The Narragansett Electric Company
d/b/a National Grid

Gas Infrastructure, Safety, and Reliability Plan FY 2020 Proposal

December 20, 2018

RIPUC Docket No. 4916

Submitted to:
Rhode Island Public Utilities Commission

nationalgrid

Filing Letter

Robert J. Humm
Senior Counsel

December 20, 2018

VIA HAND DELIVERY & ELECTRONIC MAIL

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

RE: National Grid's Proposed FY 2020 Gas Infrastructure, Safety, and Reliability Plan Docket No. 4916

Dear Ms. Massaro:

In compliance with R.I. Gen. Laws § 39-1-27.7.1, enclosed please find 10 copies of National Grid's[1] proposed Gas Infrastructure, Safety, and Reliability (ISR) Plan (Gas ISR Plan or Plan) for fiscal year (FY) 2020. The Gas ISR Plan is designed to enhance the safety and reliability of National Grid's natural gas distribution system. As required by law, National Grid submitted the proposed Plan to the Division of Public Utilities and Carriers (Division) for review, and National Grid has consulted with the Division's representatives regarding the proposed Plan. The Division has indicated general concurrence with the proposed Plan, including the programs and projects outlined in the Plan, and will continue to review the Plan and its costs after filing, consistent with prior Gas ISR Plan filings.

The Gas ISR Plan is designed to protect and improve the gas delivery system through proactively replacing leak-prone pipe; upgrading the system's custody transfer stations, pressure regulating facilities, and peak shaving plants; responding to emergency leak situations; and addressing conflicts that arise out of state, municipal, and third-party construction projects. The Plan is intended to achieve these safety and reliability goals through a cost-effective, coordinated work plan. The level of work that the Plan provides will sustain and enhance the safety and reliability of the Rhode Island gas distribution infrastructure and directly benefit all Rhode Island gas customers.

The Plan includes a description of the categories of work National Grid proposes to perform in FY 2020, as well as the proposed targeted spending levels for each work category. In addition to the Plan, this filing includes the pre-filed direct testimony of three witnesses. John B. Currie introduces the Plan document and describes the program components of the Plan; Melissa A. Little describes the calculation of National Grid's FY 2020 revenue requirement under the Plan; and Michael J. Pini describes the calculation of the Gas ISR factors proposed in this filing and provides

[1] The Narragansett Electric Company d/b/a National Grid.

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the bill impacts from the proposed rate changes. For the average residential heating customer using 845 therms annually, implementation of the proposed ISR factors for the period of April 1, 2019 through March 31, 2020 will result in an annual increase of $20.81, or 1.6 percent.

The Gas ISR Plan presents an opportunity to facilitate and encourage investment in National Grid's gas utility infrastructure and enhance National Grid's ability to provide safe, reliable, and efficient gas service to customers.

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: Christy Hetherington, Esq.
Al Mancini, Division
John Bell, Division
Rod Walker, Division

Testimony of
John B. Currie

THE NARRAGANSETT ELECTRIC COMPANY
d/b/a NATIONAL GRID
RIPUC DOCKET NO. 4916
RE: FY 2020 GAS INFRASTRUCTURE,
SAFETY, AND RELIABILITY PLAN
WITNESS: JOHN B. CURRIE

DIRECT TESTIMONY

OF

JOHN B. CURRIE

December 20, 2018

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I. INTRODUCTION AND QUALIFICATIONS

Q. Please state your name and business address.

A. My name is John B. Currie. My business address is 40 Sylvan Road, Waltham, MA 02451.

Q. By whom are you employed and in what capacity?

A. I am employed by National Grid USA Service Company, Inc. as Director of New England Gas Network Strategy. I am the Rhode Island jurisdictional lead for all gas issues for the gas division of The Narragansett Electric Company d/b/a National Grid (Company), including those related to the Company's capital investment strategy. In my role, I work closely with the Rhode Island Jurisdictional President, Timothy Horan, and jurisdictional staff on all local issues related to the Company's Rhode Island gas system. My responsibilities also include working with Rhode Island regulators on issues related to the gas system, development of strategies to support Company objectives regarding investment in the gas system, and to provide testimony regarding capital investments in National Grid's gas distribution system during state regulatory proceedings.

Q. Please describe your educational background and professional experience.

A. I graduated from Saint Michael's College in 1987 with a Bachelor of Science degree in

Accounting. In 2000, I graduated from Bentley University with a Master of Science degree in Taxation.

From 1987 to 1989, I worked as a staff accountant at Price Waterhouse (now PricewaterhouseCoopers). In 1989, I was employed by New England Electric System, a predecessor company to National Grid, in internal audit. From 1998 to 2016, I held roles of increasing responsibility related to Plant Accounting, Finance, and Regulation. I assumed my current position at National Grid in October 2016.

Q. Have you previously testified before the Rhode Island Public Utilities Commission (PUC)?

A. Yes. I testified before the PUC in support of the Company's fiscal year (FY) 2018 and FY 2019 Gas Infrastructure, Safety, and Reliability (ISR) Plans in Docket Nos. 4678 and 4781, respectively. In addition, I have testified before the Massachusetts Department of Public Utilities in support of capital projects, including the gas system enhancement plan focused on the replacement of leak-prone pipe for Boston Gas Company and Colonial Gas Company.

II. PURPOSE OF TESTIMONY

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to describe the Company's proposed FY 2020 Gas ISR Plan (Gas ISR Plan or Plan).[1] Through my testimony, I present the Company's Gas ISR Plan, which details the work the Company expects to complete under the Plan and the anticipated capital investments associated with that work. Company Witness Melissa A. Little is providing testimony on the calculation of the revenue requirement associated with the Company's Plan, and Company Witness Michael J. Pini is providing testimony relative to (1) how the Company calculated the rate design for the ISR mechanism; (2) the calculation of the ISR factors; and (3) the customer bill impacts of the proposed ISR factors.

III. OVERVIEW

Q. How did the Company prepare the Gas ISR Plan?

A. The Company prepared the Gas ISR Plan and submitted it to the Division of Public Utilities and Carriers (Division) for review on September 28, 2018.[2] On November 7, 2018, the Company met with the Division regarding the Plan and subsequently responded to discovery requests from the Division about various components of the Plan. On

[1] The Company is required by statute to annually file an infrastructure, safety, and reliability spending plan with the PUC for review and approval. *See* R.I. Gen. Laws § 39-1-27.7.1(d). In addition to budgeted spending, the annual Gas ISR Plan must contain a reconcilable allowance for the Company's anticipated capital investments and other spending for the upcoming fiscal year. *See* R.I. Gen. Laws § 39-1-27.7.1(c)(2). For FY 2020, the Company's fiscal year is for the period of April 1, 2019 through March 31, 2020, so the Plan would be effective April 1, 2019.

[2] R.I. Gen. Laws § 39-1-27.7.1(d) requires that the Company and the Division work together over the course of 60 days in an attempt to reach an agreement on a proposed plan, which is then submitted to the PUC for review and approval within 90 days.

November 8, 2018, the Company conducted field visits with the Division to provide the Division with the opportunity to observe various capital projects that have been completed, are currently under construction, and/or are planned for future periods. The Company and the Division continued to collaborate regarding the proposed Plan on a number of occasions, including subsequent meetings on November 30, December 11, December 12, and December 13, 2018. The Company also responded to several formal and informal supplemental data requests from the Division. The Division has indicated general concurrence with the proposed Gas ISR Plan, including the programs and projects outlined in the Plan, and will continue to review the Plan and its costs after filing, consistent with prior Gas ISR Plan filings. Overall, the Gas ISR Plan will allow the Company to meet state and federal safety and reliability requirements and maintain its gas distribution system in a safe and reliable condition. The Plan has been developed to improve the safety and reliability of the Company's gas system for the immediate and long-term benefit of Rhode Island's natural gas customers.

Q. What is the Gas ISR Plan designed to accomplish?

A. The Gas ISR Plan is designed to establish a spending plan, together with a reconcilable allowance for the anticipated capital investments and other spending needed to maintain and upgrade the Company's gas delivery system, such as proactively replacing leak-prone gas mains; upgrading the system's plant, pressure regulating systems, and piping;

responding to emergency leak situations; and addressing conflicts that arise out of public works projects. The Plan attempts to attain the Company's safety and reliability goals through a cost-effective, coordinated work plan. The level of work that the Plan provides will sustain and enhance the safety and reliability of the Rhode Island gas pipeline infrastructure and directly benefit Rhode Island gas customers. The Company now submits the Plan to the PUC for review and approval in accordance with Rhode Island law.[3]

Q. Are you sponsoring any exhibits through your testimony?

A. Yes. The proposed Gas ISR Plan is attached as Exhibit 1 to my testimony. The Plan is organized as follows:

Section 1 – Introduction and Summary

Section 2 – Gas Capital Investment Plan (including major categories of work)

Section 3 – Revenue Requirement Calculation

Section 4 – Rate Design and Bill Impacts

My testimony focuses on Sections 1 and 2 of the Plan. As noted earlier, Ms. Little is sponsoring the revenue requirement calculation included in Section 3 of the Plan, and Mr. Pini is sponsoring the rate design and bill impacts included in Section 4 of the Plan.

[3] *See* R.I. Gen. Laws § 39-1-27.7.1(d).

Q. What types of infrastructure, safety, and reliability work does the Gas ISR Plan include?

A. The Gas ISR Plan seeks not only to maintain the Company's distribution system, but also to proactively upgrade the system's condition to address problems before they arise. A safe and reliable gas delivery system in Rhode Island is essential to the health, safety, and well-being of its citizens, and for maintaining a healthy economy and continuing to attract new residents and businesses to Rhode Island. In 2008, the PUC embarked on a course of addressing Rhode Island's aging gas infrastructure with the establishment of the Accelerated Replacement Plan. The Company filed its first Gas ISR Plan on December 20, 2010 for FY 2012. In addition to the type of infrastructure, safety, and reliability work performed under the Accelerated Replacement Plan, the Gas ISR Plan contains spending related to safety and reliability for Public Works, Mandated programs, and Reliability programs, including Gas Expansion. Included in the Plan document is a description of the Company's proposed budget for capital investment for FY 2020 and a capital forecast for FY 2021 through FY 2024. As agreed with the Division, given the magnitude of the scope and cost for the Gas Expansion project in Southern Rhode Island (the Southern Rhode Island Project), the Company will manage any deviations from the FY 2020 Southern Rhode Island Project budget separately from the overall Discretionary budget under the Plan. If deviations do occur with the Southern Rhode Island Project, the Company will neither advance nor delay other Discretionary work to compensate for

those changes in FY 2020 costs. This year's Plan also includes a section describing the history and effectiveness of the Gas ISR Plan and a copy of the most recent System Integrity Report, as ordered by the PUC last year in Docket No. 4781.

IV. CAPITAL INVESTMENT PLAN

Q. What levels of spending are proposed in the Gas ISR Plan?

A. For FY 2020, the Company proposes to invest a total of $162.46 million, including $36.59 million for Non-Discretionary capital expenditures and $125.87 million for Discretionary capital expenditures, which includes $44.46 million for the Southern Rhode Island Project. Excluding the Southern Rhode Island Project, the Company proposes spending totaling $118.00 million. The Plan is broken down into categories of Non-Discretionary and Discretionary programs designed to maintain the safety and reliability of the Company's gas delivery infrastructure. Non-Discretionary programs include work required by legal, regulatory code, and/or agreement, or a result of damage or failure, with limited exceptions. Discretionary programs are not required by legal, regulatory code, and/or agreement, with limited exceptions.

Q. What levels of spending is the Company proposing for Non-Discretionary programs?

A. For each Non-Discretionary program category in the Gas ISR Plan, the Company

proposes the following levels of spending:

- $16.94 million net investment for Public Works programs, including $18.32 million in capital spend and $1.38 million in reimbursements;

- $19.40 million for Mandated Programs (i.e., Corrosion, Purchase Meter Replacements, Reactive Leaks (Cast Iron Joint Encapsulation/Service Replacements), Service Replacements (Reactive) – Non Leaks/Other, and Main Replacement (Reactive) – Maintenance (including Water Intrusion)); and

- $0.25 million for Damage/Failure projects.

Q. What levels of spending is the Company proposing for Discretionary programs?

A. For each Discretionary program category in the Gas ISR Plan, the Company proposes the following levels of spending:

- $62.88 million for the Proactive Main Replacement program (i.e., Proactive Main Replacement, Large Diameter, and Atwells Avenue project);

- $18.53 million for Gas System Reliability, including work relative to Gas System Control, System Automation, Heater Program, Pressure Regulating Facilities, Allens Avenue Multi Station Rebuild, Valve Installation Replacement, Take Station Refurbishment, Gas System Reliability Enhancement, Instrumentation and Regulation – Reactive, Liquefied Natural Gas (LNG) facilities, Replace Pipe on Bridges, Access Protection Remediation, and Tools and Equipment; and

- $44.46 million for the Southern Rhode Island Project (Gas Expansion).

The Company will continue to file quarterly reports with the Division and PUC detailing the progress of its Gas ISR Plan programs for FY 2020.

Q. How does the Company plan to treat the replacement of leak-prone pipe in Rhode Island in FY 2020?

A. To continue to provide safe and reliable gas service to its Rhode Island customers, the Company is proposing to abandon 61.2 miles of leak-prone pipe in FY 2020, which is an increase from the 60 miles included in the FY 2019 targets approved by the PUC. The Large Diameter and Atwells Avenue Main Replacement programs are contributing 1.2 miles to this total. The Public Works and Proactive Main Replacement programs represent the primary proactive replacement programs, through which the Company is proposing to abandon a total of 60 miles. At an average cost of approximately $1.30 million per mile, the Company is proposing FY 2020 spending of $62.89 million for the Proactive Main Replacement program and $16.94 for the Public Works program. The value of and need for targeted spending on the replacement of leak-prone gas main is well-documented, and is only increasing in importance as these facilities continue to age. The Company expects the annual abandonment target will increase to 65 miles in FY 2021.

Q. What is the difference between installation miles and abandonment miles in relation to the replacement of leak-prone pipe?

A. Installation miles represent the units of new main that are required to be connected to the distribution system. Thus, installation miles represent the main driver for unit costs when combined with service relays and tie overs. Abandonment miles represent the total of the old leak-prone pipe that is retired or disconnected from the distribution system. In some instances, the existence of parallel leak-prone main provides the Company with the opportunity to install a single section of new main to abandon two sections of existing leak-prone main. This will result in annual leak-prone pipe replacement program targets where total abandonment miles exceed total installation miles.

Q. **How do the FY 2020 leak-prone pipe replacement programs compare to the FY 2019 programs?**

A. The table below provides a summary of the installation and abandonment miles for the Public Works and Proactive Main Replacement programs. This table excludes the Large Diameter and the Atwells Avenue Main Replacement programs because the nature of those programs are not suitable for year-over-year comparison.

	FY 2019	FY 2020	Inc. / (Dec.)
Dollar amounts in ($000)			
Installation Miles:			
Public Works Miles	10	13	3
Proactive Main Replacement Miles	43	44	1
Total Installation Miles	53	57	4
Public Works Spending	$ 11,084	$ 16,940	$ 5,856
Proactive Main Spending	$ 52,802	$ 57,184	$ 4,382
Total Installation Spending	$ 63,886	$ 74,124	$ 10,238
Average Cost Per Mile	$ 1,205	$ 1,300	$ 95
Abandonment Miles:			
Public Works	10	13	3
Proactive Main Replacement	50	47	(3)
Total Installation Miles	60	60	-

This table shows that the FY 2020 total abandonment miles will remain constant at 60 miles. However, the FY 2019 Plan included seven miles of parallel mains abandoned as compared to only three miles of parallel mains expected to be abandoned in FY 2020. This has resulted in an increase of four installation miles to achieve 60 abandonment miles in FY 2020. The number of installation miles, inflation, and increases in the cast iron abandonment percentage from 55 percent to 60 percent are contributing to the overall increases in leak-prone pipe replacement program costs.

Q. Have the Company's efforts at replacing leak-prone pipe been effective?

A. Yes. When the ISR program was first implemented in FY 2012, approximately 48 percent of the Company's gas distribution system in Rhode Island was comprised of leak-prone pipe. Through the FY 2018 Gas ISR Plan, the Company has abandoned a total of 384 miles of leak-prone pipe, which has contributed to an estimated reduction of 1,075 gas leaks. An important system performance indicator regarding the effectiveness of the Company's leak-prone pipe abandonment program is the number of leak receipts. Since 2008, the Company has seen a downward trend on leak receipts, which indicates that the ISR program and former Accelerated Replacement Program have contributed to this result. More details regarding the effectiveness of the Gas ISR Plan are provided in the Company's most recent System Integrity Report (2017), included as part of the Plan at Schedule 1.

Q. Has the Company made any modifications in the Plan related to the replacement of leak-prone pipe?

A. Yes. The Company has renewed its Large Diameter Program, where there is an inventory of 37 miles of leak-prone pipe greater than 12-inches in diameter. For 2020 the Company proposes to spend $4.42 million to address approximately one mile of large diameter main through lining or sealing techniques. The Company put this program on hold in FY 2019 to mitigate the impact of the Special Projects that needed to be funded in that Plan, but the need to replace the large diameter inventory necessitates the inclusion

of the program in FY 2020. In addition, the FY 2020 Plan includes the Atwells Avenue Main Replacement project. FY 2020 is the first year of a three year program to abandon 1.3 miles (6,820 feet)of cast iron main that has recently experienced four gas main breaks in a high traffic area. In the first year of the Atwells Avenue Main Replacement project, the Company proposes to address the highest risk segment, comprised of 0.2 miles (965 feet) of main at a cost of $1.18 million.

Q. What is the Southern Rhode Island Project?

A. The Gas ISR Plan includes a Gas Expansion project, the Southern Rhode Island Project, as part of the Company's Discretionary work. The Company first introduced the Southern Rhode Island Project in the FY 2019 Gas ISR Plan as a Special Project. The more than 30,000 customers in the Company's Southern Rhode Island service territory are served by almost 600 miles of distribution infrastructure, including approximately 77 miles of distribution main operating at pressures of 99 pounds per square inch gauge (psig) and above (the Southern Rhode Island Distribution Mains). To address gas capacity issues in Southern Rhode Island, the Company proposes to reinforce the Southern Rhode Island Distribution Mains by installing approximately five miles of new 20-inch steel distribution main parallel to the existing 12-inch distribution main located beneath Route 2 (a Rhode Island Department of Transportation right-of-way) through the towns of Warwick, West Warwick, and East Greenwich. The proposed parallel

distribution main will be constructed to be in-line inspected, initially operated at 99 psig, and designed for a maximum allowable operating pressure (MAOP) of 200 psig to meet future demand. The new distribution main will be placed in-service in phases between FY 2020 and FY 2022, with normal operation at 99 psig and the potential to operate at 200 psig after a district regulator station is installed in the future near South Road in East Greenwich. This project will also require work on existing regulator and take stations in FY 2021. Based on current forecasts, each segment will add immediate capacity that will maintain system pressure to support projected residential and commercial loads. Once all of the segments are completed, it is expected that approximately 1,100 dekatherms per hour of additional capacity will be available. The installation of a second distribution main will also improve the reliability of the Company's gas distribution system in the area by decreasing the Company's dependence on pressure support from the Exeter LNG facility and by introducing redundancy that reduces the risk associated with a distribution main being out of service.

Q. Why is it important that the Company complete the Southern Rhode Island Project beginning in FY 2020?

A. The Company has identified a need to increase capacity in the Southern Rhode Island service territory. Current growth forecasts indicate that the maximum vaporization capacity at the Exeter LNG facility will be exceeded by calendar year 2019. This could

result in approximately 3,750 customers with below minimum pressures who would be at risk of losing service. In addition, several regulator station inlet pressures are predicted to fall below the minimum threshold, which would cause problems on the downstream pressure systems if the regulator stations cannot maintain their outlet set pressure. Increasing capacity in Southern Rhode Island mitigates the risk of customers in the region losing service in the event of an outage at the Exeter LNG facility. Moreover, many commercial customers seeking to expand existing and new operations in the Southern Rhode Island region, such as in and around Quonset Point, cannot be served without this project. Without this project, the Company may need to impose a moratorium on all new gas service requests, as well as requests for expansion of existing gas service, to prevent service interruptions to existing customers.

Q. What is the cost of the Southern Rhode Island Project?

A. To address the need and achieve the benefits described above, the Company estimates it will spend $44.46 million in FY 2020 for the Southern Rhode Island Project. This includes $39.92 million for the installation of 2.4 miles (12,625 feet) of gas main and $4.54 million for the material testing required to increase the maximum operating pressure from 150 psig to 200 psig for the 5.2 miles (27,578 feet) of existing main in Cranston and West Warwick. Overall, between FY 2020 and FY 2022, the Company estimates it will spend a total of $109.98 million to complete the Southern Rhode Island

Project. The work is comprised of main installation, regulator station investment, and other upgrades and investment.

Q. What main installation work does the Company plan to complete for the Southern Rhode Island Project?

A. For the main installation portion of the Southern Rhode Island Project, the Company plans to install a total of 5 miles (26,625 feet) of new 20-inch steel distribution main. Between FY 2020 and FY 2022, the total estimated cost for the main installation work is currently $81.30 million, based on 90 percent design at an 80 percent level of confidence based on identified risks and future unknown risks. Factors contributing to the 80 percent project confidence level include assumptions around the presence of ledge, permitting and work hour restrictions, requirements for night work, and handling of contaminated soil and ground water. The Company expects the total estimate to change when the Company awards the main installation contract in March 2019. For FY 2020, the Company expects to spend a total of $39.92 million for the main installation work.

Q. What regulator station work does the Company plan to complete for the Southern Rhode Island Project?

A. The Company does not plan any regulator station-related work in FY 2020 for the Southern Rhode Island Project. Between FY 2021 and FY 2022, the Company plans to

upgrade the Cranston Take Station and the Cowesett Regulator Station. The total estimated cost for the FY 2021 and FY 2022 regulator station work is currently $17.58 million. Additional funding is included for a proposed new regulator station located at the southern end of the main installation to reduce the system pressure from a MAOP of 200 psig to 99 psig before feeding back into the distribution system. At this stage, the regulator station estimates are preliminary and will be updated in the FY 2021 and FY 2022 Gas ISR Plan filings.

Q. What other work does the Company plan to complete for the Southern Rhode Island Project?

A. Other upgrades and investment for the Southern Rhode Island Project include the installation of a launcher and receiver to support in-line inspections of the 200 psig main, material testing to support the maximum operating pressure increase from 150 psig to 200 psig for 5.2 miles (27,578 feet) of existing main in Cranston and West Warwick, and the installation of a remote operating valve (ROV). For FY 2020, the Company estimates it will spend $4.54 million for the material testing; however, the Company expects this estimate may vary when the Company awards the material testing contract in March 2019. All other work in this category is planned to occur in FY 2022. The estimates related to the FY 2022 work are considered preliminary and will be updated as part of the Company's FY 2022 Gas ISR Plan.

Q. Is the Company including any proposed operation and maintenance (O&M) expense in the FY 2020 Gas ISR Plan, as it has in prior Plans?

A. No. In prior years, the Company has included O&M expenses associated with the incremental expenses for 16 Customer Meter Service technicians hired to support increases in leak-prone pipe replacement. These costs are no longer included in the Gas ISR Plan because they are now part of base rates through Docket No. 4770.

Q. Does the FY 2020 Gas ISR Plan fulfill the statutory requirements for the safety and reliability of the Company's gas distribution system in Rhode Island?

A. Yes. The FY 2020 Gas ISR Plan establishes the capital investment in Rhode Island that is necessary to meet the needs of the Company's customers, together with a spending and work plan to maintain the overall safety and reliability of the Company's Rhode Island gas distribution system.

V. CONCLUSION

Q. Does this conclude your testimony?

A. Yes.

Exhibit 1 – JBC
Gas ISR Plan FY 2020

The Narragansett Electric Company
d/b/a National Grid

Gas Infrastructure, Safety, and Reliability Plan FY 2020 Proposal

December 20, 2018

Submitted to:
Rhode Island Division of Public Utilities and Carriers

nationalgrid

Section 1
Introduction & Summary

Section 1

Introduction and Summary
FY 2020 Proposal

Introduction and Summary
FY 2020 Proposal

In consultation with the Rhode Island Division of Public Utilities and Carriers (Division), National Grid[1] has developed the following proposed fiscal year (FY) 2020[2] gas infrastructure, safety, and reliability (ISR) plan (Gas ISR Plan or Plan) in compliance with R.I. Gen. Laws § 39-1-27.7.1 (Revenue Decoupling Law), which provides for the filing of "[a]n annual gas infrastructure, safety and reliability spending plan for each fiscal year and an annual rate reconciliation mechanism that includes a reconcilable allowance for the anticipated capital investments and other spending pursuant to the annual pre-approved budget."[3] The proposed Gas ISR Plan addresses capital spending on gas infrastructure and other costs related to maintaining the safety and reliability of the Company's gas distribution system. The Plan for the Company's gas distribution operations is the product of a collaborative effort with the Division. Through the Plan, the Company will maintain and upgrade its gas delivery system by proactively replacing leak-prone pipe; upgrading the system's custody transfer stations, pressure regulating facilities, and peak shaving plants; responding to emergency leak situations; and addressing infrastructure conflicts that arise out of state, municipal, and third-party construction projects. The Plan intends to attain these safety and reliability goals through a cost-effective, coordinated work plan. The level of work that the Plan provides will sustain and enhance the safety and reliability of the Rhode Island gas pipeline infrastructure, promote efficiency in the management and operation of the gas distribution system, and directly benefit Rhode Island gas customers.

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

[2] FY 2020 is defined as the 12 months ending March 31, 2020.

[3] R.I. Gen. Laws § 39-1-27.7.1(c)(2).

The Company now submits the Plan to the Rhode Island Public Utilities Commission (PUC) for review and approval.[4]

This Introduction and Summary presents (1) a history of the Gas ISR program in Rhode Island and a statement as to how the ISR program has contributed to safety and reliability; (2) an overview of the proposed FY 2020 Plan for the statutory categories of costs; (3) the resulting FY 2020 revenue requirement associated with the proposed Plan; and (4) the rate design based upon that revenue requirement and estimated typical bill impacts resulting from the rate design.

The Gas ISR Plan describes the Company's safety and reliability activities and the multi-year plan upon which the FY 2020 Plan is based. The Plan also addresses capital investment in utility infrastructure for the upcoming fiscal year. The Plan itemizes the recommended work activities by general category and provides budgets for capital investment.

As envisioned in the Revenue Decoupling Law, after the end of the fiscal year, the Company will true up the Gas ISR Plan's budgeted levels to its actual investment and expenditures, and reconcile the revenue requirement associated with the actual investment and expenditures with the revenue billed from the rate adjustments implemented at the beginning of each fiscal year. The Company will continue to file quarterly reports with the Division and PUC concerning the progress of its Gas ISR programs. In addition, when the Company makes its reconciliation and rate adjustment filing described below, the Company will file an annual report on the prior fiscal year's activities. In implementing an ISR plan in any fiscal year, the

[4] In accordance with R.I. Gen. Laws § 39-1-27.7.1(d), the Company and the Division must work together over the course of 60 days in an attempt to reach an agreement on a proposed Plan, which must then be submitted to the PUC for review and approval within 90 days.

circumstances encountered during the year may require reasonable deviations from the original ISR plan. In such cases, the Company will include in its quarterly reports an explanation of any significant deviations.

The FY 2020 level of capital[5] spending provided in the Gas ISR Plan to maintain the safety and reliability of the Company's gas delivery infrastructure is $162.46 million. As described in more detail below, this amount includes $44.46 million for a gas expansion project in Southern Rhode Island, which the Company will manage as a distinct spending portfolio, and $118.00 million for the rest of the Plan. A description of the Company's proposed capital investment plan for FY 2020 is provided in Section 2. The revenue requirement description and calculations are contained in Section 3. A description of the rate design and bill impacts are provided in Section 4.

History of the ISR Plan

The Rhode Island natural gas distribution system is one of the oldest in the United States and includes a large proportion of leak-prone and deteriorating infrastructure installed, in some instances, more than 100 years ago. The Company, which owns and operates the gas distribution system, has an obligation to provide safe and reliable service to customers in compliance with applicable state and federal pipeline safety statutes and regulations. However, the challenge of meeting this obligation is amplified on the portions of the distribution system containing leak-prone pipe, consisting of unprotected steel, cast iron and wrought iron, and vintage Aldyl-A and Polybutylene plastic pipe.

[5] In prior years, the Company has included operation and maintenance expenses associated with the incremental expenses for 16 Customer Meter Service technicians hired to support increases in leak-prone pipe replacement. These costs are no longer included in the ISR Plan, as they are now part of base rates through Docket No. 4770.

In accordance with the Revenue Decoupling Law, the Company filed its first Gas ISR plan on December 20, 2010 for FY 2012. The ISR program replaced the Accelerated Replacement Program (ARP), which began as part of the Company's 2008 rate case, Docket No. 3943. The ARP targeted the replacement of cast iron and non-cathodically protected steel mains and non-cathodically protected steel inside services. The ISR program expanded on the ARP through inclusion of other capital programs related to safety and reliability for public works, mandated programs, and reliability. From FY 2012 to FY 2018, the Company has invested a total of $557 million through the Gas ISR program. This includes a total of $350 million that targeted the replacement of leak-prone pipe through the Company's Proactive Main Replacement and Public Works programs. When the ISR program was first implemented, approximately 48 percent of the Company's gas distribution system in Rhode Island was comprised of leak-prone pipe. The table below highlights a total of 384 miles of leak-prone pipe abandoned through the FY 2018 ISR Plan that has contributed to an estimated reduction of 1,075 leaks.

Description	FY12	FY13	FY14	FY15	FY16	FY17	FY18	Total
Total ISR Abandonment Miles	46	47	53	55	59	63	62	384
Gas Leaks Eliminated	191	186	140	121	150	109	178	1,075

To monitor its system performance, the Company prepares an annual System Integrity Report. A copy of the most recent System Integrity Report (2017) is provided as Schedule 1 at the end of the Plan. The System Integrity Report provides historical data on leak receipts, leak repairs, open leaks, and inventory of mains and services. Additional data is provided around

material type for each of the listed categories. The Company considers leak receipts to be an important system performance indicator regarding the effectiveness of its leak-prone pipe abandonment program. Since 2008, the Company has seen a downward trend on leak receipts, which would indicate that the ISR and ARP programs have contributed to this result. It is important to note that variability in year-to-year annual leaks per mile will occur. Contributing factors include weather, public awareness, and overall system deterioration rates.

Section 2: Gas Capital Investment Plan

The Company's proposed gas capital investment plan set forth in Section 2 summarizes the Company's planned capital investments in terms of the following key Discretionary[6] and Non-Discretionary[7] categories:

Non-Discretionary:

A. Public Works
B. Mandated Programs
C. Damage/Failure

Discretionary:

A. Proactive Main Replacement
B. Gas System Reliability
C. Gas Expansion

Section 2 itemizes the proposed activities by sub-categories and provides budgets for each sub-category. The Company has included its capital budget, identified the relevant projects that would be part of the Gas ISR Plan, and provided its rationale for the need for and benefit of

[6] Discretionary programs are not required by legal, regulatory code, and/or agreement, with limited exceptions.

[7] Non-Discretionary programs include those required by legal, regulatory code, and/or agreement, or as a result of damage or failure, with limited exceptions.

performing such work to provide safe and reliable service to its customers. The Company has also provided a five-year capital plan to provide a longer-term approach to infrastructure, safety, and reliability and to demonstrate how the FY 2020 Plan would be incorporated into that longer-term planning approach.

The Company's FY 2020 Plan includes the elimination or rehabilitation of a total of 61.2 miles of leak-prone pipe, comprised of 48.2 miles of Proactive Main Replacement and rehabilitation work and 13 miles of Public Works replacement work. This represents a 1.2-mile increase from the abandonment of leak-prone pipe authorized by the PUC in the FY 2019 Gas ISR Plan. In addition, it represents a four-mile reduction from the Company's annual leak-prone pipe abandonment target of 65 miles. The 1.2-mile increase in miles is attributed to the need to increase targeted investment to address the Large Diameter Program and the Atwells Avenue Main Replacement project. In addition, the Company has increased the Proactive Main Replacement program cast iron abandonment percentage from 55 percent to 60 percent. Cast iron represents 65 percent of the Company's total leak-prone pipe inventory. Under the current five-year plan, the Company expects to abandon 65 miles of leak-prone pipe per year from FY 2021 to FY 2024.

The FY 2020 Gas ISR Plan also includes a category for Gas Expansion, namely, to reinforce the distribution mains in Southern Rhode Island (the Southern Rhode Island Project). The Southern Rhode Island Project presents unique challenges to managing the Plan due to its size, cost, and complexity. As part of the execution of the Southern Rhode Island Project, the forecasted spend in FY 2020, and in future fiscal years, may change as risks occur and/or cost savings are achieved. If the Southern Rhode Island Project is managed with the overall

Discretionary portfolio, any changes may result in the need to advance or delay several projects, especially if the variance is significant. Instead, the Company will manage the Southern Rhode Island Project as a distinct portfolio of spend and not advance or delay other projects if over- or under-spend occurs on the Southern Rhode Island Project.

Section 3: Revenue Requirement

The Company has provided a calculation of the cumulative revenue requirement resulting from the proposed FY 2020 capital investment plan. Section 3 contains a description of the revenue requirement model for FY 2020 and an illustrative calculation for FY 2021. This calculation would form the basis for the Plan rate adjustment, which would become effective April 1, 2019 upon PUC approval. As provided in Section 3 of the Plan, in accordance with the Company's gas tariff, RIPUC NG-GAS No. 101, Section 3, Schedule A, Sheets 5-6, the Company will reconcile this rate adjustment as part of its annual Distribution Adjustment Charge filing. The pre-tax rate of return on rate base would be the rate of return approved by the PUC in the Amended Settlement Agreement in the Company's most recent general rate case, Docket No. 4770, and in the future it would change to reflect changes to the rate of return approved by the PUC in future rate case proceedings. Any change in the rate of return would be applicable on a prospective basis, effective at the time of the change.

Section 4: Rate Design

For purposes of rate design, the revenue requirement associated with the capital investment is allocated to rate classes based upon the most recent rate base allocator approved in the Amended Settlement Agreement in Docket No. 4770. For each rate class, the allocated

revenue requirement is divided by the applicable fiscal year forecasted therm deliveries to arrive at a per-therm factor unique to each rate class.

The estimated typical bill impacts associated with the rate design and bill impacts are provided in Section 4. The bill impact of the Gas ISR Plan for the average Residential Heating customer for the period April 1, 2019 through March 31, 2020 would be an annual increase of $20.81, or 1.6 percent, from last year's bills.

Section 2

Gas Capital Investment Plan
FY 2020 Proposal

Gas Capital Investment Plan
FY 2020 Proposal

Background

The Company developed its proposed capital investment plan to meet its obligation to provide safe, reliable, and efficient gas distribution service for customers at reasonable costs.[8] The Gas ISR Plan includes capital investment spending needed to meet state and federal regulatory requirements applicable to the Company's gas system and to maintain its distribution infrastructure in a safe and reliable condition. To address the replacement of leak-prone pipe, the Plan includes infrastructure, safety, and reliability work for cast-iron and non-cathodically protected steel mains. The Plan also contains capital spending related to safety and reliability for public works projects, mandated programs, and gas reliability, including gas expansion in Southern Rhode Island.

Consistent with the goals of the Revenue Decoupling Law, in order to continue to provide safe and reliable gas delivery service to Rhode Island customers, it is critical that the Company remain vigilant with respect to investing in its infrastructure and have appropriate and timely cost recovery. To that end, the Company's proposed Plan identifies the capital spending investment that it expects to complete during FY 2020. At the end of this section, Table 1 contains a description of the proposed budget for the FY 2020 Plan; Table 2 contains a proposed five-year spending forecast for FY 2020 through FY 2024; and Table 3 contains actual spending based on the prior five-year period, FY 2014 through FY 2018. In FY 2020, the Company

[8] The Company delivers natural gas to approximately 267,000 Rhode Island residential and commercial and industrial customers in 32 cities and towns in Rhode Island. To provide this service, the Company owns and maintains approximately 3,200 miles of gas mains and approximately 196,500 gas services.

proposes to invest a total of $162.46 million of ISR investments,[9] to be included in the FY 2020 Gas ISR recovery mechanism, including $36.59 million for Non-Discretionary capital expenditures; and $125.87 million for Discretionary capital expenditures, which includes $44.46 million for the Southern Rhode Island Project.

As set forth in Table 1 at the end of this section, the Company proposes the following levels of spending for each category of programs contained in the $162.46 million that the Company proposes for its FY 2020 Gas ISR Plan spending:

Non-Discretionary:

- $16.94 million net investment for Public Works programs, including $18.32 million in capital spend and $1.38 million in reimbursements;
- $19.40 million for Mandated Programs (i.e., Corrosion, Purchase Meter Replacements, Reactive Leaks (Cast Iron Joint Encapsulation/Service Replacement), Service Replacement (Reactive) – Non Leak/Other, Main Replacement (Reactive) – Maintenance (including Water Intrusion)); and
- $0.25 million for Damage/Failure programs.

Discretionary:

- $62.88 million for the Proactive Main Replacement program (i.e., Proactive Main Replacement, Large Diameter, and Atwells Avenue project);
- $18.53 million for Gas System Reliability, including work relative to Gas System Control, System Automation, Heater Program, Pressure Regulating Facilities, Allens Avenue Multi Station Rebuild, Valve Installation Replacement, Take Station Refurbishment, Gas System Reliability Enhancement, Instrumentation and Regulation – Reactive, Liquefied Natural

[9] For FY 2020, the Company plans to spend $193.27 million of total capital investment. Of that total amount, $30.81 million is associated with projected growth and other non-ISR spending, which is not included for recovery in the FY 2020 Gas ISR Plan.

Gas (LNG) facilities, Replace Pipe on Bridges, Access Protection Remediation, and Tools and Equipment; and

- $44.46 million for the Southern Rhode Island Project (Gas Expansion).

As noted in Section 1 above, the Company will continue to file quarterly reports with the PUC and Division detailing the progress of its Gas ISR Plan programs.

Description of Programs and Projects

The Non-Discretionary and Discretionary programs are described in detail below.

Non-Discretionary Work:

A. Public Works

The purpose of the Public Works program is to address existing gas infrastructure conflicts, as appropriate, and to improve the safety and reliability of the Company's natural gas distribution system in conjunction with municipal reconstruction and water and sewer projects, which provide significant incremental benefits to customers and communities. Municipal and water and sewer work affords the Company an opportunity to replace additional leak-prone pipe and reduce paving costs by coordinating the Company's gas main replacement work with planned third-party construction projects, while also benefitting customers and communities by improving service delivery and minimizing construction impacts and inconvenience. The Company has an ongoing plan to replace targeted gas mains on a risk-based approach. Coordinating the Company's Integrity programs with planned municipal and water and sewer projects has yielded increased system reliability, system integrity, and optimized capital

spending. Although one of the primary purposes of Public Works spending is to address direct conflicts between planned third-party projects and existing gas infrastructure, Public Works spending provides the additional opportunity to coordinate other system improvement work, such as the replacement of leak-prone pipe, system reliability upgrades, elimination of redundant main, and regulator station upgrades.

The Company will manage multiple projects to address the dynamic nature of the Public Works process through effective liaison activity. While municipal schedules and plans change largely due to funding, it must be recognized that other factors also contribute to the scheduling of these projects (e.g., political demand and maintenance). Changes in municipal projects can and do create additional work in developing and coordinating the Company's planning and budgeting processes. Using the Company's five-year work planning process, the Company can provide some flexibility in scheduling, coordinating, and engineering projects in concert with municipal public works initiatives. For FY 2020, the Plan incorporates $16.94 million in spending under the Public Works category, which includes $18.32 million in capital spend and $1.38 million that is anticipated to be reimbursed under agreements with third parties. Overall, the Public Works budget provides for the replacement of approximately 13 miles of leak-prone gas main, consisting of cast iron and unprotected steel main. Municipal water projects in Providence and East Providence are contributing to the increase in miles for this program.

B. Mandated Programs

Spending for Mandated Programs falls into the following five categories: (1) Corrosion, (2) Purchase Meter Replacement, (3) Reactive Leaks (4) Reactive Service Replacement - Non-leak/Other, and (5) Reactive Main Replacement-Maintenance.

1. **Corrosion** – Cathodic protection effectively extends the service life of buried steel facilities (as compared to unprotected buried steel facilities) and can prolong replacement by 20 years or more. In 1971, the Code of Federal Regulations, Part 192, was amended to require the cathodic protection of all new buried steel gas facilities. Protection is accomplished in part through ensuring proper coating by establishing proper conditions on pipe segments through installation of rectifiers, anodes, insulators, and test stations. In addition, the Corrosion program includes control line work at existing regulator stations and cathodic protection upgrades. For FY 2020, the Company proposes to spend $1.17 million on this program, which aligns costs to prior year experience.

2. **Purchase Meter Replacement** – Capital costs for the Purchase Meter Replacement program are required for the procurement of replacement meters. For FY 2020, the Company proposes to replace approximately 16,289 meters, which represents 5.8 percent of the existing meter population in Rhode Island, at a cost of $3.40 million.

3. **Reactive Leaks** – This category provides funding for the leak sealing of cast iron bell joints that are discovered during proactive leak surveys, public odor calls, or other activities. In addition, it provides funding for remediating leaking gas services through insertion, replacement, and/or abandonment of the services. In prior ISR plans, the Company reported these programs separately. Beginning in FY 2020, the Company is grouping these programs under a single Reactive Leak category, while still maintaining the ability to separately track the costs. For FY 2020, the Company proposes to spend $12.10 million for this work.

4. **Reactive Service Replacement - Non-leak/Other** – This program contains the capital costs for service relocations, meter protection, service abandonments, and the installation of curb valves. The Company's agreement with the Division to expand curb valve installations to properties inaccessible for inside inspection will provide additional public safety benefits and complement efforts in place aimed at improving collection and meter reading opportunities in those situations where Company personnel have encountered difficulty gaining access to meters. For FY 2020, the Company proposes to spend $2.06 million for this program.

5. **Reactive Main Replacement - Maintenance** – This category of work consists of emergency main replacements or modifications because of leaks or other unplanned events where main conditions dictate immediate replacement and/or gas facilities are subject to water intrusion or exposure and require remedy. Over the past several years, the Company has received minimal requests in this category, primarily because the Company's increased Proactive Main Replacement program work has reduced the need for reactive work through construction of a more resilient system. The Company proposes to spend $0.67 million in this area.

In total, the Gas ISR Plan for FY 2020 contains $19.40 million for all categories of Mandated work.

C. Damage/Failure Program

The Company proposes to include funding for safety and reliability projects associated with remediation of damage or failure occurrences. Damage or failure projects are initiated in

response to events outside the Company's control that require immediate action. The Company proposes a FY 2020 budget of $0.25 million for such work.

In total, for FY 2020, the Gas ISR Plan contains $36.59 million for Non-Discretionary work.

Discretionary Work:

A. Proactive Main Replacement Program

The value of and need for targeted spending on the replacement of leak-prone gas main is well-documented and has been accepted by both the PUC and Division. For FY 2020, the Company forecasts spending $62.88 million on its Proactive Main Replacement and Rehabilitation programs, which will address approximately 48.2 miles of leak-prone gas main and 3,604 service relays, inserts, or tie-ins.

