

The Narragansett Electric Company
d/b/a National Grid

**Gas Infrastructure,
Safety, and Reliability Plan
FY 2021 Proposal**

**Responses to Division's Data
Requests**

Book 2 of 2

December 20, 2019

Docket No. 4996

Submitted to:
Rhode Island Public Utilities Commission

Submitted by:

nationalgrid

The Narragansett Electric Company
d/b/a National Grid
In Re: Division's Review of FY 2021 Proposed Gas ISR Plan
Responses to Division's First Set of Data Requests
Issued November 8, 2019

Division 1-1

Request:

The Company has proposed to purchase 22,000 meters in its FY 2021 Gas ISR Plan. With respect to its Purchase Meter (Replacements) Program, please provide the following information:

- a) Identify the number of meters replaced in the FY 18, 19 and FY 20 Gas ISR plans;
- b) Explain the basis for the increase in number of meters purchased in the Company's FY 2021 vs. levels in its FY 2020 ISR Plan and in the prior years;
- c) Provide a budget number for Meter (Replacements) Program in the FY 2021 assuming: i) the number of meters purchased were frozen at FY 20 level, and ii) the number of meters purchased equals the average of the number meters purchased in the FY 18, 19 and FY 20 Gas ISR Plans; and
- d) Explain whether the budget numbers identified in c) are / are not acceptable to the Company. Why or why not?

Response:

- a) The chart below shows the actual (FY 2018-2019), forecasted (FY 2020), and proposed (FY 2021) number of Gas Infrastructure, Safety, and Reliability (ISR) meters replacements for FY 2018 through FY 2021. For FY 2020, the approved FY 2020 ISR plan included 16,289 meters, and the current forecast includes 21,080 meters. This total increase in the FY 2020 meter forecast is the result of some FY 2019 purchases being delayed until FY 2020 due to limited meter availability from a supplier, along with an increase in need for meters for all work types.

Fiscal Year	Number of Meter Replacements: Actual (FY 2018-2019), Approved & Forecasted (FY 2020), and Proposed (FY 2021)
FY18	16,507 - Actual
FY19	17,481 - Actual
FY20 Approved	16,289 - Approved
FY20 Forecast	21,080 - Forecasted
FY21	21,954 - Proposed

The Narragansett Electric Company
d/b/a National Grid
In Re: Division's Review of FY 2021 Proposed Gas ISR Plan
Responses to Division's First Set of Data Requests
Issued November 8, 2019

Division 1-1, page 2

- b) The current long-term meter change plan has peaks and valleys in terms of the number of meters mandated to be replaced on a year over year basis, with most meters scheduled for replacement every 15 years. The volume fluctuation of meter exchange work creates a staffing challenge of year-over-year peaks and valleys of required supporting Full-Time Equivalent (FTEs). The basis for increasing the number of meter changes for FY 2021 is to level out the annual workload and demand going forward.
- c) The chart below lists the number of meters for responses i) and ii). For both questions, the Company is providing a Response A, which aligns with the FY 2020 approved ISR budget and meter volume of 16,289, and a Response B, which aligns with the 21,080 meters currently forecasted FY 2020.

Responses	i), A	i), B	ii), A	ii), B
	FY 2020 Approved	FY 2020 Forecast	Average of FY 2018-2019 (Actual) and FY 2020 (Approved)	Average of FY 2018-2019 (Actual) and FY 2020 (Forecast)
Number of Meter Exchanges	16,289	21,080	16,759	18,356
FY 2021 Dollars	\$3,616,158	\$4,679,760	3,720,498	\$4,075,032

- d) The Company recommends the replacement of 21,954 meters in FY 2021 as currently proposed. The Company also recommends FY 2021 ISR Purchase Meter budget of \$4,851,339 to support forecasted demand and to level out the long-term meter change plan as described in Response B. By replacing the number of meters in responses i) and ii) the Company would fall short of the demand required to meet the FY 2021 needs to levelized the annual meter change program for future years.

Division 1-2

Request:

Provide the following information for the Company's proposed "Transmission Station Integrity" Program:

- a) Explain why this "new" program was not in prior ISR programs;
- b) Identify the amount currently in base rates relative to records review;
- c) Identify what with specificity what work is being funded by the amount identified in b) and explain why this work differs from the work requested to be funded in the FY 21 Gas ISR Plan;
- d) Identify the anticipated effective compliance date of the forthcoming PHMSA code requirements related to this program; and
- e) Identify and explain the lead time associated with engineering and procurement of materials for identified capital replacement.

Response:

- a) The Transmission Station Integrity Program is driven by the recent rulemaking by the Pipeline and Hazardous Materials Safety Administration (PHMSA), issued on October 1, 2019 and effective on July 1, 2020. Records review work has been included in base rates since September 1, 2018 (see RIPUC Docket No. 4770, November 27, 2017 Initial Filing, Book 4 at Bates Page 55, Line 17 and at Bates Page 58, Line 8; August 16, 2018 Compliance Filing Book 2 on Bates Page 204, Line 3; and Compliance Attachment 2, Schedule 38, Page 6; and the Company's response to Information Request Division 29-6; and Attachment DIV 29-6, Page 3, Line 100). Since the Transmission Station Integrity Program projects are determined by the results of the records review work, and the rulemaking was not issued until this past October, this funding category was not previously included in previous Gas ISR plans.
- b) Docket 4770 included \$0.308 million per year for station records review work: operating expense related to capital expense for Pressure Regulation Engineering- Asset Integrity Work (Records Review) of \$0.3 million per year and one Pressure Regulation Engineer for \$0.008 million per year.

