

PUC 1-16-GAS

Request:

Please provide the capital authorization and closing reports for all projects begun or finished since January 1, 2013 of \$250,000 or more in magnitude.

Response:

The Company has provided the information requested by fiscal year (FY) in Attachments PUC 1-16-1 (Gas) through PUC 1-16-6 (Gas). FY 2018 and FY 2013 include only capital authorizations for projects with spending of \$250,000 or greater. The capital authorizations reflect three types of projects during the time period specified:

- 1) **Specific Projects:** Specific projects are used for capital work of a defined scope and are closed when the work is completed. Specific projects are authorized for the expected total cost to complete the work and re-authorized for any unexpected changes in cost that may occur. Examples of specific projects include the Allens Avenue Rebuild, Exeter Boil Off Compressor, Gas Expansion, and Cumberland LNG Decommissioning.
- 2) **Blanket Projects:** Blanket funding projects (Blanket) consist of many smaller-scale work orders that typically consist of standard construction work and are of short duration. Blanket projects are intended to have duration of one year or less and must be re-authorized and closed each fiscal year. Blanket projects tend to capture reactive work. Examples of Blanket Projects include Base Growth blanket projects, City State Construction blanket projects, Service Replacement blanket projects, Purchase Meter blanket projects, and Cast Iron Joint Encapsulation blanket projects.
- 3) **Program Projects:** A Program is a group of similar funding projects at multiple locations. Most projects in the Program category consist of recurring programs that span multiple years. Recurring programs are sanctioned for one year spending at a time and are re-authorized annually. A non-recurring program has a defined completion in both scope and time. Programs tend to capture proactive work. Examples of program projects include the Leak-Prone Pipe program, Gas System Reinforcement program, Pipeline Integrity program, Gas Planning program, and Pressure Regulating Facilities program.

Pursuant to the Company's internal Sanctioning Procedure project closure papers are required only for funding projects of \$1.0 million or greater. All Blanket or Program projects requiring a Project Sanction require closure papers annually. Closure papers for Specific projects are required upon completion.

FY18

<u>Description</u>	<u>Approval</u>	<u>Closure</u>
Base Growth – Install Main Base Growth – Install Services Base Growth - Install Meter/Regulator Base Growth – Fitting	Page 1 of 110	Project not complete
Base Growth - Meter Purchase/Operations Purchase Meters Replacement	Page 10 of 110	Project not complete
Gas System Reinforcement	Page 19 of 110	Project not complete
City State Construction - Non Reimbursable City State Construction – Reimbursable	Page 31 of 110	Project not complete
Leak Prone Pipe CI Joint Encapsulation	Page 39 of 110 Page 51 of 110	Project not complete Project not complete
Main Replacement – Maintenance Service Replacements – Leaks Service Replacements – Non-Leaks/Other	Page 59 of 110	Project not complete
Gas Planning I&R Reactive Programs/CNG Pressure Regulating Facilities Allens Ave Rebuild Line	Page 69 of 110 Page 78 of 110 Page 87 of 110 Page 96 of 110	Project not complete Project not complete Project not complete Project not complete



Short Form Sanction Paper

Title:	FY18 Growth Blanket- Rhode Island Gas	Sanction Paper #:	USSC-17-071
Project #:	CRCC102, CRCC104, CRCC110, CON0009, CON00050, CON0054, CON0058	Sanction Type:	Sanction
Operating Company:	The Narragansett Electric Co.	Date of Request:	March 9, 2017
Author:	David Mirabella	Sponsor:	Jim Cross, VP Sales & Program Operations
Utility Service:	Gas	Project Manager:	Chris Nazzaro/Steve Lannon

1 Executive Summary

1.1 Sanctioning Summary

This paper requests sanction of CRCC102, CRCC104, CRCC110, CON0009, CON00050, CON0054, CON0058 in the amount \$14.712M with a tolerance of +/- 10% for the purposes of full sanction.

This sanction amount is \$14.712M broken down into:

\$14.520M Capex

\$0.000M Opex

\$0.192M Removal

With a CIAC/Reimbursement of \$0.788M

1.2 Project Summary

This program involves the installation of new main, services and meters to serve projected customer growth in the Rhode Island gas territory. The \$14.712M will fund two parts of the growth program: (1) the installation of 1,449 services and (2) the installation of 47,500 feet of main associated with new customers.

2 Project Detail

2.1 Background



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The Customer Organization is responsible for managing new gas customer connection requests and with other organizations delivers the service in a timely and efficient process. In FY18, with collaboration across multiple organizations that have a customer touch point, we have worked with the resource coordination team to build a growth plan in line with the entire gas work plan at a level that we can deliver to our customers and increase customer satisfaction.

This plan is intended to provide service for over 1,449 new gas customer accounts in Rhode Island. The estimated projected company annual revenue for the Rhode Island territory is \$2.755M for the FY18 plan.

2.2 Drivers

As a regulated utility we are required to offer delivery of service to prospective customers while obtaining a return on our investment that allows us to be profitable.

There are several factors that drive overall NDR projections and the associated capital/O&M expenditures:

- Rate Plans
- Fuel Pricing – oil versus natural gas
- Inventory levels and turnover ratios
- Saturation levels
- Marketing Lead performance
- Designs and resourcing that supports the delivery of capital at efficient pricing.
- Economic Conditions / Building Starts
- Gas system constraints

2.3 Project Description

The proposal is intended to establish the estimated FY18 Customer NDR (New Delivery Revenue) goal, \$2.755M, and the accompanying capital budgets of \$14.712M. The document takes into account current, and projected, market and pricing conditions and contains provisions should conditions worsen.

2.4 Benefits

We will be delivering clean, safe and affordable natural gas to residents and businesses in the state of Rhode Island. There is an environmental impact in regards to the reduction of oil as a heating fuel for these customers. The estimated revenue delivery for the FY18 plan is \$2.755M, and the accompanying capital budgets of \$14.712M.

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2.5 Business & Customer Issues

National Grid is balancing our commitment to deliver gas to new customers but have put the greatest emphasis on some of our mandated programs for FY18 to ensure we continue to offer safe and reliable service to our existing customers. The new customer demand has decreased due to oil prices as well as limited resource capabilities in FY15, FY16 and FY17 so we have developed the FY18 plan at a level that can be delivered while remaining fiscally balanced.

2.6 Alternatives

Alternative 1: Increase our marketing budget to help drive customer request to drive service and main installs. – This would deliver more services and main, we would spend more capital and add more revenue but at the risk of disappointing customers and falling short on our mandated programs.

Alternative 2: Focus only on prospective customers on main – This would have us focusing on bringing on main customers only. This would reduce the amount of main to be installed and lower our capital costs. This would probably have implications with the DPU and our prospective customers. This would also negatively affect our revenue.

2.7 Investment Recovery

Investment recovery will be handled through regular rate recovery mechanisms.

2.7.1 Customer Impact

This project results in an indicative first full year revenue requirement when the asset is placed in service equal to approximately \$2.969M. This is indicative only.

3 Related Projects, Scoring, Budgets

3.1 Summary of Projects

Project Number	Project Type (Elec only)	Project Title	Estimate Amount (\$M)
Various	N/A	Base Growth - Fitting	0.702
Various	N/A	Base Growth - Install Main	6.193
Various	N/A	Base Growth - Install Meter	0.754
Various	N/A	Base Growth - Install Services	7.063
Total			14.712

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3.2 Associated Projects

Project Number	Project Title	Estimate Amount (\$M)
CRCC111	Gas System Reinforcement	7.295
CRTC304, CON0063	Meter Purchase	0.668
Various	Kenyon Industries	9.527
Various	Kenyon CIAC	(7.545)
Total		9.945

3.3 Prior Sanctioning History

N/A

3.4 Category

Category	Reference to Mandate, Policy, NPV, or Other
<input checked="" type="radio"/> Mandatory <input type="radio"/> Policy- Driven <input type="radio"/> Justified NPV <input type="radio"/> Other	Regulatory agreements require National Grid to provide gas service and main. National Grid provides gas service using consistent up charge processes with targeted IRR returns across the portfolio.

3.5 Asset Management Risk Score

Asset Management Risk Score: 49

Primary Risk Score Driver: (Policy Driven Projects Only)

☐ Reliability
 ☐ Environment
 ☐ Health & Safety
 ☒ Not Policy Driven

3.6 Complexity Level



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☐ High Complexity ☐ Medium Complexity ☒ Low Complexity ☐ N/A

Complexity Score: ____15__

3.7 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
June 2018	Project Closure

4 Financial

4.1 Business Plan

Business Plan Name & Period	Project included in approved Business Plan?	Over / Under Business Plan	Project Cost relative to approved Business Plan (\$)
FY18-22 Capital Plan - Gas	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Over <input type="radio"/> Under <input checked="" type="radio"/> NA	\$0.000M

4.1.1 If cost > approved Business Plan how will this be funded?

N/A

4.2 CIAC / Reimbursement

		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
\$M	Prior Yrs	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	Total
CIAC/Reimbursement	0.000	0.788	0.000	0.000	0.000	0.000	0.000	0.788



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4.3 Cost Summary Table

Project Number	Project Title	Project Estimate Level (%)	Spend	Prior Yrs	Current Planning Horizon (\$M)						
					Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
					2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	Total
Various	Base Growth - Fitting	+/- 10%	CapEx	-	0.702	-	-	-	-	-	0.702
			OpEx	-	-	-	-	-	-	-	
			Removal	-	-	-	-	-	-	-	
			Total	-	0.702	-	-	-	-	0.702	
Various	Base Growth - Install Main	+/- 10%	CapEx	-	6.143	-	-	-	-	-	6.143
			OpEx	-	-	-	-	-	-	-	
			Removal	-	0.050	-	-	-	-	0.050	
			Total	-	6.193	-	-	-	-	6.193	
Various	Base Growth - Install Meter	+/- 10%	CapEx	-	0.657	-	-	-	-	-	0.657
			OpEx	-	-	-	-	-	-	-	
			Removal	-	0.097	-	-	-	-	0.097	
			Total	-	0.754	-	-	-	-	0.754	
Various	Base Growth - Install Services	+/- 10%	CapEx	-	7.019	-	-	-	-	-	7.019
			OpEx	-	-	-	-	-	-	-	
			Removal	-	0.044	-	-	-	-	0.044	
			Total	-	7.063	-	-	-	-	7.063	
Total Project Sanction			CapEx	-	14.520	-	-	-	-	-	14.520
			OpEx	-	-	-	-	-	-	-	
			Removal	-	0.192	-	-	-	-	0.192	
			Total	-	14.712	-	-	-	-	14.712	

4.4 Project Budget Summary Table

Project Costs per Business Plan

\$M	Prior Yrs (Actual)	Current Planning Horizon (\$M)						Total
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
		2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	
CapEx	0.000	14.520	0.000	0.000	0.000	0.000	0.000	14.520
OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Removal	0.000	0.192	0.000	0.000	0.000	0.000	0.000	0.192
Total Cost in Bus. Plan	0.000	14.712	0.000	0.000	0.000	0.000	0.000	14.712

Variance (Business Plan-Project Estimate)

\$M	Prior Yrs (Actual)	Current Planning Horizon (\$M)						Total
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
		2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	
CapEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000



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5 Key Milestones

Milestone	Target Date: (Month/Year)
Sanction	March 2017
Closure	June 2018

6 Statements of Support

6.1.1 Supporters

The supporters listed have aligned their part of the business to support the project.

Role	Individual	Responsibilities
Investment Planning	Pat Pensabene	Endorses relative to 5-year business plan or emergent work
Resource Planning	Falls, Jonathon	Endorses Resources, cost estimate, schedules
Project Management	Fortier, Joseph	Endorses resources, cost estimate, schedule
Gas Project Estimation	Paul, Art	Endorses Cost Estimate

6.1.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

Reviewer List	Individual
Finance	Easterly, Patricia
Regulatory	Zschokke, Peter
Jurisdictional Delegate	Currie, John
Procurement	Curran, Art
Gas Control	Loiacono, Paul

6.1.3 List References

N/A

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7. Decisions

The US Sanctioning Committee (USSC) at a meeting held on March 8, 2017:

- (a) APPROVED this paper and the investment of \$14.712M and a tolerance of +/- 10%
- (b) NOTED that Jonathon Falls has the approved financial delegation.
- (c) NOTE: In the event that any Blanket projects are not approved prior to the start of the FY2019 fiscal year, the FY2018 approval limits will remain in effect until such time as the FY2019 blanket projects are approved by USSC and/or other appropriate authority for approval.

Signature..........Date..........

Ross Turrini

Senior Vice President – Gas Process & Engineering Group Chief Engineer - Gas

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8 Other Appendices

8.1 Sanction Request Breakdown by Project
N/A



Short Form Sanction Paper

Title:	FY18 Purchase Gas Meter Blanket – Rhode Island	Sanction Paper #:	USSC-17-098
Project #:	CRTC304, CON0063	Sanction Type:	Sanction
Operating Company:	The Narragansett Electric Co.	Date of Request:	3/7/2017
Author:	Ryan Geiger	Sponsor:	John Stavrakas, VP Gas Asset Management
Utility Service:	Gas	Project Manager:	Ralph Sullivan

1 Executive Summary

1.1 Sanctioning Summary

This paper requests sanction of CRTC304, CON0063 in the amount \$3.035M with a tolerance of +/- 10% for the purposes of full implementation.

This sanction amount is \$3.035M broken down into:

- \$ 3.035M Capex
- \$ 0.000M Opex
- \$ 0.000M Removal

1.2 Project Summary

This project provides funding for the purchase and test of gas meters and associated instrumentation.

2 Project Detail

2.1 Background

This project includes the purchase, test, processing, and delivery of gas meters to support the Narragansett Electric Company mandated Meter Test/Replacement Program, growth targets, and continued CMS Operations. The estimated total number of meters required for FY18 is 18,354.

2.2 Drivers

The primary driver for meter and metering instrumentation purchases is compliance with state regulations governing meter accuracy and measurement of gas usage for customer bills.

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Rhode Island PUC requirements stipulate removal from the field and testing of all residential gas meters that are 15 years old and all C&I meters that are 10 years old and associated remediation / retirement program of all such gas meters.

In addition to the mandated meter change program, meters are required to support growth targets, as well as to support Customer Meter Services (CMS) operational requirements (load change, meter and/or service relocations, damage, & stopped meters)

2.3 Project Description

This project includes the purchase, test, processing, and delivery of gas meters to support The Narragansett Electric Company Mandated Meter Test/Replacement Program, growth targets, and continued CMS Operations

2.4 Benefits

This project supports regulatory requirements, operations, and growth programs. In addition, the replacement of aging assets results is required to maintain and improve overall asset health (metering and billing accuracy).

2.5 Business & Customer Issues

There are no significant business issues beyond what has been described elsewhere.

2.6 Alternatives

Alternative 1: Base Case – Leave as is

This option is not viable as it would violate statutory/regulatory requirements, adversely impact customer satisfaction, and result in our inability to support growth targets.

Alternative 2: Revise Project Size and Scope – Partial Deferral

This option is not viable as it would result in a partial violation of statutory/regulatory requirements, or result in our inability to support growth targets.



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2.7 Investment Recovery

Investment recovery will be through standard rate recovery mechanisms.

2.7.1 Customer Impact

This project results in an indicative first full year revenue requirement when the asset is placed in service equal to approximately \$0.621M. This is indicative only. The actual revenue requirement will differ, depending upon the timing of the next rate case and/or the timing of the next filing in which the project is included in rate base.

3 Related Projects, Scoring, Budgets

3.1 Summary of Projects

Project Number	Project Type (Elec only)	Project Title	Estimate Amount (\$M)
CRTC304, CON0063	N/A	Purchase Gas Meters - Grth	0.668
	N/A	Purchase Gas Meters - Mand	2.367
Total			3.035

3.2 Associated Projects

N/A

3.3 Prior Sanctioning History

N/A



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3.4 Category

Category	Reference to Mandate, Policy, NPV, or Other
<input checked="" type="radio"/> Mandatory	Support Gas Meter requirements for Mandated Meter Change Program, and system growth targets
<input type="radio"/> Policy- Driven	
<input type="radio"/> Justified NPV	
<input type="radio"/> Other	

3.5 Asset Management Risk Score

Asset Management Risk Score: 49

Primary Risk Score Driver: (Policy Driven Projects Only)

☐ Reliability ☐ Environment ☐ Health & Safety ☒ Not Policy Driven

3.6 Complexity Level

☐ High Complexity ☐ Medium Complexity ☒ Low Complexity ☐ N/A

Complexity Score: 15

3.7 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
July 2018	Closure Paper

4 Financial

4.1 Business Plan



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Business Plan Name & Period	Project included in approved Business Plan?	Over / Under Business Plan	Project Cost relative to approved Business Plan (\$)
FY18 – FY22 Capital Plan - Gas	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Over <input type="radio"/> Under <input checked="" type="radio"/> NA	\$0.000

4.1.1 If cost > approved Business Plan how will this be funded?

N/A

4.2 CIAC / Reimbursement

N/A

4.3 Cost Summary Table

Project Number	Project Title	Project Estimate Level (%)	Spend	Prior Yrs	Current Planning Horizon (\$M)						Total
					Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
CRTC304, CON0063	Purchase Gas Meters - Grth	Est Lvl (e.g. +/- 10%)	CapEx	-	0.668	-	-	-	-	-	0.668
			OpEx	-	-	-	-	-	-	-	
			Removal	-	-	-	-	-	-	-	
			Total	-	0.668	-	-	-	-	0.668	
	Purchase Gas Meters - Mand	Est Lvl (e.g. +/- 10%)	CapEx	-	2.367	-	-	-	-	-	2.367
			OpEx	-	-	-	-	-	-	-	-
			Removal	-	-	-	-	-	-	-	-
			Total	-	2.367	-	-	-	-	-	2.367
Total Project Sanction			CapEx	-	3.035	-	-	-	-	-	3.035
			OpEx	-	-	-	-	-	-	-	-
			Removal	-	-	-	-	-	-	-	-
			Total	-	3.035	-	-	-	-	-	3.035



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4.4 Project Budget Summary Table

Project Costs Per Business Plan

\$M	Prior Yrs (Actual)	Current Planning Horizon (\$M)						Total
		Yr. 1 2017/18	Yr. 2 2018/19	Yr. 3 2019/20	Yr. 4 2020/21	Yr. 5 2021/22	Yr. 6 + 2022/23	
CapEx	0.000	3.035	0.000	0.000	0.000	0.000	0.000	3.035
OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	3.035	0.000	0.000	0.000	0.000	0.000	3.035

Variance (Business Plan-Project Estimate)

\$M	Prior Yrs (Actual)	Current Planning Horizon (\$M)						Total
		Yr. 1 2017/18	Yr. 2 2018/19	Yr. 3 2019/20	Yr. 4 2020/21	Yr. 5 2021/22	Yr. 6 + 2022/23	
CapEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

5 Key Milestones

Milestone	Target Date: (Month/Year)
Sanction Approval	March 2017
Provide Vendors with delivery schedules for FY18	March 2017
Monitor Inventory Levels	Monthly
Project Complete	March 2018
Project Closeout Report	July 2018

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6 Statements of Support

6.1.1 Supporters

The supporters listed have aligned their part of the business to support the project.