1. Proactive Main Replacement (<16-inch)

The Proactive Main Replacement (<16-inch) program consists of the installation of 43.6 miles and the abandonment of approximately 47.0 miles of cast iron and unprotected steel main with a diameter of less than 16 inches, and the renewal, abandonment, or tie-over of existing services. Proactive Main Replacement program costs have increased over the past several years, in part because the proportion of cast iron gas mains that the Company is replacing has increased. Moreover, the costs for replacement of cast iron main is typically greater than

unprotected bare steel due to several key factors, including the following: (1) cast iron is predominant on low and intermediate pressure systems consisting of larger diameter mains; and (2) cast iron facilities are typically centralized in urban areas where costs are driven by higher customer density, greater underground congestion (e.g., excavation), and increased restoration and traffic control. In FY 2020, the Company is increasing the cast iron abandonment percentage to 60 percent of total leak-prone pipe inventory, which is a 5 percent increase from the FY 2019 Plan. Cast iron represents 65 percent of the Company's total leak-prone main inventory in Rhode Island. The Company has analyzed historic costs and has developed budget projections based on project specific main replacement candidates identified for completion in the program. For FY 2020, the Company proposes to spend $57.18 million on the Proactive Main Replacement (<16-inch) program.

2. Proactive Large Diameter Program (>=16-inch)

The Company operates approximately 37 miles of large diameter (less than or equal to 16 inches) leak-prone gas mains. The Proactive Large Diameter Program consists of rehabilitating large diameter leak-prone pipe through the implementation of a sealing and lining program. For FY 2020, the Company proposes to spend a total of $4.42 million on this program to address approximately one mile of large diameter leak-prone pipe. This includes lining 1,100 feet of 16-inch cast iron main and 1,500

feet of 20-inch cast iron main. In addition, the Company will seal 2,500 feet of 16-inch cast iron main. Lining and sealing are cost-effective alternatives for remediating large diameter leak-prone pipe. Additional benefits of this program include minimization of impact to customers and communities, a shortened construction period, and use of existing space in areas with significant underground utility congestion. All of this work is located in Providence.

3. Proactive - Atwells Avenue Main Replacement

In the 2017-18 winter period, the Company experienced four main breaks on Atwells Avenue in Providence on 12-inch low pressure cast iron main installed in the 1870s. This main is located in one of the busiest streets within Providence, with a heavy concentration of restaurants. Upon completion of an integrity analysis, the Company deemed it necessary to abandon 1.3 miles (6,820 feet) of cast iron main between FY 2020 and FY 2022. The Company is evaluating alternatives that will likely include a combination of installation of new plastic main or lining of existing main. Congestion above and below ground will contribute to operating conditions that will result in higher unit costs for this project. In FY 2020, the Company proposes to address the highest risk, a 0.2 mile (965 foot) segment, for a total estimated cost of $1.18 million. The Company expects to incur an additional cost of $0.10 million in FY 2020 to

engineer the abandonment of the next segment in FY 2021, consisting of 0.6 miles (3,225 feet). For FY 2020, the total estimate for the Atwells Avenue Main Replacement project is $1.28 million.

B. Reliability

Reliability spending includes 13 programs to address gas control and system automation, valve installation/replacement, take stations, pressure regulation, heating, LNG facilities, gas network reliability and resiliency, replacement pipe on bridges, access protection remediation, and capital tools and equipment. The FY 2020 Gas ISR Plan contains $18.53 million in spending for Gas System Reliability. A summary of each major program is provided below.

1. Gas System Control

Gas System Control funding of $0.57 million is necessary to address a telemetry upgrade and meter reading platform upgrades. Verizon has announced that it is eliminating its 3G network by 2021 to free up space for new networks. If left as-is, the Company's current telemetry devices will be unable to communicate with the gas system. Under the telemetry upgrade project, the Company's Instrumentation and Regulation personnel will replace the 3G telemetry devices with new 4G devices, which involves the conversion of 700 customer devices to 4G Internet Protocol in MV90. The Company expects approximately 350 of these devices will be purchased in FY 2019 and the remainder in FY 2020.

2. Valve Installation / Replacement

Valves are used to sectionalize portions of the gas network to support both planned and unplanned field activities. Replacement of inoperable valves is necessary to ensure the Company's continued ability to effectively isolate portions of the distribution system. New valve installations are also occasionally needed to provide the capability to reduce the size of an isolation area where existing valves would result in broader shutdown than desired. For FY 2020, the Company has budgeted $0.16 million for valve replacements.

3. System Automation

The primary purpose of the System Automation program is to meet the United States Department of Transportation code requirements under 49 C.F.R. Part 192, Docket ID PHMSA 2007-27954, which were issued on December 3, 2009. These code provisions contain the following pipeline safety requirements: (a) control room management/human factors, (b) modernization of the Company's system data and telemetry recording, and (c) increasing the level of system automation and control. The overall System Automation program will increase the safety, reliability, and efficiency of the gas system and, by extension, the level of service the Company provides to its customers.

The Company's ability to provide safe and reliable service is governed to a large extent by the Company's ability to maintain adequate pressure in its gas mains.

To accomplish this task, the Company has approximately 196 gas pressure regulator stations disbursed throughout its Rhode Island gas service territory. Although a limited number of these regulator stations have full system telemetry and control capability, most do not. In addition to monitoring and controlling the regulator stations, the Company must also monitor system end points to ensure that adequate system pressures are being maintained in remote areas under a variety of operating conditions. For FY 2020, the Company is proposing spending of $1.20 million for its System Automation program. The Company's FY 2020 work will provide alternating current power, telemetry, and/or remote control to approximately 25 locations.

4. Heater Program

The Heater installation program provides for the installation and replacement of gas system heaters, which are operated to ensure proper conditioning and control of gas temperatures at key Company facilities. Work for the project identified in this program began in FY 2018, and the Company plans to commence construction of the new heaters at the Company's Cranston gate station during FY 2020. The Company will spend $1.25 million for the construction phase of this work during FY 2020.

5. Pressure Regulating Facilities

The Company's pressure regulating facilities have been designed to reliably control gas distribution system pressures and maintain continuity of supply during

normal and critical gas demand periods. Each regulator station has specific requirements for flows and pressures based on the anticipated needs of the station. A facility includes both pressure-regulating piping and equipment and control lines, but it may also include a heater or a scrubber. The Company has instituted a program that provides for condition-based assessments of all regulator stations. Accepted engineering guidelines provide for design, planning, and operation of these gas distribution facilities. Applicable state and federal codes are followed to help ensure safe and continuous supply of natural gas to the Company's customers and the communities it serves. The FY 2020 Plan includes enhancements in response to regulator station work prioritized through condition-based assessments, which include, in part, station accessibility, pipe condition (i.e., corrosion), water intrusion, redundancy, station isolation, and common mode failure. In FY 2020, two regulator station replacements are planned in East Providence, a third station replacement in Providence, and a fourth station replacement location in Pawtucket. There are also three regulator stations scheduled for abandonment, located in East Providence, Warwick, and West Warwick. The Company plans to spend $4.70 million for this category during FY 2020.

6. <u>Allens Avenue Multi Station Rebuild Project</u>

The Allens Avenue Multi Station Rebuild project is a multi-year project designed to replace or retire eight existing pressure regulating facilities at the Company's

major gas interchange in Providence. Four of the existing regulator stations that feed the 99 pounds per square inch gauge (psig) distribution system will be replaced by, and consolidated into, a single new station. An additional three regulator stations feeding various distribution systems at other pressures will be relocated off-property, which will help enable abandonment of additional leak-prone pipe. An eighth station will be retired by integrating the downstream system with an existing distribution network. The new facilities on the site are designed with storm hardening protections to ensure safe and continued operation in the event of adverse weather impacts and flooding. The scope of work also includes the abandonment and/or removal of obsolete pipe and equipment in support of the safety and reliability of the Company's distribution system at this location. In FY 2020, the Company plans to spend $4.44 million to complete and commission the new station feeding the 99 psig system and relocate two other regulator stations within Providence.

7. Take Station Refurbishments

The Take Station Refurbishment program will address required modifications to the Company's custody transfer stations. Projects include installation of remote operated valves at four stations, design costs for future station construction, and control line replacement work. The remote operated valves will be installed at high pressure connection points and will support the ability to shorten response

time in the event of a major gas release. The Company plans to spend $1.05 million for this program during FY 2020.

8. Gas System Reliability – Gas Planning Program

The Gas Planning program identifies projects that support system reliability through standardization and simplification of system operations (e.g., system up-ratings and de-ratings and regulator elimination), integration of systems (e.g., tie-ins), and new supply sources (e.g., take stations). For FY 2020, the Company proposes to spend approximately $1.30 million for this program. This includes funding for the initial phase of a multi-year project designed to eliminate a single-feed system and engineering costs to address enhancements to the Cumberland Take Station on Scott Road.

9. Instrumentation and Regulation (I&R) Reactive Program

The I&R Reactive program is established to address capital project requirements over and above the Pressure Regulation capital budget. Projects range from instrumentation replacement due to failure; replacement of obsolete/unreliable equipment, such as regulators, pilots, boilers, heat exchangers, odorant equipment, and station valves; and replacement of building roofs or doors due to deterioration. For FY 2020, the Company proposes to spend $1.37 million for this program.

10. LNG

The LNG program is established to address specific and blanket capital project requirements to support the Company's LNG operations. This program includes $0.67 million of funding for specific projects associated with the Exeter LNG facility, including engineering to prepare for replacement of the second of two boil-off compressors and engineering of a future project to install a fully automated emergency shutdown system. Additional funding includes $0.20 million for engineering costs associated with peak shaving requirements for Aquidneck Island. The remaining funding of $0.56 million is associated with the blanket program for the Exeter LNG plant, which is aligned with recent historical experience for this facility. For FY 2020, the Company plans to spend $1.43 million for the LNG program.

11. Replace Pipe on Bridges

In FY 2020, the Company expects to spend $0.20 million for engineering-related costs for the replacement of main on the Glenbridge Avenue bridge in Providence. The 36-inch cast iron main on the bridge will be abandoned and replaced by relocating a 16-inch, 99 psig steel main. Construction costs associated with this program is expected to begin in FY 2021.

12. Access Protection Remediation

The Access Protection Remediation program is designed to reduce the risk of public injury by restricting and/or deterring public access to the Company's

elevated gas facilities. In FY 2020, the Company expects to spend $0.26 million for the identification and execution of projects for this program.

13. Capital Tools and Equipment

This category includes tools and equipment required to support the performance of work contained in the Gas ISR Plan and to provide for the safety and reliability of the gas distribution system. The Company will spend $0.60 million on capital tools and equipment during FY 2020.

C. Gas Expansion – Southern Rhode Island Project

The Company has identified a need to increase capacity in the Southern Rhode Island service territory. The more than 30,000 customers in the Company's Southern Rhode Island service territory are served by almost 600 miles of distribution infrastructure, including approximately 77 miles of distribution main operating at pressures of 99 psig and above (the Southern Rhode Island Distribution Mains). Current growth forecasts indicate that the maximum vaporization capacity at the Exeter LNG facility will be exceeded by calendar year 2019. This could result in approximately 3,750 customers with below minimum pressures who would be at risk of losing service. In addition, several regulator station inlet pressures are predicted to fall below the minimum threshold, which would cause problems on the downstream pressure systems if the regulator stations cannot maintain their outlet set pressure. Increasing capacity in Southern Rhode Island mitigates the risk of customers in the region losing service in the event of an outage at the Exeter LNG facility. Moreover, many commercial customers seeking to expand existing and new operations in the Southern Rhode Island region, such as in and around Quonset

Point, cannot be served without this project. Without this project, the Company may need to impose a moratorium on all new gas service requests, as well as requests for expansion of existing gas service, to prevent service interruptions to existing customers.

To address these capacity issues, the Company proposes to reinforce the Southern Rhode Island Distribution Mains by installing approximately five miles of new 20-inch steel distribution main parallel to the existing 12-inch distribution main located beneath Route 2 (a Rhode Island Department of Transportation right-of-way) through the towns of Warwick, West Warwick, and East Greenwich. The proposed parallel distribution main will be constructed to be in-line inspected, initially operated at 99 psig, and designed for a maximum allowable operating pressure (MAOP) of 200 psig to meet future demand. The new distribution main will be placed in-service in phases between FY 2020 and FY 2022, with normal operation at 99 psig and the potential to operate at 200 psig after a district regulator station is installed in the future near South Road in East Greenwich. This project will also require work on existing regulator and take stations in FY 2021. Based on current forecasts, each segment will add immediate growth capacity. Once all of the segments are completed, it is expected that approximately 1,100 dekatherms per hour of additional capacity will be available. The installation of a second distribution main will also improve the reliability of the Company's gas distribution system in the area by decreasing the Company's dependence on pressure support from the Exeter LNG facility and by introducing redundancy that reduces the risk associated with a distribution main being out of service.

Between FY 2020 and FY 2022, the Company estimates it will spend a total of $109.98 million for the Southern Rhode Island Project. The work is comprised of main installation, regulation station investment, and other upgrades and investment. For the main installation portion of the Southern Rhode Island Project, the Company plans to install a total of 5 miles (26,625 feet) of new 20-inch steel distribution main. Between FY 2020 and FY 2022, the total estimated cost for the main installation work is currently $81.30 million, based on 90 percent design at an 80 percent level of confidence based on identified risks and future unknown risks. Factors contributing to the 80 percent project confidence level include assumptions around the presence of ledge, permitting and work hour restrictions, requirements for night work, and handling of contaminated soil and ground water. The Company expects the total estimate to change when the Company awards the main installation contract in March 2019. For FY 2020, the Company expects to spend a total of $39.92 million for the main installation work.

The Company does not plan any regulator station-related work in FY 2020 for the Southern Rhode Island Project. Between FY 2021 and FY 2022, the Company plans to upgrade the Cranston Take Station and the Cowesett Regulator Station. The total estimated cost for the FY 2021 and FY 2022 regulator station work is currently $17.58 million. Additional funding is included for a proposed new regulator station located at the southern end of the main installation to reduce the system pressure from a MAOP of 200 psig to 99 psig before feeding back into the distribution system. At this stage, the regulator station estimates are preliminary and will be updated in the FY 2021 and FY 2022 Gas ISR Plan filings.

Other upgrades and investment for the Southern Rhode Island Project include the installation of a launcher and receiver to support in-line inspections of the 200 psig main, material testing to support the maximum operating pressure increase from 150 psig to 200 psig for 5.2 miles (27,578 feet) of existing main in Cranston and West Warwick, and the installation of a remote operating valve (ROV). For FY 2020, the Company estimates it will spend $4.54 million for the material testing; however, the Company expects this estimate may vary when the Company awards the material testing contract in March 2019. All other work in this category is planned to occur in FY 2022. The estimates related to the FY 2022 work are considered preliminary and will be updated as part of the Company's FY 2022 Gas ISR Plan.

A summary of the total estimate for the Southern Rhode Island Project is presented in the table below.

Description	Units	FY 2020	FY 2021	FY 2022	Total
Main Installation:					
Phase 1	12,625	$ 39,922,433			$ 39,922,433
Phase 2	11,050		$ 32,035,812		$ 32,035,812
Phase 3	2,950			$ 9,340,486	$ 9,340,486
Total Main Installation	26,625	$ 39,922,433	$ 32,035,812	$ 9,340,486	$ 81,298,731
Regulator Station Investment:					
Cranston Take Station Upgrades				$ 10,103,718	$ 10,103,718
Cowesett Regulator Station Upgrades			$ 1,687,269		$ 1,687,269
New Regulator Station				$ 5,785,034	$ 5,785,034
Total - Regulator Station Investment		$ -	$ 1,687,269	$ 15,888,752	$ 17,576,021
Other Upgrades/Investment:					
Launcher/Receiver				$ 5,697,882	$ 5,697,882
MOP Increase from 150 to 200 psi		$ 4,536,978			$ 4,536,978
Installation of ROV				$ 872,760	$ 872,760
Total - Other Investment		$ 4,536,978	$ -	$ 6,570,642	$ 11,107,620
Total Southern RI Gas Expansion Investment		$ 44,459,411	$ 33,723,081	$ 31,799,880	$ 109,982,372

For FY 2020, the Company estimates it will spend a total of $44.46 million for the Southern Rhode Island Project. This includes $39.92 million for the installation of 2.4 miles (12,625 feet) of gas main and $4.54 million for the material testing required to increase the maximum operating pressure from 150 psig to 200 psig for the 5.2 miles (27,578 feet) of existing main in Cranston and West Warwick.

Excluding the Gas Expansion category, the proposed Gas ISR Plan contains $81.41 million in spending for Discretionary work in FY 2020. Including the Gas Expansion category, the proposed Plan contains a total of $125.87 million in spending for Discretionary work.

Five-Year Gas ISR Investment Plan

As of December 31, 2017, approximately 1,190 miles, or 37 percent, of the 3,205 miles in the Company's gas distribution system in Rhode Island is made up of leak-prone pipe. The 1,190 miles of leak-prone pipe are comprised of 395 miles of unprotected steel, 745 miles of cast iron and wrought iron gas main, and 50 miles of vintage Aldyl-A and Polybutylene plastic. The Company plans to eliminate or rehabilitate all leak-prone pipe within the next 17 years.

The Company's proposed five-year Gas ISR investment plan is provided in Table 2 below. Table 2 contains the approved FY 2020 Plan spending, along with spending projected within each of the primary categories for the period FY 2020 through FY 2024.

The Company's prior five-year Gas ISR investment plan actual spend is provided in Table 3 below.

Table 1

Narragansett Gas
FY 2020
($000)

	Budget
NON-DISCRETIONARY	
Public Works	
CSC/Public Works - Non-Reimbursable	$16,940
CSC/Public Works - Reimbursable	$1,381
CSC/Public Works - Reimbursements	-$1,381
Public Works Total	**$16,940**
Mandated Programs	
Corrosion	$1,166
Purchase Meter (Replacements)	$3,400
Pipeline Integrity IVP (Integrity Verification Program)	$0
Reactive Leaks (CI Joint and Service Replacement)	$12,104
Service Replacements (Reactive) - Non-Leaks/Other	$2,063
Main Replacement (Reactive) - Maintenance (incl Water Intrusion)	$670
Mandated Total	**$19,403**
Damage / Failure (Reactive)	
Damage / Failure Total	**$250**
NON-DISCRETIONARY TOTAL	**$36,593**
DISCRETIONARY	
Proactive Main Replacement	
Main Replacement (Proactive) - Leak Prone Pipe	$57,184
Main Replacement (Proactive) - Large Diameter LPCI Program	$4,418
Atwells Avenue	$1,280
Proactive Main Replacement Total	**$62,882**
Reliability	
Gas System Control	$571
System Automation	$1,198
Heater Program	$1,250
Pressure Regulating Facilities	$4,695
Allens Ave Multi Station Rebuild	$4,437
Take Station	$1,050
Valve Installation/Replacement	$159
Gas System Reliability - Gas Planning	$1,303
I&R - Reactive	$1,372
LNG	$1,434
Replace Pipe on Bridges	$200
Access Protection Remediation	$256
Tools & Equipment	$603
Reliability Total	**$18,528**
SUBTOTAL DISCRETIONARY (Without Gas Expansion)	**$81,410**
Southern RI Gas Expansion Project	**$44,459**
DISCRETIONARY TOTAL (With Gas Expansion)	**$125,869**
GAS ISR TOTAL (Without Gas Expansion)	**$118,003**
GAS ISR TOTAL (With Gas Expansion)	**$162,462**

Table 2

RI Gas ISR Spending Forecast
($000)

Investment Categories	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
NON-DISCRETIONARY					
Public Works	$ 16,940	$ 17,448	$ 17,972	$ 18,511	$ 19,066
Mandated Programs	$ 19,403	$ 21,344	$ 21,798	$ 22,272	$ 22,431
Damage / Failure (Reactive)	$ 250	$ 250	$ 250	$ 250	$ 250
Special Projects	$ -	$ -	$ -	$ -	$ -
NON-DISCRETIONARY TOTAL	**$ 36,593**	**$ 39,042**	**$ 40,020**	**$ 41,033**	**$ 41,747**
DISCRETIONARY					
Proactive Main Replacement	$ 57,184	$ 66,267	$ 68,255	$ 70,303	$ 72,412
Proactive Main Replacement - Large Diameter LPCI Program	$ 4,418	$ 4,418	$ 5,796	$ 5,862	$ 5,929
Proactive Main Replacement - Atwells Avenue	$ 1,280	$ 2,260	$ 4,000	$ -	$ -
Reliability	$ 18,528	$ 26,810	$ 20,662	$ 18,190	$ 20,830
SUBTOTAL DISCRETIONARY (Without Gas Expansion)	**$ 81,410**	**$ 99,755**	**$ 98,713**	**$ 94,355**	**$ 99,171**
Southern RI Gas Expansion Project	$ 44,459	$ 33,723	$ 31,800	$ -	$ -
DISCRETIONARY TOTAL (With Gas Expansion)	**$ 125,869**	**$ 99,755**	**$ 98,713**	**$ 94,355**	**$ 99,171**
GAS ISR TOTAL (Without Gas Expansion)	**$ 118,003**	**$ 138,797**	**$ 138,733**	**$ 135,387**	**$ 140,918**
GAS ISR TOTAL (With Gas Expansion)	**$ 162,462**	**$ 172,520**	**$ 170,533**	**$ 135,387**	**$ 140,918**

Table 3

RI Gas ISR Historical Spend
($000)

Investment Categories	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
NON-DISCRETIONARY					
Public Works	$ 3,190	$ 7,207	$ 7,732	$ 8,597	$ 14,590
Mandated Programs	$ 15,980	$ 15,415	$ 16,861	$ 16,370	$ 22,110
Damage / Failure (Reactive)	$ -	$ -	$ -	$ -	$ 1,610
Special Projects	$ -	$ -	$ -	$ 5,020	$ 1,780
NON-DISCRETIONARY TOTAL	**$ 19,170**	**$ 22,622**	**$ 24,592**	**$ 29,987**	**$ 40,080**
DISCRETIONARY					
Proactive Main Replacement	$ 41,790	$ 40,904	$ 58,386	$ 48,872	$ 51,210
Proactice Main Replacement - Large Diameter LPCI Program	$ -	$ -	$ -	$ -	$ 1,180
Atwells Avenue	$ -	$ -	$ -	$ -	$ -
Service Replacement - Proactive	$ 2,550	$ 1,121	$ 1,789	$ -	$ -
Reliability	$ 8,720	$ 8,968	$ 7,914	$ 8,403	$ 13,950
Special Projects	$ 880	$ 3,728	$ 1,188	$ -	$ -
DISCRETIONARY TOTAL	**$ 53,940**	**$ 54,721**	**$ 69,277**	**$ 57,275**	**$ 66,330**
ISR Capital Total	**$ 73,110**	**$ 77,343**	**$ 93,869**	**$ 87,262**	**$ 106,410**
O&M Total	$ -	$ 503	$ 464	$ 488	$ 560
GAS ISR TOTAL	**$ 73,110**	**$ 77,846**	**$ 94,333**	**$ 87,750**	**$ 106,970**

Section 3
Revenue Requirement

Section 3

Revenue Requirement
FY 2020 Proposal

Revenue Requirement
FY 2020 Proposal

The attached proposed revenue requirement calculation reflects the revenue requirement related to the Company's proposed investment in its Gas ISR Plan for the fiscal year ended March 31, 2020.

As demonstrated in Attachment 1, Page 1, Column (c), the Company's FY 2020 Gas ISR Plan revenue requirement amounts to $7,290,355, or an incremental $7,290,355 over the amount currently being billed for the Gas ISR Plan. The Plan's revenue requirement consists of the following elements: (1) the revenue requirement of $4,009,777 comprised of the Company's return, taxes, and depreciation expense associated with FY 2020 proposed non-growth ISR incremental capital investment in gas utility infrastructure of $120,532,372, as calculated on Attachment 1, Page 8; (2) the FY 2020 revenue requirement on incremental non-growth ISR capital investment for FY 2018 through FY 2019 totaling $926,896; and (3) FY 2020 property tax expense of $2,353,682, as shown on Attachment 1 at Page 17, in accordance with the property tax recovery mechanism included in the Amended Settlement Agreement in Docket No. 4323 and continued under the Amended Settlement Agreement in Docket No. 4770. Importantly, the incremental capital investment for the FY 2020 ISR revenue requirement excludes capital investment embedded in base rates in Docket No. 4770 for FY 2012 through FY 2020. Incremental non-growth capital investment for this purpose is intended to represent the net change in net plant for non-growth infrastructure investments during the relevant fiscal year and is defined as capital investment plus cost of removal, less annual depreciation expense

ultimately embedded in the Company's base rates (excluding depreciation expense attributable to general plant, which is not eligible for inclusion in the Gas ISR Plan).

Prior Gas ISR plans included operation and maintenance (O&M) expenses associated with hiring, training, and supervision of additional personnel to support leak-prone pipe replacement, which was incremental to the level of O&M labor expense being recovered in base rates from Docket No. 4323. Inclusion of this labor-related O&M expense in the Gas ISR Plan is no longer required because these employees were included in the Company's labor complement in its most recent general rate case in Docket No. 4770, and therefore their associated labor costs are being recovered through base rates effective September 1, 2018.

For illustration purposes only, Attachment 1, Page 1, Column (d) provides the FY 2021 revenue requirement for the respective vintage year capital investments. Notably, these amounts will be trued up to actual investment activity after the conclusion of the fiscal year, with rate adjustments for the revenue requirement differences incorporated in future ISR filings.

Gas Infrastructure Investment

Incremental Capital Investment

As noted above, Attachment 1, Page 8 calculates the revenue requirement of incremental capital investment associated with the Company's FY 2020 Gas ISR Plan, that is, gas infrastructure investment (net of general plant) incremental to the amounts embedded in the Company's base distribution rates. The proposed capital investment, including cost of removal, is obtained from Table 1 in Section 2 of the Plan. The FY 2020 revenue requirement also includes the incremental capital investment associated with the Company's FY 2018 through

FY 2019 ISR Plans, excluding investments reflected in rate base in Docket No. 4770 for FY 2018 through FY 2020.

Attachment 1, Page 11 calculates the incremental FY 2018 through FY 2020 ISR capital investment and the related incremental cost of removal, incremental retirements, and incremental net operating loss (NOL) position for the FY 2020 ISR revenue requirement. The calculations on Page 11 compare ISR-eligible capital investment, cost of removal, retirements, and net NOL position for FY 2018 through FY 2020 to the corresponding amounts reflected in rate base in Docket No. 4770.

Incremental Capital Investment Calculation

The ISR mechanism was established to allow the Company to recover outside of base rates its costs associated with capital investment incurred to expand its gas infrastructure and improve the reliability and safety of its gas facilities. When new base rates are implemented, as was the case in Docket No. 4770, the Company no longer recovers costs for pre-rate case ISR capital investment through a separate ISR factor. Instead, such costs are recovered through base rates, and the underlying ISR investment becomes a component of base distribution rate base from that point forward. The forecast used to develop rate base in the distribution rate case included ISR investment levels for FY 2018, FY 2019, and five months of FY 2020 (using the level of capital investment approved in the FY 2018 Gas ISR Plan as a proxy for FY 2019 and FY 2020). The effective date of new rates in Docket No. 4770 was September 1, 2018. Therefore, recovery of the approved FY 2012 through FY 2019 ISR revenue requirements through the ISR factor ended on August 31, 2018, and all future recovery of those ISR capital investments will be through the Company's base rates.

As a result of the implementation of new base rates effective September 1, 2018, pursuant to Docket No. 4770, the cumulative amount of forecasted ISR capital investment was rolled into base rates effective September 1, 2018. The FY 2020 revenue requirement for incremental FY 2018, FY 2019, and FY 2020 ISR investments reflect a full year of revenue requirement because none of these incremental investments are included in the Company's rate base in Docket 4770. These incremental fiscal year vintage amounts must remain in the ISR recovery mechanism as provided in the terms of the approved Amended Settlement Agreement in Docket No. 4770. The FY 2020 Gas ISR Plan filing is based on the actual ISR capital investment for the fiscal year ended March 31, 2018 and the estimated ISR capital investment during the Company's fiscal years ended March 31, 2019 and 2020, and which were incremental to the levels reflected in rate base in the Company's last base rate case (Docket No. 4770).

Gas Infrastructure Revenue Requirement

The revenue requirement calculation on incremental gas infrastructure investment for vintage year FY 2020 is shown on Attachment 1, Page 8. The revenue requirement calculation incorporates the incremental Gas ISR Plan capital investment, cost of removal, and retirements, which are the basis for determining the two components of the revenue requirement: (1) the return on investment (i.e., average Plan rate base at the weighted average cost of capital); and (2) depreciation expense. The calculation on Page 8 begins with the determination of the depreciable net incremental capital that will be included in the Plan rate base. Because depreciation expense is affected by plant retirements, retirements have been deducted from the total allowed capital included in the Plan rate base in determining depreciation expense.

Retirements, however, do not affect rate base, as both plant-in-service and the depreciation reserve are reduced by the installed value of the plant being retired and, therefore, have no impact on net plant. Incremental book depreciation expense on Line 12 is computed based on the net depreciable capital from Line 3 at the 2.99 percent composite depreciation rate approved in Docket No. 4770, and as shown on Line 9. The Company has assumed a half-year convention for the year of installation. Unlike retirements, cost of removal affects rate base, but not depreciation expense. Consequently, the cost of removal, as shown on Line 7, is combined with the incremental depreciable amount from Line 6 (vintage year ISR Plan allowable capital additions, less non-general plant depreciation expense included in base distribution rates) to arrive at the incremental investment on Line 8 to be included in the rate base upon which the return component of the annual revenue requirement is calculated.

The rate base calculation incorporates net plant, accumulated depreciation, and accumulated deferred tax reserves, as shown on Lines 8, 13, and 18, respectively. The deferred tax amount arising from the capital investment, as calculated on Lines 14 through 18, equals the difference between book depreciation and tax depreciation on the capital investment, multiplied by the effective tax rate, net of any tax NOLs or NOL utilization. The calculation of tax depreciation is described below. The average rate base before deferred tax proration adjustment is shown on Line 23. This amount is adjusted by the deferred tax proration adjustment on Line 24 to arrive at average rate base after deferred tax proration on Line 25. This amount is then multiplied by the pre-tax rate of return approved by the PUC in Docket No. 4770, as shown on Line 26, to compute the return and tax portion of the incremental revenue requirement, as shown on Line 27. Incremental depreciation expense is added to this amount on Line 28. The sum of

these amounts reflects the annual revenue requirement associated with the capital investment portion of the Plan on Line 29, which is carried forward to Page 1, Line 5 as part of the total Plan revenue requirement. Similar revenue requirement calculations for the vintage FY 2018 and FY 2019 incremental Plan capital investment are shown on Pages 2 and 5, respectively. These capital investment revenue requirement amounts are added to the total property tax recovery on Page 1, Line 8 to derive the total FY 2020 Gas ISR Plan revenue requirement of $7,290,355, as shown on Page 1, Line 11, Column (c).

Tax Depreciation Calculation

The tax depreciation calculation for FY 2020 is provided on Attachment 1, Page 9. The tax depreciation amount assumes that a portion of the capital investment, as shown on Line 1, will be eligible for immediate deduction on the Company's fiscal year federal income tax return. This immediate deductibility is referred to as the capital repairs deduction.[1] In addition, plant additions not subject to the capital repairs deduction may be subject to bonus depreciation, as shown on Page 3, Lines 4 through 12 for FY 2020. During 2010, Congress passed the Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 (the 2010 Tax Act), which provided for an extension of bonus depreciation. Specifically, the 2010 Tax Act

[1] In 2009, the Internal Revenue Service (IRS) issued additional guidance, under Internal Revenue Code Section 162, related to certain work considered to be repair and maintenance expense, and eligible for immediate tax deduction for income tax purposes, but capitalized by the Company for book purposes. As a result of this additional guidance, the Company recorded a one-time tax expense for repair and maintenance costs in its FY 2009 federal income tax return filed on December 11, 2009 by National Grid Holdings, Inc. Since that time, the Company has taken a capital repairs deduction on all subsequent fiscal year tax returns. This has formed the basis for the capital repairs deduction assumed in the Company's revenue requirement. This tax deduction has the effect of increasing deferred taxes and lowering the revenue requirement that customers will pay under the capital investment reconciliation mechanism. The Company's federal income tax returns are subject to audit by the IRS. If it is determined in the future that the Company's position on its tax returns on this matter was incorrect, the Company will reflect any related IRS disallowances, plus any associated interest assessed by the IRS, in a subsequent reconciliation filing under the Gas ISR Plan.

provided for the application of 100 percent bonus depreciation for investment constructed and placed into service after September 8, 2010 through December 31, 2011, and then 50 percent bonus depreciation for similar capital investment placed into service after December 31, 2011 through December 31, 2012. The 50 percent bonus depreciation rate was later extended through December 31, 2013, and then extended further through December 31, 2017 via the Protecting Americans from Tax Hikes (PATH) Act. As noted in the Company's previous Gas ISR Plan filings, the Tax Cuts and Jobs Act of 2017 (the 2017 Tax Act) went into effect on December 22, 2017. The 2017 Tax Act has many elements, but two aspects in particular have an impact on the Gas ISR Plan revenue requirement. The first is the reduction of the federal income tax rate from 35 percent to 21 percent commencing January 1, 2018. The second is changes to the bonus depreciation rules eliminating bonus depreciation for certain capital investments, including ISR-eligible investments, effective September 28, 2017. The Company's FY 2020 revenue requirement includes the impact of the 2017 Tax Act on vintage FY 2018 through FY 2020 investment. Finally, the remaining plant additions not deducted as bonus depreciation are then subject to the IRS Modified Accelerated Cost-Recovery System, or MACRS, tax depreciation rate. The amount of depreciation deducted for MACRS is added to the amount of capital repairs deduction plus the bonus depreciation deduction, tax loss on retirements, and cost of removal to arrive at total tax depreciation. These annual total tax depreciation amounts are carried forward to Page 8, Line 10 and incorporated in the deferred tax calculation. Similar tax depreciation calculations are provided for FY 2018 and FY 2019 on Pages 3 and 6, respectively.

The Company continues to monitor for new guidance pertaining to the 2017 Tax Act and any resulting impacts to its pending rate requests. The Company will file its FY 2018 tax return in December 2018. At that time, the Company will evaluate whether any revisions are required to its calculation of accumulated deferred income taxes included in rate base in the FY 2018, FY 2019, and FY 2020 vintage revenue requirement calculations in this docket. If so, the Company will supplement this filing with a revised FY 2020 revenue requirement calculation.

Federal Net Operating Loss

Tax NOLs are generated when the Company has tax deductions on its income tax returns that exceed its taxable income. Tax NOLs do not mean that the Company is suffering losses in its financial statements. Instead, the Company's tax NOLs are the result of the significant tax deductions that have been generated in recent years by the bonus depreciation and capital repairs tax deductions. In addition to first-year bonus tax depreciation, the Internal Revenue Code allows the Company to classify certain costs as repairs expense, which the Company takes as an immediate deduction on its income tax return. However, such costs are recorded as plant investment on the Company's books. These significant bonus depreciation and capital repairs tax deductions have exceeded the amount of taxable income reported in tax returns filed for FY 2009 to FY 2016, with the exception of FY 2011. NOLs are recorded as non-cash assets on the Company's balance sheet and represent a benefit that the Company and customers will receive when the Company is able to realize actual cash savings and applies the NOLs against taxable income in the future.

As a result of the 2017 Tax Act, the Company does not expect to generate a new NOL in FY 2018 and anticipates it will begin to utilize prior years' NOLs in FY 2019. Estimated NOL utilization is included in base rates in Docket No. 4770. Therefore, the calculation of accumulated deferred income taxes in this filing includes only the incremental amount of forecasted NOL utilization in FY 2019 and FY 2020, which are the fiscal years the benefit would be reflected in the Company's federal income tax returns.

NOL utilization is an increase to the Company's accumulated deferred income taxes. Accumulated deferred income taxes, which equal the difference between book depreciation and tax depreciation on ISR capital investment, multiplied by the effective tax rate, are included as a credit or reduction in the calculation of rate base.

Accumulated Deferred Income Tax Proration Adjustment

The Gas ISR Plan includes a proration calculation with respect to the accumulated deferred income tax (ADIT) balance included in rate base. The calculation fulfills requirements set out under IRS Regulation 26 C.F.R. §1.167(l)-1(h)(6). This regulation sets forth normalization requirements for regulated entities so that the benefits of accelerated depreciation are not passed back to customers too quickly. The penalty of a normalization violation is the loss of all federal income tax deductions for accelerated depreciation, including bonus depreciation. Any regulatory filing which includes capital expenditures, book depreciation expense, and ADIT related to those capital expenditures must follow the normalization requirements. When the regulatory filing is based on a future period, the deferred tax must be prorated to reflect the period of time that the ADIT balances are in rate base. This FY 2020 Gas ISR Plan filing includes proration calculations for vintage investment years FY 2018, FY 2019, and FY 2020 at

Attachment 1, Pages 4, 7, and 10, respectively, the effects of which are included in each year's respective revenue requirement.

Property Tax Recovery Adjustment

The Property Tax Recovery Adjustment is set forth on Attachment 1, Pages 16 and 17. The method used to recover property tax expense under the Gas ISR Plan was modified by the Amended Settlement Agreement in Docket No. 4323 and continued by the Amended Settlement Agreement in Docket No. 4770. In determining the base on which property tax expense is calculated for purposes of the Plan revenue requirement, the Company includes an amount equal to the base rate allowance for depreciation expense and depreciation expense on incremental Plan plant additions in the accumulated reserve for depreciation that is deducted from plant-in-service. The Property Tax Recovery Adjustment also includes the impact of any changes in the Company's effective property tax rates on base rate embedded property, plus cumulative ISR net additions. Property tax impacts associated with non-ISR plant additions are excluded from the property tax recovery formula. This provision of the Amended Settlement Agreement in Docket No. 4323 took effect for ISR property tax recovery periods subsequent to the end of the rate year for that docket, or January 31, 2014, and has been continued by the Amended Settlement Agreement in Docket No. 4770. The FY 2020 revenue requirement includes $2,353,682 for the Net Property Tax Recovery Adjustment.

The Narragansett Electric Company
d/b/a National Grid
FY 2020 Gas ISR Plan Revenue Requirement
Annual Revenue Requirement Summary

Line No.		Approved Fiscal Year 2019 (a)	Effective September 1, 2018 [(a)] (b)	Fiscal Year 2020 (c)	Fiscal Year 2021 (d)
	Operation and Maintenance Expenses				
1	Forecasted Gas Infrastructure, Safety, and Reliability O&M Expenses	$ 502,000	$ -	$ -	$ -
	Capital Investment:				
2	Actual Revenue Requirement on FY 2012 through FY 2017 Capital included in ISR Rate Base	$ 22,068,150		$ -	$ -
3	Actual Annual Revenue Requirement on FY 2018 Capital Included in ISR Rate Base	$ 7,433,043		$ 206,007	$ 219,530
4	Forecasted Annual Revenue Requirement on FY 2019 Capital Included in ISR Rate Base	$ 4,353,572		$ 720,889	$ 707,408
5	Forecasted Annual Revenue Requirement on FY 2020 Capital Included in ISR Rate Base	$ -		$ 4,009,777	$ 9,074,973
6	Total Capital Investment Revenue Requirement	$ 33,854,765	$ -	$ 4,936,673	$ 10,001,910
7	FY 2019 Property Tax Recovery Adjustment	$ 9,517,495	$ -		
8	FY 2020 Property Tax Recovery Adjustment			$ 2,353,682	
9	True-Up for Cumberland LNG Settlement	$ (61,849)			
10	Total Capital Investment Component of Revenue Requirement	**$ 43,310,411**	**$ -**	**$ 7,290,355**	**$ 10,001,910**
11	Total Fiscal Year Revenue Requirement	**$ 43,812,411**	**$ -**	**$ 7,290,355**	**$ 10,001,910**
12	Incremental Fiscal Year Rate Adjustment		**$ (43,812,411)**	**$ 7,290,355**	

(a) Pursuant to the Settlement Agreement filed in RIPUC Docket No. 4770, the Capital component of the FY 2019 ISR rate will be reduced to zero coincident with the effective date of new distribution base rates.