Division 1-2, page 2

- c) The \$0.308 million included in base rates by Docket 4770 covers the records review work undertaken by the Company. This includes digitization and review of the existing records of existing transmission regulator stations and gate stations to ensure that they comply with the requirements of the new rulemaking. In particular, the records research focuses on ensuring that the Company has traceable, verifiable, and complete (TVC) material records (certified material test reports - CMTRs), and construction records, namely weld inspections and pressure test logs. These records are used to reconfirm the maximum allowable operating pressure (MAOP) of the existing assets in service. The Company has 24 transmission regulator stations and gate stations that will be the primary focus of these records review efforts. The Transmission Station Integrity Program included in the FY 2021 ISR proposal covers the resultant capital replacement projects (both full and partial replacements) for stations where existing records do not fully support reconfirmation of the MAOP.
- d) The new rulemaking has three effective compliance dates. The Company must develop and document procedures to comply with the rulemaking within one year, by July 1, 2021. The Company must ensure 50% of the affected pipeline mileage is in compliance with the rulemaking within eight years, by July 3, 2028. The Company must ensure that 100% of the affected pipeline mileage is in compliance with the rulemaking within 15 years, by July 2, 2035.
- e) In order to execute the proposed capital replacement projects, the Company utilizes an internal Capital Delivery organization. This organization utilizes a stage gate process that provides appropriate lead times for proper development, design, resourcing, and construction of projects. The process for projects of this scope anticipates a lead time of approximately two years from the initiation of the project to the beginning of the construction phase. This allows adequate time for quality engineering design and the appropriate procurement of long lead time materials needed for construction.

Division 1-3

Request:

Identify and explain the following with respect to the Company's "Heat Decarbonization" Program:

- a) All capital and expense components of the program;
- b) Has the Company performed an analysis to determine if the program or program's components satisfy the Rhode Island Test and TRC tests. If not, why not? If so, please provide; and
- c) Explain why the Company "Heat Decarbonization" Program belongs in the Gas FY 21 ISR Plan as opposed to the Company's 2021 EE Plan.

Response:

- a) The Company proposed to include \$1 million in the FY 2021 Gas Infrastructure, Safety, and Reliability (ISR) Plan to fund two feasibility studies: a Hydrogen Demonstration Lab and incentives for Clean Heat Solutions. The proposed funding would be categorized as operating expenditures (OPEX). The Company requested \$200,000 to support a market analysis for geo-thermal micro districts and to assess hydrogen blending limits specific to Rhode Island. The Company requested \$500,000 to support the first phase of a multi-phase hydrogen demonstration project--the Hydrogen Demonstration Lab. This money would be used to site and develop an isolated hydrogen production, storage and reuse facility. The over-arching purpose of the multi-phase demonstration project is to assess the role of hydrogen and the feasibility of introducing it into the gas network in Rhode Island. The Company proposed setting aside \$300,000 of incentive money to support a limited number of Renewable Natural Gas (RNG) interconnections and traditional geothermal installations.
- b) No, the Company has not performed an analysis to determine whether the program's components satisfy the Rhode Island Test and the TRC tests. Historically, the Company has conducted benefit cost analysis to assess the cost-effectiveness of energy efficiency resources and proposals in electric filings. The Heat Decarbonization Program proposed in the Gas FY 2021 ISR Plan aims to provide insights into the actions Rhode Island can take over the next decade to address heating sector emissions while ensuring reliability. This is exploratory work that is focused on developing new products for customers. The Company recognizes this work as critical to enabling a safe, reliable and low carbon future, but it is inherently less efficient than many initiatives that might be evaluated using a Benefit Cost Test.

Division 1-3, page 2

- c) The focus of energy efficiency is to reduce energy consumption while the Heat Decarbonization Program proposed in the FY 2021 Gas ISR is focused on products that reduce carbon emissions and provide customers with a heating solution. The proposed program is also focused on evaluating the use of existing gas infrastructure to deliver low carbon energy to customers in the form of RNG and, in later years, hydrogen. Understanding the potential impacts to safety and reliability is critical piece of this effort.

Division 1-4

Request:

The Company proposes to spend \$9.349 Million in connection with its Pressure Regulating Facilities Program in its 2021 ISR. With respect to that program please provide the following information:

- a) Identify what portions of the proposed budget of \$9.349 Million relates to:
 - i) Enhancements through condition-based assessments to nine regulator stations in East Providence, Providence, Newport, Warwick, and West Warwick; and
 - ii) Installation of bypass valves at 11 stations to prevent over-pressurization;
- b) Provide a detailed breakdown of the planned budget for the installation of bypass valves installations; and
- c) Can the budget attributable to the installation of the 11 bypass valves be phased in over a two-year or over longer period of time? What would that look like? Please explain.

Response:

- a)
 - i) \$8.246 million of the proposed budget is dedicated to the complete replacement and abandonment of regulator stations.
 - ii) \$1.103 million of the proposed budget is dedicated to the installation of bypass valves at 11 stations to prevent a failure of a single bypass valve resulting in over pressurization.

The Narragansett Electric Company
d/b/a National Grid
In Re: Division's Review of FY 2021 Proposed Gas ISR Plan
Responses to Division's First Set of Data Requests
Issued November 8, 2019

Division 1-4, page 2

- b) The FY 2021 proposed budget includes the installation of a second bypass valve at 11 stations which are listed in the detailed breakdown below:

Station Number	Town	Station Name	Inlet Pressure	Outlet Pressure	Bypass Size	Total Cost (000's)
RIS-017	Cranston	Station St @ Pond St	99 PSIG	LP	2"	\$0.10
RIS-047	East Providence	747 Bullocks Point Av	25 PSIG	LP	2"	\$0.08
RIS-078	Providence	Ives St @ Trenton St	35 PSIG	LP	2"	\$0.08
RIS-090	Johnston	Plainfield Pk @ Simmons ville	99 PSIG	35 PSIG	2"	\$0.10
RIS-100	Johnston	Allendale Av @ Geo. Waterman	99 PSIG	35 PSIG	12"	\$0.19
RIS-101	Johnston	1 Cottage St	99 PSIG	35 PSIG	2"	\$0.10
RIS-106	East Greenwich	Frenchtown Rd @ S County Trail	99 PSIG	35 PSIG	2"	\$0.10
RIS-110	North Providence	Smith St @ Sunset Av	35 PSIG	LP	2"	\$0.08
RIS-113	Cranston	Depot Av @ Cranston St	10 PSIG	LP	4"	\$0.08
RIS-N215	Middletown	E Main Rd @ Turner Rd	55 PSIG	10 PSIG	2"	\$0.10
RIS-N219	Newport	Carroll Av @ Ocean Dr	35 PSIG	LP	2"	\$0.08
					Total	\$1.10

- c) The budget attributable to the installation of the 11 bypass valves is part of a larger two-year plan, starting in FY 2021, to retrofit stations with single valve bypasses. This plan covers a total of 16 stations in Rhode Island. The Company target in FY 2021 of 11 stations is driven by risk scores and is optimized for the available resources. Further delaying the remediation of this risk over a longer timeframe is not recommended.