Role	Individual	Responsibilities
Investment Planner	Pensabene, Patrick M	Endorses relative to 5-year business plan or emergent work
Resource Planning	Falls, Jonathon	Endorses Resources, cost estimate, schedule, and Portfolio Alignment
Project Management	Fortier, Joseph Jr.	Endorses Resources, cost estimate, schedule
Gas Project Estimation	Paul, Art	Endorses Cost Estimate

6.1.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

Reviewer List	Individual
Finance	Easterly, Patricia
Regulatory	Zschokke, Peter
Jurisdictional Delegates	Currie, John
Procurement	Curran, Art
Control Center	Loiacono, Paul

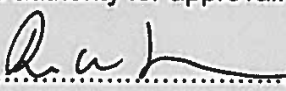
6.1.3 List References

N/A

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7 Decisions

I:	
(a)	APPROVE this paper and the investment of \$3.035M and a tolerance of +/- 10%
(b)	NOTE that Ralph Sullivan is the Project Manager and has the approved financial delegation.
(c)	NOTE: In the event that any Blanket/Program projects are not approved prior to the start of the FY2019 fiscal year, the FY2018 approval limits will remain in effect until such time as the FY2019 blanket/program projects are approved by USSC and/or other appropriate authority for approval.
Signature.....	Date.....
Executive Sponsor – Ross Turrini, SVP Gas Process & Engineering and Group Chief Engineer - Gas	



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8 Other Appendices

8.1 Sanction Request Breakdown by Project

N/A



Short Form Sanction Paper

Title:	FY18 Gas System Reinforcement Program – RI	Sanction Paper #:	USSC-17-039
Project #:	CRCC111, C077394	Sanction Type:	Sanction
Operating Company:	The Narragansett Electric Co.	Date of Request:	February 21, 2017
Author:	Adnan Malik / Eric Aprigliano	Sponsor:	John Stavrakas – VP Gas Asset Management
Utility Service:	Gas	Project Manager:	Charles Lewitt

1 Executive Summary

1.1 Sanctioning Summary

This paper requests sanction of CRCC111,C077394 in the amount \$7.295M with a tolerance of +/- 10% for the purposes of full implementation.

This sanction amount is for \$7.295M broken down into:

*\$6.427M Capex
\$0.000M Opex
\$0.868M Removal*

1.2 Project Summary

Rhode Island system growth is forecasted to experience a peak-day customer growth of 12,531 Dth over the next five (5) years, corresponding to an average annual growth rate of 0.6%. Compounded by a first-year growth of 3.5% from the 2015 forecast, similar to last year's large growth, the current infrastructure will require system reinforcements to be constructed. For this year, new main will be used to connect areas of systems with strong pressures to those with weaker pressures, relay of small diameter mains with larger diameter mains, and a replacement of an undersized district regulator station will be added in order to address a potential of 10,827 customers impacted if design conditions (i.e., average temperature of -3° F) were experienced during the 2017/18 heating season based on current sendout forecast. Construction of the proposed projects in this program will ensure continuous and reliable service to these customers.

2 Project Detail

2.1 Background

Each year, Long Term Planning performs an analysis on the U.S. gas distribution network to determine any reinforcement projects, and associated costs, that need to be constructed over the following five (5) years in order to support forecasted customer growth. Reinforcement projects are designed to maintain minimum pressures throughout the distribution system under peak-hour conditions and are generally



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constructed as they become necessary. These projects ensure that continuous service is maintained to all customers on the gas distribution network throughout the year in compliance with Federal and State Codes.

Examples of distribution system reinforcement projects include, but are not limited to, the following:

- Replacing existing undersized mains with larger diameter mains. "Leak-prone" pipe is targeted whenever practical.
- Looping or connecting system endpoints by installing new main.
- System operating pressure upratings (e.g. 10 psig to 35 psig).
- Installing new district regulators as well as replacing and/or rebuilding existing undersized district regulators.
- Transferring existing customers supplied from low-pressure mains to adjacent high-pressure mains (i.e., load shedding).

The results of the analysis are memorialized in the US Gas Distribution 5-Year Reinforcement and Reliability Plan. The Plan is issued annually so that it can be adjusted for changes to the Gas Supply send-out forecast, differences between actual and estimated load growth, reinforcement project deferrals, public works activity, main replacement program activity, Sales and Program Operations supported growth reinforcements, and updates/improvements to the Synergi computer network analysis models. The plan described herein is year one (1) of the 5 year plan covering fiscal year 2018.

The Synergi computer models used for the hydraulic analysis of the distribution network are validated on an annual basis. Field data from one of the coldest days of the year along with the highest distribution send-out is collected from across the network. The computer model is configured to match the system load experienced on that day and then calculated pressures are compared with field charts and SCADA data. Discrepancies are investigated to determine where the model might require updating and/or where field investigation is warranted. Conditions such as broken valves and mains filled with debris identified through the investigation process are remediated. For the 2015-16 verification analysis, there was good correlation on the Rhode Island gas system between model predicted pressures and actual recorded pressures with 87% of the verification points within acceptable tolerance. This shows that the model is reasonably accurate in predicting future problem areas. Also, this verification process helps identify potential new pressure monitoring locations in areas indicated by the model which could see pressure problems. These are areas which currently don't have pressure monitoring equipment. This helps in the future to ensure that predicted pressure problems are field verified before reinforcements are installed. Further details and results of the analysis are contained in the US Enterprise Wide 2016-17 Winter Performance Report.

Additionally, Long Term Planning uses a more in-depth analysis of customer growth to the zone/zip code level based on zone growth factors (percentages) provided by the



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Forecasting and Analytics group. This is allocated to the forecasted customer growth on the validated Synergi computer models. The result of this methodology is that some cities/town/zones show positive growth while others may show negative growth. By better simulating where the customer growth is expected to occur, the overall accuracy of the reinforcement projects that must be constructed in order to support each region's average annual system growth are identified. These projects are designed to maintain minimum system design pressures during periods of peak demand, (i.e. design weather conditions), thus ensuring continuous service to all customers on the network in compliance with Federal and State Codes. The peak demand for a given territory is based on the same corporate forecast that is filed annually with the state utility commission and used to develop the gas supply portfolio. The System Reinforcement program is a critical component for enabling that gas supply to be delivered to the firm customer. Design weather conditions have been established for Rhode Island as -3°F (68 HDD).

2.2 Drivers

The primary driver of this program is reliability. The 5-year gas send-out forecast for Rhode Island is as follows:

GAS SENDOUT (DT/DAY)						
Current Yr 16/17	Yr 1 17/18	Yr 2 18/19	Yr 3 19/20	Yr 4 20/21	Yr 5 21/22	Total Growth
415,374	420,124	422,553	425,964	427,725	427,905	12,531

The goal of the program is to maintain continuous service to all customers on the Rhode Island gas distribution network during periods of peak demand (i.e., design weather conditions). The results of the analysis (described above) performed on the gas distribution network for the 2017/18 winter using the current gas supply send-out forecast predicts that approximately 10,827 customers could experience pressures below minimum design and could be at risk of losing service if design conditions were to be experienced and the growth prediction is accurate. The estimated restoration cost (i.e., relight, plus claims) for this number of customers is \$10.8M, based on \$1,000/customer (See Appendix 2 for a discussion of the \$1,000/customer basis). This exceeds the cost of reinforcing the gas system to prevent this loss by approximately 48%. The projects contained in this reinforcement program have been designed to address these issues. These projects are designed for aggregate growth of all new customers; they are not for any specific customer.

2.3 Project Description

The reinforcement program includes the design, procurement, construction, testing, and completion of capital projects. The program contains various types of projects designed to cost-effectively reinforce areas of the gas distribution network that are predicted to experience pressures below minimum design levels due to forecasted growth. A full list of the Gas Planning Reinforcement Program projects for RI is in Appendix 1. The projects, totaling \$7.295M, are organized by the following work types:

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- **Relay Main – Eight (8) Projects**
Relay main projects are designed to bring pressures on systems above minimum design levels by replacing small diameter mains, which often cause bottlenecks in the system, with larger diameter mains. Whenever practicable, “leak-prone” pipe is targeted for replacement. A total of 10,165 LF (1.9 miles) of new plastic main will be installed under these projects. In addition, 79% of the main being replaced is “leak-prone” pipe. One of these projects were carryover from FY17.
- **New Main – Four (4) Projects**
In most cases, new main projects are designed to bring pressures on systems above minimum design levels by connecting areas of systems with strong pressure to areas with weaker pressure. This method of reinforcement often involves installing main in streets without gas, which provides opportunities to connect new customers. A total of 4,310 LF (0.8 miles) of new main will be installed under these projects.
- **Carryover Costs from Fiscal Year 2017 Projects**
These costs are for remaining work on projects from FY17 program, including final restoration costs. These estimates are based on remaining work on an individual project level basis for each project in FY17.
- **Regulator Stations – Two (2) Projects**
A regulator station may be optimally designed and located to assist in achieving pressure support of lower pressure systems, raising systems above minimum design levels. These stations are strategically placed based on minimizing new main and interconnecting two separately pressure systems without causing strain on the upstream system. The large project will replace and increase the outlet main of a 99 psig to LP regulator station in Johnston. Additionally, regulator equipment in a LP station in Pawtucket will be upsized to allow for additional capacity with decreased inlet pressures.
- **Engineering Costs for Fiscal Year 2019 Projects & Winter Performance Placeholder**
These costs are for engineering and design of projects identified for FY19 construction. The Level 1 estimate was determined by Project Engineering and based on historical data. Additionally, an amount is allocated to address any issues that could arise during winter operations and be identified with winter performance.

2.4 Benefits

Reinforcement projects that ensure continuous and reliable service to customers in a cost efficient manner are identified and proposed for construction. Prospective projects are evaluated for additional system benefits and synergies with other proposed capital projects and often have the added benefit of increasing overall system reliability and improving operability of the network. In addition, many of these projects create the opportunity to be combined with public works activities or replace/abandon aging infrastructure (e.g., “leak-prone” pipe) whenever applicable, providing a benefit to the integrity program.



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Approximately 10,827 customers may experience pressures below minimum design and be at risk of losing service if design conditions were to be experienced during the 2017/18 heating season and the growth forecast is accurate. The construction of the Rhode Island reinforcement program will eliminate this possibility.

Also, current conditions on the Rhode Island gas distribution system require contingency operations in order to manage the system during periods of peak demand. These operations involve the manual adjusting of thirteen (13) LP district regulator set-points above the standard 10 inches water column setting and two (2) HP district regulator set-point to MAOP. The construction of the Rhode Island reinforcement program will assist in eliminating this need.

Additionally, the program will install approximately 16,199 LF of main and facilitate the abandonment of approximately 7,995 LF of existing "leak-prone" pipe on the system. This represents a replacement rate of 49% for this program.

2.5 Business & Customer Issues

There are no significant business issues beyond what has been described elsewhere.

2.6 Alternatives

Alternative 1: Do Nothing/Deferral

This option could result in potentially 10,827 customers experiencing pressures below minimum design levels and being at risk of losing service if design conditions were to be experienced during the 2016/17 heating season term under the current Gas Supply sendout forecast. The estimated restoration cost (i.e., relight, plus claims) for this number of customers is \$10.83M, based on \$1,000/customer. In addition, restrictions on sales activities would be required in constrained areas and the Company could find itself in violation of its tariff in jurisdictions with an obligation to serve.

2.7 Investment Recovery

Investment recovery will be through standard rate recovery mechanisms.

2.7.1 Customer Impact

This project results in an indicative first full year revenue requirement when the asset is placed in service equal to approximately \$1.314M. This is indicative only. The actual revenue requirement will differ, depending upon the timing of the next rate case and/or the timing of the next filing in which the project is included in rate base.



Short Form Sanction Paper

3 Related Projects, Scoring, Budgets

3.1 Summary of Projects

Project Number	Project Title	Estimate Amount (\$M)
CRCC111	Gas System Reinforcement - RI	6.645
C077394	Traver at Killingly LP Station	0.650
Total		7.295

3.2 Associated Projects

N/A

3.3 Prior Sanctioning History

N/A

3.4 Category

Category	Reference to Mandate, Policy, NPV, or Other
<input type="radio"/> Mandatory	Federal Code 49 CFR 192.623 and (2006) RI Rules & Regulations for Gas Utilities, Section D, Part 2a require minimum pressures to be maintained in the gas system. National Grid has established system minimum pressures to be maintained for all pressure levels.
<input checked="" type="radio"/> Policy- Driven	
<input type="radio"/> Justified NPV	
<input type="radio"/> Other	

3.5 Asset Management Risk Score

Asset Management Risk Score: 35

Primary Risk Score Driver: (Policy Driven Projects Only)

☒ Reliability ☐ Environment ☐ Health & Safety ☐ Not Policy Driven

3.6 Complexity Level

☐ High Complexity ☐ Medium Complexity ☒ Low Complexity ☐ N/A

Complexity Score: 15

3.7 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
July 2018	Project Closure



Short Form Sanction Paper

4 Financial

4.1 Business Plan

Business Plan Name & Period	Project included in approved Business Plan?	Over / Under Business Plan	Project Cost relative to approved Business Plan (\$M)
FY18-FY22 Capital Plan – Gas	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Over <input type="radio"/> Under <input checked="" type="radio"/> NA	0.000

4.1.1 If cost is not aligned with approved Business Plan how will this be funded?

N/A

4.2 CIAC / Reimbursement

N/A

4.3 Cost Summary Table

					Current Planning Horizon (\$M)							
Project Number	Project Title	Project Estimate Level (%)	Spend	Prior Yrs	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +		
CRCC111	Gas System Reinforcement - RI	+/- 10%	CapEx	-	5.855	-	-	-	-	-	-	5.855
			OpEx	-	-	-	-	-	-	-	-	
			Removal	-	0.791	-	-	-	-	-	0.791	
			Total	-	6.645	-	-	-	-	-	6.645	
C077394	Traver at Killingly LP Station	+/- 10%	CapEx	-	0.573	-	-	-	-	-	-	0.573
			OpEx	-	-	-	-	-	-	-	-	
			Removal	-	0.077	-	-	-	-	-	0.077	
			Total	-	0.650	-	-	-	-	-	0.650	
Total Project Sanction			CapEx	-	6.427	-	-	-	-	-	-	6.427
			OpEx	-	-	-	-	-	-	-	-	-
			Removal	-	0.868	-	-	-	-	-	-	0.868
			Total	-	7.295	-	-	-	-	-	-	7.295

4.4 Project Budget Summary Table

Project Costs Per Business Plan

\$M	Prior Yrs (Actual)	Current Planning Horizon (\$M)						Total
		Yr. 1 2017/18	Yr. 2 2018/19	Yr. 3 2019/20	Yr. 4 2020/21	Yr. 5 2021/22	Yr. 6 + 2022/23	
CapEx	0.000	6.427	0.000	0.000	0.000	0.000	0.000	6.427
OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Removal	0.000	0.868	0.000	0.000	0.000	0.000	0.000	0.868
Total Cost in Bus. Plan	0.000	7.295	0.000	0.000	0.000	0.000	0.000	7.295



Short Form Sanction Paper

Variance (Business Plan-Project Estimate)

\$M	Prior Yrs (Actual)	Current Planning Horizon (\$M)						Total
		Yr. 1 2017/18	Yr. 2 2018/19	Yr. 3 2019/20	Yr. 4 2020/21	Yr. 5 2021/22	Yr. 6 + 2022/23	
CapEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

5 Key Milestones

Milestone	Target Date: (Month/Year)
Sanctioning Approval	02/2017
Begin Construction	04/2017
Projects in Service	11/2017
Construction Complete	03/2018
Project Closeout	07/2018

6 Statements of Support

6.1.1 Supporters

The supporters listed have aligned their part of the business to support the project.