Column/Line Notes:

Col (a)	RIPUC Docket No. 4781 - FY 2019 Gas Infrastructure, Safety, and Reliability Plan Compliance Filing - Updated Attachments to Sections 3 and 4 of the Plan dated March 2, 2018, Section 3, Attachment 1-Supp2, Page 1 Col (b) Sum of Lines 1 through 13
3	Page 2 of 19, Line 30, Col. (c) and Col. (d)
4	Page 5 of 19, Line 29, Col. (b) and Col. (c)
5	Page 8 of 19, Line 29, Col. (a) and Col. (b)
6	Sum of Lines 2 through Line 5
8	Page 17 of 19, Line 57, Column (g) × 1,000
10	Sum of Line 7 through Line 9
11	Line 1 + Line 10
12	Col (b)= Line 11 Col (b)-Col (a); Col (c)= Line 11 Col (c)-Col (b)

The Narragansett Electric Company
d/b/a National Grid
FY 2020 Gas ISR Plan Revenue Requirement
Computation of Revenue Requirement on FY 2018 Actual Gas Capital Investment

Line No.				Fiscal Year 2018 (a)	Fiscal Year 2019 (b)	Fiscal Year 2020 (c)	Fiscal Year 2021 (d)
	Depreciable Net Capital Included in ISR Rate Base						
1	Total Allowed Capital Included in ISR Rate Base in Current Year	Page 11 of 19 , Line 3 ,Col (a)		$ 4,632,718	$ -	$ -	$ -
2	Retirements	Page 11 of 19 , Line 9 ,Col (a)		$ 12,059,428	$ -	$ -	$ -
3	Net Depreciable Capital Included in ISR Rate Base	Line 1 - Line 2		$ (7,426,710)	$ (7,426,710)	$ (7,426,710)	$ (7,426,710)
	Change in Net Capital Included in ISR Rate Base						
4	Capital Included in ISR Rate Base	Line 1		$ 4,632,718	$ -	$ -	$ -
5	Depreciation Expense			$ -	$ -	$ -	$ -
6	Incremental Capital Amount	Line 4 - Line 5		$ 4,632,718	$ 4,632,718	$ 4,632,718	$ 4,632,718
7	Cost of Removal	Page 11 of 19 , Line 6 ,Col (a)		$ 1,941,168	$ 1,941,168	$ 1,941,168	$ 1,941,168
8	**Net Plant Amount**	**Line 6 + Line 7**		**$ 6,573,886**	**$ 6,573,886**	**$ 6,573,886**	**$ 6,573,886**
	Deferred Tax Calculation:						
9	Composite Book Depreciation Rate	As approved per RIPUC Docket No. 4323 and Docket No. 4770	1/	3.38%	3.15%	2.99%	2.99%
10	Tax Depreciation	Col (a)=Page 3 of 19, Line 22, Col (a); Col (b) & forward=Page 3 of 19, Col (d)		$ 5,772,454	$ 78,007	$ 72,150	$ 66,748
11	Cumulative Tax Depreciation	Prior Year Line 11 + Current Year Line 10		$ 5,772,454	$ 5,850,461	$ 5,922,612	$ 5,989,359
12	Book Depreciation	Col (a) = Line 3 * Line 9 * 50%; Col (b) forward = Line 3 * Line 9		$ (125,511)	$ (234,127)	$ (222,059)	$ (222,059)
13	Cumulative Book Depreciation	Prior Year Line 13 + Current Year Line 12		$ (125,511)	$ (359,638)	$ (581,697)	$ (803,756)
14	Cumulative Book / Tax Timer	Line 11 - Line 13		$ 5,897,965	$ 6,210,100	$ 6,504,309	$ 6,793,115
15	Effective Tax Rate		2/	21.00%	21.00%	21.00%	21.00%
16	Deferred Tax Reserve	Line 14 * Line 15		$ 1,238,573	$ 1,304,121	$ 1,365,905	$ 1,426,554
17	Less: FY 2018 Federal NOL			$ -	$ -	$ -	
18	Excess Deferred Tax	Col (a) = (Line 14 * 31.55% FY18 blended tax rate) - Line 16		$ 622,235	$ 622,235	$ 622,235	$ 622,235
19	Net Deferred Tax Reserve before Proration Adjustment	Line 16 + Line 17 + Line 18		$ 1,860,808	$ 1,926,356	$ 1,988,140	$ 2,048,789
	ISR Rate Base Calculation:						
20	Cumulative Incremental Capital Included in ISR Rate Base	Line 8		$ 6,573,886	$ 6,573,886	$ 6,573,886	$ 6,573,886
21	Accumulated Depreciation	- Line 13		$ 125,511	$ 359,638	$ 581,697	$ 803,756
22	Deferred Tax Reserve	- Line 19		$ (1,860,808)	$ (1,926,356)	$ (1,988,140)	$ (2,048,789)
23	Year End Rate Base before Deferred Tax Proration	Sum of Lines 20 through 22		$ 4,838,589	$ 5,007,168	$ 5,167,443	$ 5,328,852
	Revenue Requirement Calculation:						
24	Average Rate Base before Deferred Tax Proration Adjustment	Column (a) = Current Year Line 23 ÷ 2; Column (b) = (Prior Year Line 23 + Current Year Line 23) ÷ 2				$ 5,087,305	$ 5,248,147
25	Proration Adjustment	Page 4 of 19, Line 41, Col (c) and Col (d)				$ 2,652	$2,603
26	Average ISR Rate Base after Deferred Tax Proration	Line 24 + Line 25				$ 5,089,957	$ 5,250,751
27	Pre-Tax ROR	Page 19 of 19, Line 37				8.41%	8.41%
28	Return and Taxes	Line 26 * Line 27				$ 428,065	$ 441,588
29	Book Depreciation	Line 12				$ (222,059)	$ (222,059)
30	**Annual Revenue Requirement Revised**	**Sum of Lines 28 through 29**		**N/A**	**N/A**	**$ 206,007**	**$ 219,530**

1/ 3.38%, Composite Book Depreciation Rate approved per RIPUC Docket No. 4323, in effect until Aug 31, 2018
2.99%, Composite Book Depreciation Rate approved per RIPUC Docket No. 4770, effective on Sep 1, 2018
FY 19 Composite Book Depreciation Rate = 3.38% x 5 /12 + 2.99% x 7 / 12

2/ The Federal Income Tax rate changed from 35% to 21% on Janurary 1, 2018 per the Tax Cuts and Jobs Act of 2017

The Narragansett Electric Company
d/b/a National Grid
FY 2020 Gas ISR Plan Revenue Requirement
Calculation of Tax Depreciation and Repairs Deduction on FY 2018 Capital Investments

Line No.				Fiscal Year 2018 (a)
	Capital Repairs Deduction			
1	Plant Additions	Page 2 of 19, Line 1		$ 4,632,718
2	Capital Repairs Deduction Rate	Per Tax Department	1/	68.90%
3	Capital Repairs Deduction	Line 2 * Line 3		$ 3,191,942
4	Bonus Depreciation			
5	Plant Additions	Line 1		$ 4,632,718
6	Less Capital Repairs Deduction	Line 3		$ 3,191,942
7	Plant Additions Net of Capital Repairs Deduction	Line 5 - Line 6		$ 1,440,776
8	Percent of Plant Eligible for Bonus Depreciation	Per Tax Department		100.00%
9	Plant Eligible for Bonus Depreciation	Line 7 * Line 8		$ 1,440,776
10	Bonus Depreciation Rate (April 2017 - September 2017)	1 * 50% * 50%		25.00%
11	Bonus Depreciation Rate (October 2017 - March 2018)	1 * 50% *0%		0.00%
12	Total Bonus Depreciation Rate	Line 10 + Line 11		25.00%
13	Bonus Depreciation	Line 9 * Line 12		$ 360,194
	Remaining Tax Depreciation			
14	Plant Additions	Line 1		$ 4,632,718
15	Less Capital Repairs Deduction	Line 3		$ 3,191,942
16	Less Bonus Depreciation	Line 13		$ 360,194
17	Remaining Plant Additions Subject to 20 YR MACRS Tax Depreciation	Line 14 - Line 15 - Line 16		$ 1,080,582
18	20 YR MACRS Tax Depreciation Rates	IRS Publication 946		3.75%
19	Remaining Tax Depreciation	Line 17 * Line 18		$ 40,522
20	FY18 tax (gain)/loss on retirements	Per Tax Department	2/	$ 238,628
21	Cost of Removal	Page 2 of 19, Line 7		$ 1,941,168
22	Total Tax Depreciation and Repairs Deduction	Sum of Lines 3, 13, 19, 20 & 21		$ 5,772,454

(b)	(c)	(d)	(e)
20 Year MACRS Depreciation			
MACRS basis:		$ 1,080,582	
Fiscal Year		Annual	Cumulative
2018	3.750%	$ 40,522	$ 5,772,454
2019	7.219%	$ 78,007	$ 5,850,461
2020	6.677%	$ 72,150	$ 5,922,612
2021	6.177%	$ 66,748	$ 5,989,359
2022	5.713%	$ 61,734	$ 6,051,093
2023	5.285%	$ 57,109	$ 6,108,202
2024	4.888%	$ 52,819	$ 6,161,020
2025	4.522%	$ 48,864	$ 6,209,884
2026	4.462%	$ 48,216	$ 6,258,100
2027	4.461%	$ 48,205	$ 6,306,305
2028	4.462%	$ 48,216	$ 6,354,520
2029	4.461%	$ 48,205	$ 6,402,725
2030	4.462%	$ 48,216	$ 6,450,941
2031	4.461%	$ 48,205	$ 6,499,145
2032	4.462%	$ 48,216	$ 6,547,361
2033	4.461%	$ 48,205	$ 6,595,566
2034	4.462%	$ 48,216	$ 6,643,781
2035	4.461%	$ 48,205	$ 6,691,986
2036	4.462%	$ 48,216	$ 6,740,202
2037	4.461%	$ 48,205	$ 6,788,406
2038	2.231%	$ 24,108	$ 6,812,514
	100.000%	$ 1,080,582	

1/ Capital Repairs percentage is based on a three-year average of FYs 2013, 2014 and 2015 capital repairs rates.
2/ FY 2018 estimated tax loss on retirements

The Narragansett Electric Company
d/b/a National Grid
FY 2020 Gas ISR Plan Revenue Requirement
Calculation of Net Deferred Tax Reserve Proration on Incremental FY 2018 Investment

Line No.			(a) FY18	(b) FY19	(c) FY20	(d) FY21
	Deferred Tax Subject to Proration					
1	Book Depreciation	Page 2 of 19, Line 12	$ (125,511)	($234,127)	($222,059)	($222,059)
2	Bonus Depreciation	Page 3 of 19, Line 13	$ (360,194)	$0	$0	$0
3	Remaining MACRS Tax Depreciation	Col (a)=Page 3 of 19, Line 19(a); Col (b) & forward= Page 3 of 19, Col (d)	$ (40,522)	($78,007)	($72,150)	($66,748)
4	FY18 tax (gain)/loss on retirements	Page 3 of 19, Line 20	$ (238,628)	$0	$0	$0
5	Cumulative Book / Tax Timer	Sum of Lines 1 through 4	$ (764,855)	($312,134)	($294,209)	($288,806)
6	Effective Tax Rate		31.55%	21.00%	21.00%	21.00%
7	Deferred Tax Reserve	Line 5 * Line 6	$ (241,312)	($65,548)	($61,784)	($60,649)
	Deferred Tax Not Subject to Proration					
8	Capital Repairs Deduction	Page 3 of 19, Line 3	$ (3,191,942)			
9	Cost of Removal	Page 3 of 19, Line 21	$ (1,941,168)			
10	Book/Tax Depreciation Timing Difference at 3/31/2017		$ -			
11	Cumulative Book / Tax Timer	Line 8 + Line 9 + Line 10	$ (5,133,110)			
12	Effective Tax Rate		31.55%			
13	Deferred Tax Reserve	Line 11 * Line 12	(1,619,496)			
14	Total Deferred Tax Reserve	Line 7 + Line 13	$ (1,860,808)	($65,548)	($61,784)	($60,649)
15	Net Operating Loss		$ -		$0	$0
16	Net Deferred Tax Reserve	Line 14 + Line 15	$ (1,860,808)	($65,548)	($61,784)	($60,649)
	Allocation of FY 2018 Estimated Federal NOL					
17	Cumulative Book/Tax Timer Subject to Proration	Line 5	$ (764,855)	$ (312,134)	$ (294,209)	$ (288,806)
18	Cumulative Book/Tax Timer Not Subject to Proration	Line 11	$ (5,133,110)	$ -	$ -	$ -
19	Total Cumulative Book/Tax Timer	Line 17 + Line 18	$ (5,897,965)	$ (312,134)	$ (294,209)	$ (288,806)
20	Total FY 2018 Federal NOL	Page 2 of 19, Line 17	$ -	$ -	$ -	$ -
21	Allocated FY 2018 Federal NOL Not Subject to Proration	(Line 18 / Line 19) * Line 20	$ -	$ -	$ -	$ -
22	Allocated FY 2018 Federal NOL Subject to Proration	(Line 17 / Line 19) * Line 20	$ -	$ -	$ -	$ -
23	Effective Tax Rate		31.55%	21%	21%	21%
24	Deferred Tax Benefit subject to proration	Line 22 * Line 23	0	0	0	0
25	Net Deferred Tax Reserve subject to proration	Line 7 + Line 24	$ (241,312)	($65,548)	($61,784)	($60,649)

	Proration Calculation	(h) Number of Days in Month	(i) Proration Percentage	(j) FY18	(k) FY19	(l) FY20	(m) FY21
26	April	30	91.78%	$ (18,456)	($5,013)	($4,725)	($4,639)
27	May	31	83.29%	$ (16,749)	($4,549)	($4,288)	($4,209)
28	June	30	75.07%	$ (15,096)	($4,101)	($3,865)	($3,794)
29	July	31	66.58%	$ (13,388)	($3,637)	($3,428)	($3,365)
30	August	31	58.08%	$ (11,680)	($3,173)	($2,990)	($2,936)
31	September	30	49.86%	$ (10,027)	($2,724)	($2,567)	($2,520)
32	October	31	41.37%	$ (8,319)	($2,260)	($2,130)	($2,091)
33	November	30	33.15%	$ (6,666)	($1,811)	($1,707)	($1,675)
34	December	31	24.66%	$ (4,958)	($1,347)	($1,270)	($1,246)
35	January	31	16.16%	$ (3,251)	($883)	($832)	($817)
36	February	28	8.49%	$ (1,708)	($464)	($437)	($429)
37	March	31	0.00%	$ -	$0	$0	$0
38	Total	365		$ (110,298)	($29,961)	($28,240)	($27,721)
39	Deferred Tax Without Proration	Line 25		$ (241,312)	($65,548)	($61,784)	($60,649)
40	Average Defferred Tax without Proration	Line 25 * 50%		$ (120,656)	($32,774)	($30,892)	($30,325)
41	Proration Adjustment	Line 38 - Line 40		$ 10,358	$2,813	$2,652	$2,603

Column Notes:

(i)	Sum of remaining days in the year (Col (h)) ÷ 365
(j) through (m)	Current Year Line 25 ÷ 12 × Current Month Col (i)

The Narragansett Electric Company
d/b/a National Grid
FY 2020 Gas ISR Plan Revenue Requirement
Computation of Revenue Requirement on FY 2019 Forecasted Gas Capital Investment

Line No.				Fiscal Year 2019 (a)	Fiscal Year 2020 (b)	Fiscal Year 2021 (c)
	Depreciable Net Capital Included in ISR Rate Base					
1	Total Allowed Capital Included in ISR Rate Base in Current Year	Page 11 of 19 , Line 3 ,Col (b)		$7,595,000	$0	$0
2	Retirements	Page 11 of 19 , Line 9 ,Col (b)		$2,150,472	$0	$0
3	Net Depreciable Capital Included in ISR Rate Base	Column (a) = Line 1 - Line 2; Column (b) = Prior Year Line 3		$5,444,528	$5,444,528	$5,444,528
	Change in Net Capital Included in ISR Rate Base					
4	Capital Included in ISR Rate Base	Line 1		$7,595,000	$0	$0
5	Depreciation Expense			$0	$0	$0
6	Incremental Capital Amount	Column (a) = Line 4 - Line 5; Column (b) = Prior Year Line 6		$7,595,000	$7,595,000	$7,595,000
7	Cost of Removal	Page 11 of 19 , Line 6 ,Col (b)		($516,122)	($516,122)	($516,122)
8	**Net Plant Amount**	**Line 6 + Line 7**		**$7,078,879**	**$7,078,879**	**$7,078,879**
	Deferred Tax Calculation:					
9	Composite Book Depreciation Rate	As Approved in RIPUC Docket No. 4323 & 4770	1/	3.15%	2.99%	2.99%
10	Tax Depreciation	Column (a)=Page 6 of 19, Line 21, Col (a); Columns (b) & (c)=Page 6 of 19, Column (d)		$5,233,373	$156,315	$144,579
11	Cumulative Tax Depreciation	Prior Year Line 11 + Current Year Line 10		$5,233,373	$5,389,688	$5,534,267
12	Book Depreciation	Column (a) = Line 3 * Line 9 * 50% ; Column (b) = Line 3 *		$85,751	$162,791	$162,791
13	Cumulative Book Depreciation	Prior Year Line 13 + Current Year Line 12		$85,751	$248,542	$411,334
14	Cumulative Book / Tax Timer	Line 11 - Line 13		$5,147,622	$5,141,146	$5,122,934
15	Effective Tax Rate			21.00%	21.00%	21.00%
16	Deferred Tax Reserve	Line 14 * Line 15		$1,081,001	$1,079,641	$1,075,816
17	Add: FY 2019 Federal NOL incremental utilization	Page 11, Line 12(b)		($804,769)	($804,769)	($804,769)
18	Net Deferred Tax Reserve before Proration Adjustment	Line 16 + Line 17		$276,232	$274,872	$271,047
	ISR Rate Base Calculation:					
19	Cumulative Incremental Capital Included in ISR Rate Base	Line 8		$7,078,879	$7,078,879	$7,078,879
20	Accumulated Depreciation	- Line 13		($85,751)	($248,542)	($411,334)
21	Deferred Tax Reserve	- Line 18		($276,232)	($274,872)	($271,047)
22	Year End Rate Base before Deferred Tax Proration	Sum of Lines 19 through 21		$6,716,896	$6,555,465	$6,396,498
	Revenue Requirement Calculation:					
23	Average Rate Base before Deferred Tax Proration Adjustment	Column (a) = Current Year Line 22 ÷ 2; Column (b) = (Prior Year Line 22 + Current Year Line 22) ÷ 2			$6,636,180	$6,475,981
24	Proration Adjustment	Page 7 of 19, Line 41, Col (k) and Col (l)			($58)	($164)
25	Average ISR Rate Base after Deferred Tax Proration	Line 23 + Line 24			$6,636,122	$6,475,817
26	Pre-Tax ROR	Page 19 of 19, Line 37			8.41%	8.41%
27	Return and Taxes	Line 25 * Line 26			$558,098	$544,616
28	Book Depreciation	Line 12			$162,791	$162,791
29	**Annual Revenue Requirement Revised**	**Sum of Lines 27 through 28**		**N/A**	**$720,889**	**$707,408**

1/ 3.4%, Composite Book Depreciation Rate approved per RIPUC Docket No. 4323, in effect until Aug 31, 2018
2.99%, Composite Book Depreciation Rate approved per RIPUC Docket No. 4770, effective on Sep 1, 2018
FY 19 Composite Book Depreciation Rate = 3.38% x 5 /12 + 2.99% x 7 / 12

The Narragansett Electric Company
d/b/a National Grid
FY 2020 Gas ISR Plan Revenue Requirement
Calculation of Tax Depreciation and Repairs Deduction on FY 2019 Capital Investments

Line No.			Fiscal Year 2019 (a)
	Capital Repairs Deduction		
1	Plant Additions	Page 5 of 19, Line 1	$7,595,000
2	Capital Repairs Deduction Rate	Per Tax Department 1/	71.49%
3	Capital Repairs Deduction	Line 2 * Line 3	$5,429,666
	Bonus Depreciation		
4	Plant Additions	Line 1	$7,595,000
5	Less Capital Repairs Deduction	Line 3	$5,429,666
6	Plant Additions Net of Capital Repairs Deduction	Line 4 - Line 5	$2,165,334
7	Percent of Plant Eligible for Bonus Depreciation	Per Tax Department	100.00%
8	Plant Eligible for Bonus Depreciation	Line 6 * Line 7	$2,165,334
9	Bonus Depreciation Rate (April 2018 - December 2018)	1 * 75% * 0%	0.00%
10	Bonus Depreciation Rate (January 2019 - March 2019)	1 * 25% * 0%	0.00%
11	Total Bonus Depreciation Rate	Line 9 + Line 10	0.00%
12	Bonus Depreciation	Line 8 * Line 11	$0
	Remaining Tax Depreciation		
13	Plant Additions	Line 1	$7,595,000
14	Less Capital Repairs Deduction	Line 3	$5,429,666
15	Less Bonus Depreciation	Line 12	$0
16	Remaining Plant Additions Subject to 20 YR MACRS Tax Depreciation	Line 13 - Line 14- Line 15	$2,165,334
17	20 YR MACRS Tax Depreciation Rates	IRS Publication 946	3.750%
18	Remaining Tax Depreciation	Line 16 * Line 17	$81,200
19	FY19 tax (gain)/loss on retirements	Per Tax Department 2/	$238,628
20	Cost of Removal	Page 5 of 19, Line 7	($516,122)
21	Total Tax Depreciation and Repairs Deduction	Sum of Lines 3, 12, 18, 19 & 20	$5,233,373

(b)	(c)	(d)	(e)
20 Year MACRS Depreciation			
MACRS basis:		$ 2,165,334	
Fiscal Year		Annual	Cumulative
2019	3.750%	$ 81,200	$ 5,233,373
2020	7.219%	$ 156,315	$ 5,389,688
2021	6.677%	$ 144,579	$ 5,534,267
2022	6.177%	$ 133,753	$ 5,668,020
2023	5.713%	$ 123,706	$ 5,791,726
2024	5.285%	$ 114,438	$ 5,906,163
2025	4.888%	$ 105,842	$ 6,012,005
2026	4.522%	$ 97,916	$ 6,109,921
2027	4.462%	$ 96,617	$ 6,206,539
2028	4.461%	$ 96,596	$ 6,303,134
2029	4.462%	$ 96,617	$ 6,399,751
2030	4.461%	$ 96,596	$ 6,496,347
2031	4.462%	$ 96,617	$ 6,592,964
2032	4.461%	$ 96,596	$ 6,689,560
2033	4.462%	$ 96,617	$ 6,786,177
2034	4.461%	$ 96,596	$ 6,882,772
2035	4.462%	$ 96,617	$ 6,979,390
2036	4.461%	$ 96,596	$ 7,075,985
2037	4.462%	$ 96,617	$ 7,172,602
2038	4.461%	$ 96,596	$ 7,269,198
2039	2.231%	$ 48,309	$ 7,317,506
	100.000%	$ 2,165,334	

1/ Capital Repairs percentage is based on a three-year average of FYs 2014, 2015 and 2016 capital repairs rates.
2/ FY 2019 estimated tax loss on retirements is based on FY 2018 estimate

The Narragansett Electric Company
d/b/a National Grid
FY 2020 Gas ISR Plan Revenue Requirement
Calculation of Net Deferred Tax Reserve Proration on Incremental FY 2019 Investment

Line No.			(a) FY19	(b) FY20	(c) FY21
	Deferred Tax Subject to Proration				
1	Book Depreciation	Page 5 of 19, Line 12	$85,751	$162,791	$162,791
2	Bonus Depreciation	Page 6 of 19, Line 12	$0	$0	$0
3	Remaining MACRS Tax Depreciation	Col(a) = Page 6 of 19, Line 18(a); Col(b)&(c) = Page 6 of 19, Col (d)	($81,200)	($156,315)	($144,579)
4	FY19 tax (gain)/loss on retirements	Page 6 of 19, Line 21	($238,628)	$0	$0
5	Cumulative Book / Tax Timer	Sum of Lines 1 through 4	($234,077)	$6,476	$18,212
6	Effective Tax Rate		21.00%	21.00%	21.00%
7	Deferred Tax Reserve	Line 5 * Line 6	($49,156)	$1,360	$3,825
	Deferred Tax Not Subject to Proration				
8	Capital Repairs Deduction	Page 6 of 19, Line 3	($5,429,666)	$0	$0
9	Cost of Removal	Page 6 of 19, Line 20	$516,122	$0	$0
10	Book/Tax Depreciation Timing Difference at 3/31/2018		$0	$0	$0
11	Cumulative Book / Tax Timer	Line 8 + Line 9 + Line 10	($4,913,545)	$0	$0
12	Effective Tax Rate		21.00%	21.00%	21.00%
13	Deferred Tax Reserve	Line 11 * Line 12	($1,031,844)	$0	$0
14	Total Deferred Tax Reserve	Line 7 + Line 13	($1,081,001)	$1,360	$3,825
15	Net Operating Loss		$0	$0	$0
16	Net Deferred Tax Reserve	Line 14 + Line 15	($1,081,001)	$1,360	$3,825
	Allocation of FY 2018 Estimated Federal NOL				
17	Cumulative Book/Tax Timer Subject to Proration	Line 5	($234,077)	$6,476	$18,212
18	Cumulative Book/Tax Timer Not Subject to Proration	Line 11	($4,913,545)	$0	$0
19	Total Cumulative Book/Tax Timer	Line 17 + Line 18	($5,147,622)	$6,476	$18,212
20	Total FY 2019 Federal NOL	Page 5 of 19, Line 17 / 21%	$3,832,233	$0	$0
21	Allocated FY 2018 Federal NOL Not Subject to Proration	(Line 18 / Line 19) * Line 20	$3,657,971	$0	$0
22	Allocated FY 2018 Federal NOL Subject to Proration	(Line 17 / Line 19) * Line 20	$174,262.56	$0	$0
23	Effective Tax Rate		21.00%	21.00%	21.00%
24	Deferred Tax Benefit subject to proration	Line 22 * Line 23	$36,595	$0	$0
25	Net Deferred Tax Reserve subject to proration	Line 7 + Line 24	($12,561)	$1,360	$3,825

		(h) Number of Days in Month	(i) Proration Percentage	(j) FY19	(k) FY20	(l) FY21
	Proration Calculation					
26	April	30	91.78%	($961)	$104	$293
27	May	31	83.29%	($872)	$94	$265
28	June	30	75.07%	($786)	$85	$239
29	July	31	66.58%	($697)	$75	$212
30	August	31	58.08%	($608)	$66	$185
31	September	30	49.86%	($522)	$57	$159
32	October	31	41.37%	($433)	$47	$132
33	November	30	33.15%	($347)	$38	$106
34	December	31	24.66%	($258)	$28	$79
35	January	31	16.16%	($169)	$18	$52
36	February	28	8.49%	($89)	$10	$27
37	March	31	0.00%	$0	$0	$0
38	Total	365		($5,741)	$622	$1,748
39	Deferred Tax Without Proration	Line 25		($12,561)	$1,360	$3,825
40	Average Deferred Tax without Proration	Line 25 * 50%		($6,281)	$680	$1,912
41	Proration Adjustment	Line 38 - Line 40		$539	($58)	($164)

Column Notes:

(i) Sum of remaining days in the year (Col (h)) ÷ 365

(j) through (l) Current Year Line 25 ÷ 12 × Current Month Col (i)

The Narragansett Electric Company
d/b/a National Grid
FY 2020 Gas ISR Plan Revenue Requirement
Computation of Revenue Requirement on FY 2020 Forecasted Gas Capital Investment

Line No.				Fiscal Year 2020 (a)	Fiscal Year 2021 (b)
	Depreciable Net Capital Included in ISR Rate Base				
1	Total Allowed Capital Included in ISR Rate Base in Current Year	Page 11 of 19 , Line 3 ,Col (c)		$115,727,842	$0
2	Retirements	Page 11 of 19 , Line 9 ,Col (c)	1/	$10,634,424	$0
3	Net Depreciable Capital Included in ISR Rate Base	Column (a) = Line 1 - Line 2; Column (b) = Prior Year Line 3		$105,093,417	$105,093,417
	Change in Net Capital Included in ISR Rate Base				
4	Capital Included in ISR Rate Base	Line 1		$115,727,842	$0
5	Depreciation Expense	Page 15 of 19, Line 72(c)		$23,534,853	$0
6	Incremental Capital Amount	Column (a) = Line 4 - Line 5; Column (b) = Prior Year Line 6		$92,192,989	$92,192,989
7	Cost of Removal	Page 11 of 19 , Line 6 ,Col (c)		$4,804,530	$4,804,530
8	**Net Plant Amount**	**Line 6 + Line 7**		**$96,997,519**	**$96,997,519**
	Deferred Tax Calculation:				
9	Composite Book Depreciation Rate	Page 12 of 19, Line 86(e)	1/	2.99%	2.99%
10	Tax Depreciation	Page 9 of 19 , Line 21 ,Col (a)		$87,250,149	$2,598,216
11	Cumulative Tax Depreciation	Prior Year Line 11 + Current Year Line 10		$87,250,149	$89,848,365
12	Book Depreciation	Column (a) = Line 3 * Line 9 * 50% ; Column (b) = Line 3 * Line 9		$1,571,147	$3,142,293
13	Cumulative Book Depreciation	Prior Year Line 13 + Current Year Line 12		$1,571,147	$4,713,440
14	Cumulative Book / Tax Timer	Line 11 - Line 13		$85,679,003	$85,134,926
15	Effective Tax Rate			21.00%	21.00%
16	Deferred Tax Reserve	Line 14 * Line 15		$17,992,591	$17,878,334
17	Add: FY 2020 Federal NOL utilization	Page 8, Line 12(c)		$5,371,700	$5,371,700
18	Net Deferred Tax Reserve before Proration Adjustment	Line 16 + Line 17 + Line 24		$23,364,290	$23,250,034
	ISR Rate Base Calculation:				
19	Cumulative Incremental Capital Included in ISR Rate Base	Line 8		$96,997,519	$96,997,519
20	Accumulated Depreciation	- Line 13		($1,571,147)	($4,713,440)
21	Deferred Tax Reserve	- Line 18		($23,364,290)	($23,250,034)
22	Year End Rate Base before Deferred Tax Proration	Sum of Lines 19 through 21		$72,062,082	$69,034,045
	Revenue Requirement Calculation:				
23	Average Rate Base befor Deferred Tax Proration Adjustment	Column (a) = Current Year Line 22 ÷ 2; Column (b) = (Prior Year Line 22 + Current Year Line 22) ÷ 2		$28,983,370	$70,548,064
24	Proration Adjustment	Page 10 of 19, Line 41, Col (j) and Col (k)		$13,422	($4,904)
25	Average ISR Rate Base after Deferred Tax Proration	Line 23 + Line 24		$28,996,792	$70,543,160
26	Pre-Tax ROR	Page 19 of 19, Line 37		8.41%	8.41%
27	Return and Taxes	Line 25 * Line 26		$2,438,630	$5,932,680
28	Book Depreciation	Line 12		$1,571,147	$3,142,293
29	**Annual Revenue Requirement Revised**	**Sum of Lines 27 through 28**		**$4,009,777**	**$9,074,973**

1/ 2.99%, Composite Book Depreciation Rate approved per RIPUC Docket No. 4770, effective on Sep 1, 2018

The Narragansett Electric Company
d/b/a National Grid
FY 2020 Gas ISR Plan Revenue Requirement
Calculation of Tax Depreciation and Repairs Deduction on FY 2020 Capital Investments

Line No.				Fiscal Year 2020 (a)
	Capital Repairs Deduction			
1	Plant Additions	Page 8 of 19, Line 1		$115,727,842
2	Capital Repairs Deduction Rate	Per Tax Department	1/	68.90%
3	Capital Repairs Deduction	Line 2 * Line 3		$79,736,483
	Bonus Depreciation			
4	Plant Additions	Line 1		$115,727,842
5	Less Capital Repairs Deduction	Line 3		$79,736,483
6	Plant Additions Net of Capital Repairs Deduction	Line 4 - Line 5		$35,991,359
7	Percent of Plant Eligible for Bonus Depreciation	Per Tax Department		0.00%
8	Plant Eligible for Bonus Depreciation	Line 6 * Line 7		$0
9	Bonus Depreciation Rate (April 2018 - December 2018)	1 * 75% * 0%		0.00%
10	Bonus Depreciation Rate (January 2019 - March 2019)	1 * 25% * 0%		0.00%
11	Total Bonus Depreciation Rate	Line 9 + Line 10		0.00%
12	Bonus Depreciation	Line 8 * Line 11		$0
	Remaining Tax Depreciation			
13	Plant Additions	Line 1		$115,727,842
14	Less Capital Repairs Deduction	Line 3		$79,736,483
15	Less Bonus Depreciation	Line 12		$0
16	Remaining Plant Additions Subject to 20 YR MACRS Tax Depreciation	Line 13 - Line 14- Line 15		$35,991,359
17	20 YR MACRS Tax Depreciation Rates	IRS Publication 946		3.750%
18	Remaining Tax Depreciation	Line 16 * Line 17		$1,349,676
19	FY19 tax (gain)/loss on retirements	Per Tax Department	2/	$1,359,460
20	Cost of Removal	Page 8 of 19, Line 7		$4,804,530
21	Total Tax Depreciation and Repairs Deduction	Sum of Lines 3, 12, 18, 19 & 20		$87,250,149

1/ FY 2020 estimated capital repair deduction is based on FY 2018 estimate
2/ FY 2020 estimated tax loss on retirements is based on FY 2018 estimate

(b)	(c)	(d)	(e)
20 Year MACRS Depreciation			
MACRS basis:		$35,991,359	
		Annual	Cumulative
Fiscal Year			
2020	3.750%	$1,349,676	$87,250,149
2021	7.219%	$2,598,216	$89,848,365
2022	6.677%	$2,403,143	$92,251,508
2023	6.177%	$2,223,186	$94,474,695
2024	5.713%	$2,056,186	$96,530,881
2025	5.285%	$1,902,143	$98,433,024
2026	4.888%	$1,759,258	$100,192,282
2027	4.522%	$1,627,529	$101,819,811
2028	4.462%	$1,605,934	$103,425,746
2029	4.461%	$1,605,575	$105,031,320
2030	4.462%	$1,605,934	$106,637,255
2031	4.461%	$1,605,575	$108,242,829
2032	4.462%	$1,605,934	$109,848,763
2033	4.461%	$1,605,575	$111,454,338
2034	4.462%	$1,605,934	$113,060,272
2035	4.461%	$1,605,575	$114,665,847
2036	4.462%	$1,605,934	$116,271,781
2037	4.461%	$1,605,575	$117,877,356
2038	4.462%	$1,605,934	$119,483,290
2039	4.461%	$1,605,575	$121,088,865
2040	2.231%	$802,967	$121,891,832
	100.000%	$35,991,359	

The Narragansett Electric Company
d/b/a National Grid
FY 2020 Gas ISR Plan Revenue Requirement
Calculation of Net Deferred Tax Reserve Proration on Incremental FY 2020 Investment

Line No.			(a) FY20	(b) FY21
	Deferred Tax Subject to Proration			
1	Book Depreciation	Page 8 of 19, Line 12	$1,571,147	$3,142,293
2	Bonus Depreciation	Page 9 of 19, Line 12		
3	Remaining MACRS Tax Depreciation	Col(a) = Page 9 of 19, Line 18(a); Col(b) = Page 9 of 19, Col (d)	($1,349,676)	($2,598,216)
4	FY19 tax (gain)/loss on retirements	Page 9 of 19, Line 19	($1,359,460)	$0
5	Cumulative Book / Tax Timer	Sum of Lines 1 through 4	($1,137,989)	$544,077
6	Effective Tax Rate		21.00%	21.00%
7	Deferred Tax Reserve	Line 5 * Line 6	($238,978)	$114,256
	Deferred Tax Not Subject to Proration			
8	Capital Repairs Deduction	Page 9 of 19, Line 3	($79,736,483)	
9	Cost of Removal	Page 9 of 19, Line 20	($4,804,530)	
10	Book/Tax Depreciation Timing Difference at 3/31/2019			
11	Cumulative Book / Tax Timer	Line 8 + Line 9 + Line 10	($84,541,013)	
12	Effective Tax Rate		21.00%	
13	Deferred Tax Reserve	Line 11 * Line 12	($17,753,613)	
14	Total Deferred Tax Reserve	Line 7 + Line 13	($17,992,591)	$114,256
15	Net Operating Loss			
16	Net Deferred Tax Reserve	Line 14 + Line 15	($17,992,591)	$114,256
	Allocation of FY 2018 Estimated Federal NOL			
17	Cumulative Book/Tax Timer Subject to Proration	Line 5	($1,137,989)	$544,077
18	Cumulative Book/Tax Timer Not Subject to Proration	Line 11	($84,541,013)	$0
19	Total Cumulative Book/Tax Timer	Line 17 + Line 18	($85,679,003)	$544,077
20	Total FY 2020 Federal NOL	Page 8 of 19, Line 17 / 21%	($25,579,522)	$0
21	Allocated FY 2018 Federal NOL Not Subject to Proration	(Line 18 / Line 19) * Line 20	($25,239,774)	$0
22	Allocated FY 2018 Federal NOL Subject to Proration	(Line 17 / Line 19) * Line 20	($339,747)	$0
23	Effective Tax Rate		21.00%	21.00%
24	Deferred Tax Benefit subject to proration	Line 22 * Line 23	($71,347)	$0
25	Net Deferred Tax Reserve subject to proration	Line 7 + Line 24	($310,325)	$114,256

		(h) Number of Days in Month	(i) Proration Percentage	(j)	(k)
	Proration Calculation				
26	April	30	91.78%	($12,587)	$8,739
27	May	31	83.29%	($11,423)	$7,930
28	June	30	75.07%	($10,295)	$7,148
29	July	31	66.58%	($9,131)	$6,339
30	August	31	58.08%	($7,966)	$5,530
31	September	30	49.86%	($17,221)	$4,748
32	October	31	41.37%	($14,287)	$3,939
33	November	30	33.15%	($11,449)	$3,156
34	December	31	24.66%	($8,516)	$2,348
35	January	31	16.16%	($5,583)	$1,539
36	February	28	8.49%	($2,933)	$809
37	March	31	0.00%	$0	$0
38	Total	365		($111,390)	$52,224
39	Deferred Tax Without Proration	Line 25		($310,325)	$114,256
40	Average Deferred Tax without Proration	(j): Line 39 × Page 18 of 19, Line 16; (k): Line 39 × 0.5		($124,813)	$57,128
41	Proration Adjustment	Line 38 - Line 40		$13,422	($4,904)

Column Notes:
(i) Sum of remaining days in the year (Col (i)) divided by 365
(j) Current Year Line 25 × Page 18 of 19, Col (f) × Current Month Col (i)
(k) Current Year Line 25 ÷ 12 × Current Month Col (i)

The Narragansett Electric Company
d/b/a National Grid
FY 2020 Gas ISR Plan Revenue Requirement
FY 2018 - FY 2020 Incremental Capital Investment Summary

Line No.			Actual Fiscal Year 2018 (a)	Plan Fiscal Year 2019 (b)	Plan Fiscal Year 2020 (c)
	Capital Investment				
1	ISR-eligible Capital Investment	Col (a) Docket No. 4678 FY 2018 ISR Reconciliation Filing; Col (b) Docket No. 4781 FY 2019 ISR Plan Filing; Col (c) forecasted FY20 Planned Investment	$ 97,809,718	$ 100,772,000	$ 154,551,592
2	ISR-eligible Capital Additions included in Rate Base per RIPUC Docket No. 4770	Docket No. 4770 Schedule MAL-11-Gas Page 5, Line Notes 1(a) + 1(b), 1(c) + 1(d) and 1(e)	$ 93,177,000	$ 93,177,000	$ 38,823,750
3	Incremental ISR Capital Investment	Line 1 - Line 2	$ 4,632,718	$ 7,595,000	$ 115,727,842
	Cost of Removal				
4	ISR-eligible Cost of Removal	Col (a) Docket No. 4678 FY 2018 ISR Reconciliation Filing; Col (b) Docket No. 4781 FY 2019 ISR Plan Filing; Column (c) forecasted FY20 Planned Investment	$ 8,603,224	$ 5,440,400	$ 7,910,408
5	ISR-eligible Cost of Removal in Rate Base per RIPUC Docket No. 4770	Schedule 6-GAS, Docket No. 4770: Col(a)=[P1]L23+L42×7÷12+Docket 4678 Page 2, Line 7x3÷12; Col(b)=[P1]L42×5÷12+[P2]L18×7÷12; Col (c)=[P2]L18×5÷12+L39×7÷12; Col (d) = L39×5÷12+L60×7÷12; Col (a)= L60×5÷12	$ 6,662,056	$ 5,956,522	$ 3,105,878
6	Incremental Cost of Removal	Line 4 - Line 5	$ 1,941,168	$ (516,122)	$ 4,804,530
	Retirements				
7	ISR-eligible Retirements	Col (a) Docket No. 4678 FY 2018 ISR Reconciliation Filing; Col (b) Docket No. 4781 FY 2019 ISR Plan Filing; (c) forecasted FY20 Planned Investment x 3-year average actual retirement rate FY16 - FY18	$ 24,056,661	$ 10,050,337	$ 14,753,610
8	ISR-eligible Retirements per RIPUC Docket No. 4770	Schedule 6-GAS, Docket No. 4770: Col(a)=[P1]L24+L43×7÷12+ Docket 4678 Page 2, Line 2x3÷12; Col(b)=[P1]L46×5÷12+[P2]L19×7÷12; Col (c)=[P2]L19×5÷12+L40×7÷12; Col (d) = L40×5÷12+L61×7÷12; Col (e)= L61×5÷12	$ 11,997,233	$ 7,899,865	$ 4,119,186
9	Incremental Retirements	Line 7 - Line 8	$ 12,059,428	$ 2,150,472	$ 10,634,424
	NOL Utilitization				
10	ISR NOL Utilization/Per ISR	Per Tax Department	$ -		8,434,758
11	ISR NOL Utilization/Per Docket 4770	Schedule 11-Gas Page 12, Docket No. 4770: Col (c)= L39×5÷12; Col (d) = L39×7÷12+L49×5÷12; Col (e) = L49×7÷12	$ -	$ 804,769	$ 3,063,059
12	Incremental NOL Utilization	Line 10 - Line 11	$ -	$ (804,769)	$ 5,371,700

The Narragansett Electric Company
d/b/a National Grid
ISR Depreciation Expense per Rate Case RIPUC Docket No. 4770

	Account No.	Account Title	Test Year June 30, 2017 (a)	1/ ARO Adjustment (b)	Adjustments June 30, 2017 (c)	Adjusted Balance (d) = (a) + (b) + (c)	Proposed Rate (e)	Depreciation Expense (f) = (d) x (e)
		Intangible Plant						
1	302.00	Franchises And Consents	$213,499	$0	$0	$213,499	0.00%	$0
2	303.00	Misc. Intangible Plant	$25,427	$0	$0	$25,427	0.00%	$0
3	303.01	Misc. Int Cap Software	$19,833,570	$0	$9,991,374	$29,824,944	0.00%	$0
4								
5		Total Intangible Plant	$20,072,496	$0	$9,991,374	$30,063,870		$0
6								
7		Production Plant						
8								
9	304.00	Production Land Land Rights	$364,912	$0	$0	$364,912	0.00%	$0
10	305.00	Prod. Structures & Improvements	$2,693,397	$0	$0	$2,693,397	15.05%	$405,356
11	307.00	Production Other Power	$46,159	$0	$0	$46,159	7.16%	$3,305
12	311.00	Production LNG Equipme	$3,167,445	$0	$0	$3,167,445	11.40%	$361,089
13	320.00	Prod. Other Equipment	$1,106,368	$0	$0	$1,106,368	6.69%	$74,016
14								
15		Total Production Plant	$7,378,281	$0	$0	$7,378,281		$843,766
16								
17		Storage Plant						
18								
19	360.00	Stor Land & Land Rights	$261,151	$0	$0	$261,151	0.00%	$0
20	361.03	Storage Structures Improvements	$3,385,049	$0	$0	$3,385,049	0.99%	$33,512
21	362.04	Storage Gas Holders	$4,606,338	$0	$0	$4,606,338	0.04%	$1,843
22	363.00	Stor. Purification Equipment	$13,891,210	$0	$0	$13,891,210	3.37%	$468,134
23								
24		Total Storage Plant	$22,143,748	$0	$0	$22,143,748		$503,488
25								
26		Distribution Plant						
27								
28	374.00	Dist. Land & Land Rights	$956,717	$0	$0	$956,717	0.00%	$0
29	375.00	Gas Dist Station Structure	$10,642,632	$0	$0	$10,642,632	1.15%	$122,390
30	376.00	Distribution Mains	$46,080,760	$0	$0	$46,080,760	3.61%	$1,663,515
31	376.03	Dist. River Crossing Main	$695,165	$0	$0	$695,165	3.61%	$25,095
32	376.04	Mains - Steel And Other - Sl	$4,190	$0	$0	$4,190	0.00%	$0
33	376.06	Dist. District Regulator	$14,213,837	$0	$0	$14,213,837	3.61%	$513,120
34	376.11	Gas Mains Steel	$57,759,572	$0	$0	$57,759,572	3.31%	$1,908,954
35	376.12	Gas Mains Plastic	$382,797,443	$0	$0	$382,797,443	2.70%	$10,316,391
36	376.13	Gas Mains Cast Iron	$5,556,209	$0	$0	$5,556,209	8.39%	$465,888
37	376.14	Gas Mains Valves	$222,104	$0	$0	$222,104	3.61%	$8,018
38	376.15	Propane Lines	$0	$0	$0	$0	3.61%	$0
39	376.16	Dist. Cathodic Protect	$1,569,576	$0	$0	$1,569,576	3.61%	$56,662
40	376.17	Dist. Joint Seals	$63,067,055	$0	$0	$63,067,055	4.63%	$2,920,005
41	377.00	T&D Compressor Sta Equipment	$248,656	$0	$0	$248,656	1.07%	$2,661
42	377.62	1/ 5360-Tanks ARO	$299	($299)	$0	$0	0.00%	$0
43	378.10	Gas Measur & Reg Sta Equipment	$19,586,255	$0	$0	$19,586,255	2.08%	$407,394
44	378.55	Gas M&Reg Sta Eqp RTU	$372,772	$0	$0	$372,772	6.35%	$23,671
45	379.00	Dist. Measur. Reg. Gs	$11,033,164	$0	$0	$11,033,164	2.22%	$244,936
46	379.01	Dist. Meas. Reg. Gs Eq	$1,399,586	$0	$0	$1,399,586	0.00%	$0
47	380.00	Gas Services All Sizes	$331,205,854	$0	$0	$331,205,854	3.05%	$10,101,779

The Narragansett Electric Company
d/b/a National Grid
ISR Depreciation Expense per Rate Case RIPUC Docket No. 4770