Division 1-5

Request:

For the Company's "Gas System Reliability – Gas Planning" Program, the Company plans to spend \$2.99 Million. With respect to this program, please provide the following information:

- a) How much of the budget is for the initial phase of a multi-year project at the Cumberland Take station and how much is for Woodlawn regulator station in Bristol, RI?;
- b) Explain the sentence: "Funding is also included for the Wood at Woodlawn regulator station in Bristol which is being completed to move a regulator station out of the flood plain";
- c) Has the station ever flooded?;
- d) What is the risk of the station flooding?; and
- e) Can the station be moved out of the flood plain in a future year? Please explain.

Response:

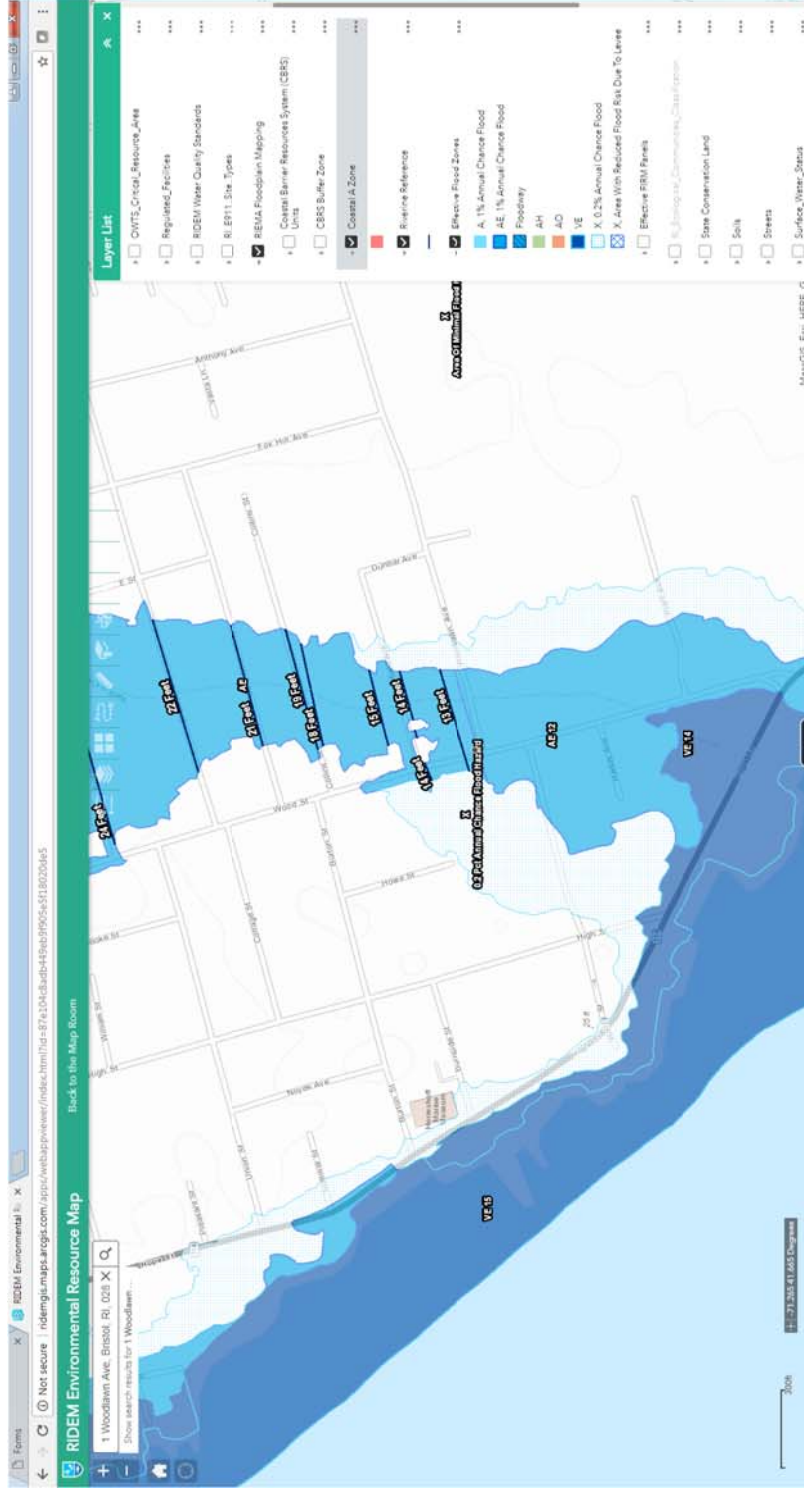
- a) Approximately \$1 million is for engineering costs to address enhancements to the Cumberland Take Station and approximately \$0.85M is for the Wood at Woodlawn regulator station relocation project in Bristol, RI. The balance of the spending is for work associated with the multi-year single-feed elimination project in East Providence. This project involves downrating a small single-feed 35 psig system and connecting it to a larger 18 psig system.
- b) This statement refers to the funding associated with moving the existing low-pressure regulator station currently located within the flood plain at the intersection of Wood Street and Woodlawn Avenue in Bristol, RI to a new location outside of the flood plain.
- c) Flooding has occurred in the vicinity of the Wood at Woodlawn low-pressure regulator station and the flooding has resulted in customer outages due to water getting into the low-pressure mains. One such example of this was on March 31, 2014 when gas service was interrupted to at least three homes on Hope Street. There was also significant flooding in the area in September 2012 that included regulator station flooding. This caused abnormal regulator operation, resulting in an over-pressurization of the low-pressure distribution system.