Role	Individual	Responsibilities
Investment Planner	Pensabene, Patrick	Endorses relative to 5-year business plan or emergent work.
Resource Planning	Falls, Jonathon	Endorses resources, cost estimate, schedule, and portfolio alignment.
Project Management	Fortier, Joseph Jr.	Endorses resources, cost estimate, and schedule.
Gas Project Estimation	Paul, Arthur	Endorses cost estimate.

6.1.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

Reviewer List	Individual
Finance	Easterly, Patricia
Regulatory	Zschokke, Peter
Jurisdictional Delegates	Currie, John
Procurement	Curran, Art
Control Center	Loiacono, Paul

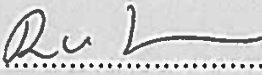

6.1.3 List References

1	US Enterprise 5-Year Distribution System Reinforcement & Reliability Plan
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Short Form Sanction Paper

7 Decisions

I:	
(a)	APPROVE this paper and the investment of \$7.295M and a tolerance of +/-10%
(b)	NOTE that Charles Lewitt is the Project Manager and has the approved financial delegation.
(c)	NOTE: In the event that any blanket projects are not approved prior to the start of the FY19 fiscal year, the FY18 approval limits will remain in effect until such time as the FY19 blanket projects are approved by USSC and/or other appropriate authority for approval.
Signature	
Date	
Executive Sponsor – Ross Turrini, SVP Gas Process & Engineering	



Short Form Sanction Paper

8 Other Appendices

8.1 Sanction Request Breakdown by Project

Appendix 1 – FY18 Rhode Island Reinforcement Projects



Short Form Sanction Paper

Work Type	Town	Project Description	Length	Size	MAOP
Main-Relay	Central Falls	Replace 920 LF of 2,4-in BS,CI LP with 8-in PE LP on Moore St from 12-in CI on Dexter St to Kendall St (9 con, 19 svcs). Replace 280 LF of 4-in CI LP with 320 LF of 6-in PE LP on Kendall St from Moore St to Lonsdale Ave (1 con, 7 svcs).	1,240	8	LP
Main-Relay	Cranston	Relay 950 ft of 12-in CI with 12-in PE 7 psig main on Old Park Ave / Dyer Ave from #12 to #877-891 (1 svcs, 2 conn)	950	12	7
Reg - Modify	Johnston	Replace LP Regulator Station RIS-092 (Traver @ Killingly) with 2-in prefab and 200 LF of 20-in CS outlet to Killingly St	200	20	LP
Main-New	Lincoln	Install 215 LF of 6-in PL LP on Pearl St from Spring St to Old Main St. (2 con, 0 svc).	215	6	LP
Carryover	Newport	FY17 Carryover Costs: Telemetry, Railroad Crossing, Restoration Estimated 35% of original 776,775 estimate.	1,524	12	LP
Main-New	North Providence	Install 250 LF of 6-in PL LP main in Humbert St from Fruit Hill Ave to 6-in WS at #368. (2 con, 0 svcs)	250	6	LP
Main-New	Pawtucket	Install 755 ft of 12-in PE 18 psig main in Central Ave from Inlet to RIN-C030 (N Bend St LP) to Cottage St, and 1,255 ft of 12-in PE 18 psig main from Central Ave to Kenyon Ave. RR, STATE RD Crossing	1,955	12	18
Main-Relay	Pawtucket	Replace 2,196 LF of 6-in BS,CI LP with 12-in PE LP on Sabin St from 12-in BS at Cottage St to Webster St (14 con, 38 svcs).	2,200	12	LP
Reg - Modify	Pawtucket	Replace 2-3" Fisher 1098s with 2-4" Fisher 1098s at Regulator Station C027 (Bloomfield St @ Armistance LP)			
TBD	Unknown	Projects associated with Winter Performance			
Engineering	Various	Engineering & Design costs associated with FY2019 projects			
Carryover	Various	Projects deferred / carryover costs from FY16/FY17: Restoration/Paving: FY16 WO#146232 - Maple CRA FY16 WO#146228 - Second CRA FY16 WO#162596 - Gibbs NPR FY16 WO#146250 - N Main WSO WO#162391 - Gibbs NPR WO#162405 - Main PAW WO#162386 - Woodland LNC WO#162548 - Wood BST WO#151094 - Charles NPV WO#162367 - Pontiac CRA WO#162545 - Martin EPV WO#162549 - Fox Hill BST WO#162546 - Wampanoag EPV WO#162406 - Reservoir LNC			
Main-Relay	Warren	Relay 1,825 LF of 6-in BS, 4-in WS 25 psig main with 12-in PE 25 psig main on the Bike Path from Brown St to 8-in PE 25 psig at Main St. (2 conn, 0 svcs) STATE ROUTE	1,825	12	25
Main-Relay	Warren	Relay 450 LF of 6-in CS71 with 12-in CS 60 psig main on Brown St from Take Station to Main St.	475	12	60
Main-Relay	Warren	Replace 40 LF of 2-in CS (1940) 8 psig main in Truman Ave from existing 4-in CS to Main St. (2 con, 0 svcs) STATE RD TIE-IN	40	6	8
Main-Relay	Warwick	Relay 1,385 LF of 2-in PE, CS 35 psig with 2,105 LF of 4-in PE 35 psig main on Draper Ave from W Shore Rd to Sunset Ave (10 svcs). CULVERT	2,105	6	35
Main-New	Warwick	Install 1,890 LF of 12-in PL 35 psig main paralleling existing main on Warwick Ave from Omaha Blvd to Edge Hill Rd. STATE RD	1,890	12	35
Main-Relay	Woonsocket	Relay 1,330 LF of 4-in,6-in CI LP with 8-in PE LP main on Social St from E School St to Privilege St (6 con, 16 svcs).	1,330	8	LP



Short Form Sanction Paper

Appendix 2 – Outage Restoration Costs

Estimates for relighting customers and recovering from a system outage have been prepared to quantify the impact of outages related to insufficient system capacity during periods of peak demand and severe winter cold.

Actual relight costs have been captured from recent incidents to quantify company expenses related to restoring service. These were all related to outages that occurred for reasons other than insufficient system capacity and operations were conducted under benign weather conditions. It is likely that during severe winter weather, costs would increase.

Claims related to frozen buildings, burst pipes and equipment damage due to a lack of heat during severe cold weather were captured from the only incident in recent times the company experienced – e.g. the outage in Hull, Ma during the peak day of January 16th, 2004.

Relight Costs

Tiverton (2008): 900 customer outage with relight costs of \$322,839 for an average relight cost of \$358.71 per customer.

Cutchoque (2003): 1,800 customer outage with relight costs of \$2,367,401 with an average relight cost of \$1,315.22

Glen Cove (2008): 1,016 customer outage with relight costs of \$275,000 for an average relight cost of \$270.67 per customer

Westerly, RI (2011): 1,686 customer outage with relight costs of \$2,811,455 for an average relight cost of \$1,667.53 per customer

Average cost to relight for combined instances above equals \$1069 per customer

Claims

Hull (2004): 297 customers affected with claims totaling \$206,336 for an average claim of \$694.73 per customer

Combined cost of relight and claims

The combined cost of relighting customers and resolving claims averages out to \$1,764 per customer.

Recognizing the amount of variability in different incidents such as weather conditions, different types of neighborhoods, variable labor costs, economies of scale, etc., for purposes of evaluating the benefits of reinforcement projects, an average value of service restoration costs and claims of \$1,000 per customer is used.



Short Form Sanction Paper

Title:	FY 18 City/State Construction Blanket - Narragansett Electric Company	Sanction Paper #:	USSC-17-130
Project #:	CRCC306, CRCC307, CRCC308, CRCC312	Sanction Type:	Sanction
Operating Company:	The Narragansett Electric Co.	Date of Request:	March 9, 2017
Author:	Laeyeng Hunt	Sponsor:	Tom Bennett, Vice President of Gas System Engineering
Utility Service:	Gas	Project Manager:	Bill Mycroft

1 Executive Summary

1.1 Sanctioning Summary

This paper requests sanction of Project # CRCC306, CRCC307, CRCC308, CRCC312 in the amount of \$13.545M with a tolerance of +/- 10% for the purpose of full implementation.

This sanction amount is \$13.545M broken down into:

\$13.040M Capex
\$0.000M Opex
\$0.505M Removal
With a CIAC/Reimbursement of \$1.327M

1.2 Project Summary

The City/State Construction (CSC) Program for the Narragansett Electric Company consists of work, mainly leak-prone pipe main replacement, driven by coordination with municipalities and various third party entities within the Narragansett Electric service territory.

2 Project Detail

2.1 Background

The City/State Construction (CSC) Program for the Narragansett Electric Company consists of work driven by coordination with the Rhode Island Department of Transportation (RIDOT) and the numerous municipalities that National Grid serves, as well as, various third party entities within the Narragansett Electric Company.



Short Form Sanction Paper

2.2 Drivers

City State Construction is a Mandated Program requiring National Grid to coordinate and work with Municipalities within our operating territory on public works projects. The primary drivers are to address existing gas infrastructure conflicts, to improve the safety and reliability of the gas distribution system in conjunction with public works projects, which have shown to have significant benefits to customers and communities. In addition, by replacing LPP in association with planned public works construction projects, the Company is able to minimize construction impacts and inconvenience to the customers and the communities.

2.3 Project Description

The estimated quantity for main replacement is 58,080 linear feet (10.0 miles for non-reimbursable work and 1.0 mile for reimbursable work).

2.4 Benefits

Approximately 90% of the CSC Non-reimbursable Main Relays for the Narragansett Electric Company territories will contribute an estimated 47,520 linear feet (9.00 miles) of LPP retirement, which is eligible for inclusion in the Company's Infrastructure, Safety and Reliability Plan (ISR).

2.5 Business & Customer Issues

There are no significant business issues beyond what has been described elsewhere.

2.6 Alternatives

Alternative 1: Doing nothing is not an option because compliance with company policy (DAM01008) and regulatory requirements (220 CMR 113.00; M.G.L. c. 164) is mandatory.

2.7 Investment Recovery

It is estimated that 100% of the funds are eligible for recovery through the 2018 Gas ISR program.

2.7.1 Customer Impact

This project results in an indicative first full year revenue requirement when the asset is placed in service equal to approximately \$2.667M. This is indicative only. The actual revenue requirement will differ, depending upon the timing of the next rate case and/or the timing of the next filing in which the project is included in rate base.



Short Form Sanction Paper

3 Related Projects, Scoring, Budgets

3.1 Summary of Projects

Project Number	Project Type (Elec only)	Project Title	Estimate Amount (\$M)
CRCC306, CRCC307, CRCC308, CRCC312		Main Repl Pub Works NON-Reimb-BE Main Repl Pub Works Reimb-BE Main Encroach Parallel-BE Main Encroach Undermined-BE	13.545

3.2 Associated Projects

NA

3.3 Prior Sanctioning History

NA

3.4 Category

Category	Reference to Mandate, Policy, NPV, or Other
<input checked="" type="radio"/> Mandatory <input type="radio"/> Policy- Driven <input type="radio"/> Justified NPV <input type="radio"/> Other	National Grid is required to relocate its facilities within the project limits that are in direct interference of the proposed construction and installation of new infrastructure facilities in accordance with 220 CMR 113.00.

3.5 Asset Management Risk Score

Asset Management Risk Score: 49

Primary Risk Score Driver: (Policy Driven Projects Only)



Short Form Sanction Paper

☐ Reliability ☐ Environment ☐ Health & Safety ☒ Not Policy Driven

3.6 Complexity Level

☐ High Complexity ☐ Medium Complexity ☒ Low Complexity ☐ N/A

Complexity Score: 15

3.7 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
June 2018	Sanction Closure

4 Financial

4.1 Business Plan

Business Plan Name & Period	Project included in approved Business Plan?	Over / Under Business Plan	Project Cost relative to approved Business Plan (\$)
FY18 - FY22 Capital Plan - Gas	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Over <input type="radio"/> Under <input checked="" type="radio"/> NA	\$0.000

4.1.1 If cost > approved Business Plan how will this be funded?

N/A

4.2 CIAC / Reimbursement

	Prior Yrs	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	Total
\$M		2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	
CIAC/Reimbursement	0.000	1.327	0.000	0.000	0.000	0.000	0.000	1.327

The CIAC was calculated based on historical percentage of capital spend.

4.3 Cost Summary Table



Short Form Sanction Paper

Project Number	Project Title	Project Estimate Level (%)	Spend	Prior Yrs	Current Planning Horizon (\$M)						
					Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
CRCC306, CRCC307, CRCC308, CRCC311	Main Repl Pub Works NON-Reimb-BE	Est Lvl (e.g. +/- 10%)	CapEx	-	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	Total
	Main Repl Pub Works Reimb-BE		OpEx	-	-	-	-	-	-	-	
	Main Encroach Parallel-BE		Removal	-	0.505	-	-	-	-	-	0.505
	Main Encroach Undermined-BE										
			Total	-	13.545	-	-	-	-	-	13.545
Total Project Sanction			CapEx	-	13.040	-	-	-	-	-	13.040
			OpEx	-	-	-	-	-	-	-	-
			Removal	-	0.505	-	-	-	-	-	0.505
			Total	-	13.545	-	-	-	-	-	13.545

4.4 Project Budget Summary Table

Project Costs Per Business Plan

\$M	Prior Yrs (Actual)	Current Planning Horizon (\$M)						Total
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
CapEx	0.000	13.040	0.000	0.000	0.000	0.000	0.000	13.040
OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Removal	0.000	0.505	0.000	0.000	0.000	0.000	0.000	0.505
Total Cost in Bus. Plan	0.000	13.545	0.000	0.000	0.000	0.000	0.000	13.545

Variance (Business Plan-Project Estimate)

\$M	Prior Yrs (Actual)	Current Planning Horizon (\$M)						Total
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
CapEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

5 Key Milestones

Milestone	Target Date: (Month/Year)
Sanction Approval	March 2017
Construction Start Date	April 2017
Completion	March 2018
Closure Report	June 2018

Short Form Sanction Paper



6 Statements of Support

6.1.1 Supporters

The supporters listed have aligned their part of the business to support the project.

Role	Individual	Responsibilities
<i>Investment Planning</i>	Pensabene, Patrick	Endorses relative to 5-year business plan
<i>Resource Planning</i>	Falls, Jonathon	Endorses Resource, cost estimate, schedule and portfolio alignment
<i>Project Management</i>	Fortier, Joseph Jr.	Endorses Resources, cost estimate, schedule
<i>Gas Preject Estimation</i>	Paul, Art	Endorses Cost Estimate

6.1.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

Reviewer List	Individual
Finance	Easterly, Patricia
Regulatory	Zschokke, Peter
Jurisdictional Delegates	Currie, John
Procurement	Curran, Art
Control Center	Loiacano, Paul

6.1.3 List References

N/A

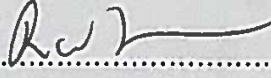
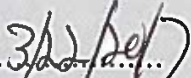
Short Form Sanction Paper



7 Decisions

I:

- (a) APPROVE this paper and the investment of \$13.545M and a tolerance of 10+/%
- (b) NOTE that Bill Mycroft is the Project Manager and has the approved financial delegation.
- (c) NOTE: In the event that any Blanket/Program projects are not approved prior to the start of the FY2019 fiscal year, the FY2018 approval limits will remain in effect until such time as the FY2019 blanket/program projects are approved by USSC and/or other appropriate authority for approval.

Signature..........Date. .....
Executive Sponsor – Ross Turrini, Senior Vice President, Gas Process and
Engineering Group Chief Engineer - Gas

Short Form Sanction Paper



8 Other Appendices

NA

8.1 Sanction Request Breakdown by Project

NA



Short Form Sanction Paper

Title:	FY18 LPP Main Replacements (Proactive)	Sanction Paper #:	USSC-17-247
Project #:	Multiple	Sanction Type:	Sanction
Operating Company:	The Narragansett Electric Co.	Date of Request:	March 27, 2017
Author:	Dana Wolkiewicz	Sponsor:	John Stavrakas – VP Gas Asset management
Utility Service:	Gas	Project Manager:	Bill Mycroft

1 Executive Summary

1.1 Sanctioning Summary

This paper requests sanction of multiple project numbers (see below) in the amount \$52.106M with a tolerance of +/- 10% for the purposes of full implementation.

This sanction amount is \$52.106M broken down into:

\$ 51.403M Capex

\$ 00.000M Opex

\$ 00.703M Removal

1.2 Project Summary

This program funds the replacement of Rhode Island's inventory of Leak Prone Pipe (LPP), defined as pipe less than 16" in diameter that is non-cathodically protected steel, whether bare or coated (collectively termed "unprotected steel"), as well as cast or wrought iron.

2 Project Detail

2.1 Background

The estimated 2016 inventory of LPP is approximately 1,161 miles, which represents approximately 36.1% of the distribution system in Rhode Island. As demonstrated in Appendix 1- Rhode Island Leak Rate Graph, the 2016 leak rate for all distribution piping is 0.23 leaks per mile, reduced from 0.85 leaks per mile in 2009. The 2016 leak rate for LPP is 0.63 leaks per mile, reduced from the 1.40 leaks per mile in 2009.

2.2 Drivers



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The goal of this program is to reduce the risk associated with leak prone pipe in Rhode Island's distribution system. The replacement of LPP and associated services is also supported by the Company's Distribution Integrity Management Plan (DIMP), which specifies that the Company implement measures to: know its system; understand the threats to its distribution piping system; and evaluate risks and prepare replacement programs to help mitigate the risks to its leak prone mains and services inventory.