	Account No.	Account Title	Test Year June 30, 2017 (a)	1/ ARO Adjustment (b)	Adjustments June 30, 2017 (c)	Adjusted Balance (d) = (a) + (b) + (c)	Proposed Rate (e)	Depreciation Expense (f) = (d) x (e)
48	381.10	Sml Meter& Reg Bare Co	$26,829,565	$0	$0	$26,829,565	1.76%	$472,200
49	381.30	Lrg Meter& Reg Bare Co	$15,779,214	$0	$0	$15,779,214	1.76%	$277,714
50	381.40	Meters	$9,332,227	$0	$0	$9,332,227	0.96%	$89,589
51	382.00	Meter Installations	$675,201	$0	$0	$675,201	3.66%	$24,712
52	382.20	Sml Meter& Reg Installation	$43,145,998	$0	$0	$43,145,998	3.66%	$1,579,144
53	382.30	Lrg Meter&Reg Installation	$2,524,025	$0	$0	$2,524,025	3.66%	$92,379
54	383.00	Dist. House Regulators	$937,222	$0	$0	$937,222	0.67%	$6,279
55	384.00	T&D Gas Reg Installs	$1,216,551	$0	$0	$1,216,551	1.56%	$18,978
56	385.00	Industrial Measuring And Regulating Station Equipment	$540,187	$0	$0	$540,187	4.18%	$22,580
57	385.01	Industrial Measuring And Regulating Station Equipment	$255,921	$0	$0	$255,921	0.00%	$0
58	386.00	Other Property On Customer Premises	$271,765	$0	$0	$271,765	0.23%	$625
59	386.02	Dist. Consumer Prem Equipment	$110,131	$0	$0	$110,131	0.00%	$0
60	387.00	Dist. Other Equipment	$930,079	$0	$0	$930,079	2.15%	$19,997
61	388.00	1/ ARO	$5,736,827	($5,736,827)	$0	$0	0.00%	$0
62								
63		Total Distribution Plant	$1,055,696,761	($5,737,126)	$0	$1,049,959,635	2.99%	$31,384,677
64								
65		General Plant						
66								
67	389.01	General Plant Land Lan	$285,357	$0	$0	$285,357	0.00%	$0
68	390.00	Structures And Improvements	$7,094,532	$0	$0	$7,094,532	3.12%	$221,349
69	391.01	Gas Office Furniture & Fixture	$274,719	$0	$0	$274,719	6.67%	$18,324
70	394.00	General Plant Tools Shop (Fully Dep)	$26,487	$0	$0	$26,487	0.00%	$0
71	394.00	General Plant Tools Shop	$5,513,613	$0	$0	$5,513,613	5.00%	$275,681
72	395.00	General Plant Laboratory	$221,565	$0	$0	$221,565	6.67%	$14,778
73	397.30	Communication Radio Site Specific	$387,650	$0	$0	$387,650	5.00%	$19,383
74	397.42	Communication Equip Tel Site	$63,481	$0	$0	$63,481	20.00%	$12,696
75	398.10	Miscellaneous Equipment (Fully Dep)	$1,341,386	$0	$0	$1,341,386	0.00%	$0
76	398.10	Miscellaneous Equipment	$2,789,499	$0	$0	$2,789,499	6.67%	$186,060
77	399.10	1/ ARO	$342,146	($342,146)	$0	$0	0.00%	$0
78								
79		Total General Plant	$18,340,436	($342,146)	$0	$17,998,289	4.16%	$748,271
80								
81		Grand Total - All Categories	$1,123,631,722	($6,079,273)	$9,991,374	$1,127,543,823	3.05%	$33,480,202
82							2.97%	
83		Other Utility Plant Assets						
84			Line 63		Total Distribution Plant	$1,049,959,635	2.99%	$31,384,677
85			Line73+ Line 74		Communication Equipment	$451,132	7.11%	$32,079
86					Total ISR Tangible Plant	$1,050,410,767	2.99%	$31,416,756
					Non ISR Assets	$77,133,057		

Lines 1 through 81 - per RIPUC Docket No. 4770 Compliance filing dated August 16, 2018 , Compliance Attachment 2, Schedule 6-GAS, Pages 3 & 4

THE NARRAGANSETT ELECTRIC COMPANY
d/b/a NATIONAL GRID
RIPUC Docket Nos. 4770/4780
Compliance Attachment 2
Schedule 6-GAS
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The Narragansett Electric Company d/b/a National Grid
Depreciation Expense - Gas
For the Test Year Ended June 30, 2017 and the Rate Year Ending August 31, 2019

Line No	Description		Reference	Amount	Less non-ISR eligible Plant	The Narragansett Electric Company d/b/a National Grid Gas ISR Depreciation Expense ISR Amount
				(a)	(b)	(c)
1	Total Company Rate Year Depreciation		Sum of Page 2, Line 16 and Line 17	$39,136,909		
2	Total Company Test Year Depreciation		Per Company Books	$33,311,851		
3	Less: Reserve adjustments		Page 4, Line 29, Col (b) + Col (c)	($15,649)		
4	Adjusted Total Company Test Year Depreciation Expense		Line 2 + Line 3	$33,296,202		
5	Depreciation Expense Adjustment		Line 1 - Line 4	$5,840,707		
6						
7				Per Book		
8	Test Year Depreciation Expense 12 Months Ended 06/30/17:			Amount		
9	Total Gas Utility Plant 06/30/17		Page 4, Line 27, Col (d)	$1,405,994,678	($77,133,057)	$1,328,861,622
10	Less Non Depreciable Plant		Sum of Page 3, Line 5, Col (d) and Page 4, Line 25, Col (e)	($308,514,725)		($308,514,725)
11	Depreciable Utility Plant 06/30/17		Line 9 + Line 10	$1,097,479,953	($77,133,057)	$1,020,346,897
12						
13	Plus: Added Plant 2 Mos Ended 08/31/17		Schedule 11-GAS, Page 3, Line 4	$19,592,266		$19,592,266
14	Less: Retired Plant 2 Months Ended 08/31/17	1/	Line 13 x Retirement Rate	($1,345,989)		($1,345,989)
15	Depreciable Utility Plant 08/31/17		Line 11 + Line 13 + Line 14	$1,115,726,231	($77,133,057)	$1,020,346,897
16						
17	Average Depreciable Plant for Year Ended 08/31/17		(Line 11 + Line 15)/2	$1,106,603,092		$1,106,603,092
18						
19	Composite Book Rate %		As Approved in RIPUC Docket No. 4323	3.38%		
20						
21	Book Depreciation Reserve 06/30/17		Page 5, Line 72, Col (d)	$357,576,825		$357,576,825
22	Plus: Book Depreciation Expense		Line 17 x Line 20	$6,233,864		$6,233,864
23	Less: Net Cost of Removal/(Salvage)	2/	Line 13 x Cost of Removal Rate	($1,014,879)		($1,014,879)
24	Less: Retired Plant		Line 14	($1,345,989)		($1,345,989)
25	Book Depreciation Reserve 08/31/17		Sum of Line 21 through Line 24	$361,449,821		
26						
27	Depreciation Expense 12 Months Ended 08/31/18					
28	Total Utility Plant 08/31/17		Line 9 + Line 13 + Line 14	$1,424,240,956	($77,133,057)	$1,347,107,900
29	Less Non Depreciable Plant		Line 10	($308,514,725)		($308,514,725)
30	Depreciable Utility Plant 08/31/17		Line 28 + Line 29	$1,115,726,231		$1,038,593,175
31						
32	Plus: Plant Added in 12 Months Ended 08/31/18		Schedule 11-GAS, Page 3, Line 11	$115,710,016		$115,710,016
33	Less: Plant Retired in 12 Months Ended 08/31/18		Line 32 x Retirement rate	($7,949,278)		($7,949,278)
34	Depreciable Utility Plant 08/31/18		Sum of Line 30 through Line 33	$1,223,486,969		$1,146,353,912
35						
36	Average Depreciable Plant for 12 Months Ended 08/31/18		(Line 30 + Line 34)/2	$1,169,606,600		$1,092,473,543
37						
38	Composite Book Rate %		As Approved in RIPUC Docket No. 4323	3.38%		3.38%
39						
40	Book Depreciation Reserve 08/31/17		Line 25	$361,449,821		
41	Plus: Book Depreciation 08/31/18		Line 36 x Line 38	$39,532,703		$36,925,606
42	Less: Net Cost of Removal/(Salvage)		Line 32 x Cost of Removal Rate	($5,993,779)		
43	Less: Retired Plant		Line 33	($7,949,278)		
44	Book Depreciation Reserve 08/31/18		Sum of Line 40 through Line 43	$387,039,467		

1/ 3 year average retirement over plant addition in service FY 15 ~ FY17 — 6.87% Retirements
2/ 3 year average Cost of Removal over plant addition in service FY 15 ~ FY17 — 5.18% COR

THE NARRAGANSETT ELECTRIC COMPANY
d/b/a NATIONAL GRID
RIPUC Docket Nos. 4770/4780
Compliance Attachment 2
Schedule 6-GAS
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The Narragansett Electric Company d/b/a National Grid
Depreciation Expense - Gas
For the Test Year Ended June 30, 2017 and the Rate Year Ending August 31, 2021

The Narragansett Electric Company
d/b/a National Grid
Gas ISR Depreciation Expense

Line No		Description		Reference		Amount	Less non-ISR eligible Plant	ISR Amount
						(a)	(b)	(c)
1		Rate Year Depreciation Expense 12 Months Ended 08/31/19:						
2		Total Utility Plant 08/31/18		Page 1, Line 28 + Line 32 + Line 33		$1,532,001,694	($77,133,057)	$1,454,868,637
3		Less Non-Depreciable Plant		Page 1, Line 10		($308,514,725)		($308,514,725)
4		Depreciable Utility Plant 08/31/18		Line 2 + Line 3		$1,223,486,969		$1,146,353,912
5								
6		Plus: Added Plant 12 Months Ended 08/31/19		Schedule 11-GAS, Page 3, Line 35		$114,477,000	($1,348,000)	$113,129,000
7		Less: Depreciable Retired Plant	1/	Line 6 x Retirement rate		($7,864,570)	$92,608	($7,771,962)
8								
9		Depreciable Utility Plant 08/31/19		Sum of Line 4 through Line 7		$1,330,099,399	($78,388,449)	$1,251,710,950
10								
11		Average Depreciable Plant for Rate Year Ended 08/31/19		(Line 4 + Line 9)/2		$1,276,793,184		$1,199,032,431
12								
13		Proposed Composite Rate %		Page 4, Line 17, Col (e)		3.05%		2.99%
14								
15		Book Depreciation Reserve 08/31/18		Page 1, Line 44		$387,039,467		$0
16		Plus: Book Depreciation Expense		Line 11 x Line 13		$38,950,409		$35,851,070
17		Plus: Unrecovered Reserve Adjustment		Schedule NWA-1-GAS, Part VI, Page 6		$186,500		$186,500
18		Less: Net Cost of Removal/(Salvage)	2/	Line 6 x Cost of Removal Rate		($5,929,909)		$0
19		Less: Retired Plant		Line 7		($7,864,570)		$0
20		Book Depreciation Reserve 08/31/19		Sum of Line 15 through Line 19		$412,381,898		$36,037,570
21								
22		Rate Year Depreciation Expense 12 Months Ended 08/31/20:						
23		Total Utility Plant 08/31/19		Line 2 + Line 6 + Line 7		$1,638,614,124	($78,388,449)	$1,560,225,675
24		Less Non-Depreciable Plant		Page 1, Line 10		($308,514,725)		($308,514,725)
25		Depreciable Utility Plant 08/31/19		Line 23 + Line 24		$1,330,099,399		$1,251,710,950
26								
27		Plus: Added Plant 12 Months Ended 08/31/20		Schedule 11-GAS, Page 5, Line 11(i)		$21,017,630	($750,000)	$20,267,630
28		Less: Depreciable Retired Plant	1/	Line 27 x Retirement rate		($1,443,911)	$51,525	($1,392,386)
29								$0
30		Depreciable Utility Plant 08/31/20		Sum of Line 25 through Line 28		$1,349,673,118	($79,086,924)	$1,270,586,194
31								
32		Average Depreciable Plant for Rate Year Ended 08/31/20		(Line 25 + Line 30)/2		$1,339,886,258		$1,261,148,572
33								
34		Proposed Composite Rate %		Page 4, Line 17, Col (e)		3.05%		2.99%
35								
36		Book Depreciation Reserve 08/31/20		Line 20		$412,381,898		$0
37		Plus: Book Depreciation Expense		Line 32 x Line 34		$40,875,154		$37,708,342
38		Plus: Unrecovered Reserve Adjustment		Schedule NWA-1-GAS, Part VI, Page 6		$186,500		$186,500
39		Less: Net Cost of Removal/(Salvage)	2/	Line 27 x Cost of Removal Rate		($1,088,713)		$0
40		Less: Retired Plant		Line 28		($1,443,911)		$0
41		Book Depreciation Reserve 08/31/20		Sum of Line 37 through Line 40		$450,910,927		$37,894,842
42								
43		Rate Year Depreciation Expense 12 Months Ended 08/31/21:						
44		Total Utility Plant 08/31/20		Line 23 + Line 27 + Line 28		$1,658,187,843	($79,086,924)	$1,579,100,919
45		Less Non-Depreciable Plant		Page 1, Line 10		($308,514,725)		($308,514,725)
46		Depreciable Utility Plant 08/31/20		Line 44 + Line 45		$1,349,673,118		
47								
48		Plus: Added Plant 12 Months Ended 08/31/21		Schedule 11-GAS, Page 5, Line 11(l)		$21,838,436	($750,000)	$21,088,436
49		Less: Depreciable Retired Plant	1/	Line 48 x Retirement rate		($1,500,301)	$51,525	($1,448,776)
50								
51		Depreciable Utility Plant 08/31/21		Sum of Line 46 through Line 49		$1,370,011,253	($79,785,399)	$19,639,660
52								
53		Average Depreciable Plant for Rate Year Ended 08/31/21		(Line 46 + Line 51)/2		$1,359,842,185		$1,359,842,185
54								
55		Proposed Composite Rate %		Page 4, Line 17, Col (e)		3.05%		2.99%
56								
57		Book Depreciation Reserve 08/31/20		Line 41		$450,910,927		$0
58		Plus: Book Depreciation Expense		Line 53 x Line 55		$41,483,938		$40,659,281
59		Plus: Unrecovered Reserve Adjustment		Schedule NWA-1-GAS, Part VI, Page 6		$186,500		$186,500
60		Less: Net Cost of Removal/(Salvage)	2/	Line 48 x Cost of Removal Rate		($1,131,231)		$0
61		Less: Retired Plant		Line 49		($1,500,301)		$0
62		Book Depreciation Reserve 08/31/21		Sum of Line 57 through Line 61		$489,949,834		$40,845,781
63								
64	1/	3 year average retirement over plant addition in service FY 15 ~ FY17			6.87%	Retirements		
65	2/	3 year average Cost of Removal over plant addition in service FY 15 ~ FY17			5.18%	COR		
66								
67		Depreciation Offset Calculation		Line 37 + Line 38				$41,061,654
68		Less: General Plant Depreciation		Page 10, Line 79(f)				($748,271)
69		Plus: Comm Equipment Depreciation		Page 10, Line 73 + Line 74				$32,079
70		Total						$40,345,462
71		7 Months						x7/12
72		FY 2020 Depreciation Expense						$23,534,853

The Narragansett Electric Company
d/b/a National Grid
FY 2020 ISR Property Tax Recovery Adjustment
(000s)

Line		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
		End of FY 2018	ISR Additions	Non-ISR Add's	Total Add's	Bk Depr (1)	Retirements	COR	End of FY 2019
1	Plant In Service	$1,236,719	$100,772	$2,800	$103,572		($10,050)		$1,330,241
2	Accumulated Depr	$457,806				$40,365	($10,050)	($5,540)	$482,581
3	Net Plant	$778,913							$847,660
4	Property Tax Expense	$22,678							$26,013
5	Effective Prop tax Rate	2.91%							3.07%
6	**Effective tax Rate Calculation**	**End of FY 2019**	**ISR Additions**	**Non-ISR Add's**	**Total Add's**	**Bk Depr (1)**	**Retirements**	**COR**	**End of FY 2020**
7	Plant In Service	$1,330,241	$154,552	$19,341	$173,893		($14,754)		$1,489,380
8	Accumulated Depr	$482,581				$45,773	($14,754)	($7,910)	$505,689
9	Net Plant	$847,660							$983,691
10	Property Tax Expense	$26,013							$28,640
11	Effective Prop tax Rate	3.07%							2.91%

			(a)	(b)	(c)	(d)	(e)	(f)	(g)
12	**Property Tax Recovery Calculation**								
			Cumulative Increm. ISR Prop. Tax for FY2018				Cumulative Increm. ISR Prop. Tax for FY2019 1st 5 month		
13	Incremental ISR Additions			$97,810				$100,772.00	
14	Book Depreciation: base allowance on ISR eligible plant			($24,356)				($24,356)	
15	Book Depreciation: current year ISR additions			($1,246)				($1,533)	
16	COR			$8,603				$5,440	
17	Net Plant Additions			$80,811				$80,323	
18	RY Effective Tax Rate			3.06%				3.06%	
19	ISR Property Tax Recovery on FY 2014 vintage investment				$194		5 month	1.27%	$76
20	ISR Property Tax Recovery on FY 2015 vintage investment				$1,311				$508
21	ISR Property Tax Recovery on FY 2016 vintage investment				$1,819				$709
22	ISR Property Tax Recovery on FY 2017 vintage investment				$1,757				$679
23	ISR Property Tax Recovery on FY 2018 vintage investment				$2,469				$908
24	ISR Property Tax Recovery on FY 2019 vintage investment								$1,023
25	Total Property Tax due to ISR				7,549				3,902
26	ISR Year Effective Tax Rate		2.91%				3.07%		
27	RY Effective Tax Rate		3.06%	-0.14%			3.06%	0.01%	
28	RY Effective Tax Rate 5 mos for FY 2019			-0.14%			5 month	0.01%	
29	RY Net Plant times 5 mo rate	7 month	$458,057	* -0.14%	($659)		$458,057	* 0.01%	$26
30	FY 2014 Net Adds times ISR Year Effective Tax	7 month	$6,343	* -0.14%	($9)		$5,949	* 0.01%	$0
31	FY 2015 Net Adds times ISR Year Effective Tax	7 month	$42,913	* -0.14%	($62)		$39,920	* 0.01%	$2
32	FY 2016 Net Adds times ISR Year Effective Tax rate		$59,527	* -0.14%	($86)		$55,693	* 0.01%	$3
33	FY 2017 Net Adds times ISR Year Effective Tax rate		$57,497	* -0.14%	($83)		$53,304	* 0.01%	$3
34	FY 2018 Net Adds times ISR Year Effective Tax rate		$80,810	* -0.14%	($116)		$71,314	* 0.01%	$4
35	FY 2019 Net Adds times ISR Year Effective Tax rate						$80,323	* 0.01%	$5
36	Total Property Tax due to rate differential				($1,014)				$43
37	Total ISR Property Tax Recovery				$6,535				$3,945

The Narragansett Electric Company
d/b/a National Grid
FY 2020 ISR Property Tax Recovery Adjustment
(000s)

				Cumulative Increm. ISR Prop. Tax for FY2019 7 months			Cumulative Increm. ISR Prop. Tax for FY2020		
38	Incremental ISR Additions			$7,595			$115,728		
39	Book Depreciation: base allowance on ISR eligible plant			$0			($23,535)		
40	Book Depreciation: current year ISR additions			($86)			($1,571)		
41	COR			($516)			$4,805		
42	Net Plant Additions			$6,993			$95,426		
43	RY Effective Tax Rate			2.93%			2.96%		
44	ISR Property Tax Recovery on FY 2018 Net Incremental			1.71%	($88)			($145)	
45	ISR Property Tax Recovery on FY 2019 Net Incremental				$119			$202	
46	ISR Property Tax Recovery on FY 2020 Net Incremental							$2,828	
47	ISR Property Tax Recovery on FY 2021 vintage investment								
48	ISR Year Effective Tax Rate		3.07%			2.91%			
49	RY Effective Tax Rate		2.93%	0.14%		2.96%	-0.05%		
50	RY Effective Tax Rate 7 mos for FY 2019			0.08%	7 mos		-0.05%		
51	RY Net Plant times Rate Difference	7 month	$917,718	* 0.08%	$755	$917,718	* -0.05%	($481)	
52	FY 2018 Net Incremental times 7 mo rate differen	7 month	($5,126)	* 0.08%	($4)	($4,904)	* -0.05%	$3	
53	FY 2019 Net Incremental times 7 mo rate differen	7 month	$6,993	* 0.08%	$6	$6,830	* -0.05%	($4)	
54	FY 2020 Net Incremental times rate difference					$95,426	* -0.05%	($50)	
55	FY 2021 Net Adds times rate difference								
56	Total Property Tax due to rate differential				$756			($532)	
57	Total ISR Property Tax Recovery				$788			$2,354	

Line	Notes
1(a) - 5(a)	FY2018 ISR Rec, Docket 4678, Attachment MAL-1, Page 18, 72(h) to 76(h)
1(b) - 1(g)	Docket No. 4781, FY 2019 Gas ISR Plan, Comp Section 53: Att. 1, P20
1(h)	Sum of L1 C(a), L1C(d), L1C(f)
2(e)	Rate Case, Docket 4770, Com. Att. 2, Sch 6-G, P1, L44, -((LCol+LCol)×3.4%÷2)×7÷12+(LCol+LCol)×(3.4%×5÷12+3.15%×7÷12)÷2
2(f) & 2(g)	Docket No. 4781, FY 2019 Gas ISR Plan, Comp Section 3: Att. 1, P20
2(h)	Sum of L2 C(a), L2C(e), L2C(f), L2C(g)
3(h)	1(h) - 2(h)
4(h)	Docket No. 4781, FY 2019 Gas ISR Plan, Comp Section 3: Att. 1, P20
5(h)	L4C(h) ÷ L3C(h)
7(a) - 11(a)	1(h) - 5(h)
7(b)	Page 8 of 20, Line 1(c)
7(c)	Estimated based on FY2018 ISR Rec, Docket 4678, Attachment MAL-1, Page 18, 72(c)
7(d)	Line 7(b) + Line 7(c)
7(f)	Page 8 of 20, L7, Col(c)
7(h)	Sum of L7 C(a), L7C(e), L7C(f), L7C(g)
8(e)	L2C(e)+(L1Col(d)+L1Col(f))×(3.4%×5÷12+3.15%×7÷12) ((L7Col(d)+L7Col(f))×3.15%÷2
8(f)	=7(f)
8(g)	Page 8 of 20, L4, Col(c)
9(h)	7(h) - 8(h)
10(h)	Rate Case, Docket 4770, Com. Att. 2, Sch 1-G, P2, L15, Col (c)
11(h)	L10C(h) ÷ L9C(h)
13(a) - 37(c)	Per FY 2018 Gas ISR Compliance Filing, Docket 4678
13(f) - 18(f)	Per FY 2018 Gas ISR Plan Filing, Docket 4781, P20, Col(j), L101 - L104
19(f)	=18(f)×5÷12
19(g)	=30(e) ×19(f)
20(g)	=31(e) ×19(f)
21(g)	=32(e) ×19(f)
22(g)	=33(e) ×19(f)
23(g)	=34(e) ×19(f)
24(g)	=35(e) ×19(f)
25(g)	Sum of 19(g) throu 24(g)
26(e)	=5(h)
27(e)	=18(b)
27(f)	=26(e) - 27(f)
28(e)	=27(e) ×5÷12
29(e) - 35(e)	Per FY 2018 Electric ISR Plan Filing, Docket 4781,
29(g)	=29(e) ×28(g)
30(g)	=30(e) ×28(g)
31(g)	=31(e) ×28(g)
32(g)	=32(e) ×28(g)
33(g)	=33(e) ×28(g)
34(g)	=34(e) ×28(g)
35(g)	=35(e) ×28(g)
36(g)	Sum of 29(g) throu 35(g)
37(g)	=25(g) + 36(g)
38(b)	Page 4 of 20, L4, Col(a) ÷ 1,000
39(b)	Page 4 of 20, L5, Col(a) ÷ 1,000
40(b)	Page 4 of 20, L12, Col(a) ÷ 1,000
41(b)	Page 4 of 20, L7, Col(a) ÷ 1,000
42(b)	Sum of Lines 38(b) through 41(b)
43(b)	Rate Case, Docket 4770, Com. Att. 2, Sch 1-G, P2,
44(c)	52(a)×43(b)×7÷12
45(c)	53(a)×43(b)×7÷12
48(a)	=5(h)
49(a)	=43(b)
49(b)	48(a)-49(a)
50(b)	49(b)×7÷12
51(a)	Rate Case, Docket 4770, Com. Att. 2, Sch 6-G, P2, (L25 - L20)
51(c)	51(a)×50(b)
52(a)	Page 6 of 20, (3(a)-8(a)+10(a)-16(a)-16(b)) ÷ 1,000
52(c)	=52(a)×50(b)
53(a)	42(b)
53(c)	=53(a)×50(b)
56(c)	sum of 51(c) through 53(c)
57(c)	=44(c)+45(c)+56(c)
38(f)	Page 2 of 20, L4, Col(a) ÷ 1,000
39(f)	Page 2 of 20, L5, Col(a) ÷ 1,000
40(f)	Page 2 of 20, L12, Col(a) ÷ 1,000
41(f)	Page 2 of 20, L7, Col(a) ÷ 1,000
42(f)	Sum of Lines 38(f) through 41(f)
43(f)	=43(b)×5÷12+Rate Case, Docket 4770, Com. Att. 2, ((Sch 1-G, P2, L15, Col (c)×5÷12+(Sch 1-G, P3, L15, Col (c)×7÷12)/(Sch 6-
44(g)	52(e) ×43(f)
45(g)	53(e) ×43(f)
46(g)	54(e) ×43(f)
48(e)	=11(h)
49(e)	=43(b)
49(f)	48(e) -49(e)
50(f)	=49(f)
51(e)	=51(a)
51(g)	51(e) ×49(f)
52(e)	52(a)-(Page 6 of 20,12(c)) ÷ 1,000
52(g)	=52(e) ×49(f)
53(e)	53(a)-(Page 4 of 20,12(b)) ÷ 1,000
53(g)	=53×49(f)
54(e)	=42(f)
54(g)	=54×49(f)
56(g)	sum of 51(g) through 54(g)
57(g)	=44(g)+45(g)+46(g)+56(g)

The Narragansett Electric Company
d/b/a National Grid
FY 2020 Gas ISR Plan Revenue Requirement
ISR Additions April through August 2020

Line No.	Month No.	Month	FY 2020 ISR Additions (a)	In Rates (b)	Not In Rates (c) = (a) - (b)	Weight for Days (d)	Weighted Average (e) = (d) * (c)	Weight for Investment (f)=(c)/Total(c)
1								
2	1	April-19	$ 12,879,299	$ 7,764,750	$ 5,114,549	0.958	$ 4,901,443	4.42%
3	2	May-19	$ 12,879,299	$ 7,764,750	$ 5,114,549	0.875	$ 4,475,231	4.42%
4	3	June-19	$ 12,879,299	$ 7,764,750	$ 5,114,549	0.792	$ 4,049,018	4.42%
5	4	July-19	$ 12,879,299	$ 7,764,750	$ 5,114,549	0.708	$ 3,622,806	4.42%
6	5	August-19	$ 12,879,299	$ 7,764,750	$ 5,114,549	0.625	$ 3,196,593	4.42%
7	6	September-19	$ 12,879,299	$ -	$ 12,879,299	0.542	$ 6,976,287	11.13%
8	7	October-19	$ 12,879,299	$ -	$ 12,879,299	0.458	$ 5,903,012	11.13%
9	8	November-19	$ 12,879,299	$ -	$ 12,879,299	0.375	$ 4,829,737	11.13%
10	9	December-19	$ 12,879,299	$ -	$ 12,879,299	0.292	$ 3,756,462	11.13%
11	10	January-20	$ 12,879,299	$ -	$ 12,879,299	0.208	$ 2,683,187	11.13%
12	11	February-20	$ 12,879,299	$ -	$ 12,879,299	0.125	$ 1,609,912	11.13%
13	12	March-20	$ 12,879,299	$ -	$ 12,879,299	0.042	$ 536,637	11.13%
14		Total	$ 154,551,592	$ 38,823,750	$ 115,727,842		$ 46,540,327	100.00%
15	**Total Additions September 2019 through March 2020**				**$ 90,155,095**			
16	**FY 2020 Weighted Average Incremental Rate Base Percentage**						**40.22%**	

Column (a) = Page 12 of 20, Line 1(c)
Column (b) = Page 8 of 17, Line 2(c)
Column (d) = (12.5 - Month No.) ÷ 12
Line 15 = Sum of Lines 7(c) through 13(c)
Line 16 = Line 14(e)/Line 14(c)

The Narragansett Electric Company
d/b/a National Grid
FY 2020 Gas ISR Plan Revenue Requirement
Calculation of Weighted Average Cost of Capital

Line No.

Weighted Average Cost of Capital as approved in RIPUC Docket No. 4323 at 35% income tax rate effective April 1, 2013

	(a)	(b)	(c)	(d)	(e)
			Weighted		
	Ratio	Rate	Rate	Taxes	Return
Long Term Debt	49.95%	5.70%	2.85%		2.85%
Short Term Debt	0.76%	0.80%	0.01%		0.01%
Preferred Stock	0.15%	4.50%	0.01%		0.01%
Common Equity	49.14%	9.50%	4.67%	2.51%	7.18%
	100.00%		7.54%	2.51%	10.05%

(d) - Column (c) x 35% divided by (1 - 35%)

Weighted Average Cost of Capital as approved in RIPUC Docket No. 4323 at 21% income tax rate effective January 1, 2018

	(a)	(b)	(c)	(d)	(e)
			Weighted		
	Ratio	Rate	Rate	Taxes	Return
Long Term Debt	49.95%	5.70%	2.85%		2.85%
Short Term Debt	0.76%	0.80%	0.01%		0.01%
Preferred Stock	0.15%	4.50%	0.01%		0.01%
Common Equity	49.14%	9.50%	4.67%	1.24%	5.91%
	100.00%		7.54%	1.24%	8.78%

(d) - Column (c) x 21% divided by (1 - 21%)

Weighted Average Cost of Capital as approved in RIPUC Docket No. 4770 effective September 1, 2018

	(a)	(b)	(c)	(d)	(e)
			Weighted		
	Ratio	Rate	Rate	Taxes	Return
Long Term Debt	48.35%	4.98%	2.41%		2.41%
Short Term Debt	0.60%	1.76%	0.01%		0.01%
Preferred Stock	0.10%	4.50%	0.00%		0.00%
Common Equity	50.95%	9.275%	4.73%	1.26%	5.99%
	100.00%		7.15%	1.26%	8.41%

(d) - Column (c) x 21% divided by (1 - 21%)

FY18 Blended Rate	Line 8(e) x 75% + Line 20(e) x 25%	9.73%
FY19 Blended Rate	Line 20 x 5 ÷ 12 + Line 30 x 7 ÷ 12	8.56%
FY 20 Rate		8.41%

Section 4
Rate Design & Bill Impac

Section 4

Rate Design and Bill Impacts
FY 2020 Proposal

Rate Design and Bill Impacts
FY 2020 Proposal

Like the revenue requirement, the proposed Gas ISR Plan rate design for FY 2020 is designed to recover incremental capital investment in excess of capital investment that has been reflected in the rate base in the Company's last general rate case, Docket No. 4770, and the property tax described in Section 3 of the Plan. For purposes of rate design, the revenue requirement associated with cumulative capital investment and property tax recovery is allocated to rate classes based upon a rate base allocator derived from the approved Allocated Cost of Service Study (ACOSS) included in the Amended Settlement Agreement in Docket No. 4770.

The Company has updated the rate base allocator to reflect the allocation of rate base included in the ACOSS approved by the PUC in Docket No. 4770. The Company is proposing separate ISR factors for all rate classes.[1] Because the revenue requirement no longer includes an amount for incremental O&M expense, there is no O&M amount included in the calculation of the proposed FY 2020 ISR factors.

The throughput for the April 2019 through March 2020 period is from the Company's most recent forecast filed in the Company's 2018-19 Gas Cost Recovery filing in Docket No. 4872. Attachment 1 of this section provides the proposed ISR factors by rate class. Attachment 2 of this section provides the Plan's bill impacts[2] associated with the rate design in Attachment 1

[1] In the FY 2019 Gas ISR Plan, the Company proposed and the PUC approved a single, consolidated Residential ISR factor to mitigate the bill impacts on the Residential Non-Heating customers as a result of a significant number of Non-Heating customers transferred to the Heating rate, which resulted in an inconsistent relationship between the rate base allocator derived from Docket No. 4323 and the forecasted throughput reflecting fewer customers and, therefore, sales to the Residential Non-Heating rate class. As the Company explained in Docket No. 4781, the Company is now proposing separate factors because the new ACOSS approved in Docket No. 4770 reflected the transferred customers in the Residential Heating rate class.

[2] Bill impacts are provided using rates approved and currently in effect as of November 1, 2018.

by rate class. For the average Residential Heating customer using 845 therms per year, the cumulative impact of the FY 2020 Gas ISR Plan will represent an annual increase of $20.81, or 1.6 percent, from last year's bills.

	FY 2020 Revenue Requirement	Rate Class	Rate Base Allocator (%)	Allocation to Rate Class ($)	Throughput (dth)	ISR Factor (dth)	ISR Factor (therm)	Uncollectible %	ISR Factor (therm)
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
(1)	$7,290,355								
(2)		Res-NH	2.55%	$185,904	329,125	$0.5648	$0.0564	1.91%	$0.0574
(3)		Res-H	64.04%	$4,668,743	19,783,983	$0.2359	$0.0235	1.91%	$0.0239
(4)		Small	8.04%	$586,145	2,517,432	$0.2328	$0.0232	1.91%	$0.0236
(5)		Medium	12.23%	$891,610	5,784,703	$0.1541	$0.0154	1.91%	$0.0156
(6)		Large LL	5.57%	$406,073	2,754,840	$0.1474	$0.0147	1.91%	$0.0149
(7)		Large HL	2.25%	$164,033	1,161,895	$0.1411	$0.0141	1.91%	$0.0143
(8)		XL-LL	0.97%	$70,716	1,223,127	$0.0578	$0.0057	1.91%	$0.0058
(9)		XL-HL	4.35%	$317,130	6,371,381	$0.0497	$0.0049	1.91%	$0.0049
(10)		Total	100.00%	$7,290,355	39,926,486				

(a) Line 1: Proposed Capital Revenue Requirement & Forecasted Annual Property Tax Recovery Mechanism (Section 3, Attachment 1, Page 1, Line 11)
(c) Docket 4770, RI 2017 Rate Case, Compliance Attachment 14, Schedule 2, Page 1 & 2, Line 15 (Rate Class divided by Total Company)
(d) Column (a) Line 1 * Column (c)
(e) Page 2, Column (m), Line 9
(f) Column (d) / Column (e), truncated to 4 decimal places
(g) Column (d) / (Column (e)*10), truncated to 4 decimal places
(h) Docket 4770, RI 2017 Rate Case, Compliance Attachment 2, Schedule 22, Page 7, Line 15
(i) Column (g) / (1- Column (h)), truncated to 4 decimal places

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Forecasted Throughput April 2019 - March 2020

		Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Total
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)
(1)	Res-NH	37,807	26,709	21,502	16,823	16,284	17,571	16,077	21,269	33,848	44,676	40,112	36,450	329,125
(2)	Res-H	2,122,108	1,225,830	619,954	435,361	397,039	439,559	532,719	1,281,951	2,428,470	3,462,671	3,686,326	3,151,995	19,783,983
(3)	Small	275,222	128,526	70,548	43,801	38,912	51,344	59,002	138,790	315,782	481,870	499,003	414,632	2,517,432
(4)	Medium	644,377	352,701	221,628	173,618	167,358	173,900	203,345	379,018	717,202	1,028,158	921,449	801,948	5,784,703
(5)	Large LL	274,298	164,280	69,925	45,599	41,998	57,635	100,837	219,577	387,854	474,237	495,365	423,235	2,754,840
(6)	Large HL	101,641	86,709	74,706	64,738	71,967	74,820	75,997	93,196	123,807	142,272	127,333	124,708	1,161,895
(7)	X-Large LL	100,082	66,456	28,476	22,053	20,999	29,362	81,753	124,995	184,684	199,533	195,152	169,584	1,223,127
(8)	X-Large HL	475,819	475,511	485,970	499,423	523,465	451,331	506,436	571,258	633,906	607,305	544,648	596,309	6,371,381
(9)		4,031,353	2,526,723	1,592,708	1,301,416	1,278,022	1,295,522	1,576,166	2,830,054	4,825,553	6,440,722	6,509,387	5,718,861	39,926,486

Source: Company forecast

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National Grid - RI Gas
Infrastructure, Safety, and Reliability (ISR) Filing
Bill Impact Analysis with Various Levels of Consumption:

Residential Heating:

						Difference due to:					
							DAC				
Annual Consumption (Therms)	Proposed Rates	Current Rates	Difference	% Chg	GCR	Base DAC	ISR	EE	LIHEAP	GET
548	$935.27	$921.77	$13.51	1.5%	$0.00	$0.00	$13.10	$0.00	$0.00	$0.41
608	$1,017.61	$1,002.66	$14.96	1.5%	$0.00	$0.00	$14.51	$0.00	$0.00	$0.45
667	$1,098.63	$1,082.20	$16.43	1.5%	$0.00	$0.00	$15.94	$0.00	$0.00	$0.49
726	$1,179.60	$1,161.72	$17.89	1.5%	$0.00	$0.00	$17.35	$0.00	$0.00	$0.54
785	$1,260.55	$1,241.20	$19.35	1.6%	$0.00	$0.00	$18.77	$0.00	$0.00	$0.58
845	$1,342.90	$1,322.08	$20.81	1.6%	$0.00	$0.00	$20.19	$0.00	$0.00	$0.62
905	$1,425.29	$1,402.98	$22.31	1.6%	$0.00	$0.00	$21.64	$0.00	$0.00	$0.67
964	$1,506.19	$1,482.44	$23.75	1.6%	$0.00	$0.00	$23.04	$0.00	$0.00	$0.71
1,023	$1,587.15	$1,561.96	$25.19	1.6%	$0.00	$0.00	$24.43	$0.00	$0.00	$0.76
1,082	$1,668.14	$1,641.50	$26.64	1.6%	$0.00	$0.00	$25.84	$0.00	$0.00	$0.80
1,142	$1,750.55	$1,722.42	$28.13	1.6%	$0.00	$0.00	$27.29	$0.00	$0.00	$0.84

Residential Heating Low Income:

						Difference due to:						
							DAC					
Annual Consumption (Therms)	Proposed Rates	Current Rates	Difference	% Chg	GCR	Low Income Discount	Base DAC	ISR	EE	LIHEAP	GET
548	$695.52	$685.39	$10.13	1.5%	$0.00	($3.28)	$0.00	$13.10	$0.00	$0.00	$0.30
608	$756.64	$745.42	$11.22	1.5%	$0.00	($3.63)	$0.00	$14.51	$0.00	$0.00	$0.34
667	$816.75	$804.43	$12.32	1.5%	$0.00	($3.98)	$0.00	$15.94	$0.00	$0.00	$0.37
726	$876.85	$863.43	$13.41	1.6%	$0.00	($4.34)	$0.00	$17.35	$0.00	$0.00	$0.40
785	$936.92	$922.40	$14.51	1.6%	$0.00	($4.69)	$0.00	$18.77	$0.00	$0.00	$0.44
845	$998.03	$982.41	$15.61	1.6%	$0.00	($5.05)	$0.00	$20.19	$0.00	$0.00	$0.47
905	$1,059.18	$1,042.45	$16.73	1.6%	$0.00	($5.41)	$0.00	$21.64	$0.00	$0.00	$0.50
964	$1,119.21	$1,101.40	$17.81	1.6%	$0.00	($5.76)	$0.00	$23.04	$0.00	$0.00	$0.53
1,023	$1,179.30	$1,160.41	$18.89	1.6%	$0.00	($6.11)	$0.00	$24.43	$0.00	$0.00	$0.57
1,082	$1,239.39	$1,219.41	$19.98	1.6%	$0.00	($6.46)	$0.00	$25.84	$0.00	$0.00	$0.60
1,142	$1,300.52	$1,279.42	$21.10	1.6%	$0.00	($6.82)	$0.00	$27.29	$0.00	$0.00	$0.63

Note: Bill Impacts are based on rates approved and currently in effect as of November 1, 2018

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National Grid - RI Gas
Infrastructure, Safety, and Reliability (ISR) Filing
Bill Impact Analysis with Various Levels of Consumption:

Residential Non-Heating:

						Difference due to:					
							DAC				
Annual Consumption (Therms)	Proposed Rates	Current Rates	Difference	% Chg	GCR	Base DAC	ISR	EE	LIHEAP	GET
144	$371.10	$362.59	$8.51	2.3%	$0.00	$0.00	$8.25	$0.00	$0.00	$0.26
158	$389.36	$380.02	$9.34	2.5%	$0.00	$0.00	$9.06	$0.00	$0.00	$0.28
172	$407.67	$397.49	$10.19	2.6%	$0.00	$0.00	$9.88	$0.00	$0.00	$0.31
189	$429.86	$418.68	$11.19	2.7%	$0.00	$0.00	$10.85	$0.00	$0.00	$0.34
202	$446.84	$434.88	$11.96	2.7%	$0.00	$0.00	$11.60	$0.00	$0.00	$0.36
220	$470.30	$457.28	$13.02	2.8%	$0.00	$0.00	$12.63	$0.00	$0.00	$0.39
238	$493.79	$479.70	$14.08	2.9%	$0.00	$0.00	$13.66	$0.00	$0.00	$0.42
251	$510.77	$495.91	$14.86	3.0%	$0.00	$0.00	$14.41	$0.00	$0.00	$0.45
268	$532.94	$517.09	$15.85	3.1%	$0.00	$0.00	$15.37	$0.00	$0.00	$0.48
282	$551.20	$534.50	$16.69	3.1%	$0.00	$0.00	$16.19	$0.00	$0.00	$0.50
297	$570.77	$553.19	$17.58	3.2%	$0.00	$0.00	$17.05	$0.00	$0.00	$0.53

Residential Non-Heating Low Income:

						Difference due to:						
							DAC					
Annual Consumption (Therms)	Proposed Rates	Current Rates	Difference	% Chg	GCR	Low Income Discount	Base DAC	ISR	EE	LIHEAP	GET
144	$276.75	$270.38	$6.38	2.4%	$0.00	($2.06)	$0.00	$8.25	$0.00	$0.00	$0.19
158	$290.33	$283.33	$7.01	2.5%	$0.00	($2.27)	$0.00	$9.06	$0.00	$0.00	$0.21
172	$303.88	$296.24	$7.64	2.6%	$0.00	($2.47)	$0.00	$9.88	$0.00	$0.00	$0.23
189	$320.35	$311.96	$8.39	2.7%	$0.00	($2.71)	$0.00	$10.85	$0.00	$0.00	$0.25
202	$332.92	$323.95	$8.97	2.8%	$0.00	($2.90)	$0.00	$11.60	$0.00	$0.00	$0.27
220	$350.35	$340.59	$9.77	2.9%	$0.00	($3.16)	$0.00	$12.63	$0.00	$0.00	$0.29
238	$367.77	$357.21	$10.56	3.0%	$0.00	($3.42)	$0.00	$13.66	$0.00	$0.00	$0.32
251	$380.35	$369.21	$11.14	3.0%	$0.00	($3.60)	$0.00	$14.41	$0.00	$0.00	$0.33
268	$396.79	$384.91	$11.88	3.1%	$0.00	($3.84)	$0.00	$15.37	$0.00	$0.00	$0.36
282	$410.37	$397.85	$12.52	3.1%	$0.00	($4.05)	$0.00	$16.19	$0.00	$0.00	$0.38
297	$424.87	$411.68	$13.18	3.2%	$0.00	($4.26)	$0.00	$17.05	$0.00	$0.00	$0.40