Division 1-5, page 2

- d) Based on the flood plain map in Attachment DIV 1-5A, the Wood at Woodlawn regulator station is an area that has a 1% annual chance of flooding.
- e) The station could have been moved out of the flood plain in a future year. However, construction began on the project in the third quarter of FY 2020 with the goal of having the new station operational by the Spring of 2020. Previously, the project had been at risk of being deferred to fiscal year 2021 and hence it was included in the 2021 ISR filing.

Attachment DIV 1-5A

Flood Zone Map in the vicinity of Wood Street and Woodlawn Street, Bristol, RI



Division 1-6

Request:

The Company has established a new program "Distribution Station Over Protection". With respect to this program please provide the following information:

- a) Provide a detailed breakdown of the proposed \$3.64 Million budget for this program;
- b) Identify and describe all over pressure situations the Company has sustained at its regulating facilities in the last ten (10) years? And
- c) Has the Company performed a risk assessment / study of the likelihood of such an event occurring on its distribution system? If so, please provide.

Response:

- a) In the category of Distribution Station Over Pressure Protection, the Company plans to spend the following: \$0.431 million to install over-ride pilots at existing regulator stations; and \$3.205 million to install full-flow relief valves, new outlet headers, and replace aging regulator equipment at existing regulator stations.
- b) The following over-pressure incidents have occurred at the Company's regulating facilities in the last ten years:
 - **September 11, 2011: Dey Street Gate Station (RIS-311), 27 Dey Street, East Providence, RI** – Upstream pressure regulation equipment owned by Enbridge malfunctioned, allowing elevated pressure gas into the station piping. The downstream control regulators owned by the Company operated properly and maintained safe pressure in the downstream system.
 - **September 5, 2012: Franklin @ Wood Regulator Station (RIS-BW001), Bristol, RI** – Flooding in a vaulted regulator station caused control regulator pilots to lose atmospheric sense pressure, which drove the regulators above setpoint and allowed elevated pressure into the downstream system and resulted in an excursion over maximum allowable operating pressure (MAOP). This station did not have vent poles for the pilot sense lines to terminate above elevated water levels.
 - **October 4, 2012: Boulevard @ Front Regulator Station (RIN-C018), Lincoln, RI** – A Company crew was executing a low-pressure main cut-off and abandonment. When a bag was inserted to interrupt the flow of gas in the low-pressure cast iron main being abandoned, the regulator station sensing lines, which were tapped off that section of main, sensed a pressure drop and the regulator station increased output

Division 1-6, page 2

- resulting in a system over pressurization. On site personnel recognized abnormal operating condition and acted to address and mitigate the situation before pressure rose above 1 PSIG.
- **June 21, 2016: Dey St Gate Station (RIS-311), 27 Dey St, East Providence, RI** – Upstream pressure regulation equipment owned by Enbridge malfunctioned allowing elevated pressure gas into the station piping. The downstream block valves owned by the Company were closed at the time for maintenance and protected the downstream system.
 - **December 25, 2017: Wampanoag Trail Gate Station (RIS-004), 259 Wampanoag Trail, East Providence, RI** – Upstream pressure regulation equipment owned by Enbridge malfunctioned allowing elevated pressure gas through the station and into the downstream system, resulting in an excursion over MAOP.
 - **October 31, 2018: Wampanoag Trail Gate Station (RIS-004), 259 Wampanoag Trail, East Providence, RI** – Upstream pressure regulation equipment owned by Enbridge malfunctioned allowing elevated pressure gas through the station and into the downstream system, resulting in an excursion over MAOP.
 - **June 29, 2019: 860 Waterman Ave Regulator Station (RIS-099), East Providence, RI** – Single valve bypass leaked by allowing high pressure gas into the downstream system, resulting in an excursion over MAOP.
- c) The Company has performed Process Hazard Analyses (PHAs) and Layers of Protection Analyses (LOPAs), including a focus on the potential for, and effects of, an over pressure scenario, on each of our current design types, as well as the balance of legacy station design types. The Company recommends and offers to provide a WebEx walkthrough of typical examples of these analyses due to the complex nature of the analysis reports. The Company proposes to provide a walkthrough of analyses for the current standard prefabricated regulator station design type that is the typical install in Rhode Island.

Division 1-7

Request:

The Company's proposed LNG budget for the FY 2021 ISR is \$7.158 Million, up from \$1.434 Million in the prior year. The Company has indicated to the Division that most of the FY 2021 budget for this program (about \$6.14 Million) is for the purchase of a "back-up boil-off compressor" solely for use in case the first compressor goes down. With respect this program, please provide the following information:

- a) What is the condition and life-expectancy of the boil-off compressor that is currently in use?
- b) Has the Company performed any studies / risk analysis of the likelihood of failure? If so, please provide; and
- c) Can the budget for the back-up boil off compressor be phased in over two-years or over a longer period of time? What would that look like? Please explain.

Response:

- a) The boil-off gas compressor system at the National Grid Exeter Liquefied Natural Gas (LNG) plant in Exeter, RI currently utilizes three compressors to maintain tank pressure. Two of the compressors were commissioned in the early 1970's. The design life of compressors is normally 25 to 30 years. These two original compressors are still in relatively good operating condition due to proper maintenance, but when a breakdown occurs, parts are difficult to source as the compressors are no longer supported by the original manufacturer. In 2015, a third compressor was installed and is used as the primary boil-off compressor. The capacity of this new boil-off compressor is 10,000 standard cubic feet per hour (scfh). The two original Chicago Pneumatic boil-off compressors are each rated for 7,500 scfh. The compressors take low pressure boil-off at 15"-39" water column (wc) and compress it to 120 psig. The gas is then injected into the 99 psig distribution system. The LNG tank design maximum boil-off rate is 4,770 scfh. However, with increased plant utilization and associated refilling, more boiloff is generated. This is normal and is no reflection on the tank or insulation, but directly a result of adding warmer LNG from trucks that causes a significant increase in boiloff. But as stated, increased usage of the plant is driving the need for increased boiloff compressor capacity. During times when the tank is being filled the operator needs to utilize multiple compressors to maintain safe tank pressure and avoid venting gas to atmosphere or lifting a tank relief valve. It is, therefore, National Grid's recommendation that two new 10,000 scfh compressors be installed to manage the boiloff flow and

Division 1-7, page 2

provide a redundant spare unit. Procuring and installing two new compressors at the same time is the most cost-effective method of completing the installations.