2.3 Project Description

Approval is being requested for the necessary funding to replace approximately 49 miles of LPP via the Rhode Island Proactive Main Replacement Program. Gas Engineering has identified individual main segments for replacement based upon an analysis that considers pipe material, leak repair history, surrounding structures, and field conditions. Opportunities to take advantage of coordination with municipal projects and other National Grid programs and projects are also considered.

2.4 Benefits

The benefits of performing this work include;

- Eliminating high risk mains & services
- Reducing the risk and potential for incidents associated with leak prone pipe
- Improved community and government relations

2.5 Business & Customer Issues

This program improves the safety and reliability of Rhode Island's gas distribution system, thus increasing reliable gas service to customers and reducing both existing and potential future gas leaks.

2.6 Alternatives

Alternative 1: Lower Rate of Replacement

Reduce this program to a lower rate of replacement. This option would replace only the quantity of main required to hold leak rates to present levels. This alternative does not align with with the Rhode Island PUC's expectations for the aggressive replacement of leak prone pipe.



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2.7 Investment Recovery

Investment recovery will be through the Gas Infrastructure Safety and Reliability Plan FY2017 proposal.

2.7.1 Customer Impact

This project results in an indicative first full year revenue requirement when the asset is placed in service equal to approximately \$10.512M. This is indicative only. The actual revenue requirement will differ, depending upon the timing of the next rate case and/or the timing of the next filing in which the project is included in rate base.

3 Related Projects, Scoring, Budgets

3.1 Summary of Projects

Project Number	Project Title	Estimate Amount (\$M)
CRCC203, CRCC207 CRCC208 CRCC221 CRCC404 CON0034	LPP Main Replacement (Proactive)	52.106
Total		52.106

3.2 Associated Projects

N/A

3.3 Prior Sanctioning History

N/A

3.4 Category

Category	Reference to Mandate, Policy, NPV, or Other
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Short Form Sanction Paper

<input type="radio"/> Mandatory <input checked="" type="radio"/> Policy- Driven <input type="radio"/> Justified NPV <input type="radio"/> Other	The program is in accordance with the Company's DIM Plan (as specified by US DOT, 49 CFR Part 192, Subpart P, entitled; "Gas Distribution Pipeline Integrity Management Plan")
--	--

3.5 Asset Management Risk Score

Asset Management Risk Score: 44

Primary Risk Score Driver: (Policy Driven Projects Only)

☐ Reliability
☐ Environment
☒ Health & Safety
☐ Not Policy Driven

3.6 Complexity Level

☐ High Complexity
☐ Medium Complexity
☒ Low Complexity
☐ N/A

Complexity Score: 15

3.7 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
June 2018	Sanction Paper Closure

4 Financial

4.1 Business Plan



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Business Plan Name & Period	Project included in approved Business Plan?	Over / Under Business Plan	Project Cost relative to approved Business Plan (\$M)
FY18-FY22 Budget File-Gas	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Over <input type="radio"/> Under <input checked="" type="radio"/> NA	\$0.000

4.1.1 If cost is not aligned with approved Business Plan how will this be funded?

N/A

4.2 CIAC / Reimbursement

N/A

4.3 Cost Summary Table

					Current Planning Horizon (\$M)						
Project Number	Project Title	Project Estimate Level (%)	Spend	Prior Yrs	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
					2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	Total
CRCC203, CRCC207, CRCC208, CRCC221, CRCC404, CON0034	LPP Main Replacement (Proactive)	+/- 10%	CapEx	-	51.403	-	-	-	-	-	51.403
			OpEx	-	-	-	-	-	-	-	
			Removal	-	0.703	-	-	-	-	0.703	
			Total	-	52.106	-	-	-	-	52.106	
Total Project Sanction			CapEx	-	51.403	-	-	-	-	-	51.403
			OpEx	-	-	-	-	-	-	-	
			Removal	-	0.703	-	-	-	-	0.703	
			Total	-	52.106	-	-	-	-	52.106	

4.4 Project Budget Summary Table

Project Costs Per Business Plan

\$M	Prior Yrs (Actual)	Current Planning Horizon (\$M)						Total
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
CapEx	0.000	51.403	0.000	0.000	0.000	0.000	0.000	51.403
OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Removal	0.000	0.703	0.000	0.000	0.000	0.000	0.000	0.703
Total Cost in Bus. Plan	0.000	52.106	0.000	0.000	0.000	0.000	0.000	52.106



Short Form Sanction Paper

Variance (Business Plan-Project Estimate)

\$M	Prior Yrs (Actual)	Current Planning Horizon (\$M)						Total
		Yr. 1 2017/18	Yr. 2 2018/19	Yr. 3 2019/20	Yr. 4 2020/21	Yr. 5 2021/22	Yr. 6 + 2022/23	
CapEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

5 Key Milestones

Milestone	Target Date: (Month/Year)
Identify and Prioritize FY16Rhode Island LPP replacement candidates	August 2016
Complete detailed design and cost estimates	January 2017
Contractor Bids and Material Procurement	February 2017
Project Sanction Approval	March 2017
Start Applying for Permits	March 2017
Engage Contractors and In-House Resources	March 2017
Construction Start	April 2017
Construction Complete	March 2018
Project Closure Report	June 2018

6 Statements of Support

6.1.1 Supporters

The supporters listed have aligned their part of the business to support the project.

Role	Individual	Responsibilities
Investment Planner	Pensabene, Patrick	Endorses relative to 5-year business plan or emergent work
Resource Planning	Falls, Jonathon	Endorses Resources, cost estimate, schedule, and Portfolio Alignment
Project Management	Fortier, Joseph Jr.	Endorses Resources, cost estimate, schedule
Gas Project Estimation	Paul, Art	Endorses Cost Estimate



Short Form Sanction Paper

6.1.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

Reviewer List	Individual
Finance	Easterly, Patricia
Regulatory	Zschokke, Peter
Jurisdictional Delegate	Currie, John
Procurement	Curran, Art
Control Center	Loiacono, Paul

6.1.3 List References

N/A



Short Form Sanction Paper

7 Decisions

The Senior Executive Sanctioning Committee (SESC) at a meeting held on 3/27/2017:

- (a) APPROVE this paper and the investment of \$52.106M and a tolerance of +/-10%
- (b) NOTE that Bill Mycroft is the Project Manager and has the approved financial delegation.
- (c) NOTE: In the event that any Blanket projects are not approved prior to the start of the FY2019 fiscal year, the FY2018 approval limits will remain in effect until such time as the FY2019 blanket projects are approved by USSC and/or other appropriate authority for approval.

Signature.....Date.....

Margaret Smyth

US Chief Financial Officer

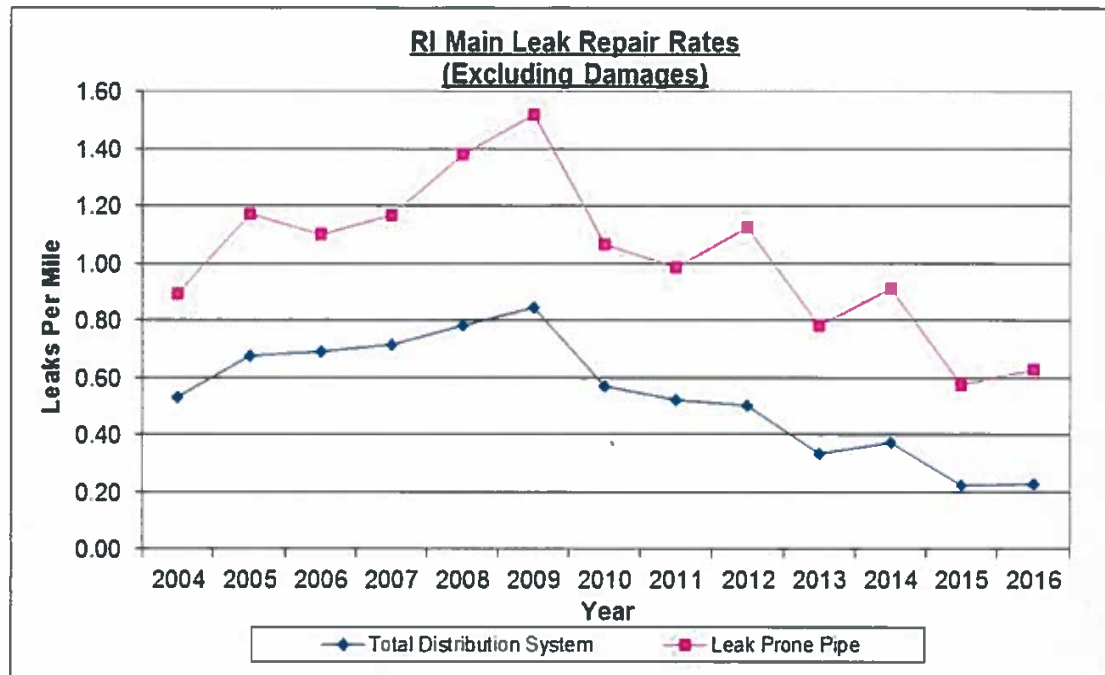
Chairman, Senior Executive Sanctioning Committee



Short Form Sanction Paper

8 Other Appendices

8.1 Rhode Island Leak Repair Graph



8.2 Work Order Breakdown by Project

Town	Main wo#	Service wo#	Project Title	Priority	Installation Mileage	Abandonment Mileage	Services	Prioritization Score	Number of G3 Open Leaks (Accurate as of last Prioritization Score Analysis for Project)
Barrington	90000163260	90000163261	Lee Ann Dr, BRG	4	0.28	0.28	12	0	0
Barrington	90000163263	90000163264	Maudsley Av, BRG	4	0.13	0.13	10	3	0
Coventry	90000175419	90000175420	Anderson Av, COV	1	0.12	0.12	5	15	0
Cranston	90000142825	90000142826	Richard St, CRA	2	0.6	0.6	65	30	2
Cranston	90000142840	90000142843	Haven Av, CRA	2	0.68	0.9	61	29	1
Cranston	90000146583	90000146584	Whiting St, CRA	1	0.33	0.33	27	21	2
Cranston	90000155095	90000155098	Preston Dr, CRA	2	0.6	0.6	64	10	1
Cranston	90000155371	90000155372	Wales St, CRA	2	0.55	0.54	50	17	4
Cranston	90000175423	90000175424	Arnold Av, CRA	2	0.26	0.26	36	16	1



Short Form Sanction Paper

Cranston	90000175427	90000175428	Broad St, CRA	1	0.3	0.32	16	18	0
Cranston	90000175432	90000175433	Oxford St, CRA	3	0.45	0.47	39	40	3
Cranston	90000175445	90000175446	Rhodes Pl, CRA	4	0.16	0.35	14	6	2
Cumberland	90000142839	90000142841	Waterman St, CLD	2	0.44	0.44	35	16	2
East Greenwich	90000175461	90000175463	Sylvan Dr, EGW	4	0.32	0.32	14	12	1
East Greenwich	90000175465	XXXXXXX	Sylvan Dr, EGW (Culvert Crossing)	4	0.01	0.01	0	3	0
East Providence	90000175466	90000175468	Barney St, EPV	3	0.1	0.1	12	17	0
East Providence	90000175565	90000175566	Roger Williams Av, EPV	4	0.31	0.43	35	6	0
Johnston	90000118581	90000118582	973-1178 Atwood Ave, JOH	1	0.64	0.64	34	15	2
Johnston	90000142764	90000142766	1294 Atwood Ave, JOH	1	0.02	0.02	1	36	1
Johnston	90000143019	90000143020	Greenville Av, JOH	3	0.4	0.4	17	10	3
Johnston	90000175578	90000175579	Morgan Av, JOH	1	1.57	1.58	76	76	3
Johnston	90000177440	90000177442	Hillside Av, JOH	3	0.11	0.13	7	16	1
Johnston	90000177445	90000177446	Vanner St, JOH	3	0.14	0.31	24	22	1
Johnston	90000177453	90000177454	Starr St, JOH	3	0.29	0.48	36	3	1
Lincoln	90000175584	90000175586	Summer St, LNC	2	0	0.22	8	18	0
Middletown	90000155184	90000155185	Boulevard, MDT	4	1.03	1.89	93	4	5
Middletown	90000175593	90000175594	Briarwood Av, MDT	3	0.96	1.02	71	12	2
Middletown	90000175595	90000175596	Reardon Dr, MDT	3	0.34	0.34	32	12	3
Middletown	90000181631	XXXXXXX	Green End Av	3	0	0.08	0	7	3
Newport	90000155194	90000155195	Whitwell Av, NPR	3	0.33	0.33	27	5	1
Newport	90000175600	90000175601	Baker Ct, NPR	4	0	0.05	1	7	0
Newport	90000175602	90000175603	Bliss St, NPR	2	0.26	0.26	18	19	2
Newport	90000175604	90000175605	Dudley Av, NPR	3	0	0.37	9	20	3
Newport	90000181556	90000181557	Lee's Wf, NPR	3	0	0.06	4	0	0
North Kingstown	90000163327	90000163328	Celestia Ct, NKS	4	0.1	0.1	4	0	0
North Kingstown	90000178048	90000178049	Stonegate Dr, NKS	4	0.46	0.46	28	0	0
North Providence	90000142692	90000142694	1540-1667 Mineral Spring Av, NPV	2	0.44	0.53	29	41	0
North Providence	90000146500	90000146501	Redwood Dr, NPV	4	0.23	0.23	15	13	0
North Providence	90000155196	90000155198	Gillen Av, NPV	3	0.46	0.46	51	11	0
North Providence	90000172062	90000172063	Benjamin Dr, NPV	3	0	0.1	4	4	1
North Providence	90000175612	90000175613	Gardner Av, NPV	4	0.54	0.69	59	13	2
Pawtucket	90000175640	90000175641	East St, PAW	2	0.21	0.21	12	18	0
Pawtucket	90000175642	90000175643	Newport Av, PAW	2	0.36	0.5	40	15	1



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Pawtucket	90000175651	90000175652	Utton Av, PAW	1	0.19	0.19	18	17	0
Providence	90000142445	90000142446	Montgomery Av, PVD	2	0.97	0.8	146	16	0
Providence	90000142530	90000142532	996-1089 Smith St, PVD	2	0.25	0.29	11	35	2
Providence	90000142682	90000142683	1135-1200 Elmwood Av, PVD	2	0.59	0.59	89	18	1
Providence	90000155214	90000155215	12-51 Bassett St, PVD	2	0.39	0.55	19	19	3
Providence	90000155216	90000155217	Benefit St, PVD	2	0.34	0.48	26	27	1
Providence	90000155220	90000155221	Canton St, PVD	3	0.17	0.17	30	17	2
Providence	90000155230	90000155231	Dean St, PVD	2	0.62	0.81	61	36	3
Providence	90000155241	90000155242	553-589 Hartford Av, PVD	2	0.5	0.51	28	39	2
Providence	90000155263	90000155268	Superior St, PVD	2	0.25	0.25	41	18	2
Providence	90000155272	90000155274	Westminster St, PVD	2	0.24	0.24	18	22	0
Providence	90000155302	90000155303	Mission Pl, PVD	1	0.14	0.14	12	26	0
Providence	90000155380	90000155382	11-108 Evergreen St, PVD	2	0.21	0.21	31	20	1
Providence	90000158437	90000158438	Courtland St, PVD	2	0.64	0.64	92	23	0
Providence	90000175655	90000175658	72-100 Oxford St, PVD	4	0	0.12	4	10	1
Providence	90000175673	90000175675	Filmore St, PVD	2	0.13	0.27	21	36	0
Providence	90000175679	90000175680	Homer St, PVD	2	0.22	0.22	45	16	1
Providence	90000175685	90000175686	S Main St, PVD	4	0.3	0.31	22	3	0
Providence	90000175690	90000175691	Vinton St, PVD	3	0.19	1.18	115	26	0
Smithfield	90000142693	90000142695	Gladstone St, SMF	4	0.27	0.27	23	11	2
Smithfield	90000155304	90000155305	Esmond St, SMF	2	0.43	0.43	36	23	1
Smithfield	90000155307	90000155308	Maple Ave, SMF	4	0.13	0.21	8	5	0
Smithfield	90000155325	90000155326	Woodland Av, SMF	4	0.17	0.17	14	8	0
Smithfield	90000175698	90000175699	Lodge Pole Ln, SMF	4	0.48	0.48	26	3	2
Smithfield	90000178051	90000178052	Lakeside Dr, SMF	4	0.46	0.46	41	0	0
South Kingstown	90000175718	90000175719	Greenwood Dr, SKS	4	0.73	0.73	32	0	0
South Kingstown	90000175720	90000175721	South Rd, SKS	4	1.76	1.94	60	0	0
Warren	90000175723	90000175724	Arlington Av, WAN	2	0.19	0.19	26	30	3
Warwick	90000142529	90000142531	Commonwealth Av, WWK	1	0.17	0.17	9	18	1
Warwick	90000146436	90000146437	Main Av, WWK	1	0.28	0.51	25	12	3
Warwick	90000150299	90000150302	Hedgerow Dr, WWK	4	0.21	0.21	15	14	2
Warwick	90000155581	90000155582	Beach Av, WWK	4	0.17	0.17	14	13	1
Warwick	90000155592	90000155593	Greenwich Av, WWK	1	0.17	0.17	7	19	2