Note: Bill Impacts are based on rates approved and currently in effect as of November 1, 2018

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National Grid - RI Gas
Infrastructure, Safety, and Reliability (ISR) Filing
Bill Impact Analysis with Various Levels of Consumption:

C & I Small:

						Difference due to:					
							DAC				
Annual Consumption (Therms)	Proposed Rates	Current Rates	Difference	% Chg	GCR	Base DAC	ISR	EE	LIHEAP	GET
830	$1,376.80	$1,356.59	$20.21	1.5%	$0.00	$0.00	$19.60	$0.00	$0.00	$0.61
919	$1,490.09	$1,467.74	$22.35	1.5%	$0.00	$0.00	$21.68	$0.00	$0.00	$0.67
1,010	$1,606.04	$1,581.46	$24.58	1.6%	$0.00	$0.00	$23.84	$0.00	$0.00	$0.74
1,099	$1,719.45	$1,692.70	$26.75	1.6%	$0.00	$0.00	$25.95	$0.00	$0.00	$0.80
1,187	$1,831.61	$1,802.73	$28.88	1.6%	$0.00	$0.00	$28.01	$0.00	$0.00	$0.87
1,277	$1,946.22	$1,915.15	$31.07	1.6%	$0.00	$0.00	$30.14	$0.00	$0.00	$0.93
1,367	$2,060.85	$2,027.59	$33.26	1.6%	$0.00	$0.00	$32.26	$0.00	$0.00	$1.00
1,456	$2,174.26	$2,138.84	$35.42	1.7%	$0.00	$0.00	$34.36	$0.00	$0.00	$1.06
1,544	$2,286.40	$2,248.84	$37.56	1.7%	$0.00	$0.00	$36.43	$0.00	$0.00	$1.13
1,635	$2,402.30	$2,362.53	$39.77	1.7%	$0.00	$0.00	$38.58	$0.00	$0.00	$1.19
1,725	$2,516.93	$2,474.95	$41.98	1.7%	$0.00	$0.00	$40.72	$0.00	$0.00	$1.26

C & I Medium:

						Difference due to:					
							DAC				
Annual Consumption (Therms)	Proposed Rates	Current Rates	Difference	% Chg	GCR	Base DAC	ISR	EE	LIHEAP	GET
6,907	$8,939.12	$8,828.05	$111.07	1.3%	$0.00	$0.00	$107.74	$0.00	$0.00	$3.33
7,650	$9,786.71	$9,663.68	$123.03	1.3%	$0.00	$0.00	$119.34	$0.00	$0.00	$3.69
8,391	$10,631.53	$10,496.56	$134.97	1.3%	$0.00	$0.00	$130.92	$0.00	$0.00	$4.05
9,136	$11,481.14	$11,334.22	$146.92	1.3%	$0.00	$0.00	$142.51	$0.00	$0.00	$4.41
9,880	$12,329.75	$12,170.86	$158.89	1.3%	$0.00	$0.00	$154.12	$0.00	$0.00	$4.77
10,623	$13,177.33	$13,006.46	$170.87	1.3%	$0.00	$0.00	$165.74	$0.00	$0.00	$5.13
11,366	$14,024.85	$13,842.05	$182.79	1.3%	$0.00	$0.00	$177.31	$0.00	$0.00	$5.48
12,111	$14,874.52	$14,679.73	$194.79	1.3%	$0.00	$0.00	$188.95	$0.00	$0.00	$5.84
12,855	$15,723.10	$15,516.36	$206.74	1.3%	$0.00	$0.00	$200.54	$0.00	$0.00	$6.20
13,596	$16,567.90	$16,349.25	$218.65	1.3%	$0.00	$0.00	$212.09	$0.00	$0.00	$6.56
14,340	$17,416.52	$17,185.90	$230.63	1.3%	$0.00	$0.00	$223.71	$0.00	$0.00	$6.92

Note: Bill Impacts are based on rates approved and currently in effect as of November 1, 2018

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National Grid - RI Gas
Infrastructure, Safety, and Reliability (ISR) Filing
Bill Impact Analysis with Various Levels of Consumption:

C & I LLF Large:

						Difference due to:					
							DAC				
Annual Consumption (Therms)	Proposed Rates	Current Rates	Difference	% Chg	GCR	Base DAC	ISR	EE	LIHEAP	GET
37,587	$46,303.34	$45,725.97	$577.37	1.3%	$0.00	$0.00	$560.05	$0.00	$0.00	$17.32
41,634	$51,021.03	$50,381.50	$639.53	1.3%	$0.00	$0.00	$620.34	$0.00	$0.00	$19.19
45,683	$55,741.46	$55,039.73	$701.73	1.3%	$0.00	$0.00	$680.68	$0.00	$0.00	$21.05
49,731	$60,460.83	$59,696.93	$763.90	1.3%	$0.00	$0.00	$740.98	$0.00	$0.00	$22.92
53,777	$65,177.42	$64,351.37	$826.05	1.3%	$0.00	$0.00	$801.27	$0.00	$0.00	$24.78
57,825	$69,896.80	$69,008.58	$888.22	1.3%	$0.00	$0.00	$861.57	$0.00	$0.00	$26.65
61,873	$74,616.21	$73,665.78	$950.43	1.3%	$0.00	$0.00	$921.92	$0.00	$0.00	$28.51
65,920	$79,333.85	$78,321.26	$1,012.60	1.3%	$0.00	$0.00	$982.22	$0.00	$0.00	$30.38
69,967	$84,052.14	$82,977.39	$1,074.75	1.3%	$0.00	$0.00	$1,042.51	$0.00	$0.00	$32.24
74,016	$88,772.57	$87,635.63	$1,136.95	1.3%	$0.00	$0.00	$1,102.84	$0.00	$0.00	$34.11
78,063	$93,490.24	$92,291.13	$1,199.10	1.3%	$0.00	$0.00	$1,163.13	$0.00	$0.00	$35.97

C & I HLF Large:

						Difference due to:					
							DAC				
Annual Consumption (Therms)	Proposed Rates	Current Rates	Difference	% Chg	GCR	Base DAC	ISR	EE	LIHEAP	GET
41,956	$42,789.27	$42,170.75	$618.53	1.5%	$0.00	$0.00	$599.97	$0.00	$0.00	$18.56
46,471	$47,126.81	$46,441.73	$685.08	1.5%	$0.00	$0.00	$664.53	$0.00	$0.00	$20.55
50,991	$51,468.62	$50,716.90	$751.71	1.5%	$0.00	$0.00	$729.16	$0.00	$0.00	$22.55
55,507	$55,806.99	$54,988.69	$818.30	1.5%	$0.00	$0.00	$793.75	$0.00	$0.00	$24.55
60,028	$60,149.72	$59,264.78	$884.94	1.5%	$0.00	$0.00	$858.39	$0.00	$0.00	$26.55
64,545	$64,488.96	$63,537.40	$951.56	1.5%	$0.00	$0.00	$923.01	$0.00	$0.00	$28.55
69,062	$68,828.19	$67,810.05	$1,018.14	1.5%	$0.00	$0.00	$987.60	$0.00	$0.00	$30.54
73,583	$73,170.90	$72,086.12	$1,084.77	1.5%	$0.00	$0.00	$1,052.23	$0.00	$0.00	$32.54
78,099	$77,509.29	$76,357.93	$1,151.36	1.5%	$0.00	$0.00	$1,116.82	$0.00	$0.00	$34.54
82,619	$81,851.12	$80,633.13	$1,217.99	1.5%	$0.00	$0.00	$1,181.45	$0.00	$0.00	$36.54
87,137	$86,192.17	$84,907.55	$1,284.62	1.5%	$0.00	$0.00	$1,246.08	$0.00	$0.00	$38.54

Note: Bill Impacts are based on rates approved and currently in effect as of November 1, 2018

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Bill Impact Analysis with Various Levels of Consumption:

C & I LLF Extra-Large:

						Difference due to:					
							DAC				
Annual Consumption (Therms)	Proposed Rates	Current Rates	Difference	% Chg	GCR	Base DAC	ISR	EE	LIHEAP	GET
233,835	$227,458.57	$226,060.38	$1,398.20	0.6%	$0.00	$0.00	$1,356.25	$0.00	$0.00	$41.95
259,019	$251,288.31	$249,739.55	$1,548.76	0.6%	$0.00	$0.00	$1,502.30	$0.00	$0.00	$46.46
284,197	$275,113.06	$273,413.73	$1,699.33	0.6%	$0.00	$0.00	$1,648.35	$0.00	$0.00	$50.98
309,381	$298,942.76	$297,092.87	$1,849.90	0.6%	$0.00	$0.00	$1,794.40	$0.00	$0.00	$55.50
334,562	$322,770.00	$320,769.52	$2,000.48	0.6%	$0.00	$0.00	$1,940.47	$0.00	$0.00	$60.01
359,745	$346,598.90	$344,447.83	$2,151.07	0.6%	$0.00	$0.00	$2,086.54	$0.00	$0.00	$64.53
384,928	$370,427.81	$368,126.19	$2,301.62	0.6%	$0.00	$0.00	$2,232.57	$0.00	$0.00	$69.05
410,110	$394,255.88	$391,803.68	$2,452.20	0.6%	$0.00	$0.00	$2,378.63	$0.00	$0.00	$73.57
435,293	$418,084.80	$415,482.00	$2,602.79	0.6%	$0.00	$0.00	$2,524.71	$0.00	$0.00	$78.08
460,471	$441,909.48	$439,156.15	$2,753.33	0.6%	$0.00	$0.00	$2,670.73	$0.00	$0.00	$82.60
485,655	$465,739.18	$462,835.27	$2,903.91	0.6%	$0.00	$0.00	$2,816.79	$0.00	$0.00	$87.12

C & I HLF Extra-Large:

						Difference due to:					
							DAC				
Annual Consumption (Therms)	Proposed Rates	Current Rates	Difference	% Chg	GCR	Base DAC	ISR	EE	LIHEAP	GET
486,528	$403,433.91	$400,976.20	$2,457.70	0.6%	$0.00	$0.00	$2,383.97	$0.00	$0.00	$73.73
538,924	$446,214.30	$443,491.89	$2,722.40	0.6%	$0.00	$0.00	$2,640.73	$0.00	$0.00	$81.67
591,320	$488,993.85	$486,006.73	$2,987.11	0.6%	$0.00	$0.00	$2,897.50	$0.00	$0.00	$89.61
643,718	$531,775.63	$528,523.86	$3,251.77	0.6%	$0.00	$0.00	$3,154.22	$0.00	$0.00	$97.55
696,109	$574,551.48	$571,035.04	$3,516.44	0.6%	$0.00	$0.00	$3,410.95	$0.00	$0.00	$105.49
748,506	$617,332.56	$613,551.43	$3,781.12	0.6%	$0.00	$0.00	$3,667.69	$0.00	$0.00	$113.43
800,903	$660,113.62	$656,067.82	$4,045.80	0.6%	$0.00	$0.00	$3,924.43	$0.00	$0.00	$121.37
853,294	$702,889.43	$698,578.98	$4,310.45	0.6%	$0.00	$0.00	$4,181.14	$0.00	$0.00	$129.31
905,692	$745,671.25	$741,096.10	$4,575.14	0.6%	$0.00	$0.00	$4,437.89	$0.00	$0.00	$137.25
958,088	$788,450.77	$783,610.95	$4,839.81	0.6%	$0.00	$0.00	$4,694.62	$0.00	$0.00	$145.19
1,010,485	$831,231.86	$826,127.37	$5,104.49	0.6%	$0.00	$0.00	$4,951.36	$0.00	$0.00	$153.13

Note: Bill Impacts are based on rates approved and currently in effect as of November 1, 2018

The Narragansett Electric Company
d/b/a National Grid
Gas Infrastructure, Safety, and Reliability Plan FY 2020
Section 4: Attachment 2
Page 5 of 5

Schedule 1
2017 System Integrity
Report

Schedule 1

2017 System Integrity Report

2017 SYSTEM INTEGRITY REPORT

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Enterprise

Gas Distribution Systems

Trend-Based Integrity Analysis

RI

Gas Distribution Engineering
Gas Asset Management– Gas Process & Engineering

Saadat Khan (631) 710-3510 Director – Gas Distribution Engineering
Leomary Bader (781) 907-2785 Manager- Gas Distribution Engineering
Aamir Khizar (631) 770-3511 Senior Engineer – Gas Distribution Engineering
Madeline Blaisdell (781) 907-4164 Assoc. Engineer – Gas Distribution Engineering

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2017 SYSTEM INTEGRITY REPORT

Overall Regional Gas Distribution Integrity Assessment Summary

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2017 SYSTEM INTEGRITY REPORT

Overall Regional Distribution Integrity Assessment Summary

Distribution Engineering has reviewed all of the findings in the annual Trend-Based Distribution System Integrity Analysis (*System Integrity Report*) in accordance with our Distribution Integrity Management Plan (DIMP).

Below is a summary of the individual key integrity measure results for Rhode Island.

NATIONAL GRID 2017 System Integrity Report Summary	
REGIONS ITEMS	RI
• Leak Receipts	↑
• Workable Leak Backlog	↑
• LPP Main and Service Inventories	↓
• Overall Main Leak Rate	↓
• Cast Iron Main Break Rate	↓
• Steel Main Corrosion Leak Rate	↑
• Service Leak Rate	↑

↑ Increase ↑ Slight Increase — No Change ↓ Decrease

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2017 SYSTEM INTEGRITY REPORT

LEAK RECEIPTS, REPAIRS AND BACKLOG BY HDD TREND (Main & Service)

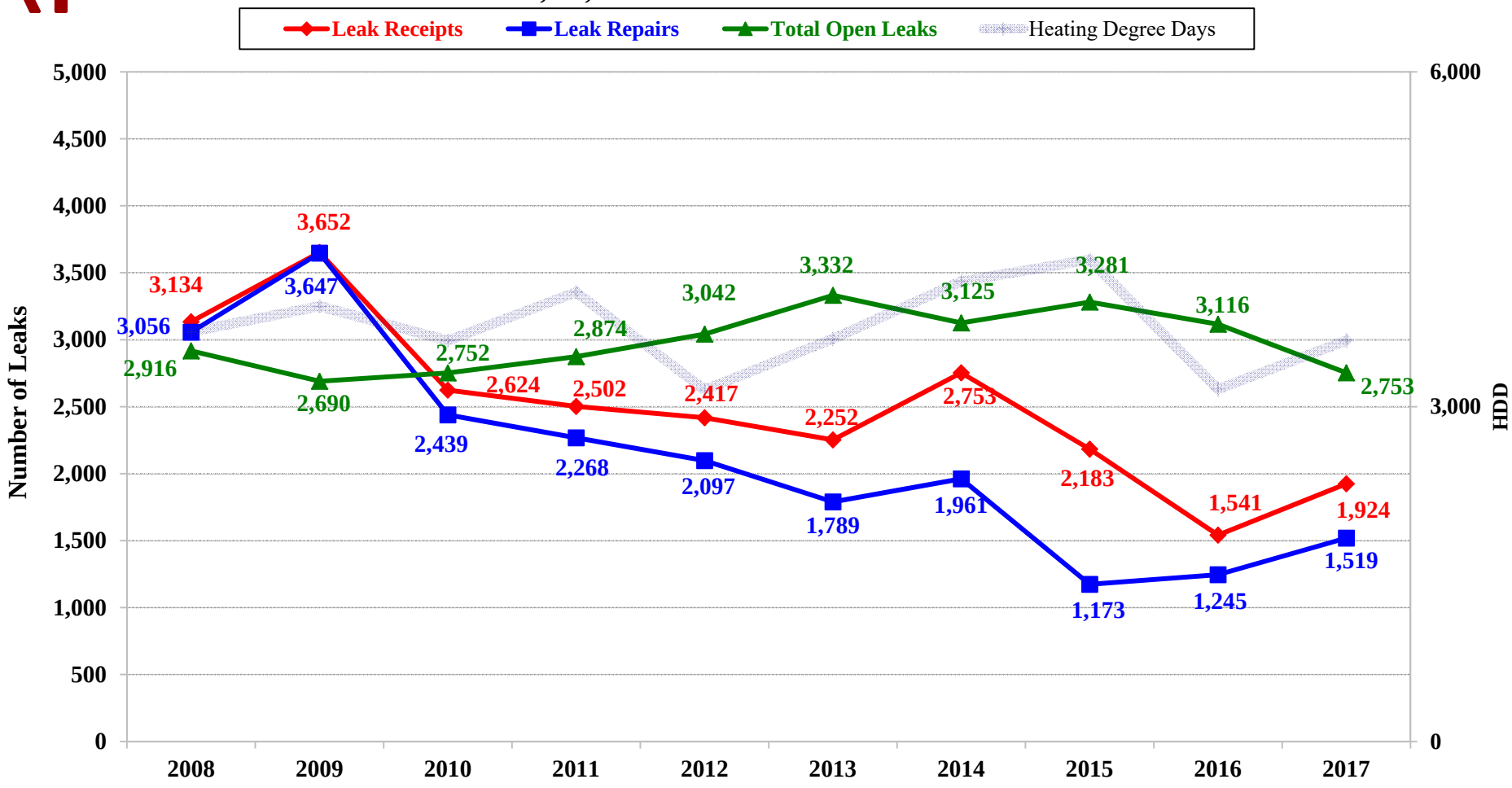
NOTE: Heating Degree Day (HDD)

2017 SYSTEM INTEGRITY REPORT

RI

TOTAL LEAK RECEIPTS, REPAIRS & BACKLOG

INCLUDES ALL TYPE 1, 2A, 2 and 3 LEAKS DISCOVERED - EXCLUDING DAMAGES



Leak Receipts and Repairs and Backlog:

2017 RI Leak Repairs = ↑ **2017 RI Leak Receipts =** ↑ **2017 RI Leak Backlogs =** ↓

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2017 SYSTEM INTEGRITY REPORT

Overall Regional Distribution Integrity Assessment Summary

RI

Rhode Island (RI)

- Leak receipts increased.
- Workable leak backlog increased.
- Leak prone main and service inventories continue to decline steadily.
- Overall main leak rate, Cast iron main break rate, and Steel main corrosion rate decreased.
- Service leak rate increased.

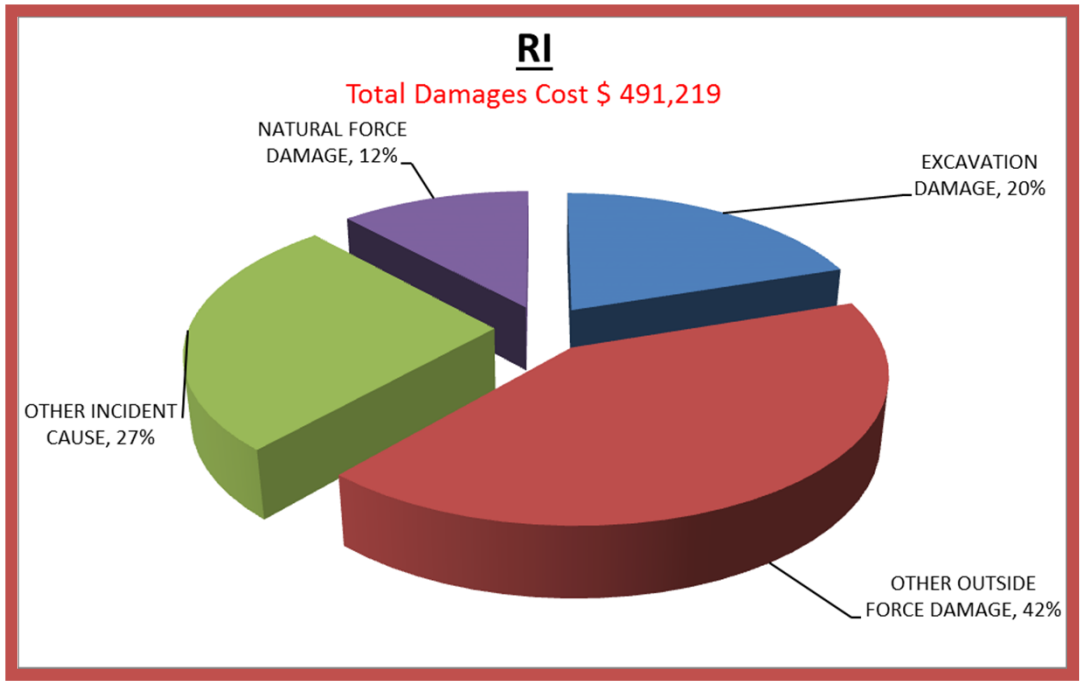
PHMSA Reported Incidents Cost

2017 SYSTEM INTEGRITY REPORT

RI

TOTAL PROPERTY DAMAGES

PHMSA Incident data from 2010 to 2017



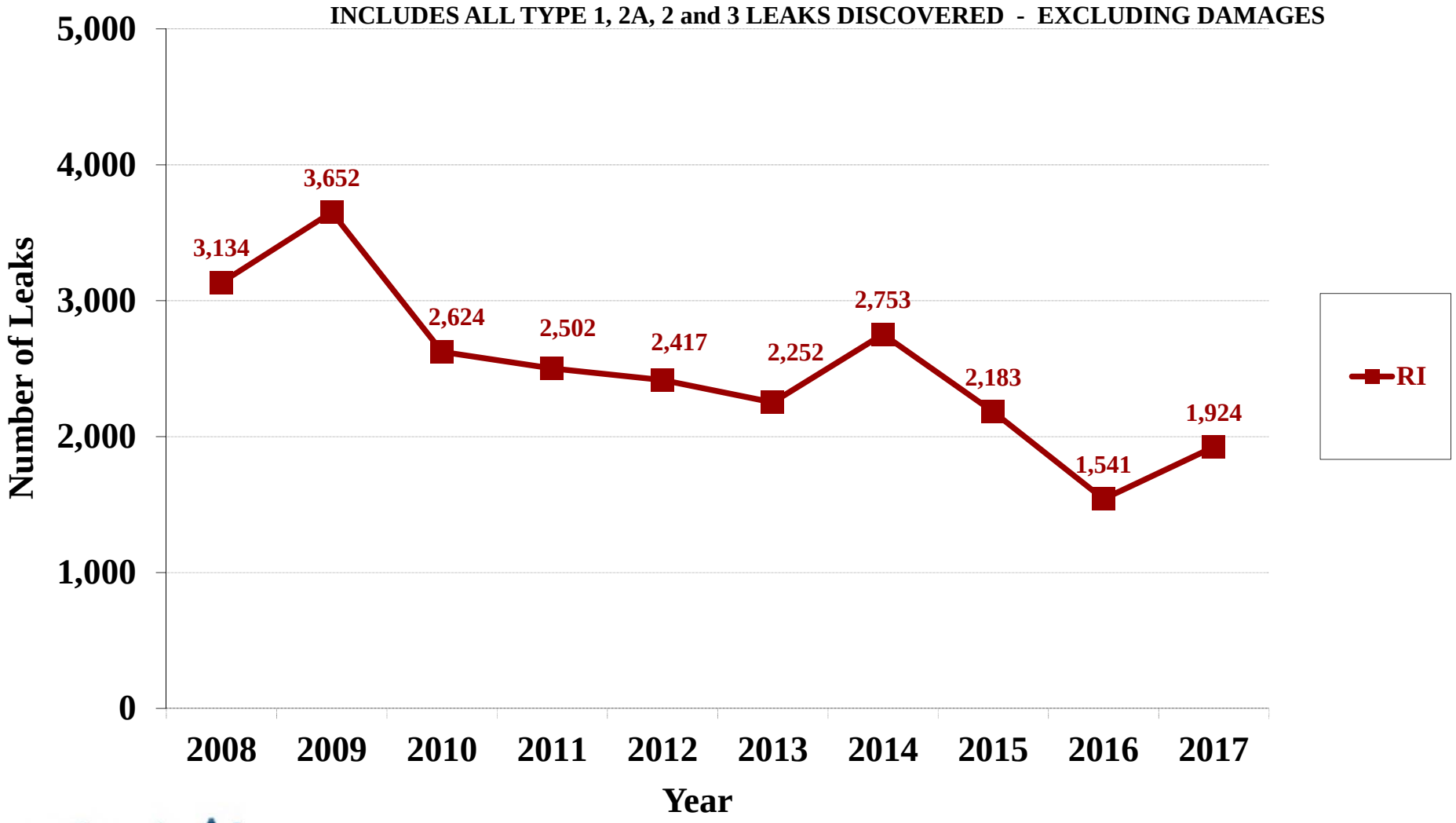
LEAK MANAGEMENT ANALYSIS

(Mains & Services)

2017 SYSTEM INTEGRITY REPORT

RI

TOTAL LEAK RECEIPTS



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Note: SI '15 and '16 data corrected with Excluding Damages

2017 SYSTEM INTEGRITY REPORT

2017 LEAK RECEIPTS

RI

1,924 Leak Receipts

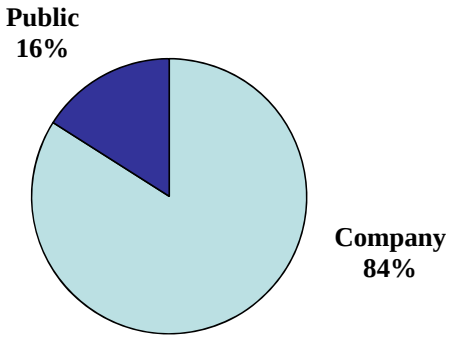
3,205 miles of Main
196,505 #'s of Services
(2,754 miles)

5,959 total miles of pipe

0.29 Leak Receipts per Mile of Pipe

2017 LEAK RECEIPTS BY DISCOVERY SOURCE (EXCLUDING DAMAGES)

RI

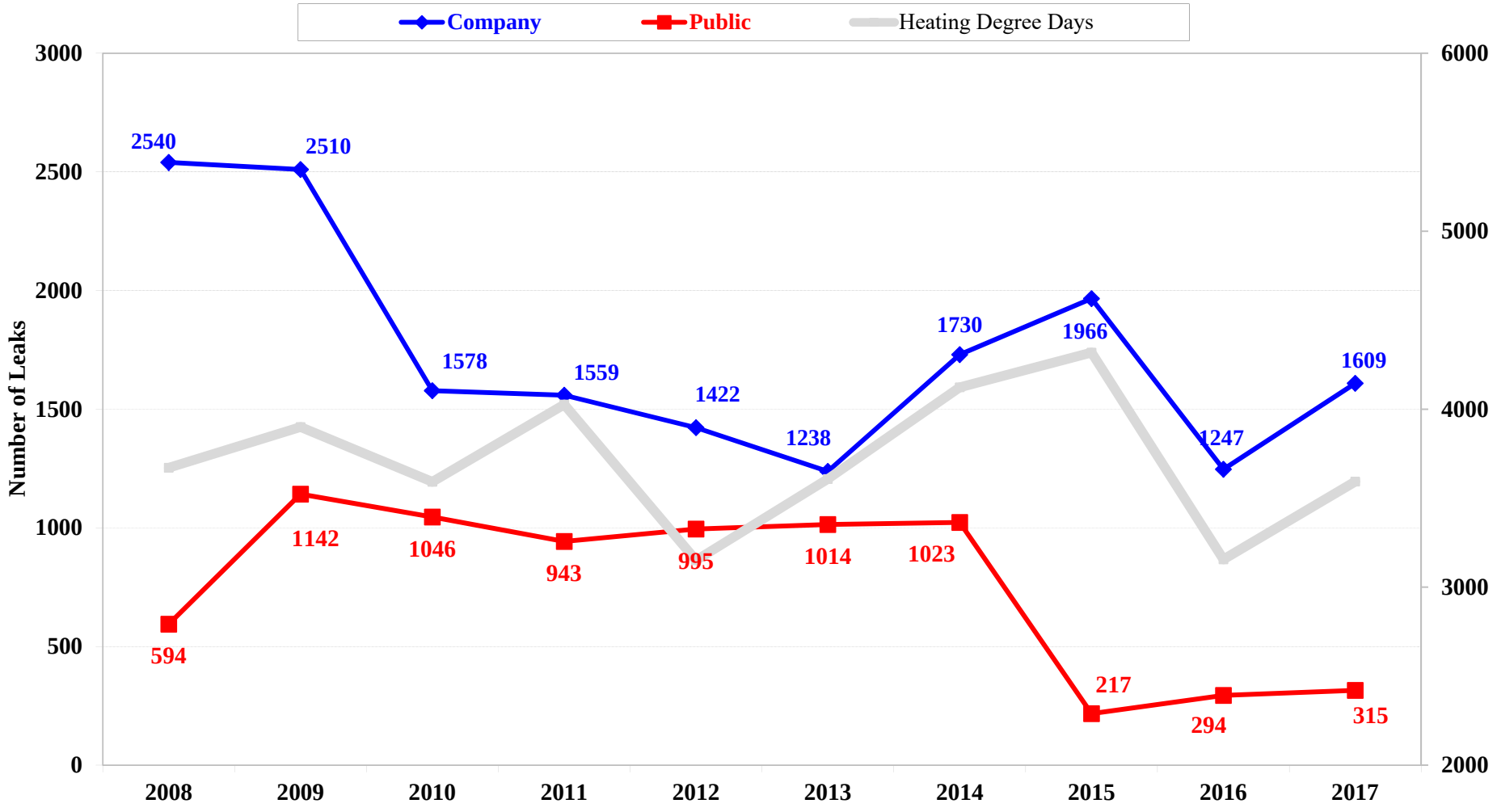


2017 SYSTEM INTEGRITY REPORT

RI

2008 - 2017 LEAK RECEIPTS

By Discovery Source (Excluding damages)



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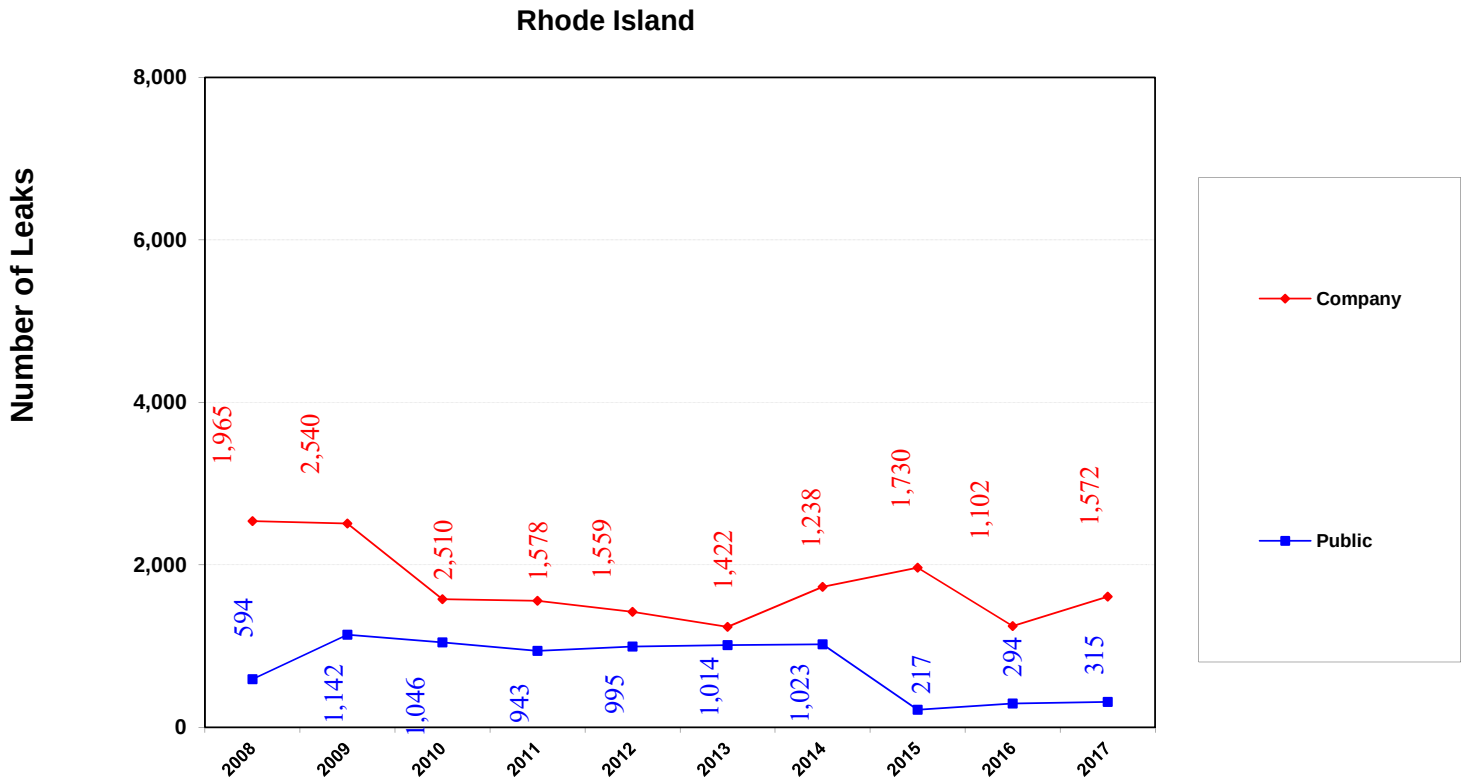
2017 SYSTEM INTEGRITY REPORT

RI

2007 - 2017 LEAK RECEIPTS

By Discovery Source (Excluding damages)



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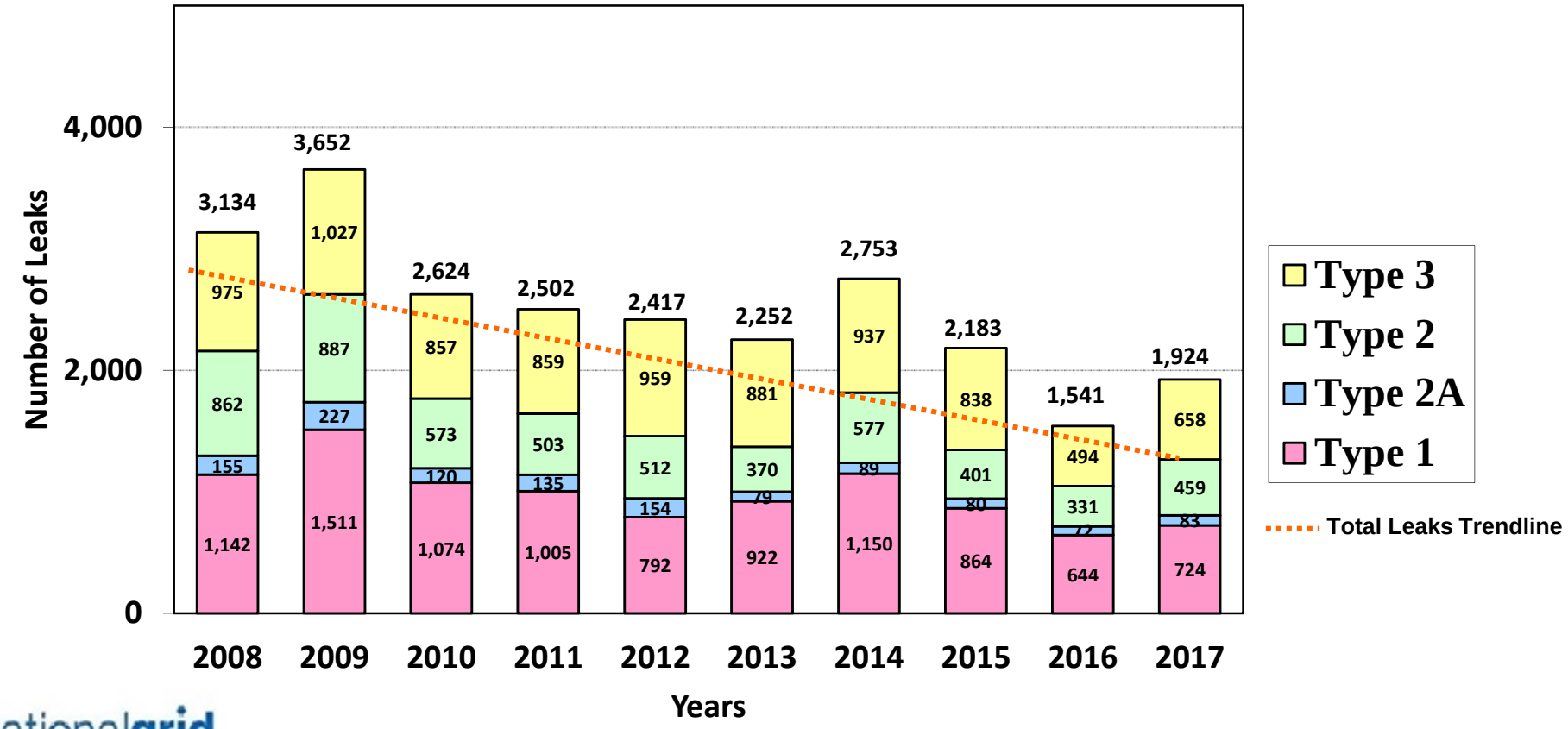
2017 SYSTEM INTEGRITY REPORT

RI

LEAK RECEIPTS
By ORIGINAL Type

(Excluding Damages)



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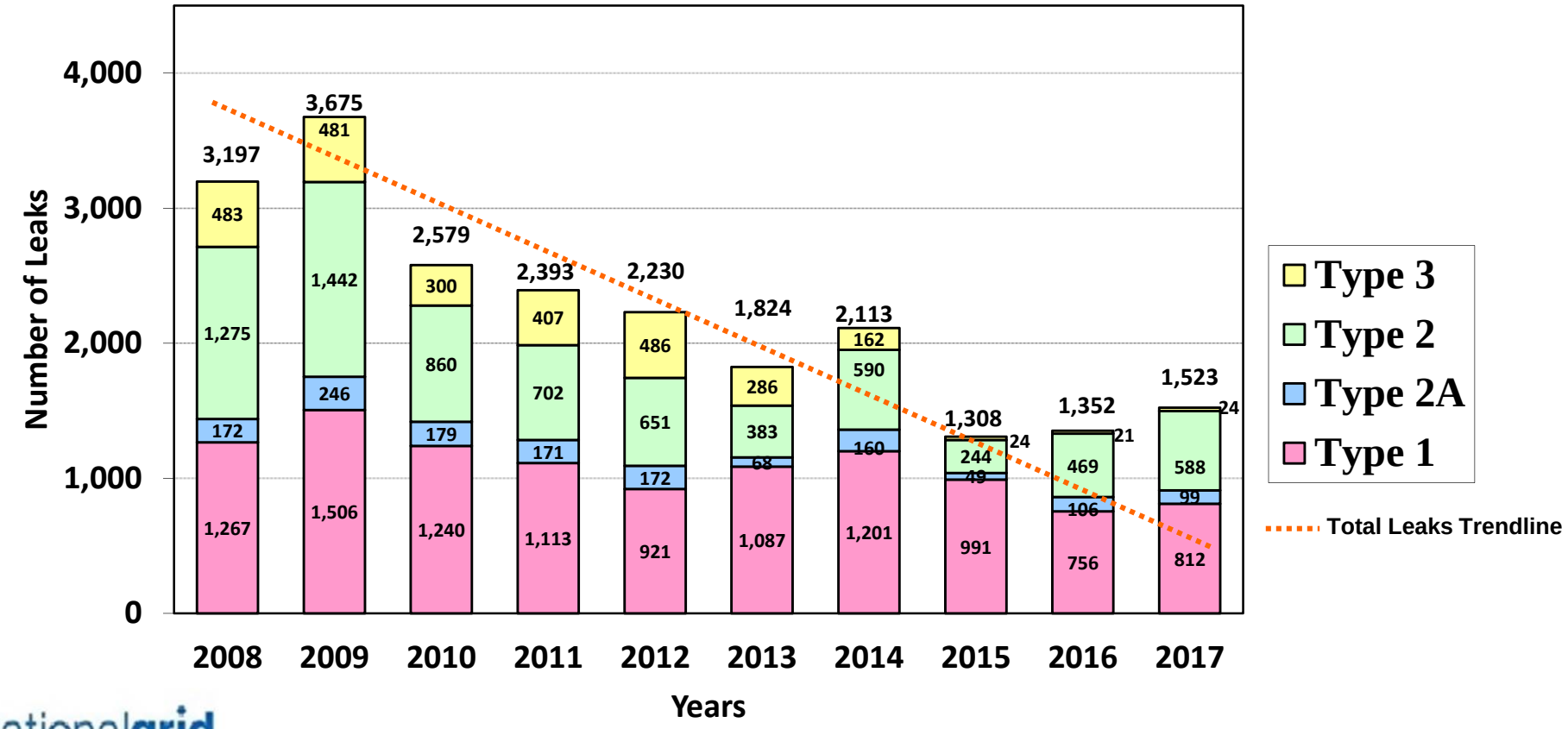
2017 SYSTEM INTEGRITY REPORT

RI

LEAKS REPAIRED
By REPAIRED Type

(Including Damages)



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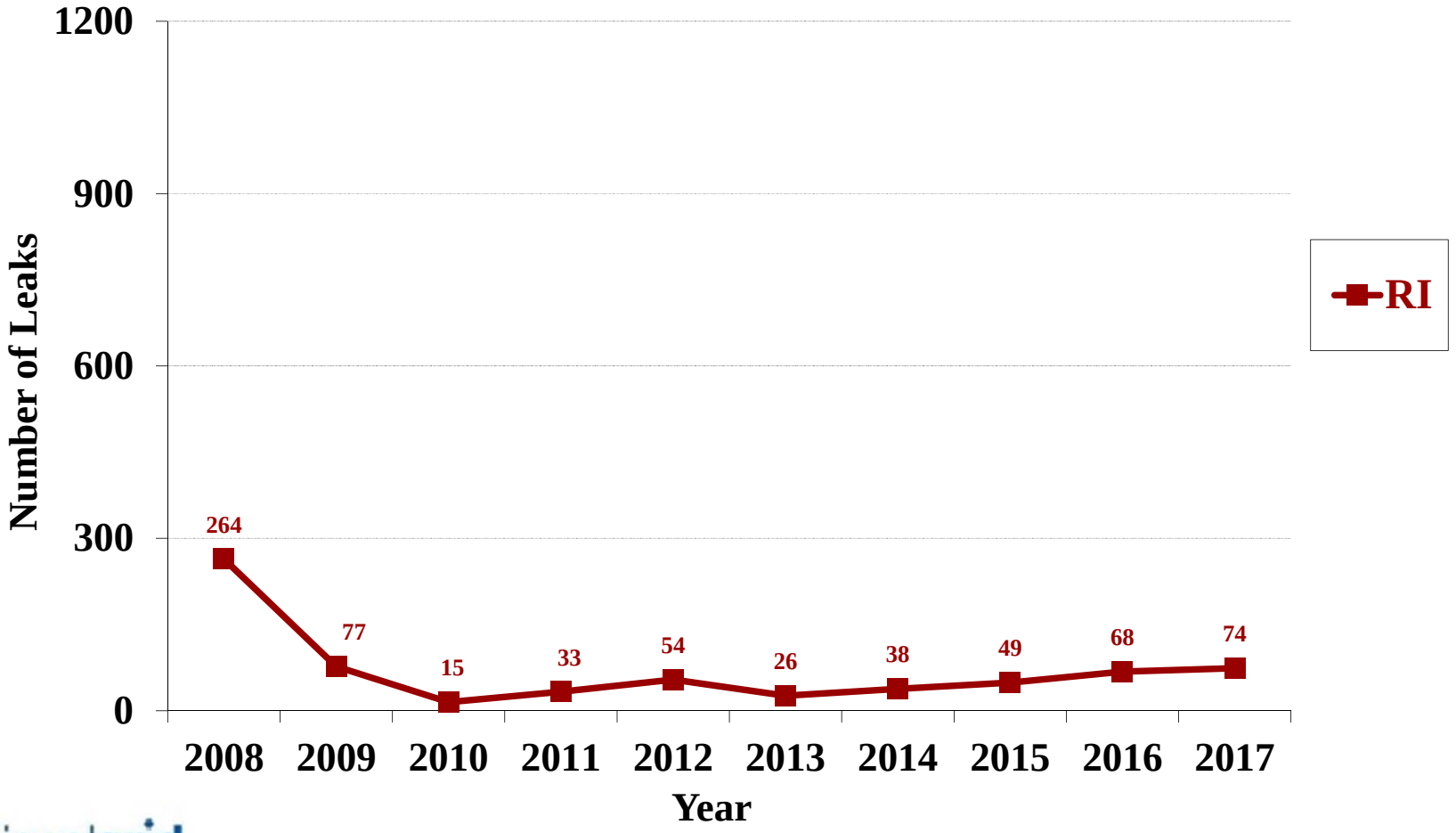
2017 SYSTEM INTEGRITY REPORT