- b) The Company has not performed any studies/risk analysis of the likelihood of failure but has much operating experience with these machines. Experience has shown that the most likely failures associated with these compressors are broken valves, worn piston rings, and worn rider bands. A catastrophic compressor failure occurred in one of National Grid's New York LNG plants after 25 years of service. This failure was a crack in one of the cylinders. Because a replacement was not available, the machine had to be retired. This is the concern at Exeter given the age and similarity to the machine in New York. As stated above in response a), the design life of compressors is normally 25 to 30 years. The Company is relying on previous experience with numerous similar boil-off compressors at other facilities in New England and New York in estimating the service life and believes that these machines have exceeded their useful service life.
- c) Yes, the boil-off compressor project can be phased in over two-years. In fact, the proposed FY 2021 ISR budget calls for the project to primarily occur over a two-year period. Engineering/Procurement would occur in FY 2021 at an approximate cost of \$2 million and Construction would start in FY 2022 with a current approximate budget of \$1.5 million.

The FY 2021 LNG plan includes five standalone projects for the Exeter facility totaling approximately \$6.14 million, consisting of three plant safety projects accounting for approximately \$4 million. As stated above, the boil-off compressor project contributes to approximately \$2 million of the total budget for FY 2021. National Grid would be able to defer portions of each project to extend the expected budget over multiple years. This would require projects to be broken out into Design-Procure-Construct years. However, in the case of the boil-off compressor project, the Company recommends the project to occur over the two-year period, starting in FY 2021, as is currently proposed.

Division 1-8

Request:

The Company has budgeted \$16.8 Million for Patching Paving Costs in connection with R.I.G.L. § 39-2.2-1 *et seq.* With respect to this amount, please provide the following information:

- a) Identify the timing as to when patches are re-paved under R.I.G.L. § 39-2.2-1 *et seq.* (e.g., one (1) year following installation, etc.);
- b) Confirm R.I.G.L. § 39-2.2-1 *et seq.*'s effective date is July 15, 2019;
- c) Does the Company believe that R.I.G.L. § 39-2.2-1 *et seq.*, only requires the Company to apply the statute's curb to curb paving obligation to patches installed on or after July 15, 2019? Please explain;
- d) Identify the number patches installed from July 15, 2019 through the date of the Company's response;
- e) Identify the number of patches estimated to be installed from the date of this response through March 31, 2020;
- f) Identify the number of patches that will likely be repaved under R.I.G.L. § 39-2.2-1 *et seq.* from April 1, 2020 through July 14, 2020;
- g) Identify the number of patches that will likely be repaved under R.I.G.L. § 39-2.2-1 *et seq.* from July 15, 2020 through March 31, 2021.;
- h) Update the Company's discussions (if any) with RIDOT relative to the promulgation of standards that would mitigate the application of § 39-2.2-1 *et seq.* to patches; and
- i) Identify the all municipalities who have required curb to curb paving for patches in permits after July 15, 2019.

Response:

- a) Final restoration patches for excavations completed for maintenance work (i.e. Leak Repair, Corrosion, Valve Installations, etc.) are typically restored within 30-90 days from the date of the excavation. An exception to this would be winter moratoriums. Some cities and towns put moratoriums on restoration work after December 15th because of falling temperatures; the patch work resumes in March to April timeframe, depending upon weather conditions.

Division 1-8, page 2

In most cases, trenches and associated patches related to Main Replacement/Extension projects are restored by milling and paving in the next calendar year from the date of project completion. On a limited basis, some final restoration paving will occur in the **same calendar year of the project completion.**

- b) The Company confirms that the effective date of R.I. Gen. Laws § 39-2.2-1 is July 15, 2019. The application of that effective date means that for any permits received prior to July 15, 2019, the Company will follow the requirements of those permits. Any permits received on or after July 15, 2019 will fall under the jurisdiction of R.I. Gen. Laws § 39-2.2-1 at the discretion of the respective Town, City, or State Department of Public Works (DPW) Director's (or designee) authority, which may include curb to curb paving.
- c) Please see the Company's response to section (b) above.
- d) The Company estimates that approximately 1,800 final restoration patches were completed between July 15, 2019 and November 15, 2019.
- e) The Company estimates that approximately 600-800 final restoration patches will be completed from November 16, 2019 through March 31, 2020. The number of final restoration patches that can be completed during this upcoming period is restricted by several factors. First, some cities and towns put winter moratoriums on restoration work after December 15th because of falling temperatures; the work is typically able to resume in March or April, depending upon weather conditions. Second, the supply of hot asphalt is affected by the closure of asphalt plants during the winter months (December - February). Third, temperature restrictions on asphalt installations per Rhode Island Department of Transportation (RIDOT) requirements also limit the number of patches that can be installed during winter months.
- f) The Company estimates that approximately 1,200 final restoration patches will be completed between April 2, 2020 through July 14, 2020.
- g) The Company estimates that approximately 2,400 final restoration patches will be completed between July 15, 2020 through March 31, 2021.
- h) The Company last met with RIDOT on September 25, 2019 to discuss R.I. Gen. Laws § 39-2.2-1. At that time, RIDOT projected the end of October 2019 as the approximate timeframe of when they may have been able to issue guidelines to Rhode Island Cities and Towns regarding the application of R.I. Gen. Laws § 29-2.2-1. This guidance is anticipated to include guidance on patches. As of November 19, 2019, the Company does not have an updated time table of when RIDOT may issue their guidance regarding

Division 1-8, page 3

R.I. Gen. Laws § 29-2.2-1. However, the Company is attempting to receive updated information from RIDOT.