Short Form Sanction Paper

Warwick	90000155595	90000155596	Hawksley Av, WWK	4	0.18	0.18	15	6	0
Warwick	90000155600	90000155601	Kirby Av, WWK	4	0.31	0.31	13	7	1
Warwick	90000155606	90000155607	Majestic Av, WWK	2	0.43	0.58	37	15	4
Warwick	90000155616	90000155617	140-325 Red Chimney Dr, WWK	4	1.11	1.11	63	12	12
Warwick	90000155655	90000155656	Wyoming Av, WWK	4	0.46	0.46	35	12	5
Warwick	90000175779	90000175781	373-535 Red Chimney Rd, WWK	4	0.34	0.34	18	8	2
Warwick	90000175801	90000175802	Buttonwoods Av, WWK	4	0.5	0.5	28	14	1
Warwick	90000175803	90000175804	Byron Blvd, WWK	4	0.53	0.5	49	10	4
Warwick	90000175805	90000175806	Cowesett Rd, WWK	1	0.27	0.27	9	17	4
Warwick	90000175807	90000175808	Douglas Rd, WWK	4	1.33	1.57	115	7	21
Warwick	90000175809	90000175810	Easton Av, WWK	1	0.74	0.74	49	15	4
Warwick	90000175811	90000175812	Massasoit Dr, WWK	4	0.71	0.71	58	4	0
Warwick	90000175834	90000175835	Oakland Beach Av, WWK	4	0.53	0.83	51	3	1
Warwick	90000175838	90000175839	Old Warwick Av, WWK	1	0.03	0.03	1	22	0
Warwick	90000175851	90000175852	Paterson Av, WWK	4	0.48	0.48	22	0	0
Warwick	90000175853	90000175854	Pine Grove Av, WWK	4	0.26	0.26	23	6	3
Warwick	90000175855	90000175856	Prince St, WWK	4	0.1	0.1	14	6	0
Warwick	90000178056	90000178058	Edmond Dr, WWK	4	0.6	0.6	54	4	0
Warwick	90000178099	90000178100	Kerri Lynn Rd, WWK	4	1.1	1.1	116	5	1
West Warwick	90000155342	90000155343	Archambault Ave, WWWW	1	0.25	0.25	13	28	1
Westerly	90000146444	90000146445	217-360 Bradford Rd, WLY	3	0.55	0.55	14	10	7
Westerly	90000155330	90000155331	15-169 Bradford Rd, WLY	3	0.96	0.96	14	13	3
Westerly	90000155533	90000155535	370-410 Westerly Bradford Rd, WLY	3	0.38	0.38	1	7	1
Westerly	90000175883	90000175884	1-45 East Av, WLY	4	0.21	0.47	17	2	0
Westerly	90000175887	90000175888	Beach St, WLY	3	0.26	0.4	16	4	1
Westerly	90000175892	90000175893	Pierce St, WLY	1	0.41	0.42	43	15	0
Woonsocket	90000142417	90000142419	Roberta Av, WSO	2	0.14	0.26	15	15	0
Woonsocket	90000175904	90000175906	Halsey Rd, WSO	4	1.25	1.25	115	8	5
Woonsocket	90000175908	90000175909	Hemond Av, WSO	2	0.49	0.49	36	15	0
Woonsocket	90000175911	90000175912	S Main St, WSO	4	0.32	0.66	28	12	1



Short Form Sanction Paper

Title:	FY18 Cast Iron Joint Encapsulation – Reactive Blanket – Rhode Island	Sanction Paper #:	USSC-17-174
Project #:	CRFN211, CRFS211	Sanction Type:	Sanction
Operating Company:	The Narragansett Electric Co.	Date of Request:	3/28/2017
Author:	Fredrick Pisani	Sponsor:	Neil Proudman – VP Gas Operations, NE
Utility Service:	Gas	Project Manager:	Dan Sancomb

1 Executive Summary

1.1 Sanctioning Summary

This paper requests the sanction of CRFN211, CRFS211 in the amount of \$3.519M with a tolerance of +/- 10% for the purposes of full implementation.

This sanction amount is \$3.519M broken down into:

*\$3.506M Capex
\$0.000M Opex
\$0.013M Removal*

1.2 Project Summary

This proposed blanket investment is to provide approved funding for the repair of cast iron bell joints that are discovered randomly during the proactive leakage surveys or discovered following public odor calls.

2 Project Detail

2.1 Background

The proactive main and service replacement programs upgrade existing main piping and customer services as prioritized by risk based on pressure, material, vintage, location, and select other variables. The potential for leakage on joint connections on the remaining underground piping exists and requires a reactive response to correct the deficiency which is the focus of this request.



Short Form Sanction Paper

2.2 Drivers

The goal of this program is to reduce the risk associated with cast iron joint connections. The drivers for this category are both safety and reliability.

2.3 Project Description

Approval is being requested for the necessary funding to repair leaking cast iron joints.

2.4 Benefits

The benefits of performing this work include:

- Elimination of the risk associated with these joints.
- Improved community and government relations.
- Adherence to Regulatory compliance requirements.

2.5 Business & Customer Issues

There are no significant business issues beyond what has been described elsewhere.

2.6 Alternatives

These work activities are random, emergency driven and mandated, therefore, there is not an alternative to completing the activities.

2.7 Investment Recovery

Investment recovery will be through standard rate recovery mechanisms.

2.7.1 Customer Impact

This project results in an indicative first full year revenue requirement when the asset is placed in service equal to approximately \$0.638M. This is indicative only. The actual revenue requirement will differ, depending upon the timing of the next rate case and/or the timing of the next filing in which the project is included in rate base.



Short Form Sanction Paper

3 Related Projects, Scoring, Budgets

3.1 Summary of Projects

Project Number	Project Type (Elec only)	Project Title	Estimate Amount (\$M)
CRFN211, CRFS211		Main Replacement (Reactive) - CI Joint Encapsulation	3.519
		Total	3.519

3.2 Associated Projects

N/A

3.3 Prior Sanctioning History

N/A

3.4 Category

Category	Reference to Mandate, Policy, NPV, or Other
<input checked="" type="radio"/> Mandatory	Mandatory work activities related to emergency response and regulatory compliance as stipulated in the National Grid Maintenance Plan, Federal and State Requirements. There is also mandatory work included in this sanctioning related to customer driven requests.
<input type="radio"/> Policy- Driven	
<input type="radio"/> Justified NPV	
<input type="radio"/> Other	

3.5 Asset Management Risk Score

Asset Management Risk Score: 49



Short Form Sanction Paper

Primary Risk Score Driver: (Policy Driven Projects Only)

☐ Reliability ☐ Environment ☐ Health & Safety ☒ Not Policy Driven

3.6 Complexity Level

☐ High Complexity ☐ Medium Complexity ☒ Low Complexity ☐ N/A

Complexity Score: 15

3.7 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
March 2018	Closure Paper

4 Financial

4.1 Business Plan

Business Plan Name & Period	Project included in approved Business Plan?	Over / Under Business Plan	Project Cost relative to approved Business Plan (\$M)
FY18 – FY22 Capital Plan - Gas	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Over <input type="radio"/> Under <input checked="" type="radio"/> NA	\$0.000M

4.1.1 If cost is not aligned with approved Business Plan how will this be funded?

N/A



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4.2 CIAC / Reimbursement

N/A

4.3 Cost Summary Table

Number		Name	Proj Est. Lvl	Spend	Prior Yrs	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6 +	Total
Proj Num	Project Type	Proj Name	Est Lvl (e.g. +/- 10%)	CapEx		2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	
CRF1211 CRFS211		Main Replacement		OpEx	0.000	3.506	0.000	0.000	0.000	0.000	0.000	3.506
		(Reactive) - CI		Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Joint Encapsulation		CIAC/Reimbursement	0.000	0.013	0.000	0.000	0.000	0.000	0.000	0.013
					0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Name	Proj Est. Lvl	Spend (\$M)	Prior Yrs	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6 +	Total
Proj Name	Est Lvl (e.g. +/- 10%)	CapEx		2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	
Totals		OpEx	0.000	3.506	0.000	0.000	0.000	0.000	0.000	3.506
		Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		CIAC/Reimbursement	0.000	0.013	0.000	0.000	0.000	0.000	0.000	0.013
			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Total	0.000	3.519	0.000	0.000	0.000	0.000	0.000	3.519

4.4 Project Budget Summary Table

Project Costs Per Business Plan

Current Planning Horizon (\$M)								
		Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6 +	
Spend (\$M)	Prior Yrs	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	Total
CapEx	0.000	3.506	0.000	0.000	0.000	0.000	0.000	3.506
OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Removal	0.000	0.013	0.000	0.000	0.000	0.000	0.000	0.013
CIAC/Reimbursement	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	3.519	0.000	0.000	0.000	0.000	0.000	3.519

Variance (Business Plan-Project Estimate)

Current Planning Horizon (\$M)								
		Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6 +	
Spend (\$M)	Prior Yrs	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	Total
CapEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CIAC/Reimbursement	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000



Short Form Sanction Paper

5 Key Milestones

Milestone	Target Date: (Month/Year)
Sanction Paper Approval	March 2017
Begin Construction	April 2017
Complete Construction	March 2018
Sanction Paper Closure	June 2018

6 Statements of Support

6.1.1 Supporters

The supporters listed have aligned their part of the business to support the project.

Role	Individual	Responsibilities
Investment Planner	Patrick Pensabene	Endorses relative to 5-year business plan or emergent work
Resource Planning	Falls, Jonathon	Endorses Resources, cost estimate, schedule, and Portfolio Alignment
Project Management	Fortier, Joseph Jr.	Endorses Resources, cost estimate schedule
Gas Project Estimation	Paul, Art	Endorses Cost Estimate

6.1.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

Reviewer List	Individual
Finance	Easterly, Patricia
Regulatory	Zschokke, Peter
Jurisdictional Delegate	Currie, John
Procurement	Curran, Art
Control Center	Loiacono, Paul


6.1.3 List References

N/A

Short Form Sanction Paper



7 Decisions

I:	
(a)	APPROVE this paper and the investment of \$3.519M and a tolerance of +/-10%
(b)	NOTE that Dan Sancomb is the Project Manager and has the approved financial delegation.
Signature.....	 <i>ON BEHALF OF</i> <i>ROSS TURRINI</i> Date <i>3/5/17</i>
Ross Turrini	
Senior Vice President - Gas Process and Engineering	

Short Form Sanction Paper



Other Appendices

N/A

7.1 Sanction Request Breakdown by Project

N/A



Short Form Sanction Paper

Title:	FY18 Main/Service Replacement – Reactive Blanket – Rhode Island	Sanction Paper #:	USSC-17-115
Project #:	Various	Sanction Type:	Sanction
Operating Company:	The Narragansett Electric Co.	Date of Request:	3/9/2017
Author:	Fredrick Pisani	Sponsor:	Neil Proudman – VP Gas Operations, NE
Utility Service:	Gas	Project Manager:	Dan Sancomb

1 Executive Summary

1.1 Sanctioning Summary

This paper requests the sanction of CRCC210, CRFS210, CRFN210, CRFN309, CRFS309, CRFN310, CRFS310, CRFN219, and CRFS219 in the amount of \$10.499M with a tolerance of +/- 10% for the purposes of full implementation.

This sanction amount is \$10.499M broken down into:

*\$8.246M Capex
\$0.000M Opex
\$2.253M Removal*

1.2 Project Summary

This program funds the Main/Service Replacement – Reactive Program for Narragansett Electric Company. The work in this category is non-discretionary, and is randomly generated through public leak reports, programmed leak survey, mandated activities, and customer generated requests. The drivers for this category are both safety and reliability.

2 Project Detail

2.1 Background



Short Form Sanction Paper

This proposed blanket investment is to provide approved funding for the reactive replacement of gas mains/services to address leak and non-leak work activities that fall outside the normal scope of the integrity, reliability, public works and growth programs.

The proactive main and service replacement programs upgrade existing customer services prioritized by risk based on pressure, material, vintage, location, and select other variables. The potential for leakage and other maintenance activities on the remaining services exists and requires a reactive response to correct the deficiency which is the focus of this request.

2.2 Drivers

The drivers for this category are both Safety and Reliability. The goal of this program is to reduce the risk associated with main/service leaks, damages, service abandonments due to inactivity or demolition requests, customer driven relocations of existing services, and other substandard conditions. The Drivers for this category are both safety and reliability.

2.3 Project Description

Approval is being requested for the necessary funding to replace as identified service leaks, damages, service abandonments due to inactivity or demolition requests, customer driven relocations of existing mains/services, and other substandard conditions.

2.4 Benefits

The benefits of performing this work include:

- Elimination of the risk associated with these services.
- Improved community and government relations.
- Adherence to Regulatory compliance requirements.

2.5 Business & Customer Issues

There are no significant business issues beyond what has been described elsewhere.



Short Form Sanction Paper

2.6 Alternatives

These work activities are random, emergency driven, mandated and customer driven in nature, therefore, there is not an alternative to completing the activities.

2.7 Investment Recovery

Investment recovery will be through standard rate recovery mechanisms.

2.7.1 Customer Impact

This project results in an indicative first full year revenue requirement when the asset is placed in service equal to approximately \$1.450M. This is indicative only. The actual revenue requirement will differ, depending upon the timing of the next rate case and/or the timing of the next filing in which the project is included in rate base.

3 Related Projects, Scoring, Budgets

3.1 Summary of Projects

Project Number	Project Type (Elec only)	Project Title	Estimate Amount (\$M)
CRCC210		Main Replacements (Reactive) - Maintenance	0.745
CRFN219, CRFS219		Service Replacement (Reactive) - Leaks	7.256
CRFS210, CRFN210, CRFN309, CRFS309, CCRFN310, CRFS310		Service Replacements (Reactive) - Non Leaks - Other	2.498
Total			10.499



Short Form Sanction Paper

3.2 Associated Projects

N/A

3.3 Prior Sanctioning History

N/A

3.4 Category

Category	Reference to Mandate, Policy, NPV, or Other
<input checked="" type="radio"/> Mandatory	Mandatory work activities related to emergency response and regulatory compliance as stipulated in the National Grid Maintenance Plan, Federal and State Requirements. There is also mandatory work included in this sanctioning related to customer driven requests.
<input type="radio"/> Policy- Driven	
<input type="radio"/> Justified NPV	
<input type="radio"/> Other	

3.5 Asset Management Risk Score

Asset Management Risk Score: 49 (leaks)/21 (non-leak – Other)

Primary Risk Score Driver: (Policy Driven Projects Only)

☐ Reliability ☐ Environment ☐ Health & Safety ☒ Not Policy Driven

3.6 Complexity Level

☐ High Complexity ☐ Medium Complexity ☒ Low Complexity ☐ N/A

Complexity Score: __15__



Short Form Sanction Paper

3.7 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
March 2018	Closure Paper

4 Financial

4.1 Business Plan

Business Plan Name & Period	Project included in approved Business Plan?	Over / Under Business Plan	Project Cost relative to approved Business Plan (\$M)
FY18 – FY27 Capital Plan - Gas	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Over <input type="radio"/> Under <input checked="" type="radio"/> NA	\$0.000M

4.1.1 If cost is not aligned with approved Business Plan how will this be funded?

N/A

4.2 CIAC / Reimbursement

N/A



Short Form Sanction Paper

4.3 Cost Summary Table

					Current Planning Horizon (\$M)							
Number	Proj. Num.	Name	Proj. Est. Lvl	Spend	Prior Yrs	Yr 1 2017/18	Yr 2 2018/19	Yr 3 2019/20	Yr 4 2020/21	Yr 5 2021/22	Yr 6 + 2022/23	Total
CRCC210		Man Replacements (Reactive) - Maintenance	Est. Lvl (e.g. +/- 10%)	CapEx	0.000	0.522	0.000	0.000	0.000	0.000	0.000	0.522
				OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
				Removal	0.000	0.223	0.000	0.000	0.000	0.000	0.000	0.223
				CIAC/Reimbursement	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Number	Proj. Num.	Name	Proj. Est. Lvl	Spend	Prior Yrs	Yr 1 2017/18	Yr 2 2018/19	Yr 3 2019/20	Yr 4 2020/21	Yr 5 2021/22	Yr 6 + 2022/23	Total
CRF1219, CRFS219		Service Replacements (Reactive) - Leaks	Est. Lvl (e.g. +/- 10%)	CapEx	0.000	0.588	0.000	0.000	0.000	0.000	0.000	0.588
				OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
				Removal	0.000	0.663	0.000	0.000	0.000	0.000	0.000	0.663
				CIAC/Reimbursement	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Number	Proj. Num.	Name	Proj. Est. Lvl	Spend	Prior Yrs	Yr 1 2017/18	Yr 2 2018/19	Yr 3 2019/20	Yr 4 2020/21	Yr 5 2021/22	Yr 6 + 2022/23	Total
CRFS210, CRF1210, CRF1309, CRFS309, CCRF1310, CRFS310		Service Replacements (Reactive) - Non Leaks - Other	Est. Lvl (e.g. +/- 10%)	CapEx	0.000	1.137	0.000	0.000	0.000	0.000	0.000	1.137
				OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
				Removal	0.000	1.361	0.000	0.000	0.000	0.000	0.000	1.361
				CIAC/Reimbursement	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
					Prior Yrs	Yr 1 2017/18	Yr 2 2018/19	Yr 3 2019/20	Yr 4 2020/21	Yr 5 2021/22	Yr 6 + 2022/23	Total
Totals					0.000	8.247	0.000	0.000	0.000	0.000	0.000	8.247
					0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
					0.000	2.252	0.000	0.000	0.000	0.000	0.000	2.252
					0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total					0.000	10.499	0.000	0.000	0.000	0.000	0.000	10.499

4.4 Project Budget Summary Table

Project Costs Per Business Plan

Current Planning Horizon (\$M)								
Spend (\$M)	Prior Yrs	Yr 1 2017/18	Yr 2 2018/19	Yr 3 2019/20	Yr 4 2020/21	Yr 5 2021/22	Yr 6 + 2022/23	Total
CapEx	0.000	8.247	0.000	0.000	0.000	0.000	0.000	8.247
OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Removal	0.000	2.252	0.000	0.000	0.000	0.000	0.000	2.252
CIAC/Reimbursement	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total		10.499	0.000	0.000	0.000	0.000	0.000	10.499

Variance (Business Plan-Project Estimate)

Current Planning Horizon (\$M)								
Spend (\$M)	Prior Yrs	Yr 1 2017/18	Yr 2 2018/19	Yr 3 2019/20	Yr 4 2020/21	Yr 5 2021/22	Yr 6 + 2022/23	Total
CapEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CIAC/Reimbursement	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total		0.000	0.000	0.000	0.000	0.000	0.000	0.000



Short Form Sanction Paper

5 Key Milestones

Milestone	Target Date: (Month/Year)
Sanction Paper Approval	March 2017
Construction Start Date	April 2017
Construction Complete	March 2018
Closure Paper	June 2018

6 Statements of Support

6.1.1 Supporters

The supporters listed have aligned their part of the business to support the project.