RI

YEAR-END WORKABLE LEAK BACKLOGS



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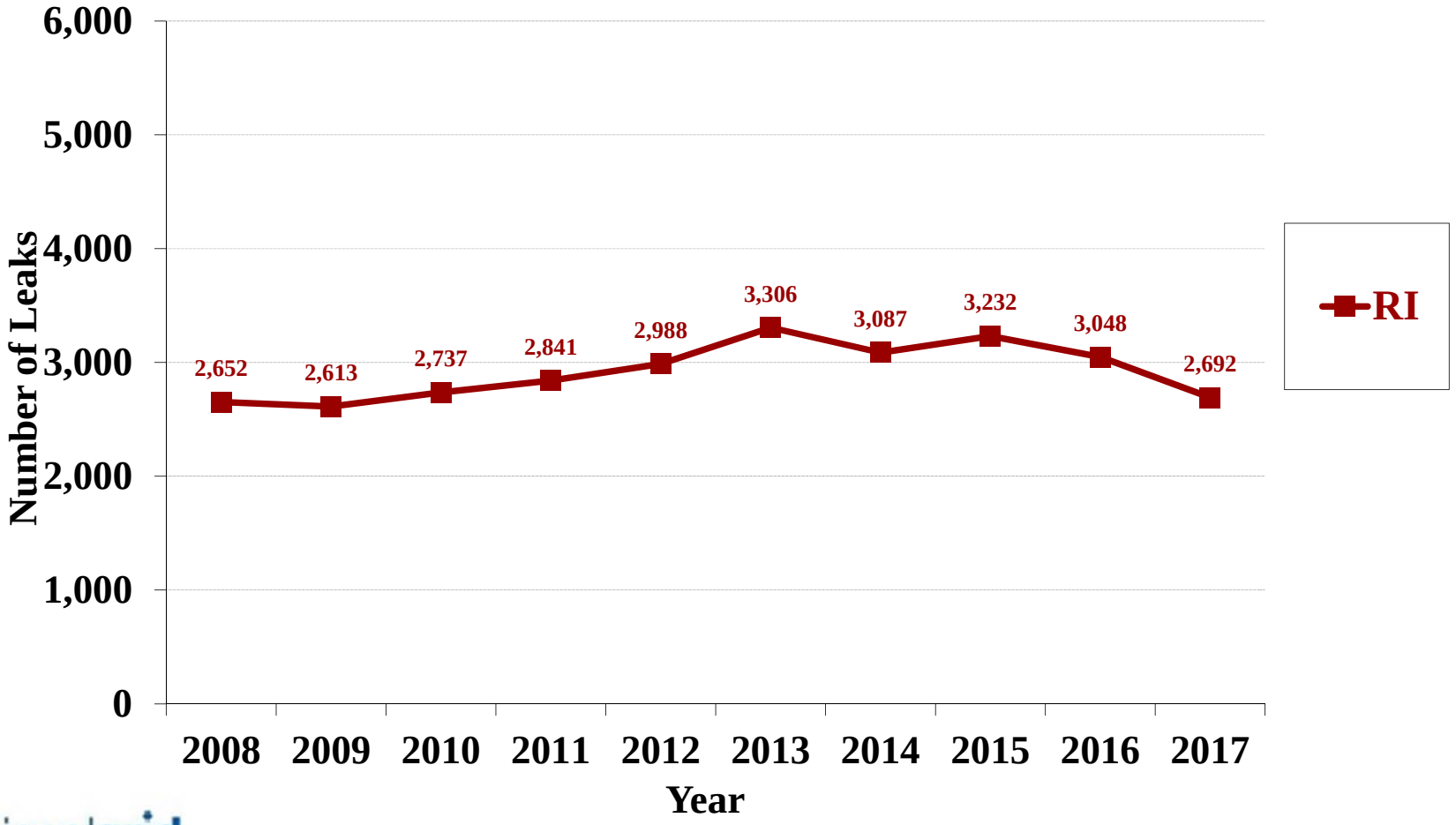
2017 SYSTEM INTEGRITY REPORT

RI

YEAR-END OPEN TYPE 3



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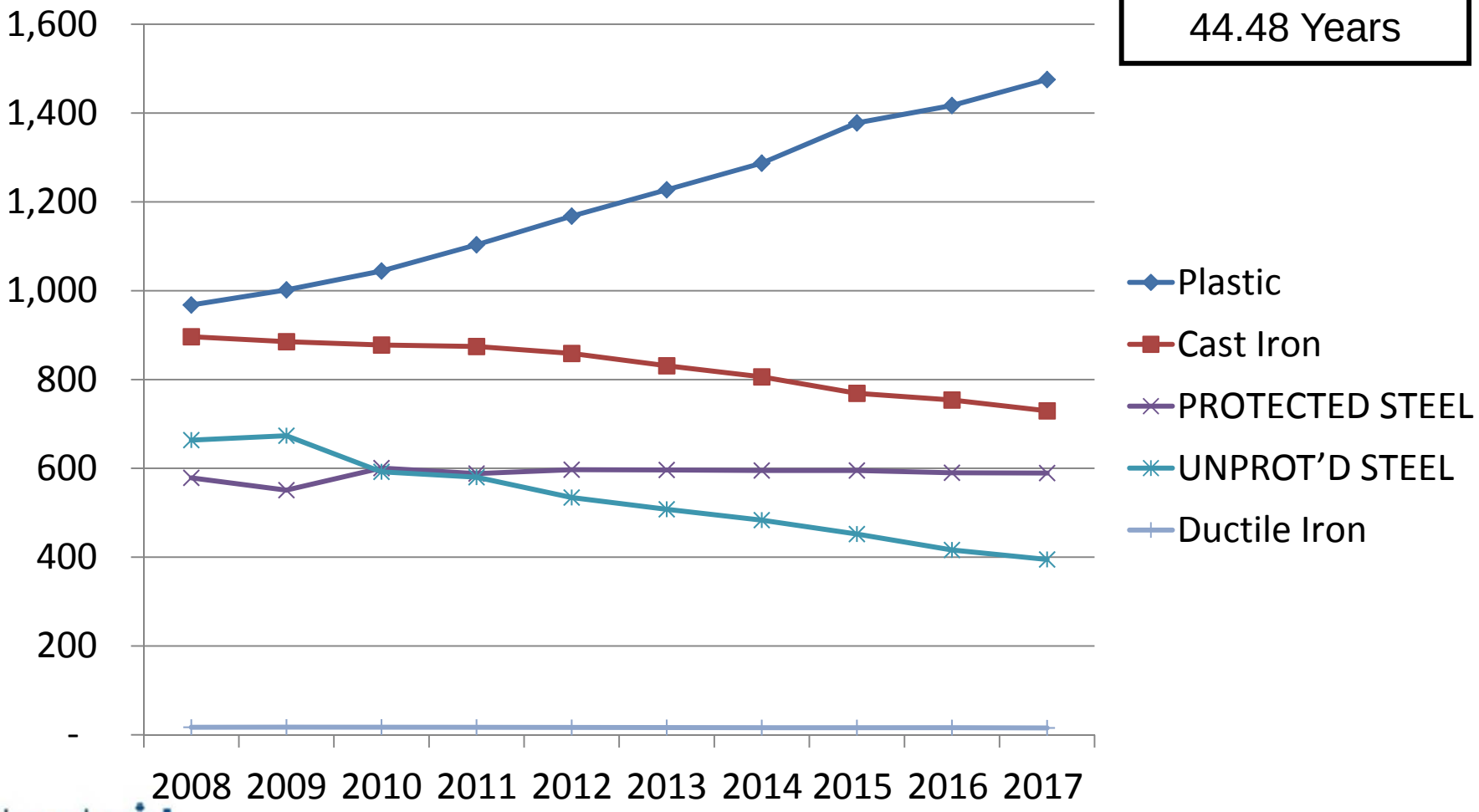
MAIN INVENTORY ANALYSIS

2017 SYSTEM INTEGRITY REPORT

RI

MAIN INVENTORY
TREND (MILES)

Average Age Of All RI Distribution Main: 44.48 Years



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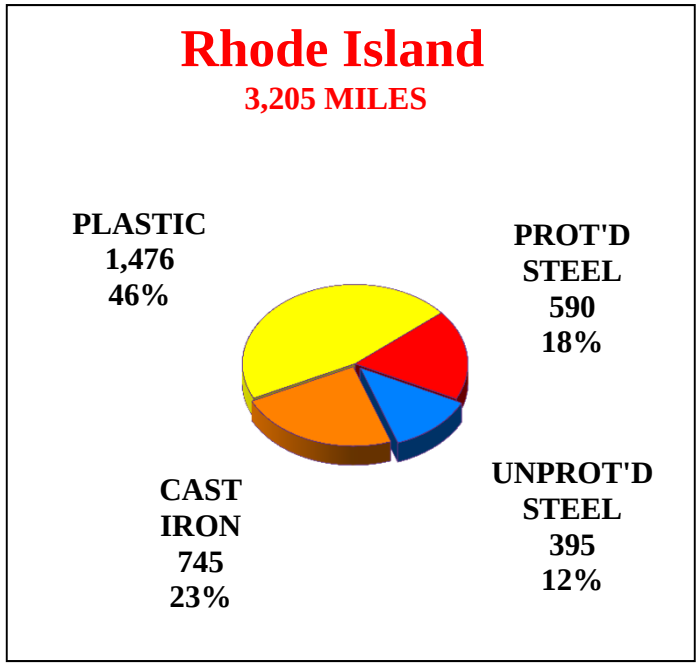
Note: See number of main breakdown in appendix (start from slide 306)

2017 SYSTEM INTEGRITY REPORT

MAIN INVENTORY

RI

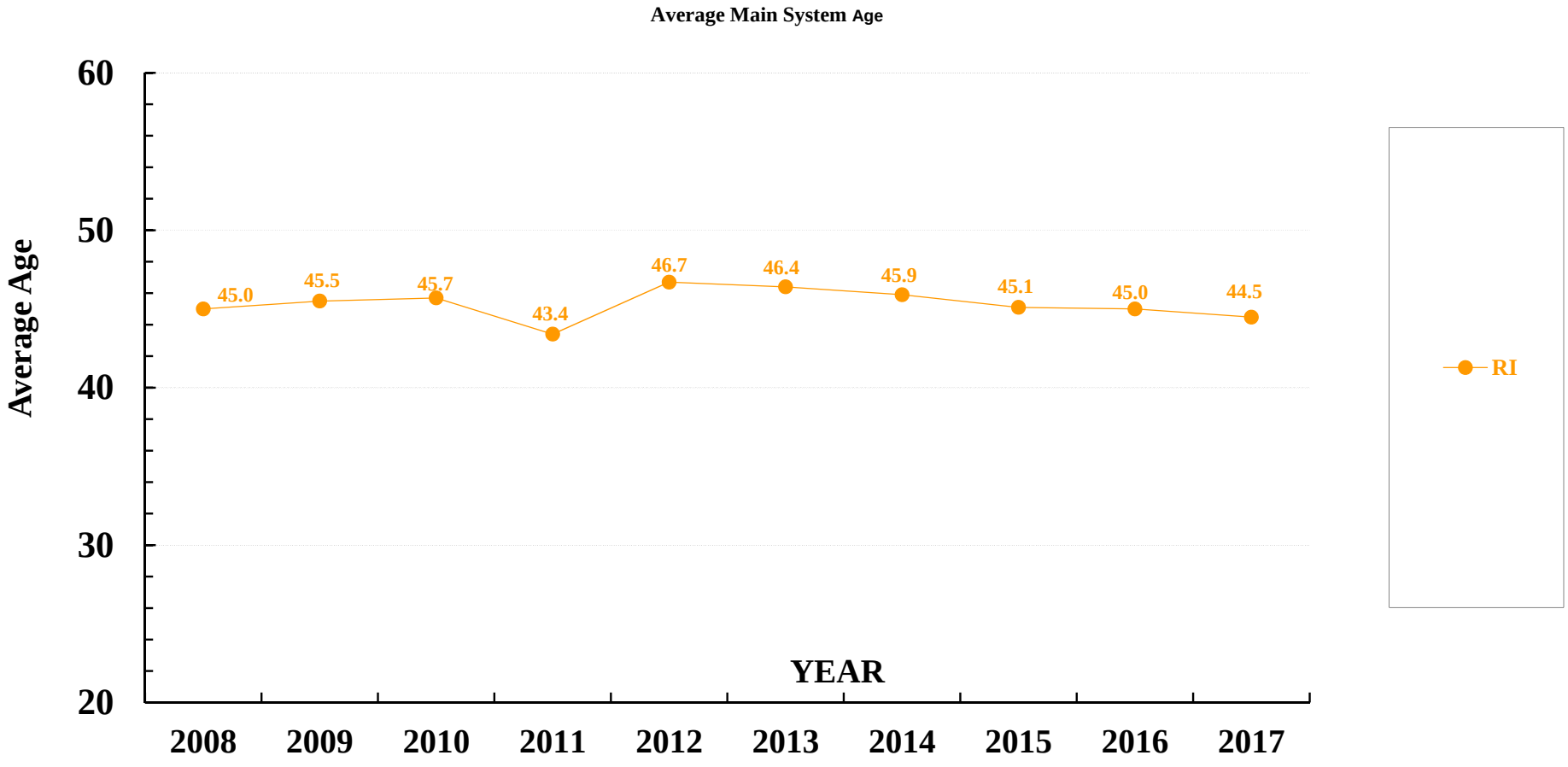
RI



2017 SYSTEM INTEGRITY REPORT

RI

National Grid Gas Distribution System
Average Age of Main by Legacy NG Company Reflects Expected Northeast Pattern(i.e., old civilization areas and cast iron)



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2017 SYSTEM INTEGRITY REPORT

RI NATIONAL GRID MAIN REPLACEMENT

Rate Case Supported "Leak-Prone" Main Replacement Levels										
Region	2017 Total Main (Miles)	2017 Leak Prone Main (Miles)	Leaks/Miles of Total Main (Repair rate)	Leaks/Miles of Leak Prone Main (Repair rate)	(5)2017 Annual "Planned" Replacement (Miles)	Planned Replacement % of Leak prone system	(5)2017 Annual "Actual" Replacement (Miles)	Actual Replacement % of Leak prone system	(5)2018 Annual "Planned" Replacement (Miles)	Years to LPP Main Elimination based on "Current" annual plan
RI	3,205	1,124	0.26	0.73	53.7	4.8%	53.6	4.8%	60.0	18

Note:
1. Leaks per mile of total main excludes Excavation leaks.
2. Leaks per mile of Leak-Prone main (LPP) excludes Excavation leaks and Plastic leaks.
3. Leak-Prone Pipe = Unprotected steel (Bare & Coated) + CI/WI + Aldyl-A (MD, 1985 and prior) + Other.
4. Miles of Leak-Prone main replaced includes all Proactive programs (Main Replacement program & System Reinforcement) and all Reactive programs (Public Works, Water Intrusion & Leak/reactive).
5. Annual planned and actual replacement miles are CY.
6. Data sources are 2016 & 2017 US Gas Leak Prone Pipe Replacement Programs monthly reports from Gas Resource Management CMS.

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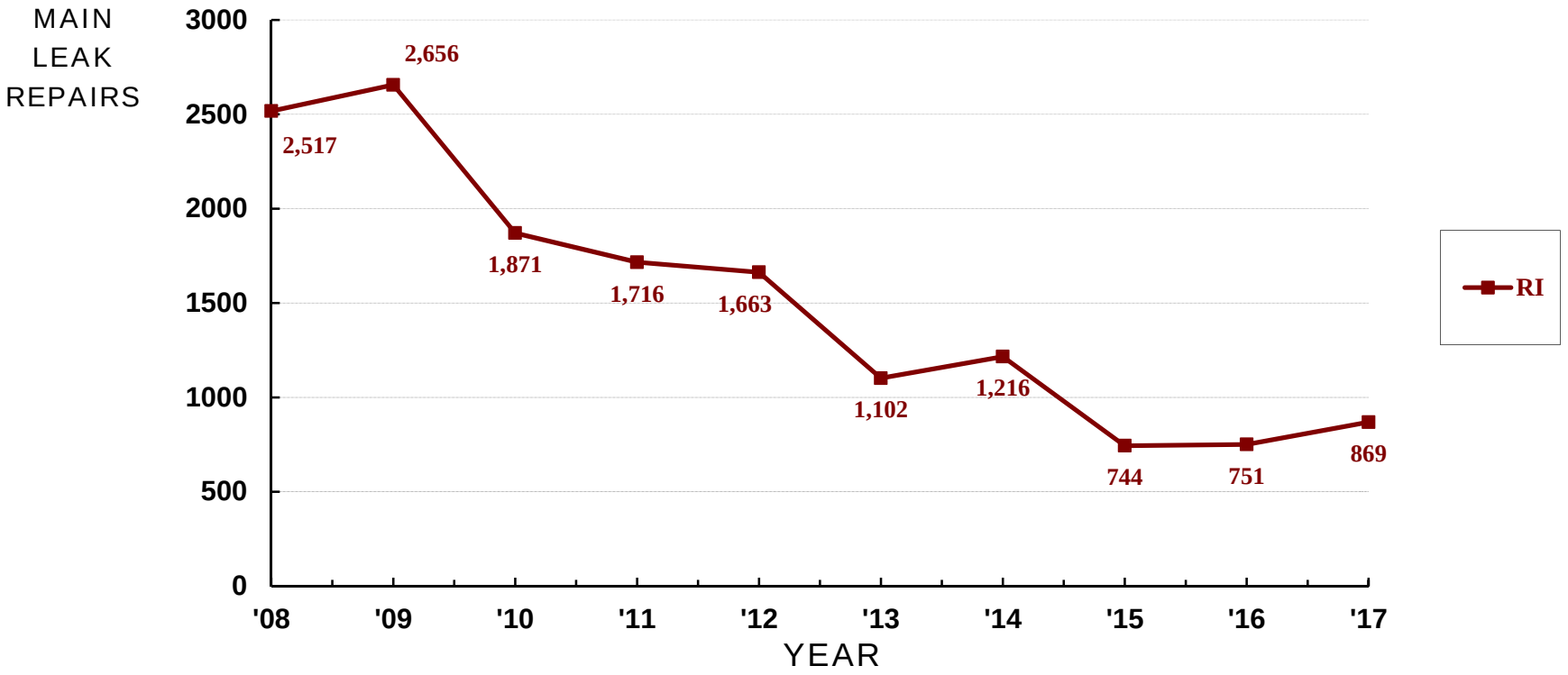
MAIN LEAK REPAIR ANALYSIS

2017 SYSTEM INTEGRITY REPORT

RI TOTAL MAIN LEAK REPAIRS

INCLUDING Damages



NOTE: Cast Iron Leaks Count Total Individual Joint Repairs

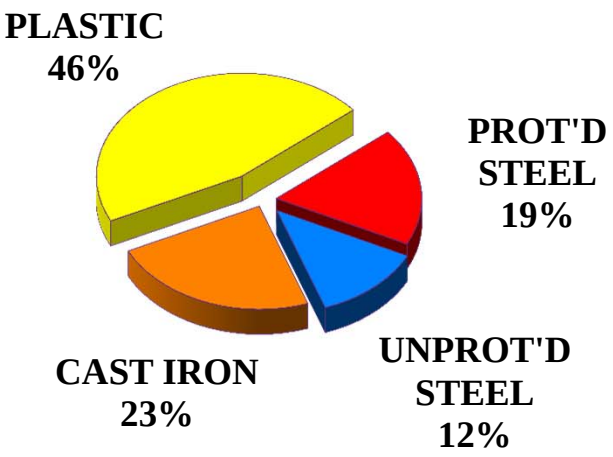
2017 SYSTEM INTEGRITY REPORT

RI

TOTAL MAIN INVENTORY COMPARED TO LEAK REPAIRS

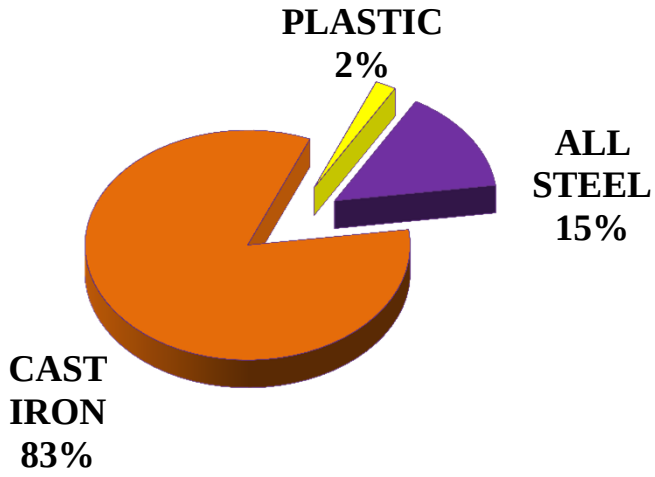
TOTAL MAIN INVENTORY *BY MATERIAL*

3,205 MILES



TOTAL MAIN LEAK REPAIRS *BY MATERIAL*

751 LEAKS (including damages)



NOTE: (*) CI Leaks include Other material Leaks.
Leak Count Totals Individual Repairs.

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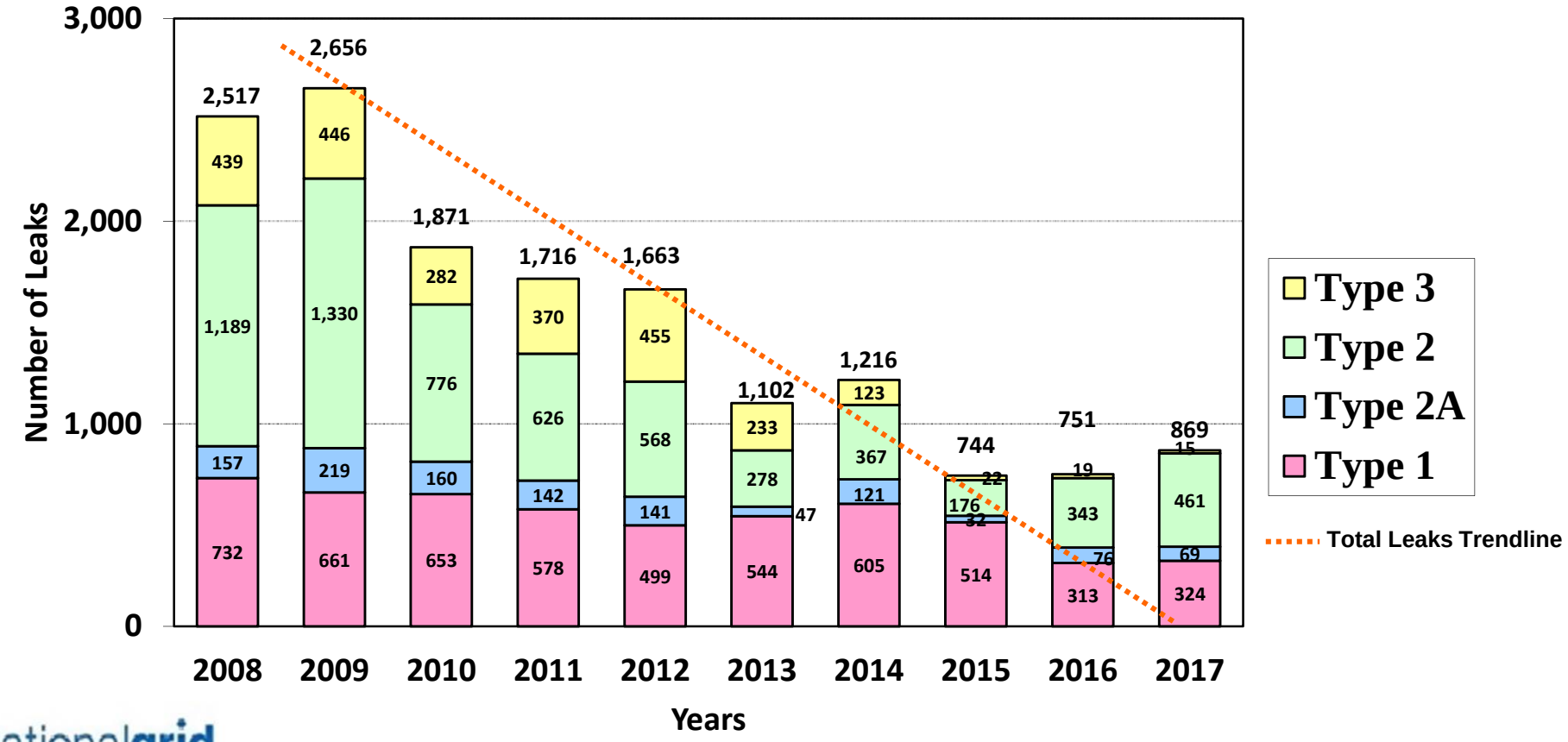
2017 SYSTEM INTEGRITY REPORT

RI

LEAKS REPAIRED
By Type

MAIN

(Including Damages)



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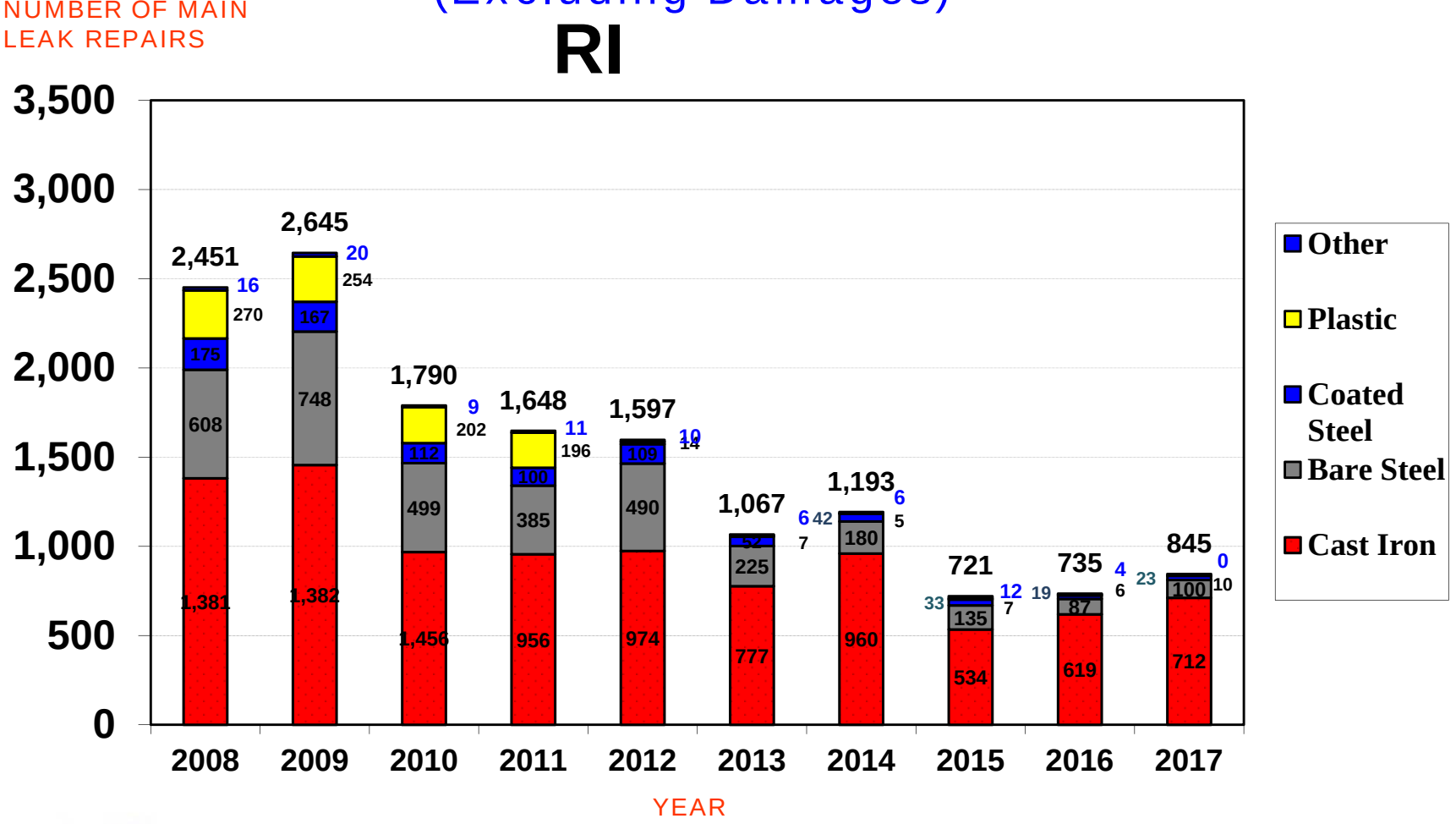
2017 SYSTEM INTEGRITY REPORT

2008 - 2017 MAIN LEAK REPAIRS

RI

All Main Leak Repairs by Material
(Excluding Damages)



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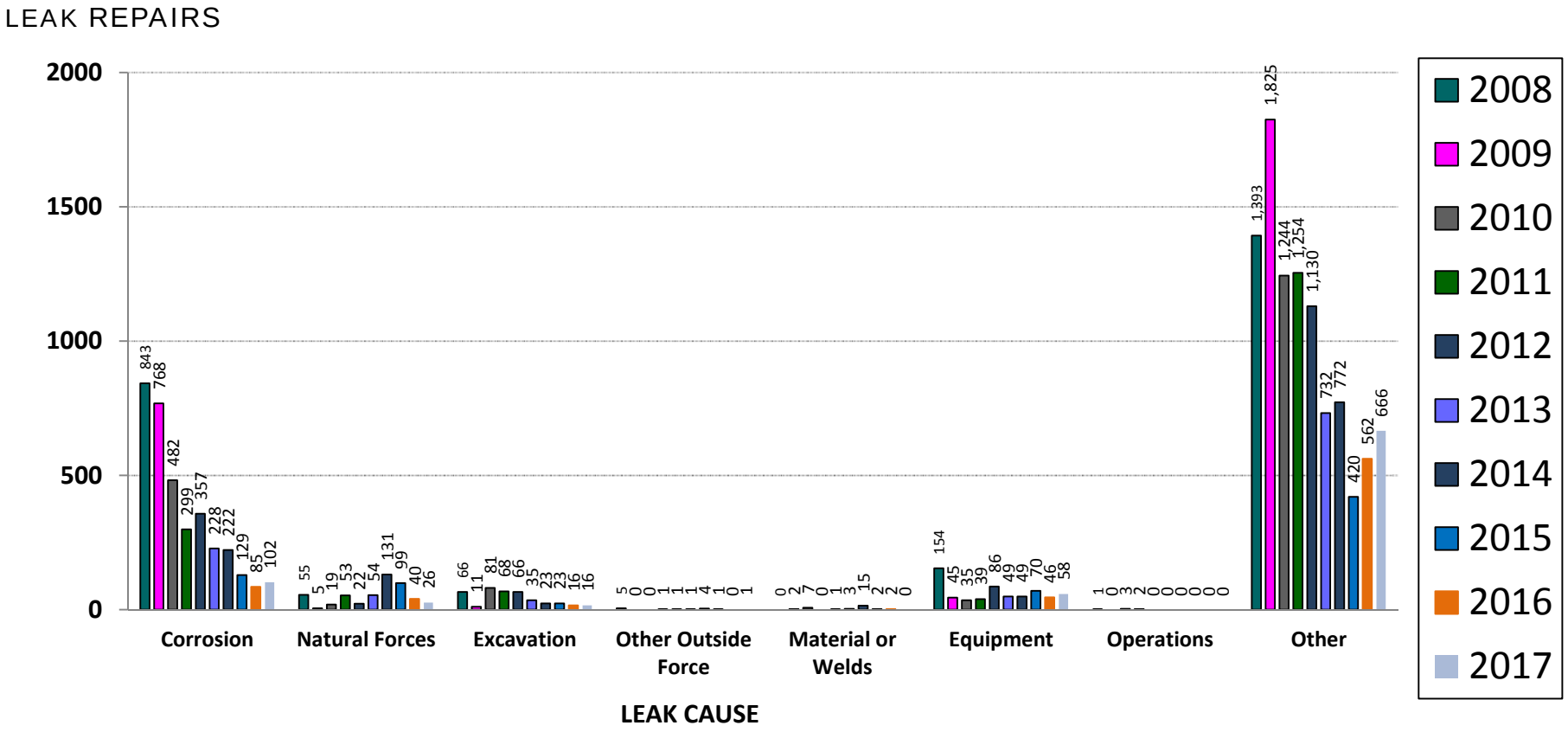
2017 SYSTEM INTEGRITY REPORT

RI

MAIN LEAKS REPAIRED
COMPARISON BY LEAK CAUSES



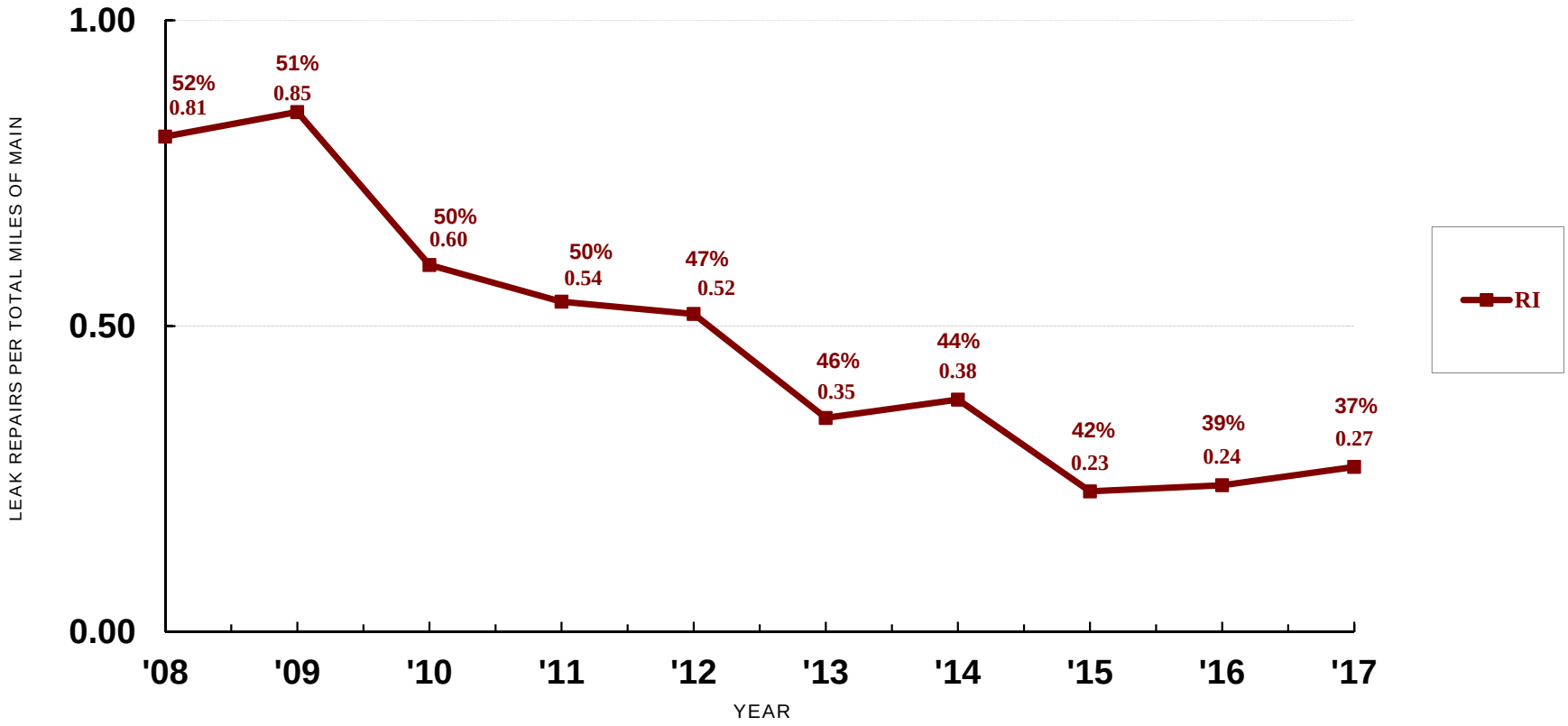
2017 SYSTEM INTEGRITY REPORT

RI

TOTAL MAIN LEAK "RATES"

INCLUDING Damages

PERCENTAGES SHOWN ARE PERCENT OF LEAK-PRONE PIPE



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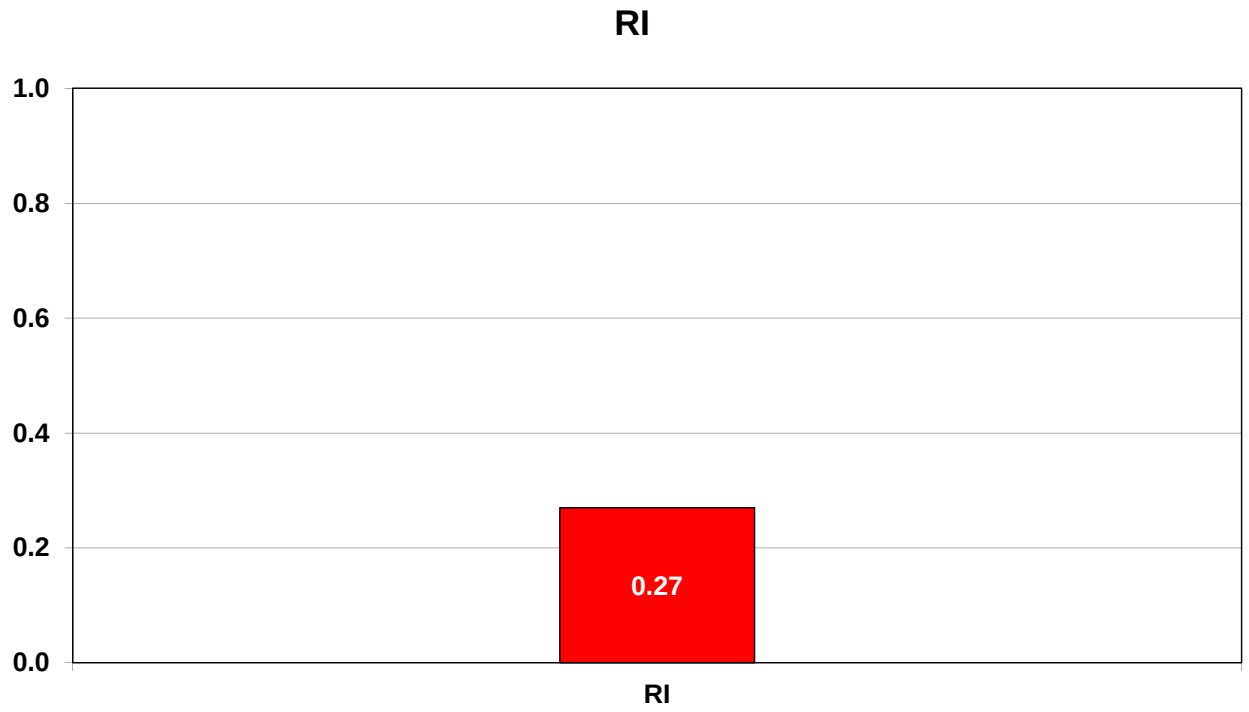
2017 SYSTEM INTEGRITY REPORT

RI

MAIN LEAK "RATES"

Total Main Leak Repairs (incl. damages)
/ Mile of Total Main



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2017 SYSTEM INTEGRITY REPORT

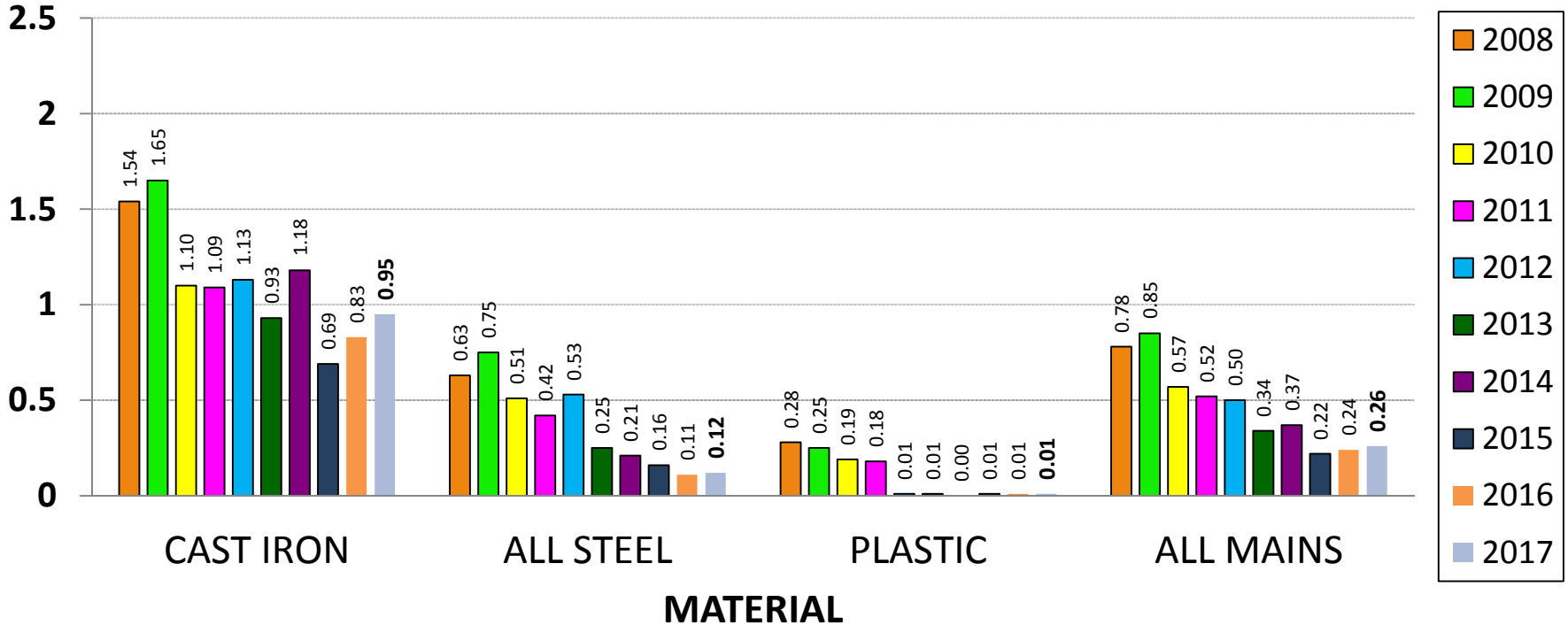
RI

MAIN LEAK "RATES"