- i) As of the date of this response, the Company is aware that the City of Woonsocket is the only municipality that has required curb-to-curb paving on patches for permits issued on or after July 15, 2019.

The Narragansett Electric Company
d/b/a National Grid
In Re: Division's Review of FY 2021 Proposed Gas ISR Plan
Responses to Division's First Set of Data Requests
Issued November 8, 2019

Division 1-9

Request:

Incremental PE (professional engineer) expenses purportedly to be incurred under R.I.G.L. § 5-8-21 have not been included in the Company's FY 2021 Gas ISR Plan yet the Company has indicated to the Division that it anticipates seeking recovery of certain PE costs / expenses in its FY 2021 ISR Plan. Please provide the following information:

- a) detailed summary of incremental PE capital costs / expenses that will be included in the Company's FY 2021 ISR Plan when it is filed with the PUC; and
- b) Explain why the costs / expenses identified in a) are appropriate for inclusion in the FY 2021 Gas ISR Plan rather than in base rates.

Response:

- a) The chart below provides a detailed breakdown of the Professional Engineer (PE) Stamp capital costs that the Company currently estimates will be included in the Company's FY 2021 ISR Plan when it is filed with the Public Utilities Commission (PUC):

FY 2021			
Category	Estimated Project Count	Estimated Cost per Project	Total Estimated Cost
CSC/Public Works	70	\$ 5,000	\$ 350,000
CSC/Public Works - Encroachments	30	\$ 3,500	\$ 105,000
Corrosion	10	\$ 3,500	\$ 35,000
Proactive Main and Service Replacements	160	\$ 5,000	\$ 800,000
Reliability	45	\$ 5,000	\$ 225,000
			\$ 1,515,000

- b) The estimated PE Stamp costs that are detailed in Response a) are appropriate for inclusion in the FY 2021 Gas ISR Plan, rather than base rates, because the PE review step will now be a defined or required step of each applicable project. As these costs will now be a requirement of specific applicable projects such as a requirement for a police detail, the PE costs are appropriate to include in the ISR Plan along with the associated project work, which is already included in the ISR Plan.

Division 1-10

Request:

The Company has included \$200,000 in its FY 2021 for a "Cumberland Tank Replacement feasibility study. The Division has recently been informed that the Company has decided to execute a TGP pipeline contract for 20,000 Dt/day as a "Long-term Solution" for Cumberland, RI in the not to distance future. Why is the \$200,000 for this study still appropriate to include in the FY 2021 Gas ISR Plan? Please explain.

Response:

The Company believes it is appropriate to pursue the Cumberland Tank replacement project in parallel with the TGP pipeline contract. The time to develop the design, obtain the requisite permits, and construct the Liquefied Natural Gas (LNG) Tank would require approximately five years. The Company expects that a new tank would not be larger in size than the original tank (as reflected by the preliminary siting analysis conducted). See the Company's response to Division 1-11. The original tank held approximately 86,000 dts and was capable of vaporizing up to approximately 32,000 dth/ day (representing a 2.6-day supply). Pursuing and implementing both options would allow the LNG plant to be used to meet peak requirements on the very coldest days, while the TGP pipeline contract would be used on both peak days as well as throughout the peak season to meet customer requirements.

Division 1-11

Request:

The Division was recently informed that the Company had retained a firm to perform a study to assess obstacles (regulatory, legal, *etc.*) associated with constructing an LNG tank on property in Cumberland, RI where the demolished Cumberland LNG Tank had been located. The Division was further informed that the study had indicated that constructing such a tank was possible:

- a) Please provide that study; and
- b) What is the Company's current position regarding constructing a replacement LNG Tank on the property where the demolished Cumberland LNG Tank had been located?

Response:

- a) CH-IV International conducted a preliminary siting analysis for National Grid. Please see Confidential Attachment DIV 1-11, for a copy of the report, entitled "*Preliminary Siting Analysis Cumberland LNG,*" issued November 13, 2019.
- b) As discussed in the Company's response to Division 1-10, the Company believes it is appropriate to pursue a replacement Liquefied Natural Gas (LNG) Tank on the Cumberland LNG Facility site. The Company intends to pursue the project at this site while retaining flexibility as to the exact location of the tank on the property in order to meet federal, state, and any local siting requirements. The tank will be a full containment type, which does not rely on an external dike for containment but instead uses a full containment outer "shell" that is designed to contain any liquid. Other measures that are mentioned in the report, provided as Confidential Attachment DIV 1-11, to ensure that the thermal radiation and vapor dispersion models are acceptable will be taken to ensure that the tank meets all current code safety requirements. The next step for this project is to conduct a more detailed computer modeling study (referred to in the study as FLACS).

The Narragansett Electric Company
d/b/a National Grid
In Re: Division's Review of FY 2021 Proposed Gas ISR Plan
Responses to Division's First Set of Data Requests
Issued November 8, 2019

REDACTED
Attachment DIV 1-11

The Company is seeking confidential treatment of Attachment DIV 1-11 in accordance with
Rule 815-RICR-00-00-1.3(D)

The paper copies of Confidential Attachment DIV 1-11 are being hand delivered to the Division.

Division 1-12

Request:

Please provide the Allens Avenue Multi Station Rebuild Project Summary as previously requested.