Role	Individual	Responsibilities
Investment Planner	Pensabene, Patrick	Endorses relative to 5-year business plan or emergent work
Resource Planning	Falls, Jonathon	Endorses Resources, cost estimate, schedule, and Portfolio Alignment
Project Management	Fortier, Joseph Jr.	Endorses Resources, cost estimate schedule
Gas Project Estimation	Paul, Art	Endorses Cost Estimate

6.1.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

Reviewer List	Individual
Finance	Easterly, Patricia
Regulatory	Zschokke, Peter
Jurisdictional Delegate	Currie, John
Procurement	Curran, Art
Control Center	Loiacono, Paul



Short Form Sanction Paper

6.1.3 List References

N/A

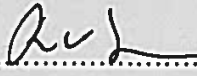
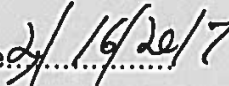
Short Form Sanction Paper



7 Decisions

The US Sanctioning Committee (USSC) at a meeting held on March 9, 2017

- (a) APPROVE this paper and the investment of \$10.499M and a tolerance of +/-10%
- (b) NOTE that Dan Sancomb is the Project Manager and has the approved financial delegation.
- (c) NOTE: In the event that any Blanket projects are not approved prior to the start of the FY2019 fiscal year, the FY2018 approval limits will remain in effect until such time as the FY2019 blanket projects are approved by USSC and/or other appropriate authority for approval.

Signature. .....Date. .....

Ross Turrini
Senior Vice President - Gas Process and Engineering



Short Form Sanction Paper

Other Appendices

N/A

7.1 Sanction Request Breakdown by Project

N/A



Short Form Sanction Paper

Title:	FY18 Gas System Reliability Program – RI	Sanction Paper #:	USSC-17-038
Project #:	CRCC401	Sanction Type:	Sanction
Operating Company:	The Narragansett Electric Co.	Date of Request:	February 21, 2017
Author:	Adnan Malik / Eric Aprigliano	Sponsor:	John Stavrakas – VP Gas Asset Management
Utility Service:	Gas	Project Manager:	Charles Lewitt

1 Executive Summary

1.1 Sanctioning Summary

This paper requests sanction of CRCC401 in the amount \$2.250M with a tolerance of +/- 10% for the purposes of full implementation.

This sanction amount for CRCC401 is \$2.250M broken down into:

*\$1.805M Capex
\$0.000M Opex
\$0.445M Removal*

1.2 Project Summary

The gas system reliability program is comprised of projects focused on improving overall system reliability by providing operational benefits to customers beyond those of traditional gas system reinforcement projects. The overall reliability of a gas distribution system relates to its ability to maintain continuous service to existing customers during abnormal operating conditions (e.g., unexpected shutdown of a pipeline facility). Construction of the projects proposed in this program will improve reliability for the equivalent of approximately 3,760 Rhode Island gas distribution system customers through initiatives such as system integration and eliminating single-feed gas systems.

2 Project Detail

2.1 Background

The Long Term Planning reliability projects are identified and developed to improve the overall reliability of the Company's transmission and distribution systems. The Rhode Island distribution network consists of over fifty (50) independent distribution and feeder systems. Pressure and flow on the system is controlled through a network of cascading feeder and distribution systems fed by eighteen (18) take stations and production facilities and consisting of one hundred ninety eight (198) regulator stations. Reliability is defined in this context as the likelihood or probability of experiencing



Short Form Sanction Paper

customer service outages on all or portions of these systems. The distribution network layout and operation of these systems vary significantly by area. Differences in design practices of legacy companies over many decades have resulted in significant variation in levels of reliability throughout Rhode Island, and the entire US gas distribution service territory. In some cases, expansion of both the customer base and distribution mains has resulted in changes on the system that negatively impact reliability over time (i.e., probability and number of customers at risk increases). Reliability is assessed by reviewing the ability of various operating systems to respond to abnormal operating conditions (e.g., shutdown of pipeline or facility). Gas system reliability concerns include transmission and distribution systems with limited number of feeds (i.e., take stations or regulator stations), systems that are either weakly integrated or consist of long single-feed laterals, networks that contain a wide variety of operating pressures, pressure regulating equipment in areas prone to flooding, and varying design philosophies associated with system and equipment redundancy (e.g., production plants, take stations, regulator stations).

Reliability projects that improve reliability and operation of the distribution system in a cost-efficient manner are identified and proposed for construction. Prospective projects are evaluated for additional system benefits and synergy with other proposed capital projects and often have the added benefit of increasing system capacity and improving operability of the network. In addition, many of these projects also create the opportunity to replace or abandon leak-prone pipe, providing a benefit to the integrity program or be combined with public works activities.

2.2 Drivers

The goal and primary driver of the program is to improve overall system reliability. This year's program improves reliability for the equivalence of approximately 3,760 existing customers. The program includes a variety of types of projects that create flexibility in how the system is operated and adaptability for abnormal system operation scenarios.

A major driver in the FY 2017/18 Program looks to improve reliability in operability and maintenance of system regulators under adverse conditions while removing risks of customer outages. Almost every project hopes to integrate a single-feed system into other nearby larger system. There is a significant reliability benefit achieved in reducing the number of isolated systems that exist by connecting them to larger systems. The three (3) major benefits are: first, it creates new connections into distribution systems for better supply into the system; second, it reduces the possibility of customer outages in the event of a regulator abnormal operation issue or third-party damage; and third, in some cases a regulator can be abandoned once the isolated system is connected to the larger distribution system, reducing O&M costs. One method is via system downgrading, while three additional projects in the FY2018 reliability program look to increase reliability by transferring customers to a higher pressure system while replacing inventory of leak-prone pipe.



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2.3 Project Description

The gas planning program includes the design, procurement, construction, testing, and completion of capital projects. A full list of the Gas Planning Reliability Program projects for Rhode Island is provided in Appendix 1. The projects, totaling \$2.25M, are organized by the following work types:

- **Single Feed System Elimination – Four (4) Projects**
There are currently over 150 distribution systems fed by a single district regulator across the U.S. distribution system, with 27 in the legacy Rhode Island Company. These projects improve overall reliability by working towards reducing that number. Two projects are continuations of a phased approach towards eliminating two separate district regulators by upgrading the downstream distribution system and integrating with the higher pressure 99 psig system in Lincoln and 8 psig system in Bristol. Another project similarly is a phased approach towards integration of a single feed 35 psig system and a dead-end 10 psig system in Newport that was previously deferred in FY17. Ideally, projects that involve a pressure upgrade or upgrading are preferred when easily feasible, as system capacity is also improved enabling the addition of new customers without reinforcement. However, certain conditions make downgrading a more feasible option such as the proposed project also deferred from FY17 in East Providence allowing the system to be integrated with the Pawtucket 18 psig system.
- **Carryover Costs from Fiscal Year 2017 Projects**
These costs are for remaining work on projects from FY17 program, including final restoration costs. These estimates are based on remaining work on an individual project level basis for each project in FY17.
- **Flood Zone Remediation– One (1) Project**
This is a project addressing pipeline facilities (district regulators) that have experienced flooding and that may impact a substantial number of customers if out of service. The project addresses reliability concerns that occur at the Wood at Woodlawn regulator situated in a flood zone in Bristol, Rhode Island, particularly during periods with large amounts of rainfall. This involves the relocation of the flooding district regulator to an area outside of the floodzone.
- **Engineering Costs for Fiscal Year 2019 Projects Placeholder**
These costs are for engineering and design of projects identified for FY19 construction. The Level 1 estimate was determined by Project Engineering and based on historical data.

2.4 Benefits

In summary, the above mentioned work will improve reliability to over 3,760 customers. The projects work towards the elimination of four (4) single feed systems, eliminating one by the end of the Fiscal Year 18, and also benefits System Integrity's risk assessment program with the replacement of 4,552 LF of leak-prone pipe.

2.5 Business & Customer Issues

There are no significant business issues beyond what has been described elsewhere.



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2.6 Alternatives

Alternative 1: Do Nothing/Deferral

The consequences of not completing the proposed work would result in a failure to take advantage of cost-effective ways to improve distribution system reliability in a proactive manner as discussed above. It could also potentially result in disruption of service for up to approximately 3,760 customers with adverse operation conditions.

2.7 Investment Recovery

Investment recovery will be through standard rate recovery mechanisms.

2.7.1 Customer Impact

This project results in an indicative first full year revenue requirement when the asset is placed in service equal to approximately \$0.369M. This is indicative only. The actual revenue requirement will differ, depending upon the timing of the next rate case and/or the timing of the next filing in which the project is included in rate base.

3 Related Projects, Scoring, Budgets

3.1 Summary of Projects

Project Number	Project Title	Estimate Amount (\$M)
CRCC401	Gas System Reliability - RI	2.250
Total		2.250

3.2 Associated Projects

N/A

3.3 Prior Sanctioning History

N/A

3.4 Category

Category	Reference to Mandate, Policy, NPV, or Other
<input type="radio"/> Mandatory	National Grid's goal is to operate a reliable gas distribution system and thus maintain continuous, uninterrupted service to all customers throughout the year. National Grid has established system minimum pressures to be maintained for all pressure levels.
<input checked="" type="radio"/> Policy- Driven	
<input type="radio"/> Justified NPV	
<input type="radio"/> Other	



Short Form Sanction Paper

3.5 Asset Management Risk Score

Asset Management Risk Score: 39

Primary Risk Score Driver: (Policy Driven Projects Only)

☒ Reliability ☐ Environment ☐ Health & Safety ☐ Not Policy Driven

3.6 Complexity Level

☐ High Complexity ☐ Medium Complexity ☒ Low Complexity ☐ N/A

Complexity Score: 15

3.7 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
July 2018	Project Closure

4 Financial

4.1 Business Plan

Business Plan Name & Period	Project included in approved Business Plan?	Over / Under Business Plan	Project Cost relative to approved Business Plan (\$M)
FY18-FY22 Gas Budget File	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Over <input type="radio"/> Under <input checked="" type="radio"/> NA	0.000

4.1.1 If cost is not aligned with approved Business Plan how will this be funded?

N/A

4.2 CIAC / Reimbursement

N/A

4.3 Cost Summary Table

Project Number	Project Title	Project Estimate Level (%)	Spend	Prior Yrs	Current Planning Horizon (\$M)						Total
					Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
CRCC401	Gas System Reliability - RI	+/- 10%	CapEx	-	1.805	-	-	-	-	-	1.805
			OpEx	-	-	-	-	-	-	-	-
			Removal	-	0.445	-	-	-	-	-	0.445
			Total	-	2.250	-	-	-	-	-	2.250



Short Form Sanction Paper

4.4 Project Budget Summary Table

Project Costs Per Business Plan

\$M	Prior Yrs (Actual)	Current Planning Horizon (\$M)						Total
		Yr. 1 2017/18	Yr. 2 2018/19	Yr. 3 2019/20	Yr. 4 2020/21	Yr. 5 2021/22	Yr. 6 + 2022/23	
CapEx	0.000	1.805	0.000	0.000	0.000	0.000	0.000	1.805
OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Removal	0.000	0.445	0.000	0.000	0.000	0.000	0.000	0.445
Total Cost in Bus. Plan	0.000	2.250	0.000	0.000	0.000	0.000	0.000	2.250

Variance (Business Plan-Project Estimate)

\$M	Prior Yrs (Actual)	Current Planning Horizon (\$M)						Total
		Yr. 1 2017/18	Yr. 2 2018/19	Yr. 3 2019/20	Yr. 4 2020/21	Yr. 5 2021/22	Yr. 6 + 2022/23	
CapEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

5 Key Milestones

Milestone	Target Date: (Month/Year)
Sanctioning Approval	02/2017
Begin Construction	04/2017
Projects in Service	11/2017
Construction Complete	03/2018
Project Closeout	07/2018

6 Statements of Support

6.1.1 Supporters

The supporters listed have aligned their part of the business to support the project.

Role	Individual	Responsibilities
Investment Planner	Pensabene, Patrick	Endorses relative to 5-year business plan or emergent work.
Resource Planning	Falls, Jonathon	Endorses resources, cost estimate, schedule, and portfolio alignment.
Project Management	Fortier, Joseph Jr.	Endorses resources, cost estimate, and schedule.
Gas Project Estimation	Paul, Arthur	Endorses cost estimate.



Short Form Sanction Paper

6.1.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

Reviewer List	Individual
<i>Finance</i>	Easterly, Patricia
<i>Regulatory</i>	Zschokke, Peter
<i>Jurisdictional Delegates</i>	Currie, John
<i>Procurement</i>	Curran, Art
<i>Control Center</i>	Loiacono, Paul


6.1.3 List References

1	US Enterprise 5-Year Distribution System Reinforcement & Reliability Plan
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Short Form Sanction Paper

7 Decisions

I:	
(a)	APPROVE this paper and the investment of \$2.250M and a tolerance of +/-10%
(b)	NOTE that Charles Lewitt is the Project Manager and has the approved financial delegation.
(c)	NOTE: In the event that any blanket projects are not approved prior to the start of the FY19 fiscal year, the FY18 approval limits will remain in effect until such time as the FY19 blanket projects are approved by USSC and/or other appropriate authority for approval.
Signature.....	Date.....
Executive Sponsor – Ross Turrini, SVP Gas Process & Engineering	



Short Form Sanction Paper

8 Other Appendices

8.1 Sanction Request Breakdown by Project

Appendix 1 – FY18 Rhode Island Reliability Projects

Work Type	Town	Project Description	Length	Size	MAOP
Single Feed Elimination	Bristol	Phase 3 of 3 Gibson LP Retirement: Relay 1,415 LF of LP with 4-in PE 8 psig main in Chester Ave from Gibson Rd to Sandra Dr (6 svc), 540 LF of LP with 4-in PE 8 psig main in Sandra Dr (20 svc), 230 LF of LP with 4-in PE 8 psig main in Celia Ct (1 svc), 692 LF of 6-in PE, 213 LF of 4-in WS LP with 905 LF of 4-in PE 8 psig main in Ridge Rd from Gibson Rd to Mulberry Rd (9 svc), & abandon Gibson Rd LP Regulator BW003.	3,090	4	LP to 8
Flood Prone Regulator	Bristol	Relocate flood-prone Regulator Station RIS-BW007 (Wood @ Woodlawn) to Fox Hill Ave & Burton St. Install 740 LF of 4-in PL 60 psig main on Fox Hill Ave from Woodlawn Ave to Cole St. Install 500 LF of 12-in PL LP main on Cole St to existing 6-in CI from Fox Hill Ave to E St.	1,250		LP
Single Feed Elimination	East Providence	Downrate EPV 35# SF system to 18# (185 customers, 23,000LF). Coordinate with Pressure Regulation Station replacements of RIS-067 & RIS-056. Down-rating of Regulator Station 067 @ Roger Williams & Whitaker to 18 psig. Install 130 LF of 6-in PE 18 psig main on Narragansett Park Dr from #700 to #750, Install 130 LF of 6-in PE 18 psig main on Narragansett Park Dr from #411 to #435.	260	6	35 to 18
Single Feed Elimination	Lincoln	Phase 2 of 3 to eliminate the Quinn LP Single-Feed Regulator (RC015). Relay of 1,120 ft of 4-in CI LP main on Lower River Rd with 935 ft of 4-in PE 99 psig from #882 to Quinn Ln (7 svcs), 300 ft of 4-in WS LP main on Ave D with 2-in PE 99 psig from Lower River Rd to EOM (3 svcs), 380 ft of 2-in BS LP main on Ave E with 2-in PE 99 psig from Lower River Rd to EOM (6 svcs). 800 ft of 2,4-in BS, WS LP main on Ave F with 2-in PE 99 psig from Lower River Rd to EOM S/ Hidden Valley Rd (7 svcs).	2,415	4,2	LP to 99
Single Feed Elimination	Newport	Relay 1,200 LF of 4-in CI 10 psig with 6-in PE 35 psig on Wellington Ave from #35 to Harrison Ave (relay 10 services), transfer service for #4 Halidon Ave to existing 6-in PE 35 psig, & abandon 286 LF of 4-in PL 10 psig on Halidon Ave S/ Harrison Ave. Disconnect 6-in PE 10 psig main on Wellington @ Roseneath, connecting to 8-in PE 35 psig on Wellington, & uprate 1,970 LF of 6-in PE 10 psig (2012) on Wellington Ave from #35 to Roseneath St (8 services) and 762 LF of 2-in PE 10 psig (1992) on Columbus Ave (3 services). Cut & Cap 4-in CI 10 psig at Wellington @ Thames, abandoning 990 LF of 4-in CI, 472 LF of 6-in PL 10 psig main on Wellington Ave.	1,220	6	10 to 35
Engineering	Various	Surveying, Engineering, & Permitting costs associated with 2018 Reliability Projects.			
Carryover	Various	Carry-over costs associated with 2016/17 Projects WO#162565 - Lower River LNC (Restoration) WO#162566 - Aylsworth WSO (Restoration)			



Short Form Sanction Paper

Title:	FY18 Instrumentation & Regulation (I&R) – Reactive Blanket - RI	Sanction Paper #:	USSC-17-128
Project #:	CRIC213	Sanction Type:	Sanction
Operating Company:	The Narragansett Electric Co.	Date of Request:	March 21, 2017
Author:	John Barrett/Maureen Daly	Sponsor:	Neil Proudman – Vice President , NE Gas Operations
Utility Service:	Gas	Project Manager:	John Barrett

1 Executive Summary

1.1 Sanctioning Summary

This paper requests sanction of CRIC213 in the amount \$1.300M with a tolerance of +/- 10% for the purposes of full implementation.