COMPARISON BY MATERIAL

EXCLUDING Damages

LEAK REPAIRS
PER MILE OF MAIN



COUNTING EACH INDIVIDUAL REPAIR AS A LEAK

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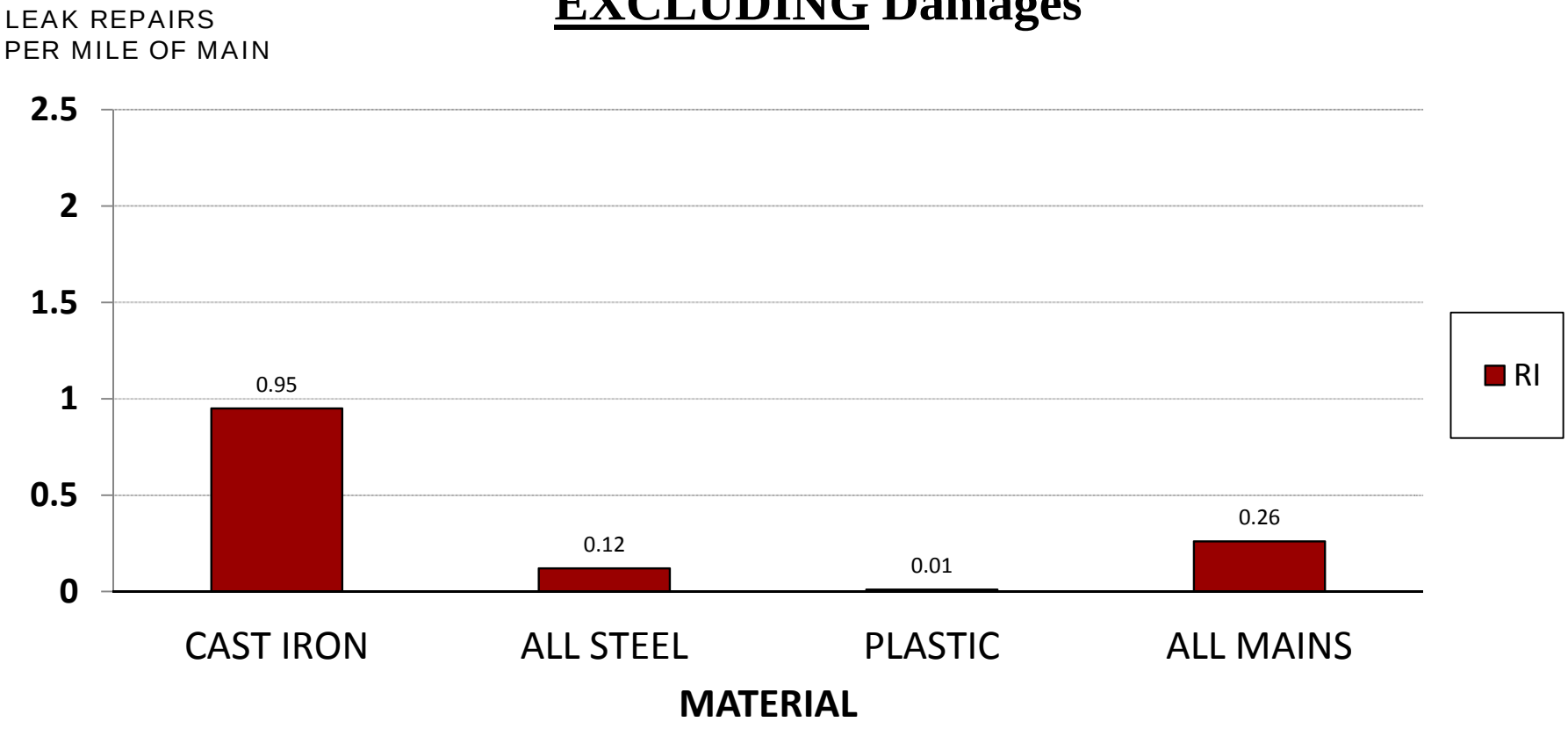
2017 SYSTEM INTEGRITY REPORT

RI

MAIN LEAK "RATES"

COMPARISON BY MATERIAL

EXCLUDING Damages



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2017 SYSTEM INTEGRITY REPORT

2017 DETAILS OF MAIN LEAK REPAIRS

2017 SYSTEM INTEGRITY REPORT

RI

MAIN LEAK REPAIRS

MATERIAL-CAUSE MATRIX

	CORROSION	MATL/WELD	NAT FORCE	OTH OS FRC	EQUIPMENT	OPERATIONS	CI JT/OTHER	DAMAGES	ALL CAUSES
CAST IRON	4	0	26	0	27	0	663	5	725
STEEL	98	0	0	0	22	0	3	3	126
BARE	85	0	0	0	12	0	3	2	0
COATED	13	0	0	0	10	0	0	1	24
PLASTIC	0	0	0	1	9	0	0	8	18
OTHER	0	0	0	0	0	0	0	0	0
ALL MAINS	102	0	26	1	58	0	666	16	869

COUNTING EACH INDIVIDUAL REPAIR AS A LEAK

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2017 SYSTEM INTEGRITY REPORT

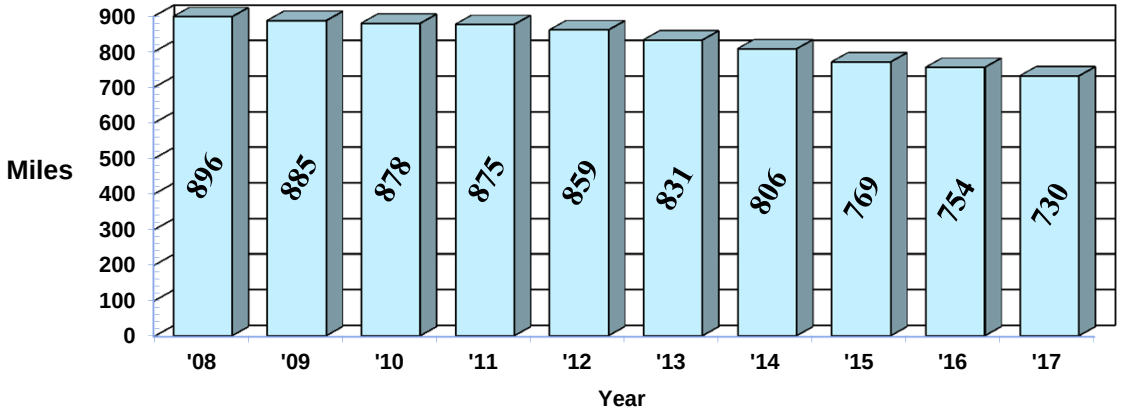
A CLOSER LOOK AT CAST IRON MAINS

2017 SYSTEM INTEGRITY REPORT

RI

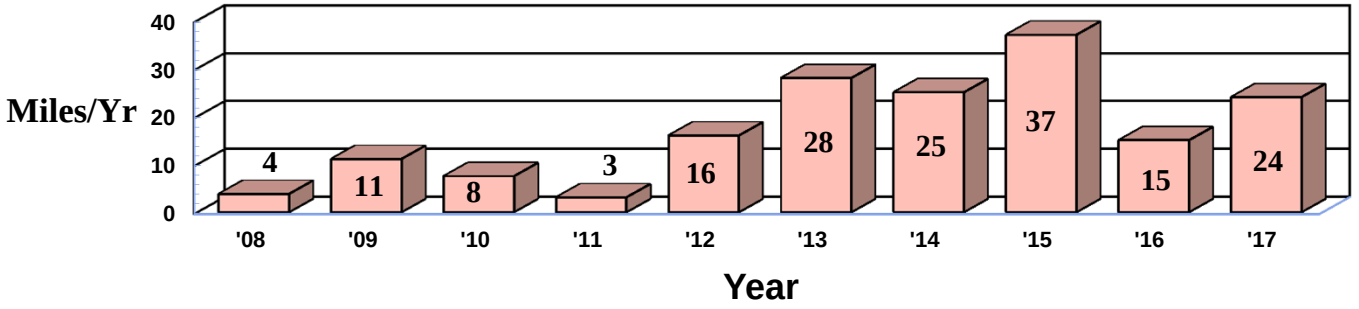
CAST IRON MAIN INVENTORY

DOT-Reported Pipe Inventories



CAST IRON ATTRITION RATE

Avg 10-Yr Attrition Rate: 17.05 Miles/Year (2.34%)



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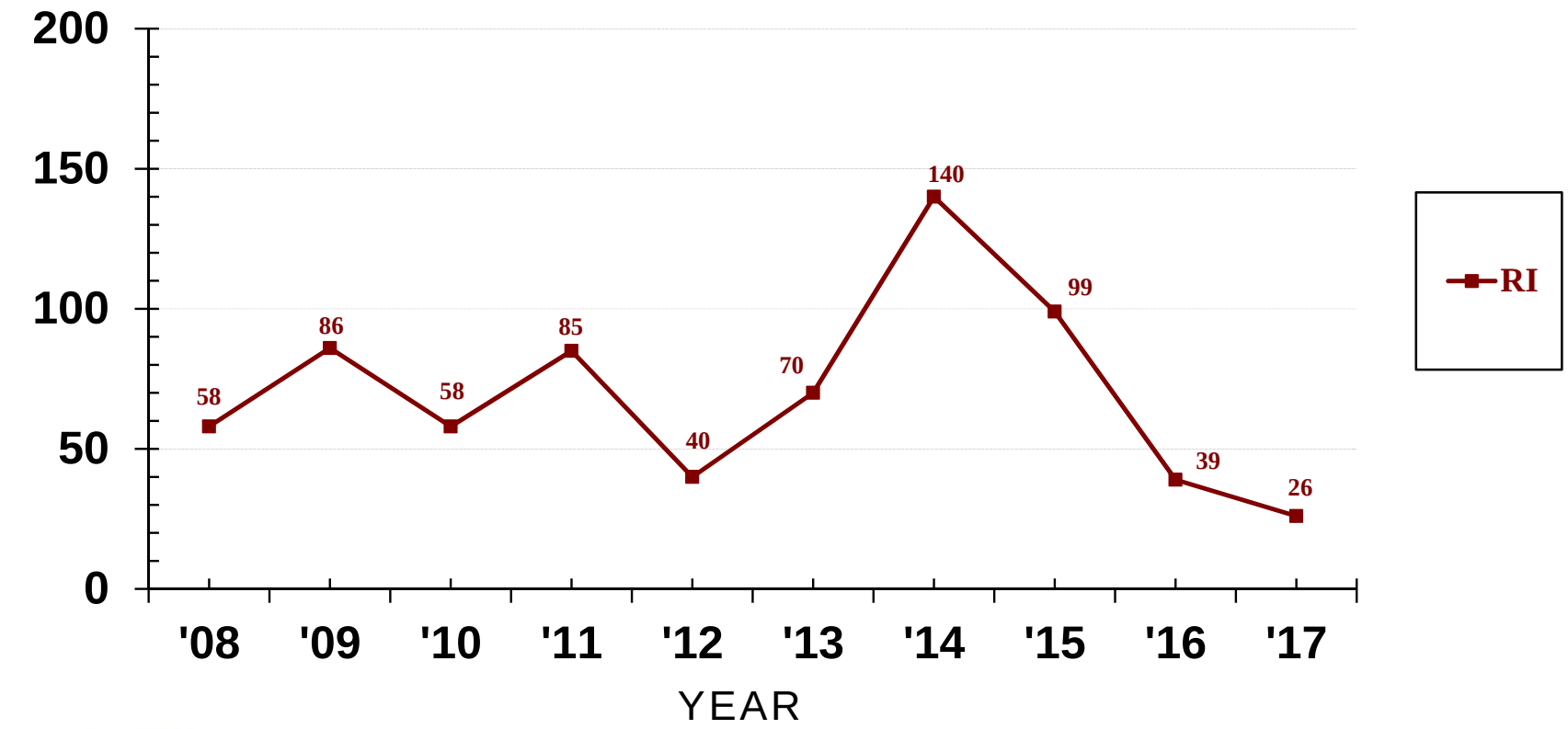
2017 SYSTEM INTEGRITY REPORT

RI

TOTAL CAST IRON MAIN BREAKS



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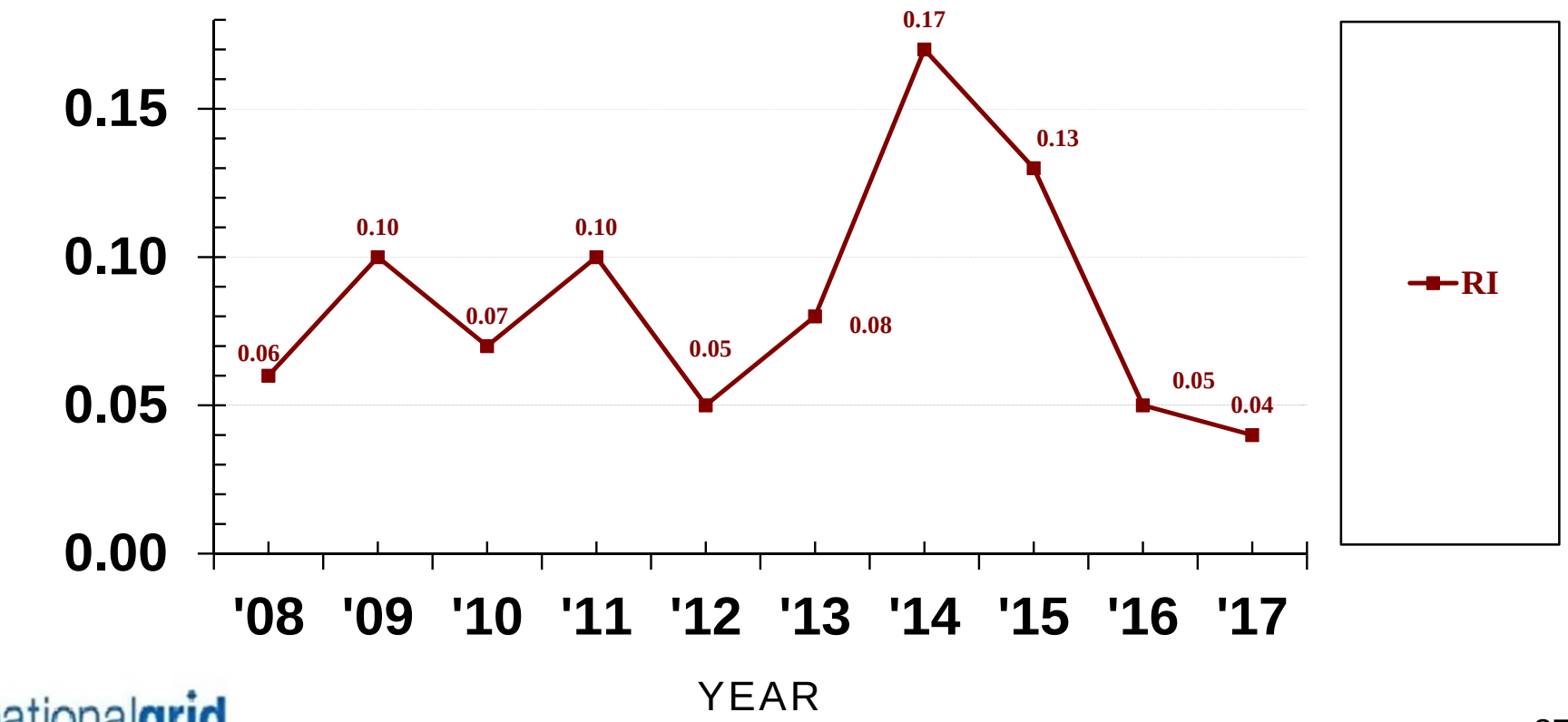
2017 SYSTEM INTEGRITY REPORT

RI

CAST IRON
MAIN BREAK "RATES"



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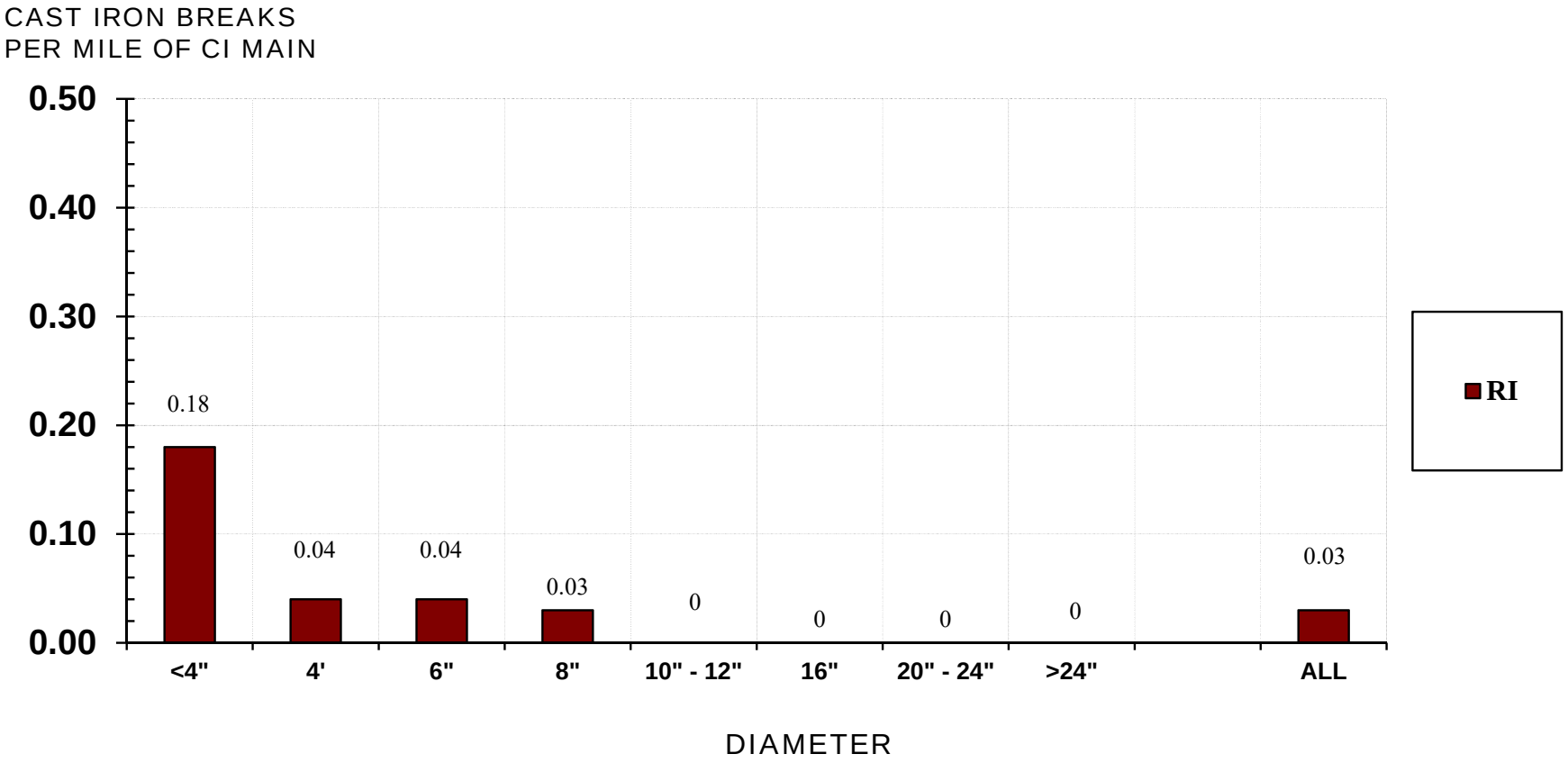
2017 SYSTEM INTEGRITY REPORT

RI CAST IRON MAIN BREAK "RATES"

"RI REGION" COMPARISON BY DIAMETER



	CI Inventory	
Size	2016	2017
< 4"	6	5
4"	302	281

	CI Inventory	
Size	2016	2017
6"	319	303
8"	32	30

	CI Inventory	
Size	2016	2017
10" - 12"	73	71
16"	18	17

	CI Inventory	
Size	2016	2017
20" - 24"	14	13
24"	5	5

2017 SYSTEM INTEGRITY REPORT

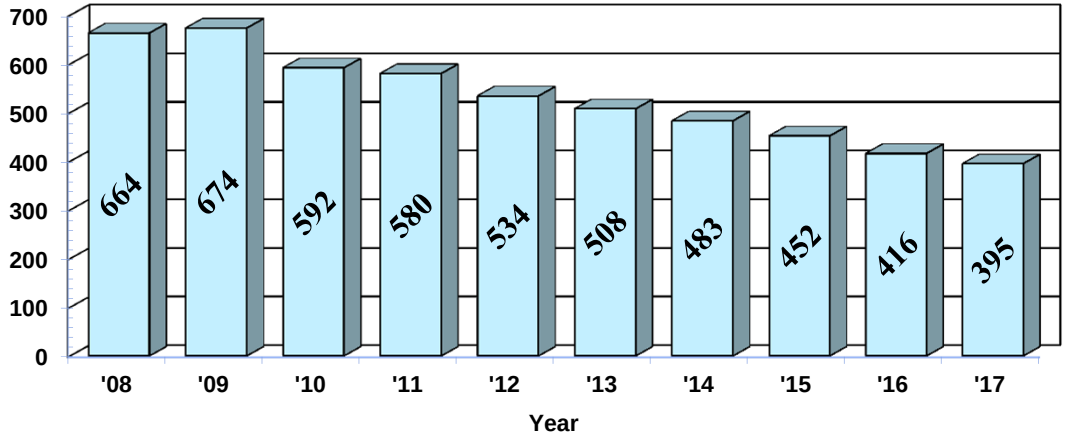
A CLOSER LOOK AT STEEL MAINS

2017 SYSTEM INTEGRITY REPORT

RI

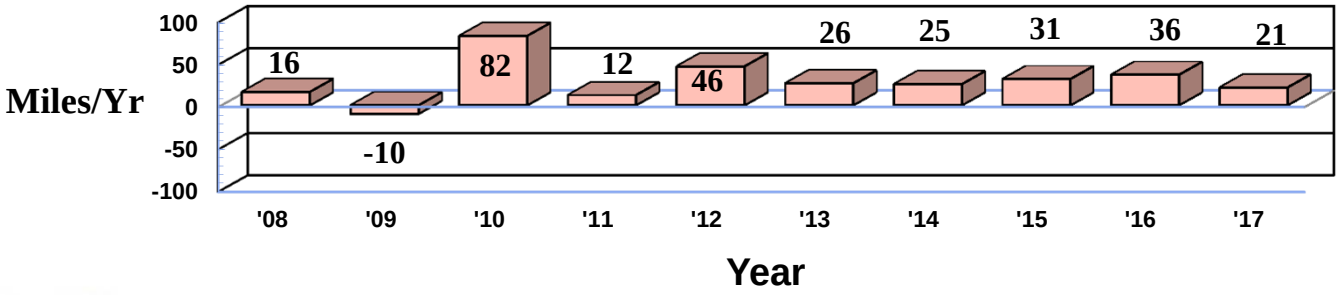
UNPROTECTED STEEL MAIN INVENTORY

DOT-Reported Pipe Inventories



UNPROTECTED STEEL ATTRITION RATE

Avg 10 -Yr Attrition Rate: 28.43 Miles/Year (7.20%)



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NOTE: In RI, Attrition is due to both replacement and "added" cathodic protection.

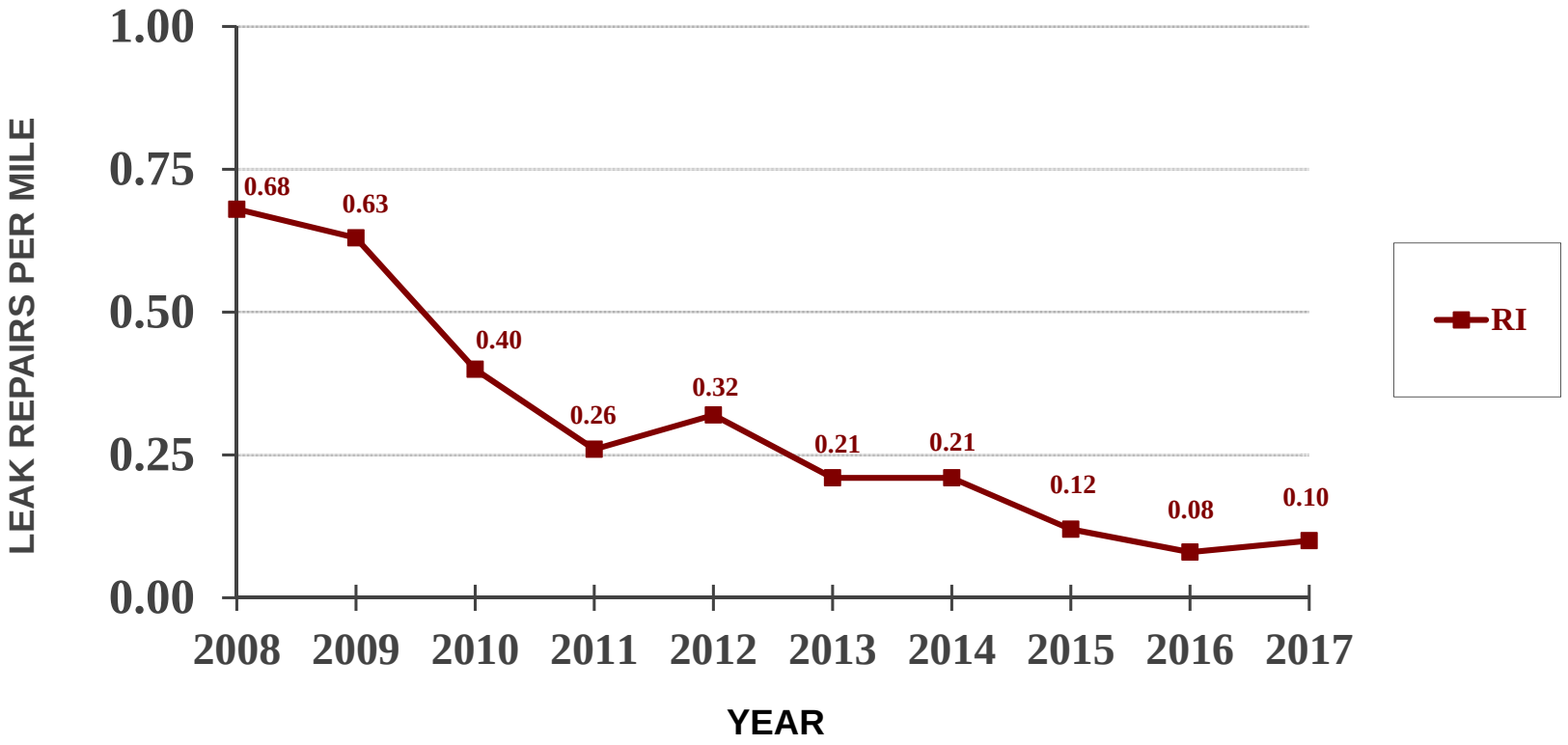
2017 SYSTEM INTEGRITY REPORT

RI

MAIN CORROSION LEAK "RATES"

CORROSION Leak Repairs Per Mile of "TOTAL" Steel

INCLUDES **ALL** CORROSION LEAKS, REGARDLESS OF MAIN MATERIAL



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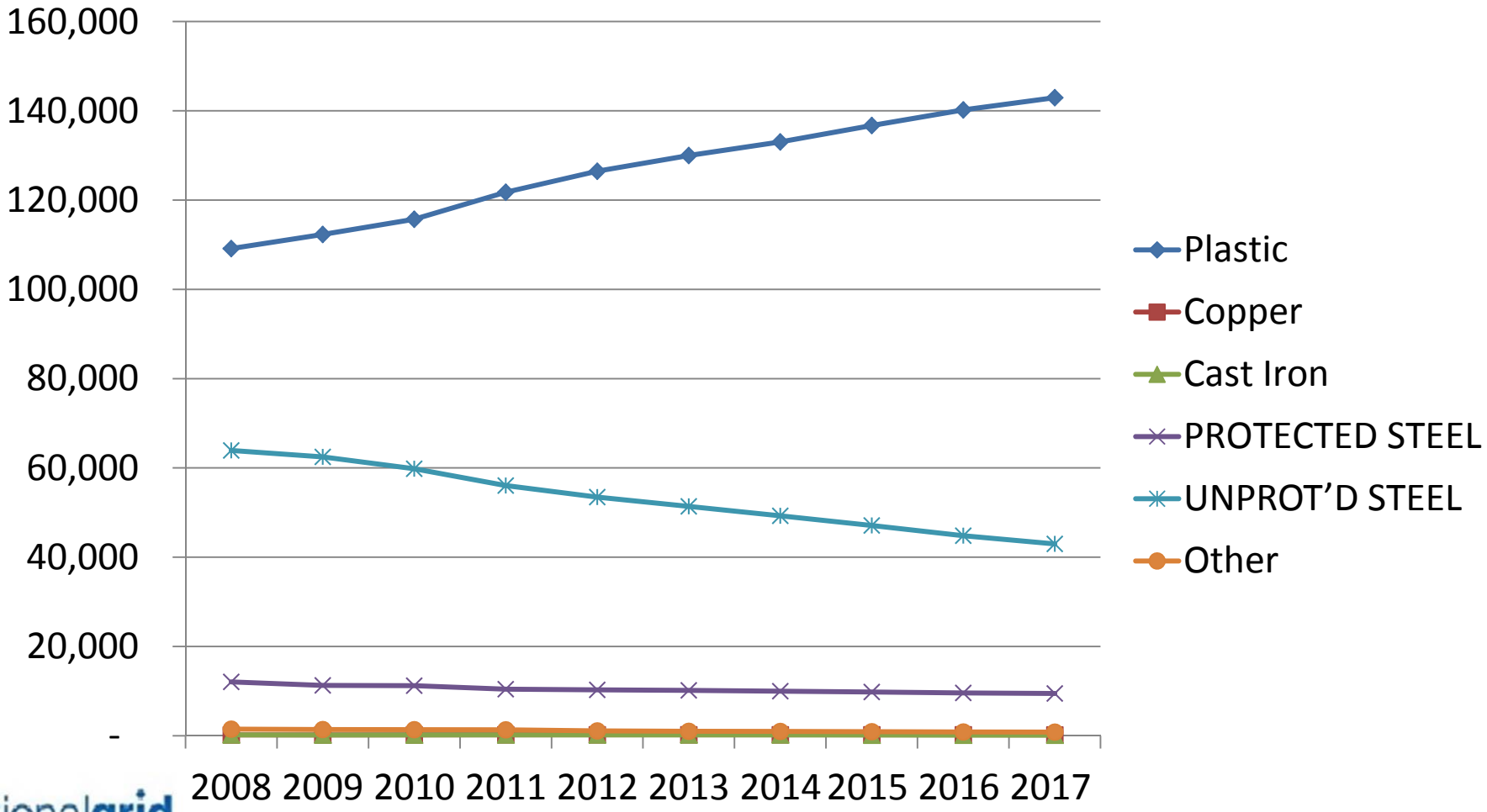
2017 SYSTEM INTEGRITY REPORT

SERVICE INVENTORY ANALYSIS

2017 SYSTEM INTEGRITY REPORT

RI

SERVICE INVENTORY TREND



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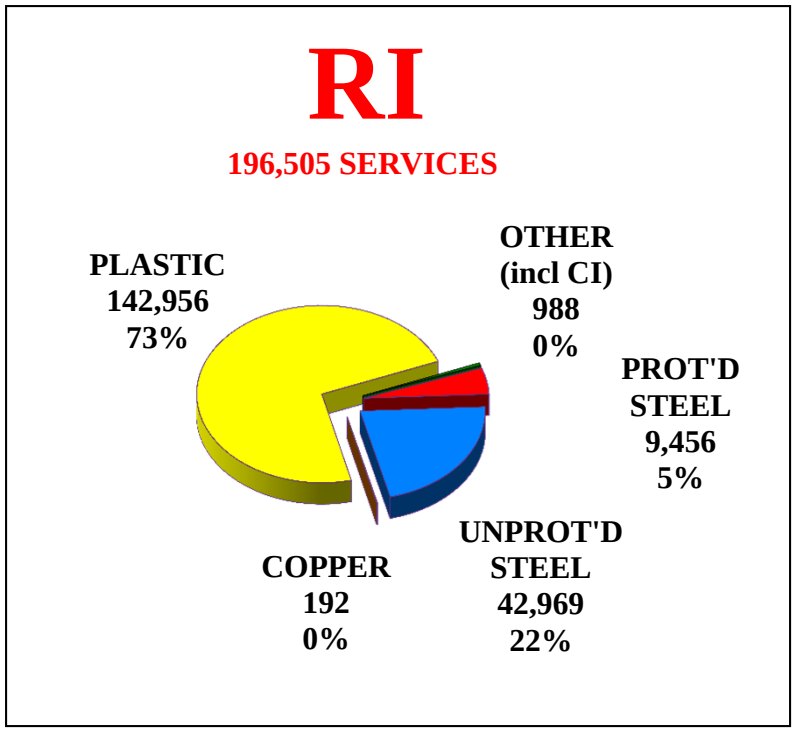
Note: See number of services breakdown in appendix (start from slide 318)

2017 SYSTEM INTEGRITY REPORT

SERVICE INVENTORY

RI



2017 SYSTEM INTEGRITY REPORT

SERVICE LEAK REPAIR ANALYSIS

NOTE: Above Ground Leaks, which are included in the DOT Reports (beginning in 2012), are excluded from this report in order to maintain the integrity of our trend analyses for distribution (not CMS) piping.

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2017 SYSTEM INTEGRITY REPORT

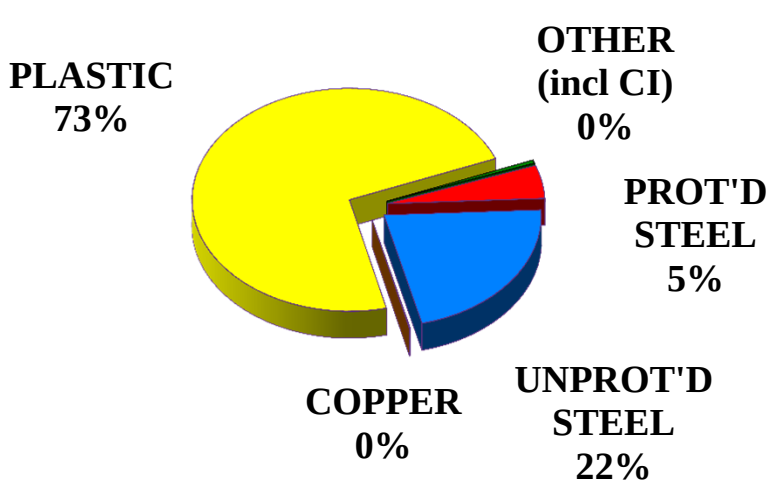
RI

TOTAL SERVICE LEAK REPAIRS

INCLUDING Damages

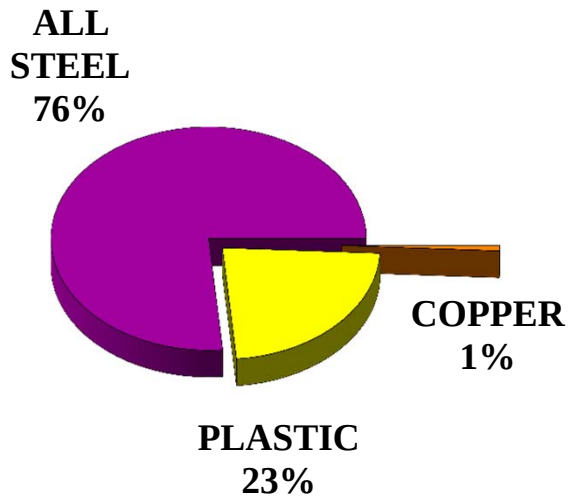
TOTAL SERVICE INVENTORY *BY MATERIAL*

196,505 SERVICES



TOTAL SERVICE LEAK REPAIRS *BY MATERIAL*

654 LEAKS



IMPORTANT: *Service Repairs are identified by the service material. This is not necessarily the material that leaked. For example - a leak caused by corrosion of a steel valve or fitting on a plastic service is shown as a plastic service leak.*

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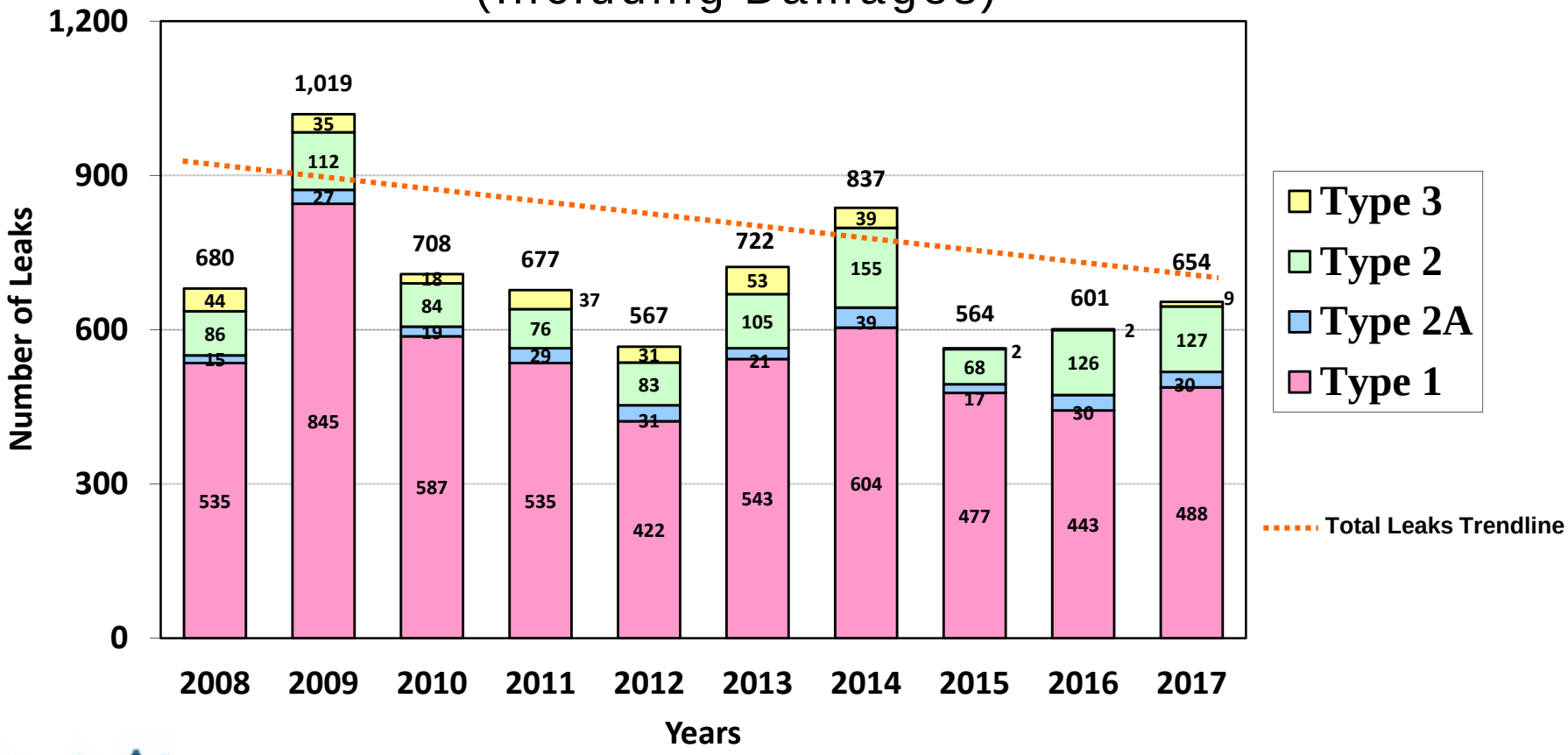
2017 SYSTEM INTEGRITY REPORT

RI LEAKS REPAIRED By REPAIRED Type SERVICE

(Including Damages)



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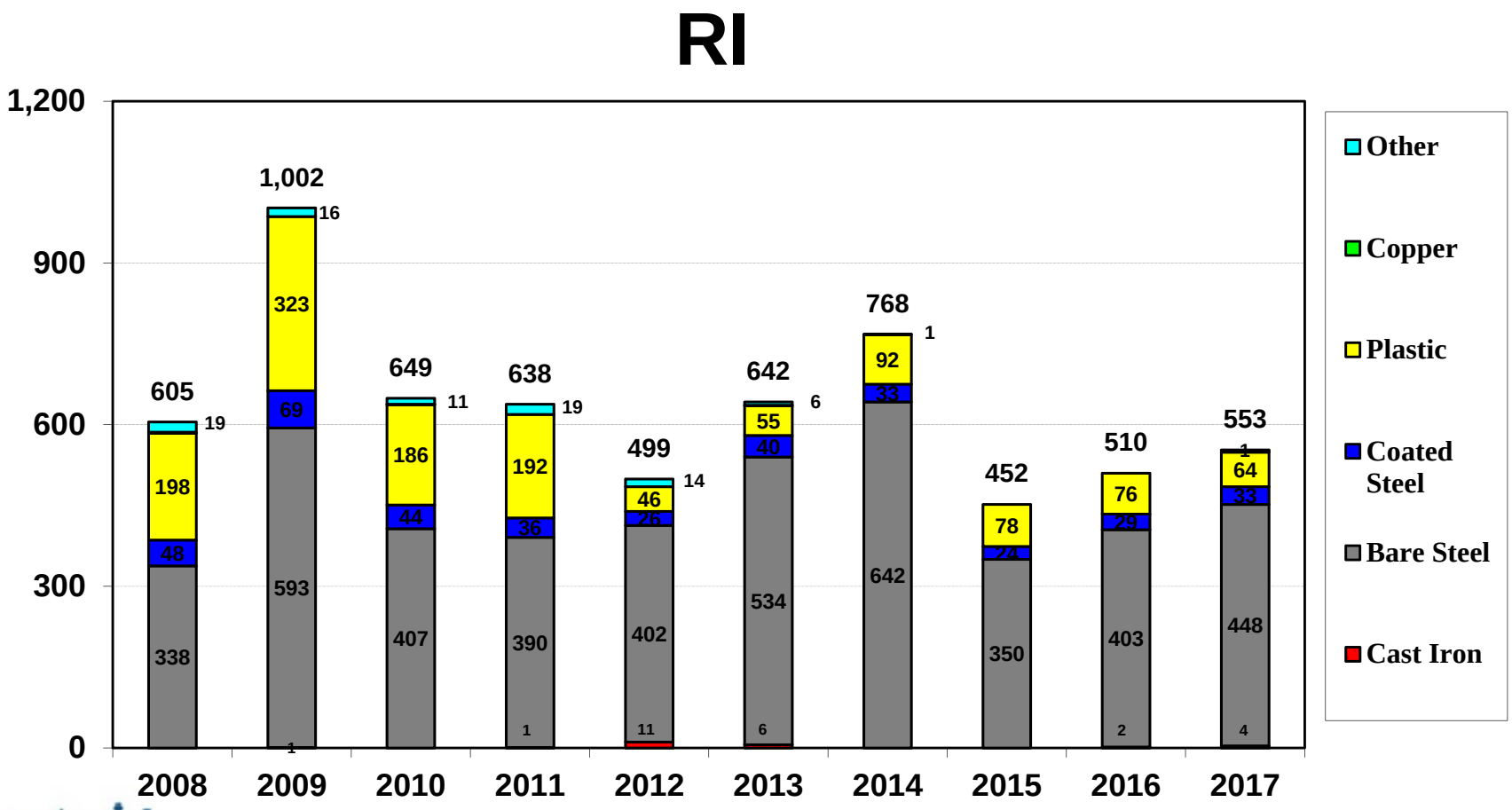
2017 SYSTEM INTEGRITY REPORT