Response:

The Allens Avenue Multi Station Rebuild project is a multi-year project designed to replace or retire eight (8) existing pressure regulating facilities at the Company's major gas interchange in Providence, RI. The project scope consists of three phases of work, as well as the installation of a filter-separator as detailed below:

- **Phase I:** This phase consists of the following: (i) Replace the (4) existing 200PSIG to 99PSIG regulator stations at the Allens Avenue facility in Providence, RI with a single regulator station located in a building elevated above projected flood levels; (ii) Tie in the Providence LNG sendout line to the inlet header and make provisions to tie in the Providence LNG liquefaction tail-gas line to the outlet header; and (iii) Install main connection near Allens Avenue CNG station to tie in the North 99PSIG system to the South 99PSIG system.
- **Filter-Separator:** Install a filter-separator on the 200PSIG pipeline in the Allens Avenue facility (upstream of all regulator stations) to protect from liquid and particulates.
- **Phase II:** Replace the existing 99PSIG to 35 PSIG, 99PSIG to 10PSIG, and 99PSIG to 7PSIG regulator stations at the Allens Avenue facility with new prefabricated regulator stations at 3 locations in the Providence distribution systems.
- **Phase III:** Abandon the existing (8) regulator stations and associated above-grade piping and structures in the central portion of the Allens Avenue facility.

Division 1-12, page 2

The chart and additional detail below provide an overview of the project spend, by phase, and forecast drivers:

Allens Avenue Multi-Station Rebuild Project - Annual Cost Summary

Project Spend (\$M)	FY16 Total	FY17 Total	FY18 Total	FY19 Total	FY20 Forecast	FY21 Forecast	FY22 Forecast	Project Total Forecast
Phase I	\$1.10	\$2.20	\$7.40	\$2.50	\$9.34	\$2.90		\$25.44
Filter-Separator	\$0.10	\$1.90	\$0.10					\$2.10
Phase II						\$4.60		\$4.60
Phase III				\$0.30			\$2.00	\$2.30
ISR Total	\$1.20	\$4.10	\$6.14	\$1.54	\$6.68	\$7.50	\$2.00	\$29.17
Non-ISR* Total			\$1.40	\$1.26	\$2.66			\$5.32
Total	\$1.20	\$4.10	\$7.50	\$2.80	\$9.34	\$7.50	\$2.00	\$34.44

* Note: Allens Avenue LNG-related costs are excluded from the ISR.

- National Grid's in-house Project Estimating methodology and capability has evolved and improved significantly in recent years. In particular, new estimates fully account for all Company labor (particularly engineering, project management, and project supervision) and the associated labor overhead impact.
- Based on the past few years' experience excavating at this property, real experienced costs for dewatering, soil management, and environmental scientist costs are now included in the forecast for future work.
- Recent results of contractor bid events have provided more accurate contractor cost forecasts.

The Narragansett Electric Company
d/b/a National Grid
In Re: Division's Review of FY 2021 Proposed Gas ISR Plan
Responses to Division's First Set of Data Requests
Issued November 8, 2019

Division 1-13

Request:

Please provide as previously requested: High, Medium, Low FY 21 Gas ISR Plan alternative proposals.

Response:

Please see the attached Excel spreadsheet which shows illustrative Medium and Low cost scenarios for the FY 21 Gas ISR plan. The High scenario show reflects the proposal submitted to the Division on September 27, 2019. Incremental paving costs are not included in the scenario comparisons. Much of the incremental paving cost is associated with patch restoration for leak repairs, which remain constant in all scenarios. In addition, main replacement work has not been significantly reduced in the Medium and Low scenarios except for the Southern RI Gas Expansion project. The cost of compliance with the new paving law and the new Professional Engineering law will be included in the Company's final proposal.

A comparison of the scenarios is shown in the table below. An Excel file with line item comparisons is included as Division 1-13 Attachment 1.

	\$(000)	Proposed Plan (High)	Medium Case	Low Case
NON-DISCRETIONARY				
Public Works		\$ 17,368	\$ 17,368	\$ 17,368
Mandated Programs		\$ 21,702	\$ 21,702	\$ 21,637
Damage / Failure (Reactive)		\$ 249	\$ 249	\$ 249
NON-DISCRETIONARY TOTAL		\$ 39,319	\$ 39,319	\$ 39,254
DISCRETIONARY				
Proactive Main Replacement		\$ 68,441	\$ 68,441	\$ 68,441
Proactive Service Replacement		\$ 350	\$ 350	\$ 350
Heat Decarbonization		\$ 1,000	\$ 1,000	\$ -
Reliability		\$ 40,396	\$ 36,973	\$ 35,038
SUBTOTAL DISCRETIONARY (Without Gas Expansion)		\$ 110,187	\$ 106,764	\$ 103,829
Southern RI Gas Expansion Project		\$ 40,460	\$ 38,960	\$ 33,568
DISCRETIONARY TOTAL (With Gas Expansion)		\$ 150,647	\$ 145,723	\$ 137,396
Gas ISR TOTAL (Base)		\$ 149,506	\$ 146,083	\$ 143,083
GAS ISR TOTAL (With Gas Expansion)				
AMOUNT DOES NOT INCLUDE INCREMENTAL PAVING COSTS ASSOCIATED WITH NEW RI PAVING LAW OR PE STAMPS		\$ 189,966	\$ 185,042	\$ 176,651

Given that the majority of ISR work categories contain work that is either mandated or required for system integrity and reliability as detailed in our Distribution Integrity Management Plan (DIMP), the majority of work contained in the plan cannot be deferred without increasing risk.

Division 1-13, page 2

Lower risk work, or work where risk can be mitigated through increased inspection and maintenance efforts were removed. Items removed in the Medium and Low scenarios include:

Pressure Regulating Facilities

- Reductions taken in both Medium and Low Scenarios.
- Defers replacement of 1 station into FY22.
- Risk impact of reduction: Increases risk of system failure.
- Overall budget impact: Reduces potential cost efficiencies that come from bundling bids/contracts.

Gas System Reliability

- Reduction taken in Low Scenario.
- Defers 1 reliability program.
- Risk impact of reduction: Risk of poor system pressure and/or customer outages.
- Mitigation Strategy: Run system pressures closer to Maximum Operating Pressure.

LNG

- Reduction taken in Low Scenario
- Shifts costs to FY22 for portion of Exeter Boiloff Compressor and Critical Spares.
- Reduces critical work on Exeter AESD System.
- Risk impact of reduction: AESD System – increased risk of obsolete controls causing plant shutdown or not shutting down when called upon.
- Mitigation Strategy: Continue instrument maintenance and testing plan in place to ensure existing plant shut down equipment is fully operational.

