Massaro, Commission Clerk
Rhode Island Public Utilities Commission
89 Jefferson Boulevard
Warwick, RI 02888

RE: Docket 4916 - National Grid's Proposed FY 2020 Gas Infrastructure, Safety, and Reliability Plan
Responses to PUC Post-Hearing Data Requests – Set 3

Dear Ms. Massaro:

Enclosed please find 10 copies of National Grid's¹ responses to the Rhode Island Public Utilities Commission's Third Set of Post-Hearing Data Requests in the above-referenced matter.

Thank you for your attention to this matter. If you have any questions, please contact me at 401-784-7415.

Very truly yours,



Robert J. Humm

Enclosures

cc: Docket 4916 Service List
Leo Wold, Esq.
Al Mancini, Division
John Bell, Division
Rod Walker, Division

¹ The Narragansett Electric Company d/b/a National Grid (National Grid or the Company).

Certificate of Service

I hereby certify that a copy of the cover letter and any materials accompanying this certificate was electronically transmitted to the individuals listed below.

The paper copies of this filing are being hand delivered to the Rhode Island Public Utilities Commission and to the Rhode Island Division of Public Utilities and Carriers.



Joanne M. Scanlon

April 24, 2019

Date

Docket No. 4916 - National Grid's FY 2020 Gas Infrastructure, Safety and Reliability (ISR) Plan - Service List 2/5/2019

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Post-Hearing PUC 3-1

Request:

What steps has the Company undertaken to ensure that meters being replaced under the FY 2020 ISR Plan do not become stranded assets?

Response:

The Company's response to PUC 4-1 in Docket No. 4916 indicates physical gas meter testing is required to occur no less than every 15 years for all residential meters and no less than every 10 years for commercial and industrial meters. This is in accordance with the Rhode Island Division of Public Utilities and Carriers' Standards for Gas Utilities, Master Meter Systems and Jurisdictional Propane Systems (815-RICR-20-00-1), which states all gas meters in service shall be tested for accuracy and proper functionality at the aforementioned schedule. Upon investigation of the physical gas meter, if the meter is found to be damaged or outside of accuracy thresholds, it is replaced.

As described in the Company's response to PUC 3-2, any ongoing replacement of gas meters will effectively integrate with future installation of AMF-compatible gas communication modules, thereby eliminating any risk of the physical meter itself becoming a stranded asset.

Post-Hearing PUC 3-2

Request:

Please reconcile the statement found in Docket 4780, PST Book 1, Chapter 4, p. 6 of 31 which states that Gas ERT Deployment will occur over 11 years, and the response to PUC 4-1 in the current docket which states that implementation will take place over a period of 15 years.

Response:

The Company’s response to PUC 4-1 in Docket No. 4916 indicates physical gas meter testing is required to occur no less than every 15 years for all residential meters and no less than every 10 years for commercial and industrial meters. This is in accordance with the Rhode Island Division of Public Utilities and Carriers’ Standards for Gas Utilities, Master Meter Systems and Jurisdictional Propane Systems (815-RICR-20-00-1), which states all gas meters in service shall be tested for accuracy and proper functionality at the aforementioned schedule. Upon investigation of the physical gas meter, if the *gas communication module* attached to the meter is determined to be five years old or older, it is replaced with a new module.

In the Company’s proposal for deployment of Advanced Metering Functionality (AMF), it indicates that 100% of the gas communication modules will be replaced with AMF-compatible communication modules over a period of 11 years. This follows the forecasted replacement schedule for gas communication modules outlined below and adjusted from the previously provided schedule in Docket No. 4780, PST Book 2, Appendix 4.1, p. 1 of 30, Table 4-1, to account for a delay in AMF-compatible gas module deployment.

Gas ERT Replacement Cycle, Fiscal Year (FY) 2020 – FY 2030

Deployment Year	Gas ERT Installation
FY 20	1.80%
FY 21	7.85%
FY 22	7.85%
FY 23	7.85%
FY 24	27.55%
FY 25	7.85%
FY 26	7.85%
FY 27	7.85%
FY 28	7.85%
FY 29	7.85%
FY 30	7.85%

Post-Hearing PUC 3-3

Request:

Given that the miles of cast iron main has been decreasing (See Bates 114) what is the cause of increasing number of leaks in cast iron main from 2015 to 2017 (see Bates 122)?