This sanction amount is \$1.300M broken down into:

*\$1.275M Capex
\$0.000M Opex
\$0.025M Removal*

1.2 Project Summary

Pressure regulating facilities have been designed to safely and reliably control system pressures and maintain continuity of supply during periods of normal and peak gas demand. There are 194 pressure regulating facilities in the Rhode Island service territory. The Instrumentation and Regulation (I&R) Reactive Capital Program focuses on capital upgrades/improvements and replacements of pressure regulating facilities throughout the year. This program contributes to the high reliability of the Rhode Island distribution system.

2 Project Detail

This program is an annual capital improvement/replacement program. During the course of the year several projects are highlighted by I&R field staff due to equipment



Short Form Sanction Paper

damage and/or unsatisfactory operating issues. Projects mainly include valve replacements, regulator replacements and instrumentation upgrades/replacements.

2.1 Background

This program is an annual capital program. The work plan mainly consists of projects that are highlighted by the various field supervisors over the course of the year. During maintenance inspections crews come across broken doors, broken valves, etc. that need to be replaced as soon as possible. Lightning storms, vehicles hitting traffic boxes, etc. also lead to instrumentation being damaged and in need of immediate replacement.

2.2 Drivers

2.3 Project Description

The I&R Reactive budget is designed to address capital project requirements over and above what the Pressure Regulation Capital budget provides. I&R Reactive projects range from instrumentation replacement due to weather or vehicular damage, replacement of obsolete/unreliable equipment, such as regulators, pilots, boilers, heat exchangers, odorant equipment and replacement of building roofs or doors due to deterioration. There are approximately 194 I&R facilities in Rhode Island that require continuous assessment. In addition to the above mentioned work, valve replacements are also included in this budget.

2.4 Benefits

The reactive regulator program will help to ensure continuous and reliable service to our customers. This program will increase reliability by refurbishing existing stations, and replacing obsolete/unreliable equipment. In many cases capital replacement are required as soon as possible. This budget allows the I&R group to react swiftly to any operational deficiencies.

2.5 Business & Customer Issues

There are no significant business issues beyond what has been described elsewhere

2.6 Alternatives

Alternative 1: Do Nothing/Defer Project

Doing nothing or deferring this program does not meet our obligation to provide safe and reliable gas service, nor the longer term objective of improving the operation and performance of the pressure regulating stations. The consequences of not completing the work scheduled will result in increased risks associated with the



Short Form Sanction Paper

failure of station equipment, and/or the stations associated piping. Specifically, failure to complete identified work would reduce the integrity of the system and potentially result in significant customer outages.

2.7 Investment Recovery

Investment recovery will be through standard rate recovery mechanisms.

2.7.1 Customer Impact

This project results in an indicative first full year revenue requirement when the asset is placed in service equal to approximately \$0.261M. This is indicative only. The actual revenue requirement will differ, depending upon the timing of the next rate case and/or the timing of the next filing in which the project is included in rate base.

3 Related Projects, Scoring, Budgets

3.1 Summary of Projects

Project Number	Project Type (Elec only)	Project Title	Estimate Amount (\$M)
CRIC213		I&R - Reactive Program - RI	1.300
Total			1.300

3.2 Associated Projects

Project Number	Project Title	Estimate Amount (\$M)
CRIC402	Pressure Regulating Facilities	1.640
Total		1.640

3.3 Prior Sanctioning History

N/A

Short Form Sanction Paper



3.4 Category

Category	Reference to Mandate, Policy, NPV, or Other
<input type="radio"/> Mandatory	National Grid Document ENG01001 – “Design of Gas Regulator Stations – Part 1”
<input checked="" type="radio"/> Policy- Driven	National Grid Document ENG01002 – “Design of Gas Regulator Stations – Part 2”
<input type="radio"/> Justified NPV	
<input type="radio"/> Other	

3.5 Asset Management Risk Score

Asset Management Risk Score: 40

Primary Risk Score Driver: (Policy Driven Projects Only)

☐ Reliability ☐ Environment ☒ Health & Safety ☐ Not Policy Driven

3.6 Complexity Level

☐ High Complexity ☐ Medium Complexity ☒ Low Complexity ☐ N/A

Complexity Score: 15

3.7 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
June 2018	Project Closure



Short Form Sanction Paper

4 Financial

4.1 Business Plan

Business Plan Name & Period	Project included in approved Business Plan?	Over / Under Business Plan	Project Cost relative to approved Business Plan (\$)
FY18-FY22 Capital Plan – Gas	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Over <input type="radio"/> Under <input checked="" type="radio"/> NA	\$0.000

The basis of the budget estimate is historical spending levels.

4.1.1 If cost > approved Business Plan how will this be funded?

N/A

4.2 CIAC / Reimbursement

N/A

4.3 Cost Summary Table

Project Number	Project Title	Project Estimate Level (%)	Spend	Prior Yrs	Current Planning Horizon (\$M)						
					Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	Total
					2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	
CRIC213	I&R - Reactive Program - RI	Est Lvl (e.g. +/- 10%)	CapEx	-	1.275	-	-	-	-	-	1.275
			OpEx	-	-	-	-	-	-	-	
			Removal	-	0.025	-	-	-	-	0.025	
			Total	-	1.300	-	-	-	-	1.300	
Total Project Sanction			CapEx	-	1.275	-	-	-	-	-	1.275
			OpEx	-	-	-	-	-	-	-	
			Removal	-	0.025	-	-	-	-	0.025	
			Total	-	1.300	-	-	-	-	1.300	

4.4 Project Budget Summary Table

Project Costs Per Business Plan

		Current Planning Horizon (\$M)						
	Prior Yrs	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
\$M	(Actual)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	Total
CapEx	0.000	1.275	0.000	0.000	0.000	0.000	0.000	1.275
OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Removal	0.000	0.025	0.000	0.000	0.000	0.000	0.000	0.025
Total Cost in Bus. Plan	0.000	1.300	0.000	0.000	0.000	0.000	0.000	1.300

Short Form Sanction Paper



Variance (Business Plan-Project Estimate)

\$M	Prior Yrs (Actual)	Current Planning Horizon (\$M)						Total
		Yr. 1 2017/18	Yr. 2 2018/19	Yr. 3 2019/20	Yr. 4 2020/21	Yr. 5 2021/22	Yr. 6 + 2022/23	
CapEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

5 Key Milestones

Milestone	Target Date: (Month/Year)
Sanction Approval	March 2017
Construction start	April 2017
Construction complete	March 2018
Project Closure	June 2018

6 Statements of Support

6.1.1 Supporters

The supporters listed have aligned their part of the business to support the project.

Role	Individual	Responsibilities
Investment Planner	Pensabene, Patrick M.	Endorses relative to 5-year business plan or emergent work
Resource Planning	Falls, Jonathon	Endorses Resources, cost estimate, schedule, and Portfolio Alignment
Project Management	Fortier, Joseph Jr.	Endorses Resources, cost estimate, schedule
Gas Project Estimation	Paul, Art	Endorses Cost Estimate

Short Form Sanction Paper



6.1.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

Reviewer List	Individual
Finance	Easterly, Patricia
Regulatory	Zschokke, Peter
Jurisdictional Delegate	Currie, John
Procurement	Curran, Art
Control Center	Loiacono, Paul

Short Form Sanction Paper



7 Decisions

- I:
- (a) APPROVE this paper and the investment of \$1.300M and a tolerance of +/-10%
 - (b) NOTE that John Barrett is the Project Manager and has the approved financial delegation.
 - (c) NOTE: In the event that any Blanket projects are not approved prior to the start of the FY2019 fiscal year, the FY2018 approval limits will remain in effect until such time as the FY2019 blanket projects are approved by USSC and/or other appropriate authority for approval.

Signature..... *[Handwritten Signature]* on behalf of Date..... *3/30/17*
Executive Sponsor – Ross Turrini *[Handwritten Signature]*
Senior Vice President, Gas Process & Engineering Group Chief Engineer-Gas

Short Form Sanction Paper



8 Other Appendices

8.1 *Sanction Request Breakdown by Project*

N/A



Short Form Sanction Paper

Title:	FY18 Pressure Regulating Facilities - RI	Sanction Paper #:	USSC-17-083
Project #:	CRIC402, C077237	Sanction Type:	Sanction
Operating Company:	The Narragansett Electric Co.	Date of Request:	March 7, 2017
Author:	Stephen Soroka	Sponsor:	John S. Stavrakas, Vice President – Gas Asset Management
Utility Service:	Gas	Project Manager:	Joseph Fortier

1 Executive Summary

1.1 Sanctioning Summary

This paper requests sanction of CRIC402 and C077237 in the amount \$1.640M with a tolerance of +/- 10% for the purposes of full implementation.

This sanction amount is \$1.640M broken down into:

*\$1.529M Capex
\$0.000M Opex
\$0.111M Removal*

1.2 Project Summary

Pressure regulating facilities have been designed to safely and reliably control system pressures and maintain continuity of supply during periods of normal and peak gas demand. There are 194 facilities in the Rhode Island service territory. The Pressure Regulating Facilities Program focuses on capital upgrades/improvements and replacement installations of pressure regulating stations.

2 Project Detail

2.1 Background

This program is an annual capital improvement program. In order to determine the work plan, all 194 stations have been inspected and risk ranked once every three (3) years. Using data from the annual Performance Testing (PT), Cathodic Protection (CP) testing, risk assessments and on-site inspections; technical assessments were made for each pressure regulating station taking into account: pipe and equipment condition, operating pressure, regulator performance, and corrosion data. This information combined with



Short Form Sanction Paper

the potential customer impact resulting from a station outage was used to prioritize and schedule projects within the Capital Improvement Plan in accordance with the National Grid Distribution Integrity Management Plan (DIMP).

2.2 Drivers

Key Drivers are asset condition and reliability.

2.3 Project Description

The Proactive Regulator Program for FY18 includes the following work:

Station's RIS-067/056 is located at Roger Williams and Puritan in East Providence, RI. These stations were built in 1969, and each have two-stage regulation (monitor and control) where each device is contained within its own vault. The inlet MAOP is 99PSIG for RIS-067 and 35PSIG for RIS-056 PSIG. The Outlet for the RIS-067 station is 35PSIG and the outlet for the RIS-056 station is . Peak flow through RIS-067 is 109 MSCFH and peak flow through RIS-056 is 51.1 MSCFH. Losing these stations could potentially impact approximately 3,566 customers based on average residential usage. The piping and equipment are outdated. This station will be replaced with a standard prefabricated regulator station with two layers of protection (housed in individual vaults), redundant runs, and up-to-date telemetry.

Two stations have also been identified for abandonment in FY18. Station RIN-C011 is located at Newland Ave @ Cumberland Hill Rd in Woonsocket, RI. The other station to be abandoned in FY18 is RIS-N214, located at Edge Hill Dr @ Harrison in Newport, RI. These stations have become obsolete and are no longer needed to feed the nearby low pressure neighborhoods in Newport and Woonsocket, RI.

The FY18 budget was built based on the budget level and actual spend for this program in FY17, as well as detailed project estimates for each of the projects identified above.



Short Form Sanction Paper

2.4 Benefits

The proactive regulator program will help to ensure continuous and reliable service to our customers. This program will increase reliability by installing new stations, refurbishing existing stations, and replacing obsolete equipment.

2.5 Business & Customer Issues

There are no significant business issues beyond what has been described elsewhere.

2.6 Alternatives

Alternative 1: Do Nothing/Defer Project

Doing nothing or deferring this program does not meet our obligation to provide safe and reliable gas service, nor the longer term objective of improving the operation and performance of the pressure regulating stations. The consequences of not completing the work scheduled will result in increased risks associated with the failure of station equipment, and/or the stations associated piping. Specifically, failure to complete identified work would reduce the integrity of the system and potentially result in significant customer outages.

2.7 Investment Recovery

Investment recovery will be through standard rate recovery mechanisms.

2.7.1 Customer Impact

This project results in an indicative first full year revenue requirement when the asset is placed in service equal to approximately \$0.313M. This is indicative only. The actual revenue requirement will differ, depending upon the timing of the next rate case and/or the timing of the next filing in which the project is included in rate base.



Short Form Sanction Paper

3 Related Projects, Scoring, Budgets

3.1 Summary of Projects

Project Number	Project Type (Elec only)	Project Title	Estimate Amount (\$M)
C077237	N/A	Roger Williams @ Puritan/Whitaker	1.355
CRIC402	N/A	FY18 Pressure Regulating Facilities - RI	0.285
Total			1.640

3.2 Associated Projects

N/A

3.3 Prior Sanctioning History

N/A

3.4 Category

Category	Reference to Mandate, Policy, NPV, or Other
<input type="radio"/> Mandatory	National Grid Document ENG01001 – “Design of Gas Regulator Stations – Part 1” National Grid Document ENG01002 – “Design of Gas Regulator Stations – Part 2”
<input checked="" type="radio"/> Policy- Driven	
<input type="radio"/> Justified NPV	
<input type="radio"/> Other	



Short Form Sanction Paper

3.5 Asset Management Risk Score

Asset Management Risk Score: 30

Primary Risk Score Driver: (Policy Driven Projects Only)

☒ Reliability ☐ Environment ☐ Health & Safety ☐ Not Policy Driven

3.6 Complexity Level

☐ High Complexity ☐ Medium Complexity ☒ Low Complexity ☐ N/A

Complexity Score: 15

3.7 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
June 2018	Closure Paper

4 Financial

4.1 Business Plan

Business Plan Name & Period	Project included in approved Business Plan?	Over / Under Business Plan	Project Cost relative to approved Business Plan (\$M)
FY18-FY22 Capital Plan - Gas	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Over <input type="radio"/> Under <input checked="" type="radio"/> NA	\$0.000M



Short Form Sanction Paper

4.1.1 If cost is not aligned with approved Business Plan how will this be funded?

N/A

4.2 CIAC / Reimbursement

N/A

4.3 Cost Summary Table

					Current Planning Horizon						
Project Number	Project Title	Project Estimate Level (%)		Prior Yrs	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
					2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	
C077237	Roger Williams, PVD, RIS-067/056	Est Lvl (e.g. +/- 10%)	CapEx	0.000	1.285	0.000	0.000	0.000	0.000	0.000	1.285
			OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
			Removal	0.000	0.070	0.000	0.000	0.000	0.000	0.070	
			Total	0.000	1.355	0.000	0.000	0.000	0.000	1.355	
CRIC402	FY18 Pressure Regulating Facilities Program - RI	Est Lvl (e.g. +/- 10%)	CapEx	0.000	0.244	0.000	0.000	0.000	0.000	0.244	
			OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
			Removal	0.000	0.041	0.000	0.000	0.000	0.000	0.041	
			Total	0.000	0.285	0.000	0.000	0.000	0.000	0.285	
Total Project Sanction			CapEx	0.000	1.529	0.000	0.000	0.000	0.000	1.529	
			OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
			Removal	0.000	0.111	0.000	0.000	0.000	0.000	0.111	
			Total	0.000	1.640	0.000	0.000	0.000	0.000	1.640	

4.4 Project Budget Summary Table

Project Costs Per Business Plan

\$M	Prior Yrs (Actual)	Current Planning Horizon						Total
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
		2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	
CapEx	0.000	1.529	0.000	0.000	0.000	0.000	0.000	1.529
OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Removal	0.000	0.111	0.000	0.000	0.000	0.000	0.000	0.111
Total Cost in Bus. Plan	0.000	1.640	0.000	0.000	0.000	0.000	0.000	1.640

Variance (Business Plan-Project Estimate)

\$M	Prior Yrs (Actual)	Current Planning Horizon						Total
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
		2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	
CapEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000



Short Form Sanction Paper

5 Key Milestones

Milestone	Target Date: (Month/Year)
Sanction Approval	March 2017
Delivery of Materials	April 2017
Start Construction	April 2017
Complete Construction	December 2017
Project Closure	June 2018

6 Statements of Support

6.1.1 Supporters

The supporters listed have aligned their part of the business to support the project.

Role	Individual	Responsibilities
<i>Investment Planning</i>	Pensabene, Patrick M.	Endorses relative to 5-year business plan or emergent work
<i>Resource Planning</i>	Falls, Jonathon	Endorses Resources, cost estimate, schedule, and Portfolio Alignment
<i>Project Management</i>	Fortier, Joseph Jr.	Endorses Resources, cost estimate, schedule
<i>Gas Project Estimation</i>	Paul, Art	Endorses Cost Estimate

6.1.2 Reviewers


The reviewers have provided feedback on the content/language of the paper.