2008 -2017 SERVICE LEAK REPAIRS

All Service Leak Repairs by Material
(Excluding Damages)

RI

NUMBER OF SVC LEAK REPAIRS



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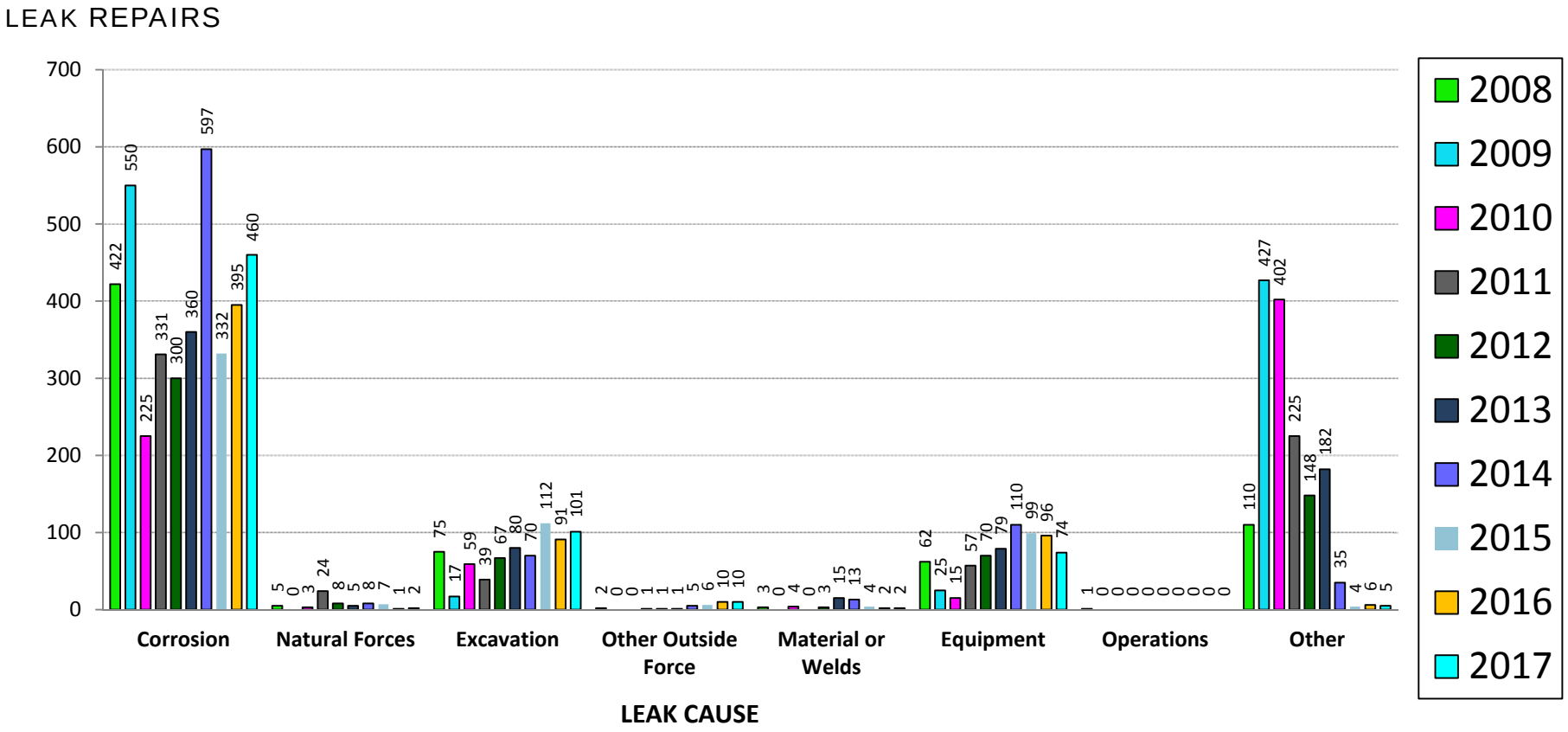
2017 SYSTEM INTEGRITY REPORT

RI

SERVICE LEAKS REPAIRED
COMPARISON BY LEAK CAUSES



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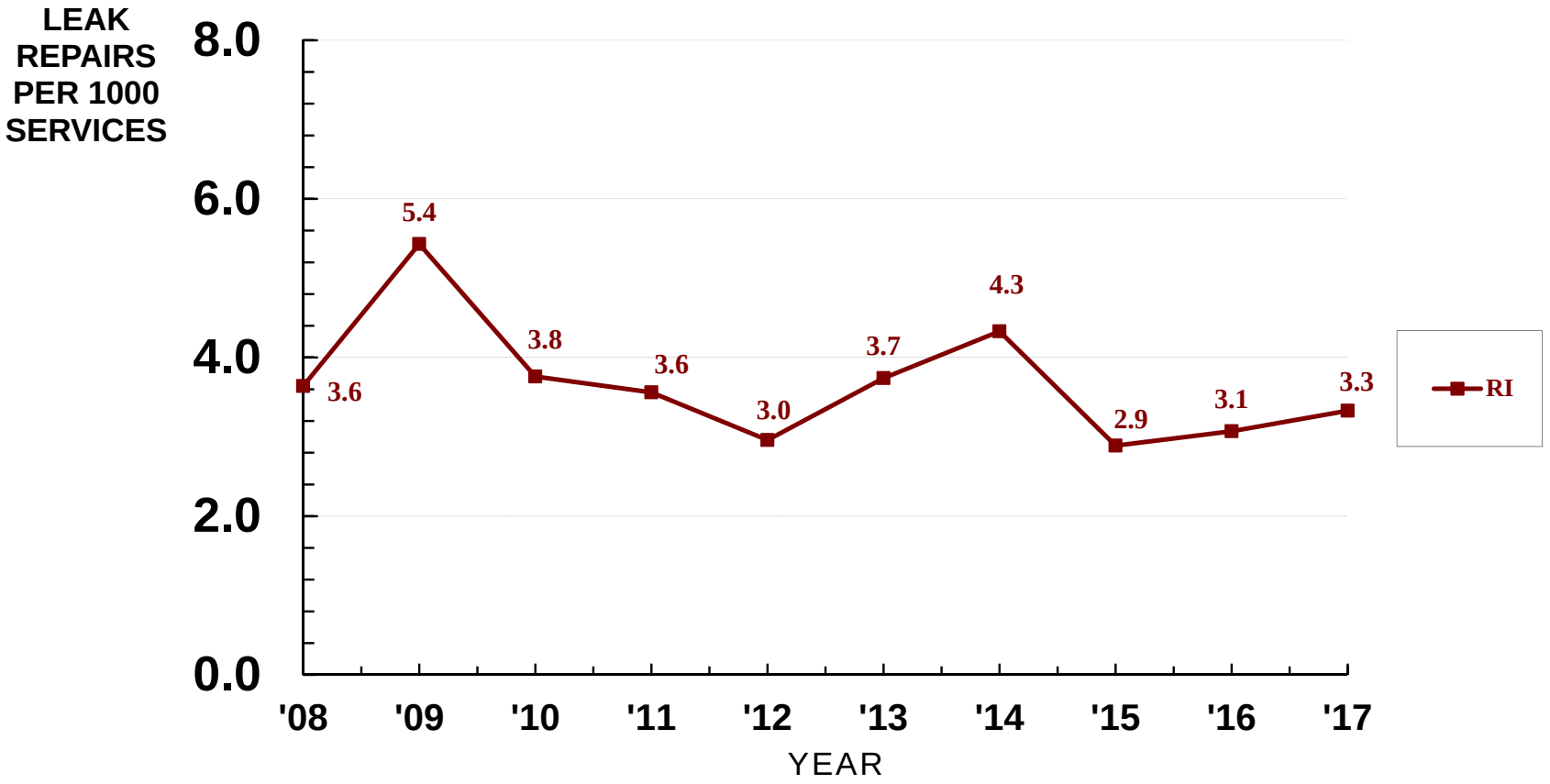
COUNTING EACH INDIVIDUAL REPAIR AS A LEAK

2017 SYSTEM INTEGRITY REPORT

RI TOTAL SERVICE LEAK "RATES"

INCLUDING Damages

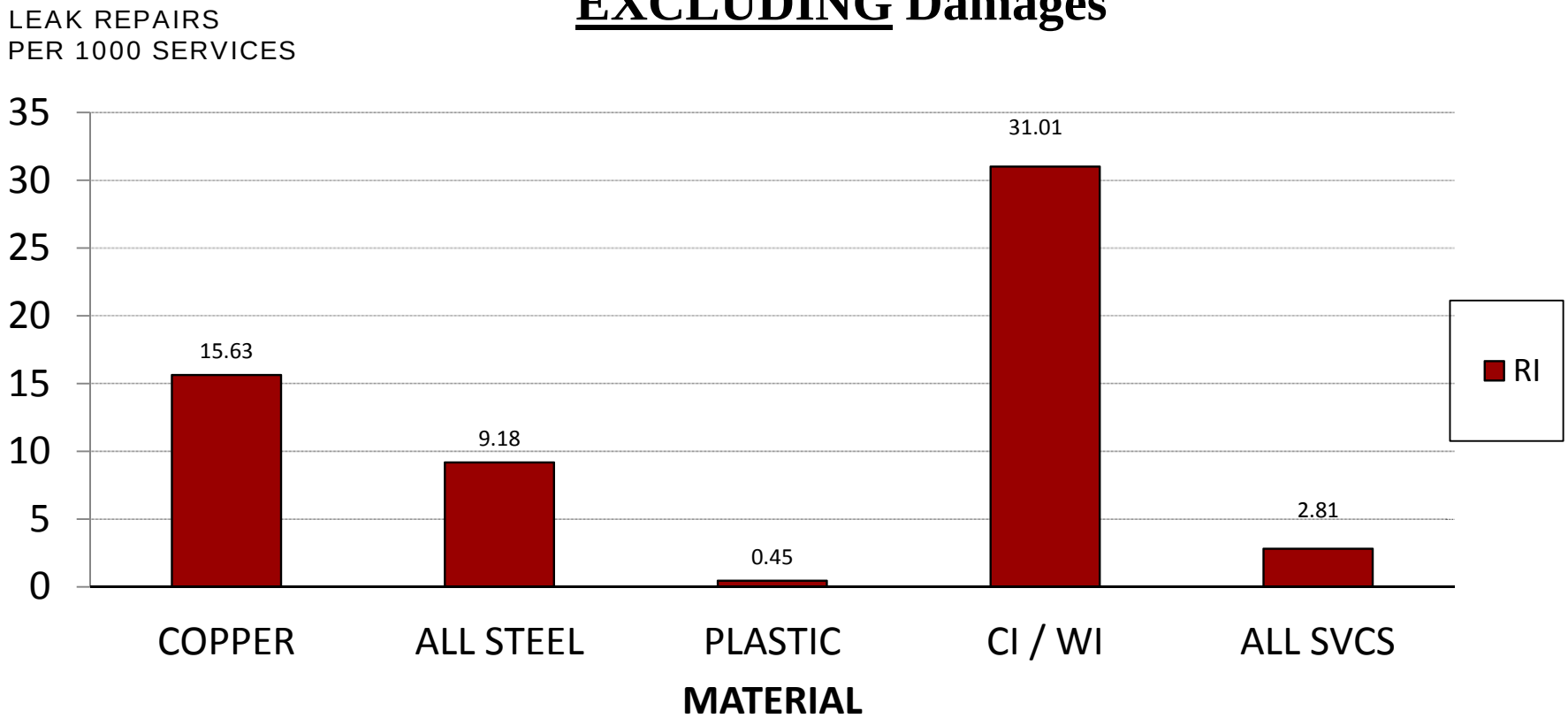


2017 SYSTEM INTEGRITY REPORT

RI

SERVICE LEAK "RATES"
COMPARISON BY MATERIAL

EXCLUDING Damages



COUNTING EACH INDIVIDUAL REPAIR AS A LEAK

2017 MATERIAL CAUSE MATRIX (SERVICE LEAK REPAIR)

2017 SYSTEM INTEGRITY REPORT

RI

2017 SERVICE LEAKS

MATERIAL-CAUSE MATRIX

	CORROSION	MATL/WELD	NAT FORCE	OTH OS FRC	EQUIPMENT	OPERATIONS	OTHER	DAMAGES	ALL CAUSES
CAST IRON	1	0	2	0	1	0	0	0	4
COPPER	3	0	0	0	0	0	0	2	5
STEEL	452	0	0	0	27	0	2	15	496
BARE	*429*	*0*	*0*	*0*	*17*	*0*	*2*	*12*	460
COATED	*23*	*0*	*0*	*0*	*10*	*0*	*0*	*3*	36
PLASTIC	3	2	0	10	46	0	3	84	148
OTHER	1	0	0	0	0	0	0	0	1
ALL SVCS	460	2	2	10	74	0	5	101	654

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COUNTING EACH INDIVIDUAL REPAIR AS A LEAK

2017 SYSTEM INTEGRITY REPORT

2016/2017
DISTRIBUTION
DOT REPORT
DATA COMPARISONS

2017 SYSTEM INTEGRITY REPORT

RI

General Data Correction
Explanation Needed
Discussed & Approved

2016 - 2017 DOT Comparisons		RI					
		2017		2016		Delta(17-16)	%
Main Inventory	Cast Iron	730	miles	754	miles	-24	-3%
	Reconditioned Cast Iron	0	miles	0	miles	0	N/A
	Plastic	1,476	miles	1,417	miles	+59	4%
	UP Bare Steel	224	miles	242	miles	-18	-7%
	UP Coated Steel	171	miles	175	miles	-4	-2%
	Total UP Steel	395	miles	416	miles	-22	-5%
	CP Bare Steel	0	miles	0	miles	+0	0%
	CP Coated Steel	590	miles	590	miles	-0.49	-0.1%
	Total CP Steel	590	miles	590	miles	0	0%
	Other	0	miles	0	miles	-0.01	0%
	Ductile Iron	16	miles	16	miles	-0.3	-2%
	TOTAL MAIN	**3,205**	**miles**	**3,193**	**miles**	**+12**	**0.4%**
Main Leaks	Corrosion	102	repairs	85	repairs	+17	20%
	Natural Forces	26	repairs	40	repairs	-14	-35%
	Excavation	16	repairs	16	repairs	+0	0%
	Other Outside Force	1	repairs	0	repairs	+1	#DIV/0!
	Material or Welds	0	repairs	2	repairs	-2	-100%
	Equipment	58	repairs	46	repairs	+12	26%
	Operations	0	repairs	0	repairs	+0	0%
	Other	666	repairs	562	repairs	+104	19%
	TOTAL MAIN LEAKS	**869**	**repairs**	**751**	**repairs**	**+118**	**16%**
Service Inventory	Copper	192	svcs	201	svcs	-9	-4%
	Plastic	142,956	svcs	140,206	svcs	+2750	2%
	UP Bare Steel	34,701	svcs	36,227	svcs	-1526	-4%
	UP Coated Steel	8,268	svcs	8,579	svcs	-311	-4%
	Total UP Steel	42,969	svcs	44,806	svcs	-1837	-4%
	CP Bare Steel	0	svcs	0	svcs	+0	0%
	CP Coated Steel	9,456	svcs	9,585	svcs	-129	-1%
	Total CP Steel	9,456	svcs	9,585	svcs	-129	-1%
	Other	803	svcs	854	svcs	-51	-6%
	Cast Iron / Wrought Iron	129	svcs	134	svcs	-5	-4%
	TOTAL SERVICES	**196,505**	**svcs**	**195,786**	**svcs**	+719	**0.4%**
Service Leaks Excluding Above Ground Leaks	Corrosion	460	repairs	396	repairs	+64	16%
	Natural Forces	2	repairs	1	repairs	+1	100%
	Excavation	101	repairs	91	repairs	+10	11%
	Other Outside Force	10	repairs	10	repairs	+0	0%
	Material or Welds	2	repairs	2	repairs	+0	0%
	Equipment	74	repairs	96	repairs	-22	-23%
	Operations	0	repairs	0	repairs	+0	0%
	Other	5	repairs	5	repairs	+0	0%
	TOTAL SVC LEAKS	**654**	**repairs**	**601**	**repairs**	**+53**	**9%**
Service Leaks Including Above Ground Leaks	Corrosion	460	repairs	396	repairs	+64	16%
	Natural Forces	2	repairs	1	repairs	+1	100%
	Excavation	101	repairs	95	repairs	+6	6%
	Other Outside Force	13	repairs	10	repairs	+3	30%
	Material or Welds	2	repairs	2	repairs	+0	0%
	Equipment	74	repairs	96	repairs	-22	-23%
	Operations	0	repairs	0	repairs	+0	0%
	Other	5	repairs	5	repairs	+0	0%
	TOTAL SVC LEAKS	**657**	**repairs**	**605**	**repairs**	**+52**	**9%**
Total Leak Repairs (Main & Service) Excluding Above Ground Leak		1,523	repairs	1,352	repairs	+171	13%
Total Leak Repairs (Main & Service) Including Above Ground Leak		1,526	repairs	1,356	repairs	+170	13%
Workable Backlog As of 12/31		74	leaks	68	leaks	+6	9%
UFG (Net)		2.2%		1.8%		0	22%
Average Service Length (Ft)		66.5	ft	66.0	ft	+0.49	1%

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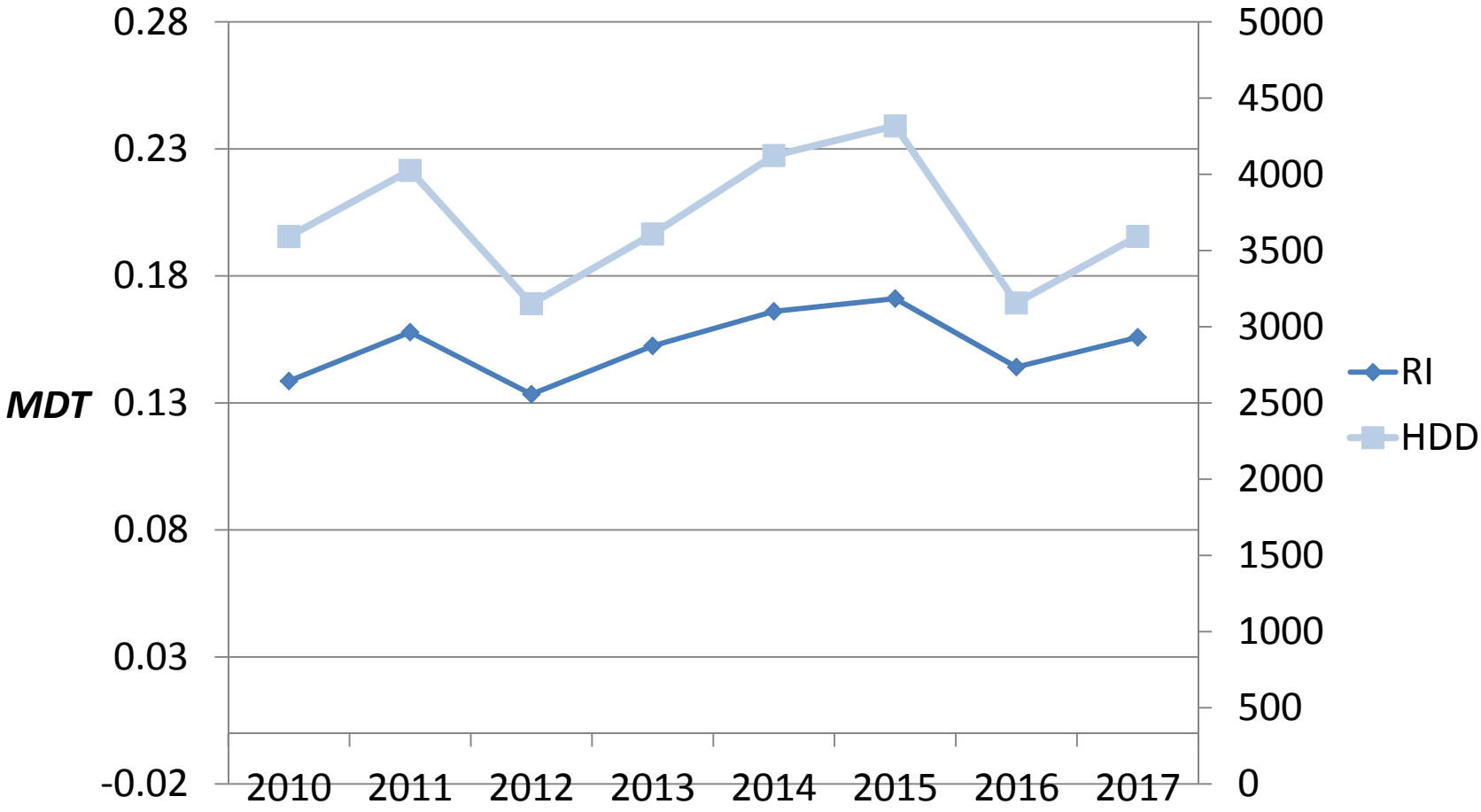
Data Shown Includes Filed Revisions

2017 SYSTEM INTEGRITY REPORT

NATIONAL GRID-US
2017 GAS DISTRIBUTION SYSTEM STATISTICS

2017 SYSTEM INTEGRITY REPORT

RI AVG. CUSTOMER USED RATE



Note:

- Customer Used = Sendout (MDT) / Total Customer (see slide 294)
- Total Customer includes Residential and Commercial
- *Heating Degree Days (**HDD**)*
- *Million Dekatherm (**MDT**)*

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2017 SYSTEM INTEGRITY REPORT

2017 GAS DISTRIBUTION SYSTEM STATISTICS

STATE	LEGACY	2017 PIPELINE / CUSTOMER / SENDOUT STATISTICS								
		Miles of Main	# of Services	Avg Service Length (ft/svc)	Miles of Services	TOTAL Distribution Pipeline	Residential Customers	Commercial and Industrial Customers	TOTAL Customers	Sendout (MDT)
RHODE ISLAND		3,205	196,505	66.5	2,475	5,680	241,126	25,048	266,174	41,489

2017 GAS DISTRIBUTION SYSTEM STATISTICS

STATE	LEGACY	PERCENTAGES OF NGRID-US SYSTEM					ASSET RATIOS			GAS CONSUMPTION RATIOS			
		% of Main	% of Services	% of Distrib-ution Pipeline	% of Custo-mers	% of Sendout	Service Density (Svcs / Mile Main)	Meter Density (Custo-mers / Service)	Customer Density (Customers / Mile Total Pipeline)	Main Capacities Used (Sendout MDT / Mile Main)	Service Capacities Used (Sendout MDT/ Service)	Pipeline Capacities Used (Sendout MDT / Mile Total Pipe)	Customer Usage (Sendout MDT / Customer)
RHODE ISLAND		9.0%	7.5%	8.7%	7.3%	6.8%	61	1.4	46.9	12.95	0.21	7.30	0.156

CAUTION:

This chart is for comparative-illustrative purposes only. The data is not audited & many assumption have been made.

Inventory data is from the Annual DOT/PHMSA Distribution Reports.
Customer data is from the Gas Customer Data base- Active Gas Accounts
Sendout data is from the sendouts for the 12-month period used to calculate UFG for the DOT Reports.

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2017 SYSTEM INTEGRITY REPORT

SEPARATE LEAK-PRONE PIPE ANALYSIS

STATE	LEGACY	2017 LEAK-PRONE PIPE INVENTORY						LEAK-PRONE PIPE %'s		
		Leak - Prone Main (miles)	% of TOTAL Main	Leak - Prone Services (#)	% of TOTAL Services	Miles of Leak - Prone Services	TOTAL Leak - Prone Pipe (in miles)	% of NG-US Leak - Prone Main (miles)	% of NG-US Leak - Prone Services (#)	% of NG-US TOTAL Leak - Prone Pipe
RHODE ISLAND		1,124	35.1%	43,290	22.0%	545	1,669	11.4%	8.2%	10.7%

LEAK AND REPAIR ANALYSIS

STATE	LEGACY	2017 LEAK DATA				LEAK RATE RATIOS					
		TOTAL Leak Receipts (Main & Service)	TOTAL Leak Repairs (Main & Service)	Year-End Workable Leak Backlog	TOTAL Repairs + Workable Leaks	TOTAL Leak Receipts / Mile TOTAL Pipe	TOTAL Leak Receipts / Mile Leak-Prone Pipe	TOTAL Leak Repairs / Mile TOTAL Pipe	TOTAL Leak Repairs / Mile Leak-Prone Pipe	Repairs + Workables / Mile TOTAL Pipe	Repairs + Workable / Mile Leak-Prone Pipe
RHODE ISLAND		1,924	1,523	74	1,597	0.3	1.2	0.3	0.9	0.3	1.0

NOTES:
Leak-Prone Main includes Cast Iron/Wrought Iron, Unprotected Steel , Aldyl-A and Other Material.
Leak-Prone Service includes Cast Iron/Wrought Iron, Copper and Unprotected Steel.

2017 SYSTEM INTEGRITY REPORT ANALYSIS (FINDINGS AND EXPLANATIONS)

2017 SYSTEM INTEGRITY REPORT

RI

ANALYSIS OF FINDINGS AND EXPLANATIONS

FINDING 2:

RI

Total leak receipts have increased by 25% in 2017 compared to 2016, and the total Leak Repairs increased by 13%.

MAIN- Leak repairs have increased by 16% in 2017 compared to 2016. Total Cast Iron break reduced by 33%.

SERVICE- Leak repairs have increased by 9% compared to 2016. Type 1 leak repair increased by 10%, and the number of Type 3 repairs increased by over three times.

2017 SYSTEM INTEGRITY REPORT

RI

LPP Replacement Projection

NE - Leak Prone Pipe Replacement																		
		2009	2010	2011	2012	2013	2014	2015	2016	2017	CY18	CY19	CY20	CY21	CY22	CY23	CY24	CY25
RI	All Programs	-	32.1	27.2	54.3	44.0	28.8	56.0	62.7	63.3	60	65	65	65	65	65	65	69
	Proactive	-	-	-	50.0	39.9	23.0	50.3	51.0	48.3	50	49.7	49.7	49.7	49.7	53.0	54	59

*Projected

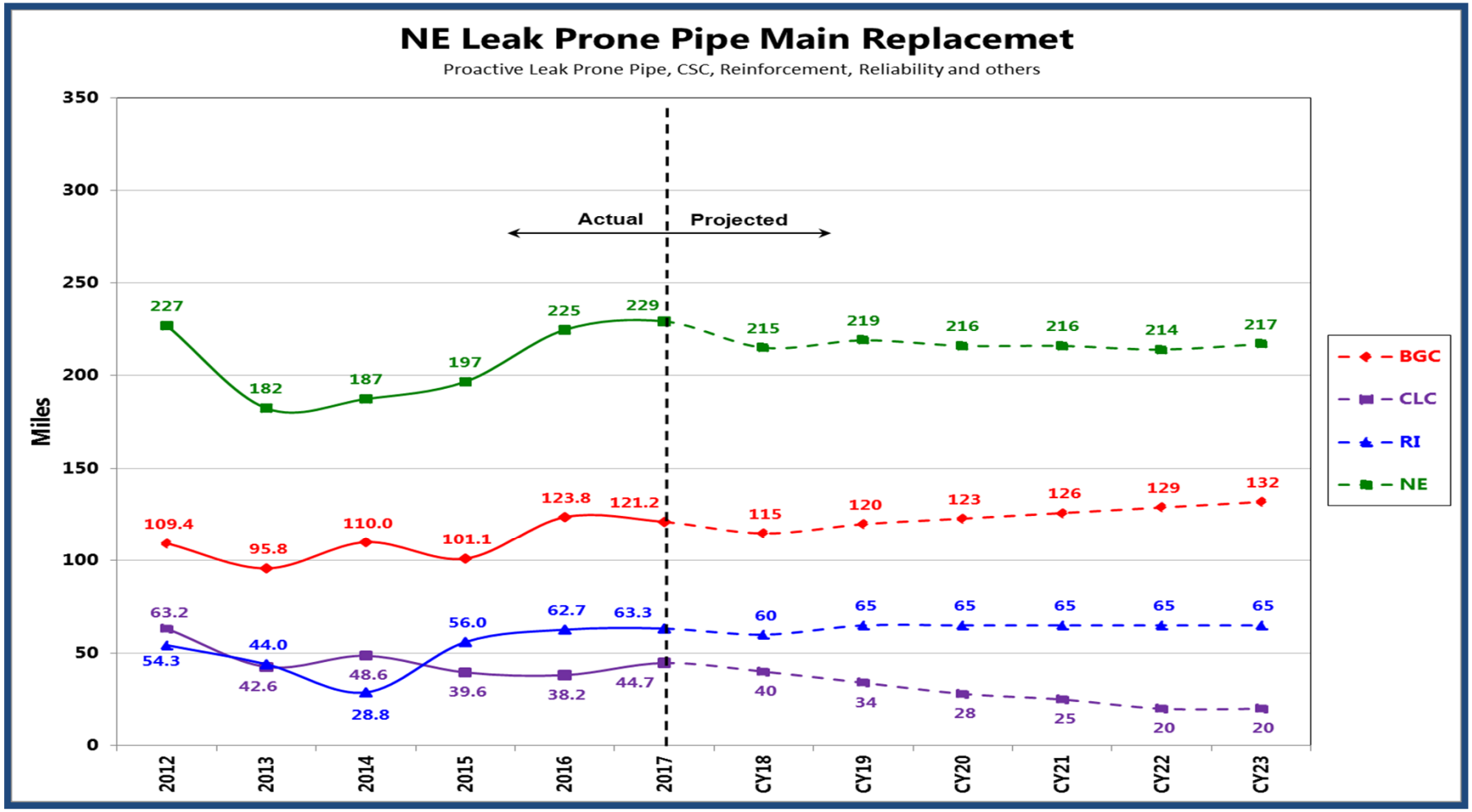
2017 SYSTEM INTEGRITY REPORT

RI Cast Iron/Unprotected Steel Ratio

NE - Cast Iron / Unprotected Steel					
Calendar Years		2014	2015	2016	2017
RI	Cast Iron	20.1	29.4	19.8	24.7
	Unp. Steel	8.7	39.5	41.0	28.5

2017 SYSTEM INTEGRITY REPORT

NE - MA & RI



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2017 SYSTEM INTEGRITY REPORT

APPENDICES

2017 SYSTEM INTEGRITY REPORT

MAIN

2017 SYSTEM INTEGRITY REPORT

RI

MAIN INVENTORY (MILES)

Average Age Of All RI Distribution Main: 44.48 Years

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Plastic	968	1,002	1,044	1,103	1,168	1,227	1,287	1,378	1,417	1,476
Cast Iron	896	885	878	875	859	831	806	769	754	730
Recond. Cast Iron	-	-	-	-	-	-	-	-	-	-
PROTECTED STEEL	578	551	601	588	597	596	595	595	590	590
UNPROT'D STEEL	664	674	592	580	534	508	483	452	416	395
Other	1	-	-	0	0	0	-	-		-
Ductile Iron	17	17	17	17	16	16	16	16	16	16
TOTAL MAIN	***3,124***	***3,129***	***3,132***	***3,163***	***3,174***	***3,179***	***3,188***	***3,210***	***3,193***	***3,205***

nationalgrid **DOT-Reported Distribution Pipe Inventories**

SERVICES

2017 SYSTEM INTEGRITY REPORT

RI SERVICE INVENTORY

(NUMBER OF SERVICES)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Plastic	109,144	112,313	115,718	121,770	126,474	130,002	133,024	136,700	140,206	142,956
Copper	178	177	171	209	208	207	205	202	201	192
Cast Iron	*175*	*168*	*162*	*194*	*189*	*185*	*174*	*137*	*134*	*129*
PROTECTED STEEL	*12,066*	*11,260*	*11,206*	*10,422*	*10,285*	*10,150*	*9,989*	*9,800*	*9,585*	*9,456*
UNPROT'D STEEL	63,919	62,462	59,800	56,049	53,449	51,387	49,265	47,104	*44,806*	*42,969*
Other	1,470	1,405	1,348	1,322	1,085	1,000	958	900	854	803
TOTAL SERVICES	***186,952***	***187,785***	***188,405***	***189,966***	***191,690***	***192,931***	***193,615***	***194,843***	***195,786***	***196,505***

DOT- Reported Pipe Inventories

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2017 SYSTEM INTEGRITY REPORT

END OF RI SYSTEM INTEGRITY REPORT

Testimony of
Melissa A. Little

THE NARRAGANSETT GAS COMPANY
d/b/a NATIONAL GRID
RIPUC DOCKET NO. 4916
RE: FY 2020 GAS INFRASTRUCTURE,
SAFETY, AND RELIABILITY PLAN
WITNESS: MELISSA A. LITTLE

DIRECT TESTIMONY

OF

MELISSA A. LITTLE

December 20, 2018

Table of Contents

I. INTRODUCTION

Q. Please state your full name and business address.

A. My name is Melissa A. Little, and my business address is 40 Sylvan Road, Waltham, Massachusetts 02451.

Q. By whom are you employed and in what capacity?

A. I am Director, New England Revenue Requirements for National Grid USA Service Company, Inc. (Service Company). The Service Company provides engineering, financial, administrative, management, and other technical support to direct and indirect subsidiary companies of National Grid USA (National Grid). My current duties include revenue requirement responsibilities for National Grid's gas and electric distribution activities in New England, including the gas operations of The Narragansett Electric Company d/b/a National Grid (the Company).

Q. Please describe your education and professional experience.

A. In 2000, I received a Bachelor of Science degree in Accounting Information Systems from Bentley College (now Bentley University). In September 2000, I joined Pricewaterhouse Coopers LLP in Boston, Massachusetts, where I worked as an associate in the Assurance practice. In November 2004, I joined National Grid as an Analyst in the General Accounting group. After the merger of National Grid and KeySpan Corporation in 2007, I joined the Regulation and Pricing department as a Senior Analyst in the

Regulatory Accounting function and also supporting the Revenue Requirement team for the Company's upstate New York affiliate, Niagara Mohawk Power Corporation. In July 2011, I joined the New England Revenue Requirement team and was promoted to Lead Specialist in the Regulation and Pricing department, where my duties included revenue requirement responsibilities for National Grid's gas and electric distribution activities in New England, including the Company. In August 2017, I was promoted to my current position.

Q. Have you previously filed testimony or testified before the Rhode Island Public Utilities Commission (PUC)?

A. Yes. I have testified before the PUC on numerous occasions, including in support of the Company's revenue requirement for the Company's Application to Change Electric and Gas Base Distribution Rates in Docket No. 4770 and the Proposed Power Sector Transformation (PST) Vision and Implementation Plan in Docket No. 4780. In addition, I have testified as the revenue requirement witness in numerous Gas and Electric Infrastructure, Safety, and Reliability proceedings, and in other matters before the PUC.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to sponsor Section 3 of the FY 2020 Gas ISR Plan (Gas ISR Plan or Plan), which describes the calculation of the Company's revenue requirement for FY 2020 in Attachment 1 of that section. The revenue requirement is based on the

FY 2020 Gas ISR Plan capital investment described in the testimony of Company Witness John B. Currie.

II. GAS ISR PLAN REVENUE REQUIREMENT

Q. Please summarize the revenue requirement for the Company's FY 2020 Gas ISR Plan.

A. As demonstrated in Attachment 1, Page 1, Column (c), the Company's FY 2020 Gas ISR Plan revenue requirement amounts to $7,290,355, or an incremental $7,290,355 over the amount currently being billed for the Gas ISR Plan. The Plan's revenue requirement consists of the following elements: (1) the revenue requirement of $4,009,777 comprised of the Company's return, taxes, and depreciation expense associated with FY 2020 proposed non-growth ISR incremental capital investment in gas utility infrastructure of $120,532,372, as calculated on Attachment 1, Page 8; (2) the FY 2020 revenue requirement on incremental non-growth ISR capital investment for FY 2018 through FY 2019 totaling $926,896; and (3) FY 2020 property tax expense of $2,353,682, as shown on Attachment 1 at Page 17, in accordance with the property tax recovery mechanism included in the Amended Settlement Agreement in Docket No. 4323 and continued under the Amended Settlement Agreement in Docket No. 4770. Importantly, the incremental capital investment for the FY 2020 ISR revenue requirement excludes capital investment embedded in base rates in Docket No. 4770 for FY 2012 through FY 2020. Incremental non-growth capital investment for this purpose is intended to represent the net change in

net plant for non-growth infrastructure investments during the relevant fiscal year and is defined as capital additions plus cost of removal, less annual depreciation expense ultimately embedded in the Company's base rates (excluding depreciation expense attributable to general plant, which is not eligible for inclusion in the Gas ISR Plan).

Prior Gas ISR plans included operation and maintenance (O&M) expenses associated with hiring, training, and supervision of additional personnel to support leak-prone pipe replacement, which was incremental to the level of O&M labor expense being recovered in base rates from Docket No. 4323. Inclusion of this labor-related O&M expense in the Gas ISR Plan is no longer required because these employees were included in the Company's labor complement in its most recent general rate case in Docket No. 4770, and therefore their associated labor costs are being recovered through base rates effective September 1, 2018.

For illustration purposes only, Attachment 1, Page 1, Column (d) provides the FY 2021 revenue requirement for the respective vintage year capital investments. Notably, these amounts will be trued up to actual investment activity after the conclusion of the fiscal year, with rate adjustments for the revenue requirement differences incorporated in future ISR filings. A detailed description of the calculation of the Company's revenue requirement for FY 2020 is provided in Section 3 of the Gas ISR Plan.

Q. Did the Company calculate the FY 2020 Gas ISR Plan revenue requirement in the same fashion as calculated in the previous ISR factor submissions?

A. Yes. Specifically, in regards to the Tax Cuts and Jobs Act of 2017 (Tax Act), the FY 2020 Gas ISR Plan revenue requirement has been calculated consistent with the Company's FY 2019 Gas ISR Plan revenue requirement, as well as its FY 2018 Gas ISR reconciliation revenue requirement.

Q. Does the Company plan to update the FY 2020 Gas ISR Plan revenue requirement calculation subsequent to the date of this filing?

A. Yes. The Company will file its FY 2018 federal income tax return in December 2018, coincident with the submission of this filing. The Company will compare the results of the actual FY 2018 federal tax return with the FY 2018 tax assumptions used to calculate deferred federal income taxes included in vintage FY 2018 incremental rate base and assess any impact to the FY 2020 Gas ISR Plan revenue requirement. The Company will then file a supplemental FY 2020 Gas ISR Plan revenue requirement prior to the hearing in this docket, which will quantify the impact of any revisions to vintage FY 2018 accumulated deferred income taxes on the FY 2020 Gas ISR Plan revenue requirement, including any further implications of the Tax Act.

III. CONCLUSION

Q. Does this conclude your testimony?

A. Yes.

THE NARRAGANSETT ELECTRIC COMPANY
d/b/a NATIONAL GRID
RIPUC DOCKET NO. 4916
RE: FY 2020 GAS INFRASTRUCTURE,
SAFETY, AND RELIABILITY PLAN
WITNESS: MICHAEL J. PINI

DIRECT TESTIMONY

OF

MICHAEL J. PINI

December 20, 2018

TABLE OF CONTENTS

I. INTRODUCTION

Q. Please state your names and business address.

A. My name is Michael J. Pini and my business address is 40 Sylvan Road, Waltham, Massachusetts 02451.

Q. By whom are you employed and in what capacity?

A. I am a Lead Program Manager in the New England Gas Pricing department for National Grid USA Service Company, Inc. My responsibilities include the design, implementation, and administration of rates and tariffs for the gas division of The Narragansett Electric Company d/b/a National Grid (the Company) and its Massachusetts affiliates, Boston Gas Company (Boston Gas) and Colonial Gas Company (Colonial Gas), each d/b/a National Grid.

Q. Please provide your educational background and professional experience.

I earned a Bachelor of Science in Economics and Finance from Bentley University in 2010.

In 2009, I joined National Grid as an intern in the Support Services function within the Gas Operations department. In 2010, I became an Associate Analyst in the Regulatory Compliance department. In 2011, I joined the New England Electric Pricing group and was promoted to Analyst in 2012. In 2013, my

responsibilities changed to supporting Boston Gas and Colonial Gas and, in 2014, I was promoted to Senior Analyst in the same capacity. In 2017, I was promoted to Lead Program Manager, supporting the Company.

Q. Have you previously testified before the Rhode Island Public Utilities Commission (PUC) or any other regulatory commissions?

A. I have not testified before the PUC, but I have testified before the Massachusetts Department of Public Utilities on several occasions related to the Gas System Enhancement Plan for Boston Gas and Colonial Gas, namely, to present the calculation of the Gas System Enhancement Plan Factors and customer bill impacts associated with the implementation of the Gas System Enhancement Plan Factors.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to sponsor Section 4 of the Fiscal Year (FY) 2020 Gas Infrastructure, Safety, and Reliability (ISR) Plan (Gas ISR Plan or Plan), which describes the calculation of the proposed FY 2020 ISR factors and the customer bill impacts of the proposed ISR factors.

II. RATE DESIGN

Q. Please summarize the rate design used to develop the ISR factors presented as part of this filing.

A. Like the revenue requirement, the proposed Gas ISR Plan rate design for FY 2020 is based on the revenue requirement of incremental capital investment in excess of capital investment that has been reflected in rate base in the Company's most recent general rate case in Docket No. 4770. The Company has allocated the revenue requirement associated with the capital investment to each rate class based on the rate base allocator approved by the PUC in the Amended Settlement Agreement in Docket No. 4770. The Company also utilized the most recently available forecasted throughput for the period April 2019 through March 2020 that had been developed for the Company's 2018-19 Gas Cost Recovery filing in Docket No. 4872. That data was compiled by rate class and summarized as set forth in Section 4, Attachment 1, Page 2 of the proposed Gas ISR Plan. As shown in Section 4, Attachment 1, Page 1, the Company divided the allocated rate class revenue requirement, as multiplied by the rate base allocation, by the forecasted throughput for each rate class to develop separate ISR capital factors per rate class on a per-therm basis. The Company then adjusted each rate class' ISR factor to reflect the 1.91 percent uncollectible factor from the Amended Settlement Agreement in Docket No. 4770.

Q. Is the Company proposing any changes to the calculation of the Residential Non-Heating and Residential Heating ISR capital factors?

A. No. The Company has reset the revenue allocator based on the rate year revenues reflected in the Amended Settlement Agreement in Docket No. 4770, so an adjustment between the Residential Non-Heating and Residential Heating rate classes is no longer required.

III. ISR FACTORS

Q. What are the ISR factors proposed by the Company?

A. The ISR factors proposed by the Company are shown in the table below and in the Gas ISR Plan at Section 4, Attachment 1.

Table 3-1 FY 2020 ISR factors per rate class

Rate Class	ISR Rate ($/therm)
Res-Non-Heating	$0.0574
Res-Heating	$0.0239
Small C&I	$0.0236
Medium C&I	$0.0156
Large LL	$0.0149
Large HL	$0.0143
XL-LL	$0.0058
XL-HL	$0.0049

*Rates include uncollectible allowance.

The same factors noted above for Residential Heating and Residential Non-Heating customers would also apply to each of the Low-Income rate classes.

IV. BILL IMPACTS

Q. What is the impact of the proposed ISR factors on customers' bills?

A. For the average Residential Heating customer using 845 therms annually, the proposed FY 2020 ISR factors will result in an annual bill increase of $20.81, or 1.6 percent,[1] as shown in the proposed Gas ISR Plan at Section 4, Attachment 2. The annual impact of the proposed ISR factors for all rate classes is set forth in Section 4 (Rate Design and Bill Impacts) of the Plan.

Q. Does this conclude your testimony?

A. Yes.

[1] Please note that the bill impact includes the Rhode Island Gross Earnings Tax of three percent.