Response:

Overall, the Company's leak receipts have been trending down for the last 10 years, with some variability year-over-year that may be attributable to weather. *See* the Company's Fiscal Year (FY) 2020 Gas Infrastructure, Safety and Reliability (ISR) Plan, at Schedule 1, Bates 100. Notably, there was a 29% decrease in leak receipts from 2015 to 2016, followed by a 20% increase in leak receipts from 2016 to 2017. *See* the Company's FY 2020 Gas ISR Plan, at Schedule 1, Bates 100.

The referenced graph on Bates 122 demonstrates an increase in cast iron leak repairs from 2015 to 2017. The increase in leak receipts in 2017, when coupled with the Company's commitment to reducing its leak backlog through the Proactive Main Replacement and Public Works programs, helps to explain the increase in cast iron leak repairs from 2015 to 2017 despite the decrease in miles of cast iron main.

From 2015 to 2017, total leak repairs increased by 23%, which, in turn, reduced the leak backlog by 16%. The majority of leak-prone main in the Company's distribution system is comprised of cast iron (65%). Thus, the increase in total repairs of new and existing leaks contributed to the increase in cast iron leak repairs from 2015 to 2017, even though the overall miles of cast iron main have decreased due to the Proactive Main Replacement and Public Works programs.

Post-Hearing PUC 3-4

Request:

Please provide an estimate of the annual volume and cost of lost gas from leaks in the distribution system?

Response:

The Company's calendar year 2018 estimated annual volume of lost gas from system leakage is 302,667 thousand cubic feet (MCF), or 0.7% of total sendout, with an estimated annual cost of \$2,235,859 based on the Fiscal Year 2019 system average gas cost of \$0.72 per therm.

The task of estimating unmeasured volumes is, by nature, inexact. A commonly available method to estimate activities on a distribution system such as the Company's, with over 19,700 services and more than 3,200 miles of main within Rhode Island, is the use of factors. The Company uses U.S. Environmental Protection Agency (EPA) 40 C.F.R. Part 98 Subpart W emission factors to calculate estimated gas loss through system leakage. Available EPA factors are estimations based on a fixed number of measurements or sample engineering calculations applied to gross counts of material inventory. These factors are provided in terms of standard cubic feet per main per year and standard cubic feet per service per year and are applied to the Company's end of calendar year main and service inventory by material using the following steps:

1. The Company uses the annual U.S. Department of Transportation Pipeline Hazardous Materials Safety Administration (PHMSA) report to pull the total miles of distribution main and number of services by material in its system.
2. For each material, the Company multiplies the inventory by the population emission factor listed in Table W-7 of 40 C.F.R., Chapter I, Subpart C, Part 98, Subpart W to estimate the total leakage in MCF of natural gas by material.
 - a. The Company then converts the population emission factor from per hour to per year.
 - b. Because certain service materials have no listed emission factor, the Company includes reconditioned cast iron main with cast iron, cast/wrought iron services with unprotected steel services, and services with unknown materials with plastic services.

Supporting calculations are provided in Attachment PH PUC 3-4.

RI

MATERIAL	SERVICE COUNT	MILES OF MAIN	LOST GAS FROM LEAKAGE
Main - CI/WI		714	170439
MAIN - Prot Steel		562	1723
MAIN - UP Steel		386	42538
MAIN - Plastic		1539	15234
SERV - CI	189		50
SERV - Prot Steel	9334		1635
SERV - UP Steel	41920		69772
SERV - Plastic	145692		1276
Total Leakage			302667 MCF

Total Leakage 31053.6 Therm

(1 Therms = 0.1 DTH = MCF x 0.1026 DTH/MCF)

Cost per Therm \$ 0.72

Total Cost due to Lost Gas \$ **22,358.59** Per Year

Post-Hearing PUC 3-5

Request:

Please provide any information on how many Massachusetts customers may have switched to electric heat pumps, as opposed to replacing oil services during the gas moratorium?

Response:

This data request references a moratorium on new gas services on parts of Cape Cod, including the towns and villages East of Barnstable (Yarmouth, Dennis, Harwich, Brewster, Chatham, Orleans, and Eastham).

The Cape Light Compact is the electric energy efficiency Program Administrator on Cape Cod, which is not a National Grid-owned entity. While the Massachusetts Clean Energy Center does publish public data about the historical volume of air source heat pumps that have been incentivized through their programs, these installations represent an unknown fraction of the overall market. As a result, the Company does not have a reliable means to estimate the number of energy efficient electric heat pumps that have been installed during the moratorium in question.