Heat Decarbonization

- Reduction taken in Low Scenario.
- Impact of reduction: Lack of funding to advance technologies/ programs that reduce Rhode Island's carbon emissions. May require alternative funding source.

Main Replacement (Reactive) – Maintenance (incl Water Intrusion)

- Reduction taken in Low Scenario.
- Will result is a small reduction in the number of water intrusion jobs completed
- Risk impact of reduction: It may increase leaks and service interruptions due to water intrusion.
- Mitigation strategy: Will repair existing leaks and respond to and address customer outage complaints if they should occur. Will schedule those sections for repair in future years as part of the Proactive main replacement program.

Division 1-13, page 3

Southern RI Gas Expansion Project

- Reductions taken in Medium and Low Scenarios.
- Medium scenario assumes purchase of long lead materials (gas main) for FY21 completed in FY20.
- Low scenario assumes actions from Medium scenario along with assumed reduction of total pipeline being installed in FY21
- Overall budget impact of Low Scenario: Potentially increases overall project costs by changing scope of contracted work for FY21.

The Narragansett Electric Company
d/b/a National Grid
In Re: Division's Review of FY 2021 Proposed Gas ISR Plan
Responses to Division's First Set of Data Requests
Issued November 8, 2019

Attachment DIV 1-13

Please see also Excel file with line item comparisons is included as Division 1-13 Attachment 1.

Narragansett Gas

FY 2021 - ISR Scenarios - 11/13/2019

\$(000)

	Proposed Plan (High)	Medium Case	Low Case
NON-DISCRETIONARY			
Public Works			
<i>CSC/Public Works - Non-Reimbursable</i>	\$ 17,368	\$ 17,368	\$ 17,368
<i>CSC/Public Works - Reimbursable</i>	\$ 1,403	\$ 1,403	\$ 1,403
<i>CSC/Public Works - Reimbursements</i>	\$ (1,402)	\$ (1,402)	\$ (1,402)
Public Works Total	\$ 17,368	\$ 17,368	\$ 17,368
Mandated Programs			
<i>Corrosion</i>	\$ 1,185	\$ 1,185	\$ 1,185
<i>Purchase Meters (Replacements)</i>	\$ 4,851	\$ 4,851	\$ 4,851
<i>Reactive Leaks (CI Joint Encapsulation/Service Replacement)</i>	\$ 12,280	\$ 12,280	\$ 12,280
<i>Service Replacements (Reactive) - Non-Leaks/Other</i>	\$ 2,096	\$ 2,096	\$ 2,096
<i>Main Replacement (Reactive) - Maintenance (incl Water Intrusion)</i>	\$ 680	\$ 680	\$ 615
<i>Transmission Station Integrity</i>	\$ 610	\$ 610	\$ 610
Mandated Total	\$ 21,702	\$ 21,702	\$ 21,637
Damage / Failure (Reactive)			
Damage / Failure (Reactive)	\$ 249	\$ 249	\$ 249
NON-DISCRETIONARY TOTAL	\$ 39,319	\$ 39,319	\$ 39,254
DISCRETIONARY			
Proactive Main Replacement			
<i>Main Replacement (Proactive) - Leak Prone Pipe</i>	\$ 61,794	\$ 61,794	\$ 61,794
<i>Main Replacement (Proactive) - Large Diameter LPCI Program</i>	\$ 4,398	\$ 4,398	\$ 4,398
<i>Atwells Avenue</i>	\$ 2,250	\$ 2,250	\$ 2,250
Proactive Main Replacement Total	\$ 68,441	\$ 68,441	\$ 68,441
Proactive Service Replacement			
Proactive Service Replacement Total	\$ 350	\$ 350	\$ 350
Heat Transformation			
Heat Decarbonization Total	\$ 1,000	\$ 1,000	\$ -
Reliability			
<i>Gas System Control</i>	\$ 118	\$ 118	\$ 118
<i>System Automation</i>	\$ 1,252	\$ 1,252	\$ 1,252
<i>Heater Installation Program</i>	\$ 2,961	\$ 2,961	\$ 2,961
<i>Pressure Regulating Facilities</i>	\$ 9,349	\$ 5,926	\$ 4,915
<i>Allens Ave Multi Station Rebuild</i>	\$ 7,500	\$ 7,500	\$ 7,500
<i>Take Station Refurbishment</i>	\$ 995	\$ 995	\$ 995
<i>Valve Installation/Replacement (incl Storm Hardening & Middletown/Newport)</i>	\$ 676	\$ 676	\$ 676
<i>Gas System Reliability</i>	\$ 2,986	\$ 2,986	\$ 2,787
<i>I&R - Reactive</i>	\$ 1,392	\$ 1,392	\$ 1,392
<i>Distribution Station Over Pressure Protection</i>	\$ 3,636	\$ 3,636	\$ 3,636
<i>LNG</i>	\$ 7,158	\$ 7,158	\$ 6,433
<i>Replace Pipe on Bridges</i>	\$ 1,500	\$ 1,500	\$ 1,500
<i>Access Protection Remediation</i>	\$ 260	\$ 260	\$ 260
<i>Tools & Equipment</i>	\$ 612	\$ 612	\$ 612
Reliability Total	\$ 40,396	\$ 36,973	\$ 35,038
SUBTOTAL DISCRETIONARY (Without Gas Expansion)	\$ 110,187	\$ 106,764	\$ 103,829
<i>Southern RI Gas Expansion Project</i>	\$ 40,460	\$ 38,960	\$ 33,568
DISCRETIONARY TOTAL (With Gas Expansion)	\$ 150,647	\$ 145,723	\$ 137,396
Gas ISR TOTAL (Base)	\$ 149,506	\$ 146,083	\$ 143,083
GAS ISR TOTAL (With Gas Expansion)			
AMOUNT DOES NOT INCLUDE INCREMENTAL PAVING COSTS ASSOCIATED WITH NEW RI PAVING LAW OR PE STAMPS	\$ 189,966	\$ 185,042	\$ 176,651