Post-Hearing PUC 3-6

Request:

Referring to PUC 3-2 (e) (i) and the reference to 635 tons of CO₂: What would be the Greenhouse Gas emissions reductions if the 350 conversions were from oil to electric heat pump?

Response:

Pending an evaluation of heat pump performance in the field, the Company's Energy Efficiency Plan provisionally assumes 3.08 to 4.57 tons of avoided carbon dioxide per oil-to-electric heat pump conversion per year. For 350 conversions per year, this would equate to a total reduction range of 1,078 to 1,600 tons per year.

Realized emissions reductions will vary based on whether there is full or partial displacement of oil, the presence of integrated controls to optimize system performance, and the level of weatherization of the building, among other things.

Post-Hearing PUC 3-7

Request:

What, if anything, is the Company doing to advance the use of hydrogen and synthetic fuels?

Response:

The Company's downstate New York gas distribution affiliates, The Brooklyn Union Gas Company d/b/a National Grid NY (formerly d/b/a KeySpan Energy Delivery New York) and KeySpan Gas East Corporation d/b/a National Grid (formerly d/b/a KeySpan Energy Delivery Long Island) will be filing a rate case in April 2019. The rate case will include a power-to-gas demonstration project that the downstate New York affiliates are undertaking with the National Renewable Energy Laboratory and potentially with the City of New York. Ultimately, this project will produce synthetic methane by utilizing hydrogen from electrolysis and carbon dioxide sourced from a wastewater treatment plant.

The downstate New York rate case will also include a hydrogen blending study to assess the percentage of hydrogen that can be introduced into the gas distribution system and whether any changes are required to ensure that blended hydrogen does not negatively impact safety or reliability.

Post-Hearing PUC 3-8

Request:

Will customer appliances be able to burn hydrogen and synthetic fuels?

Response:

Research indicates that the gas distribution system can receive low concentrations of hydrogen (approximately 10% blend) without impact to gas quality. As stated in the Company's response to Post-Hearing PUC 3-7, National Grid is proposing a hydrogen blending study in its upcoming downstate New York rate case. The purpose of the hydrogen blending study proposed is to assess precisely the percentage of hydrogen National Grid can blend into the gas distribution system. This threshold will be based on the premise that customers will continue to use their existing appliances. Synthetic fuels, which are composed primarily of methane, should be compatible with existing customer appliances.

Post-Hearing PUC 3-9

Request:

Will the introduction of hydrogen and synthetic fuels have a negative effect on the Company's gas infrastructure or cause incremental cost?

Response:

As stated in the Company's response to Post-Hearing PUC 3-7, National Grid is developing a hydrogen blending study as part of the downstate New York rate case to determine the amount of hydrogen that can be blended safely into the existing gas infrastructure and whether any changes are needed to scale hydrogen blending. National Grid anticipates that these required changes and any associated costs will be better understood once the study is complete. Existing research indicates that low concentrations of hydrogen (up to 10% by volume) are feasible with few modifications to existing natural gas infrastructure. The feasibility, however, is very dependent on location, pipe material, and seal material, among other factors. Additional hydrogen research is underway by the natural gas industry, which will further the Company's understanding of the impacts of hydrogen blending. Pipeline quality synthetic methane should not have a negative effect on the Company's gas infrastructure as it is interchangeable with geological natural gas. Prior to introduction of hydrogen or synthetic fuels, the Company will ascertain that the safety and reliability of gas infrastructure and customer end uses will not be impacted negatively.

The Narragansett Electric Company

d/b/a National Grid

RIPUC Docket No. 4916

In Re: Gas Infrastructure, Safety, and Reliability Plan FY2020

Responses to the Commission's Third Set of Post-Hearing Data Requests

Issued on April 3, 2019

Post-Hearing PUC 3-10

Request:

Are there any PHSMA requirements or regulations that restrict the use of hydrogen and synthetic fuels?

Response:

The Company is not aware of any PHSMA requirements or regulations that restrict the use of hydrogen or synthetic fuels.

Post-Hearing PUC 3-11

Request:

Referencing PUC 3-9, what is the Company doing to accelerate the rate of customer conversions from oil to heat pumps to ten times the current rate? How will the Southern Rhode Island Gas Expansion project impact these efforts?

Response:

The Northeast 80 x 50 Pathway observed that remaining on track to achieve the 80 x 50 emissions goal will require converting nearly all of the Northeast region's five million oil-heated buildings to electric heat pumps or natural gas. This would require both a ten-fold increase in heat pump adoption *and* an acceleration of oil-to-gas conversions.

Customer choice drives home heating decisions. Accelerating oil-to-heat pump conversions by ten times the current rate would require coordinated and ambitious action from many stakeholders, including National Grid, state policy makers, municipal leaders, customers, HVAC professionals, and equipment manufacturers. The Company's main contribution to this acceleration is through the Heat Pump Initiative offered as part of the HVAC Electric Program in its Energy Efficiency (EE) Plans. As detailed in the Company's 2019 EE Plan, the Heat Plan Initiative provides rebates to customers with oil and propane heat to switch to heat pumps and offers training and support for oil dealers and HVAC contractors for the installation of heat pumps. The Company also provides these rebates through its electric income-eligible and multi-family EE programs. The Community Initiative in the 2019 Plan will also include heat pumps as one of the performance metrics to further drive marketing and education about the Heat Pump Initiative.

A customer's decision to adopt any heating system comes down to the cost, performance, and ease of installation of the system relative to its alternatives. To the extent the Southern Rhode Island Gas Expansion Project will impact the state's decarbonization goals, it will be by making oil-to-gas conversions more affordable and accessible, thus expanding customer choice and supporting lower emissions from the heating sector.

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4916
In Re: Gas Infrastructure, Safety, and Reliability Plan FY2020
Responses to the Commission's Third Set of Post-Hearing Data Requests
Issued on April 3, 2019

Post-Hearing PUC 3-12

Request:

Does the Company have any updated general estimate on relight costs and restoration costs, based upon the recent gas issue on Aquidneck Island?

Response:

No, the Company does not yet have an updated general estimate on relight costs and restoration costs based upon the recent gas issue on Aquidneck Island. The Company anticipates it will be able to provide an updated general estimate of such costs within the next six months, although the estimate may not be final at that point. The Company anticipates that the updated general estimate of restoration costs will be higher than the current estimate.

Post-Hearing PUC 3-13

Request:

Are there any in-home methane detection strategies in Rhode Island?

Response:

In-home residential methane detectors (RMDs) are commercially available for purchase; however, there are currently no RMD programs available through National Grid for Rhode Island customers.

There are several ongoing initiatives and pilots within the industry that are aimed at improving the RMD technology currently available to consumers and looking to integrate RMDs with an approach National Grid is developing for enhancing home safety for customers. National Grid, through its New York Research and Development (R&D) programs, is an active participant in those initiatives.

As discussed in the Company's response to PUC 4-8, the Rhode Island rate structure does not currently support R&D. If the Public Utilities Commission wishes to consider supporting gas R&D projects for the benefit of gas customers in Rhode Island, the Company would be willing to discuss opportunities for co-funding gas research with other companies through industry research consortia or specific joint industry projects and explore synergies that may be obtained through such co-funding.

Post-Hearing PUC 3-14

Request:

Based on the Company's 80 x 50 plan or its 70x 30 plan, is there any time period in the next 33 years when the Company might need to reverse its strategy of gas expansion to achieve those goals?

Response:

It is unlikely that the Company would need to *reverse* its strategy of gas expansion to achieve the State's 80 x 50 goal.¹ There are pathways to achieving 80% reductions by 2050 – for example, with high penetrations of biogas and hydrogen – in which gas expansion could be *accelerated* across the period. The future of gas expansion is a function of the solutions the Company can provide to lower the emissions profile of the gas distribution system while delivering safe, reliable, and affordable service. All else being equal, the Company believes it is a lower-cost proposition to utilize an existing set of assets as part of its strategy for meeting the State's 80 x 50 goals.

The solutions the Company can bring to reduce gas network emissions include, but are not limited to:

- a) Increasing appliance efficiency, including gas furnaces and gas-fired heat pumps;
- b) Increasing building energy efficiency and weatherization;
- c) Decarbonizing gas supply via biogas and hydrogen;
- d) Reducing methane leaks; and
- e) Hybridizing homes to utilize use of both heat pumps and gas heat.

Promoting innovation in these areas will preserve customer choice, maximize the value of existing assets, and add tools to the toolbox in meeting the State's challenging 80 x 50 goals.

¹ Rhode Island's "80 x 50 goal" is established by the Resilient Rhode Island Act of 2014, which specifies an economy-wide emissions reduction target of 80% below 1990 levels by 2050.