Reviewer List	Individual
Finance	Easterly, Patricia
Regulatory	Zschokke, Peter
Jurisdictional Delegate	Currie, John
Procurement	Curran, Art
Control Center	Loiacono, Paul

Short Form Sanction Paper



7 Decisions

I:	
(a)	APPROVE this paper and the investment of \$1.640M and a tolerance of +/-10%
(b)	NOTE that Joseph Fortier is the Project Manager and has the approved financial delegation.
(c)	NOTE: In the event that any Blanket projects are not approved prior to the start of the FY2019 fiscal year, the FY2018 approval limits will remain in effect until such time as the FY2019 blanket projects are approved by USSC and/or other appropriate authority for approval.
Signature  Date <u>3/17/2017</u>	
Executive Sponsor – Ross W. Turrini, SVP Gas Process & Engineering and Group Chief Engineer - Gas	

Short Form Sanction Paper



8 Other Appendices

Station	Scope of Work	Estimate (\$M)
RIS-067; Roger Williams @ Puritan, PVD	Regulator Replacement	1.355
RIN-C011, Newland Av @ Cumberland Hill Rd, WSO	Regulator Abandonment	0.065
RIS-N214, Edge Hill Dr @ Harrison, NPR	Regulator Abandonment	0.06
	FY19 Engineering Design	0.16
	Total	1.64



US Sanction Paper

Of Title:	Allen's Avenue Regulator Station Rebuild	Sanction Paper #:	USSC-15-112 v3
Project #:	C056104 & C070527	Sanction Type:	Partial Sanction
Operating Company:	The Narragansett Electric Co.	Date of Request:	10/11/2017
Author:	Paul DiLorenzo	Sponsor:	John Stavrakas Vice President, Gas Asset Management
Utility Service:	Gas	Project Manager:	Paul DiLorenzo

1 Executive Summary

1.1 Sanctioning Summary

This paper requests the partial sanction of phase one of C056104 and C070527 in the amount \$9.756M with a tolerance of +/-10% for the purposes of full implementation construction activities of Phase 1 and engineering and long lead items of Phase 2 of the Allen's Avenue Regulator Station Rebuild project.

This sanction amount is \$9.756M broken down into:

*\$9.756M Capex
\$0.000M Opex
\$0.000M Removal*

NOTE: the potential investment of \$15.391M with a tolerance of +/-25% is broken into multiple phases of work upon submittal and approval of a Project Sanction papers in the following schedule:

- September 2017 - Partial Project Sanction Phase 1: Full implementation of construction activities of Phase 1 and preliminary engineering of Phase 2.
- November 2017- Project Sanction Phase 1
- November 2017- Partial Project Sanction Phase 2: Level III estimate of 100% design and procurement of long lead items.
- February 2017- Project Sanction Phase 2: Final determined after level IV estimate pending procurement and competitive bidding cycle.



US Sanction Paper

1.2 Project Summary

This project replaces aging pressure regulating equipment that is in place across various sections of the Allen's Ave property, consolidating four 99 psig regulator stations into a single station with 3 regulator runs and a common header inside a new building. The project will also eliminate interconnects between two pressure systems that could not be cut out given the current configuration and the separate station feed to National Grid LNG.

The second phase of the project will replace the 3 lower pressure stations on the property and move them into the distribution system along with associated main reinforcements to provide better pressure support to the gas system in Providence and eliminate leak-prone pipe.

The final phase of project will be the remaining abandonments of mains and stations once the new system configuration has been tested and final clean-up of the surrounding property is complete.

1.3 Summary of Projects

Project Number	Project Type (Elec only)	Project Title	Estimate Amount (\$M)
CO56104	N/A	Allens Ave Regulator ReBuild	13.306
CO70527	N/A	Allens Ave Filter Separator	2.085
Total			15.391

1.4 Associated Projects

Project Number	Project Title	Estimate Amount (\$M)
C049332	Liquefaction Project @ Providence, RI LNG Plant	186.327
Total		186.327



US Sanction Paper

1.5 Prior Sanctioning History

Date	Governance Body	Sanctioned Amount	Potential Project Investment	Paper Title	Sanction Type	Tolerance
08/10/2016	USSC	\$4.940M	\$10.575M	Partial	Sanction	+/- 25%
04/21/2015	USSC	\$3.600M	\$5.500M	Partial	Sanction	+/- 25%
08/01/2014	Electronic DOA-Power Plant	\$0.800M (for engineering and materials purchase)	\$5.200M	DOA	Sanction	+/- 25%

1.6 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
November 2017	Project Sanction

1.7 Category

Category	Reference to Mandate, Policy, NPV, or Other
<input type="radio"/> Mandatory	
<input checked="" type="radio"/> Policy- Driven	National Grid Document ENG01001 – “Design of Gas Regulator Stations – Part 1”
<input type="radio"/> Justified NPV	National Grid Document ENG01002 – “Design of Gas Regulator Stations – Part 2”
<input type="radio"/> Other	



US Sanction Paper

1.8 Asset Management Risk Score

Asset Management Risk Score: 26

Primary Risk Score Driver: (Policy Driven Projects Only)

☒ Reliability ☐ Environment ☐ Health & Safety ☐ Not Policy Driven

1.9 Complexity Level

☐ High Complexity ☒ Medium Complexity ☐ Low Complexity ☐ N/A

Complexity Score: 22

1.10 Process Hazard Assessment

A Process Hazard Assessment (PHA) is required for this project:

☒ Yes ☐ No

1.11 Business Plan

Business Plan Name & Period	Project included in approved Business Plan?	Over / Under Business Plan	Project Cost relative to approved Business Plan (\$)
FY18-FY22 Capital Plan- Gas	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input checked="" type="radio"/> Over <input type="radio"/> Under <input type="radio"/> NA	\$2.027M

1.12 If cost > approved Business Plan how will this be funded?

The request is this sanction paper is in alignment with approved ZVM/PCM as well as FY18-27 Gas capital plan. Re-allocation of funds within the portfolio has been managed by Resource Planning to meet jurisdictional budgetary, statutory and regulatory requirements.



US Sanction Paper

1.13 Current Planning Horizon

\$M	Prior Yrs	Current Planning Horizon						Total
		Yr. 1 2017/18	Yr. 2 2018/19	Yr. 3 2019/20	Yr. 4 2020/21	Yr. 5 2021/22	Yr. 6 + 2022/23	
CapEx	5.231	4.525	2.970	2.365	0.050	0.000	0.000	15.141
OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Removal	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250
CIAC/Reimbursement	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	15.391

1.14 Key Milestones

Milestone	Target Date: (Month/Year)
Initial Project Sanction (Power Plan for Engineering)	August 2014
Partial Project Sanction (Phase 1 Original Scope)	April 2015
Partial Project Sanction (Phase 1 Initial Portion)	August 2016
Installation of Foundations & Pre-fab Buildings	August 2016
Installation of Filter/Separator	October 2016
Installation of Piping inside of Adjacent Laydown Area	November 2016
Partial Project Sanction (Phase 1)	September 2017
Project Sanction (Phase 1)	November 2017
Partial Project Sanction (Phase 2)	November 2017
Project Sanction (Phase 2)	February 2018
Project Closure (Phase 1)	March 2018
Project Closure (Phase 2)	March 2021



US Sanction Paper

1.15 Resources, Operations and Procurement

Resource Sourcing			
Engineering & Design Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor	
Construction/Implementation Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor	
Resource Delivery			
Availability of internal resources to deliver project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Availability of external resources to deliver project:	<input type="radio"/> Red	<input checked="" type="radio"/> Amber	<input type="radio"/> Green
Operational Impact			
Outage impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Procurement Impact			
Procurement impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green

1.16 Key Issues (include mitigation of Red or Amber Resources)

1	Coordination of work with ongoing LNG liquefaction project / Kiewit controlled area
2	Environmental concerns working in former manufactured gas plant (MGP) site
3	Available/Qualified contractors to bid on remaining scope

1.17 Climate Change

Contribution to National Grid's 2050 80% emissions reduction target:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative
Impact on adaptability of network for future climate change:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative

1.18 List References

N/A

US Sanction Paper



2 Decisions

The US Sanctioning Committee (USSC) at a meeting held on 10/11/2017

- (a) APPROVED the investment of \$9.756M and a tolerance of +/- 10% for the purposes of initial construction activities of Phase 1 and design and engineering of the remaining phases of the Allen's Avenue Regulator Station Rebuild project and installation of the Allen's Avenue filter separator in Providence, Rhode Island.
- (b) NOTE the potential investment of \$15.391M and a tolerance of +/- 25 %, contingent upon submittal and approval of a Project Sanction paper following completion of final engineering and design of remaining phases.
- (c) NOTED that Paul DiLorenzo has the approved financial delegation to undertake the activities stated in (a).

Signature..........Date.....10/4/17.....

David H. Campbell
Vice President, ServCo Business Partnering



US Sanction Paper

3 Sanction Paper Detail

Title:	Allen's Avenue Regulator Station Rebuild	Sanction Paper #:	USSC-15-112 v3
Project #:	C056104 & C070527	Sanction Type:	Partial Sanction
Operating Company:	The Narragansett Electric Co.	Date of Request:	10/11/2017
Author:	Paul DiLorenzo	Sponsor:	John Stavrakas Vice President, Gas Asset Management
Utility Service:	Gas	Project Manager:	Paul DiLorenzo

3.1 Background

The primary location of this project will be at the Company-owned facility at 642 Allen's Avenue, Providence RI. Phase one will be entirely located on the property. Phase Two of the project will be in three areas of the city of Providence. Phase three will also take place at the Allen's Avenue property for final clean-up.

Historically, there have been concerns with the configuration of these regulator stations and how the systems are connected and fed in this part of the Rhode Island distribution system. This project will simplify how the regulator stations work, making it safer for the technicians who will maintain these facilities in the future. These regulator stations are significant feeds into the Providence, Johnston, Cranston, Warwick, East Greenwich, and North Kingstown areas. Therefore, in order to maintain continued reliability for customers in the region, these regulator stations need to be upgraded to function in a safe and reliable manner.

This project is important for the safety of the public in the nearby distribution area by reducing the potential for over-pressurization of the system by including additional over-pressure protection devices. Also, by relocating the three (3) lower pressure regulator stations, National Grid can abandon large sections of leak-prone pipe and eliminate the related potential for gas leaks. Lastly, this project is one part of the larger effort to improve the appearance of the Company property for the neighbors and the overall community.

US Sanction Paper



3.2 Drivers

The key driver for the Allen's Avenue regulator station rebuild project is to improve the safety and reliability of the station. The project also allows for the removal of old regulator station buildings and above-grade piping in the central portion of the 642 Allen's Avenue, Providence, RI property. Thus, this supports the effort across the entire property to demolish several old buildings that are no longer in use, including the abandonment and/or removal of obsolete pipe and equipment in support of the safety and reliability of the Company's system at this location.

In addition, the Company has also agreed to replace sections of 200 psig main and other transmission-grade facilities throughout the RI distribution system, which do not have sufficient records. Some sections of the main that are connected to the existing Allen's Avenue regulator stations meet this replacement criterion.

3.3 Project Description

To improve the safety and reliability of the Allen's Avenue gas regulator stations, the Company will:

- Consolidate the existing four regulator stations fed from the 200 psig main into one new building. The replacement of these stations offers an opportunity to add a third layer of overpressure protection to reduce the risk of over pressurization. The new building will also be storm-hardened by establishing it on higher ground, as the existing grade of the property is within the 100 year flood zone.
- Install a new filter/separator to protect the downstream distribution system from pipeline contaminants and liquids.
- Move the three regulator stations fed from the 99psig mains further into the distribution system, which provides better pressure support and allows elimination of several thousand feet of leak-prone cast iron main.
- Cut off the piping interconnects and coordinate with Environmental to safely and properly address the contaminated portions of the yard around the existing regulator stations.
- Tie the tail-gas line from the liquefaction project into the distribution system so that tail gas can mix properly with street gas and feed the required quality of gas to the distribution system beyond.

US Sanction Paper



3.4 Benefits Summary

Consolidating the four 200 psig to 99 psig regulator stations allows for retirement for four old stations that have integrity issues, improved reliability and improved safety by adding an additional layer of over pressure protection.

To support both Long Term Planning and Main and Service Replacement, the three lower pressure regulator stations fed from the 99psig system will be moved off of the Allen's Avenue property further into the distribution system. This will provide better pressure support to Providence as well as facilitate the replacement of several thousand feet of large diameter leak-prone cast iron pipe.

Lastly, the project also allows for the removal of interconnects between different pressure systems for public and employee safety. Some of these valves interconnects exist in the current piping configuration and cannot be removed because there is not enough space to do the work while maintaining a feed to the distribution system. These interconnects will be removed when the gas mains feeding the old regulator stations are cut and capped.

Moving the four 200psig to 99psig Allen's Avenue regulator stations from the current location to a more southern location near the NG-LNG property also provides a better mix of liquefaction tail gas and street gas, assuring the quality of the gas in the distribution system as well as allowing for the elimination of the separate station that feeds NG-LNG.

3.5 Business and Customer Issues

There is no significant business or customer issues beyond what has been described elsewhere in this paper.



US Sanction Paper

3.6 Alternatives

Alternative 1: 200psig Fed Stations Only

This alternative is less expensive than the proposed project, as the three newer lower pressure regulator stations would remain in place. However, approximately the same amount of piping work would be required on the property regardless of whether the Company replaces all seven (7) regulator stations or only four. Thus, it is logical and more efficient to replace all regulator stations. Also, the cut and caps would not eliminate the older transmission pressure pipelines as cleanly. Additionally, if the stations feeding the 35psig, 10psig, and 7psig systems are not relocated further into the distribution system, several thousand feet of leak-prone pipe could not be abandoned. Therefore, this option is not recommended.

Alternative 2: Leave As Is

This option is not recommended. Not removing the system interconnects does not address the safety issues associated with different pressure systems. Also, doing nothing does not address integrity issues with the existing equipment.

3.7 Safety, Environmental and Project Planning Issues

A Health and Safety Plan has been developed and all National Grid Safety and Environmental Rules will be followed.

3.8 Execution Risk Appraisal

Number	Detailed Description of Risk / Opportunity	Probability	Impact		Score		Strategy	Pre-Trigger Mitigation Plan	Residual Risk	Post Trigger Mitigation Plan
			Cost	Schedule	Cost	Schedule				
1	Unknown subsurface conditions may impact ultimate location of gas main piping	3	3	2	9	6	Mitigate	Conduct survey investigation of proposed area of work	Unknown subsurface conditions remain	Utilize survey information to reroute gas main as needed
2	Coordination with liquefaction project schedule	2	2	5	4	10	Mitigate	Biweekly project coordination meetings	Residual Conflicts Exist	Prioritize work between projects
3	Presence of contaminated soil in excavation	4	2	2	8	8	Mitigate	Detailed environmental contingency plan in place	Environmental contaminants found in excavation	Enact contingency plan and take corrective environmental actions

US Sanction Paper



3.9 Permitting

Permit Name	Probability Required (Certain/ Likely/ Unlikely)	Duration To Acquire Permit	Status (Complete/ In Progress Not Applied For)	Estimated Completion Date
Conditional Building Permit	Certain	2-3 Months	Complete	Jan 2016
Full Building Permit	Certain	2-3 Months	Complete	Dec 2016

3.10 Investment Recovery

3.10.1 Investment Recovery and Regulatory Implications

Investment recovery will be through standard rate recovery mechanisms approved by appropriate regulatory agencies.

3.10.2 Customer Impact

This project results in an indicative first full year revenue requirement when the asset is placed in service equal to approximately \$3.096M. This is indicative only. The actual revenue requirement will differ, depending upon the timing of the next rate case and/or the timing of the next filing in which the project is included in rate base.

3.10.3 CIAC / Reimbursement

N/A



US Sanction Paper

3.11 Financial Impact to National Grid

3.11.1 Cost Summary Table

Project Number	Project Title	Project Estimate Level (%)	Spend (\$M)	Prior Yrs	Current Planning Horizon						Total
					Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
					2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	
C056104	Allens Ave. Regulator Station Rebuild	Est Lvl (e.g. +/- 10%)	CapEx	3.249	4.422	2.970	2.365	0.050	0.000	0.000	13.056
			OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
			Removal	0.000	0.000	0.000	0.250	0.000	0.000	0.250	
			Total	3.249	4.422	2.970	2.365	0.300	0.000	0.000	13.306
C070527	Allens Ave Filter/Seperator	Est Lvl (e.g. +/- 10%)	CapEx	1.982	0.103	0.000	0.000	0.000	0.000	0.000	2.085
			OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			Total	1.982	0.103	0.000	0.000	0.000	0.000	0.000	2.085
Total Project Sanction			CapEx	5.231	4.525	2.970	2.365	0.050	0.000	0.000	15.141
			OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			Removal	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250
			Total	5.231	4.525	2.970	2.365	0.300	0.000	0.000	15.391

3.11.2 Project Budget Summary Table

Project Costs Per Business Plan

\$M	Prior Yrs (Actual)	Current Planning Horizon						Total
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
		2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	
CapEx	5.231	2.498	2.970	2.365	0.050	0.000	0.000	13.114
OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Removal	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250
Total Cost in Bus. Plan	5.231	2.498	2.970	2.365	0.300	0.000	0.000	13.364

Variance (Business Plan-Project Estimate)

\$M	Prior Yrs (Actual)	Current Planning Horizon						Total
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
		2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	
CapEx	0.000	(2.027)	0.000	0.000	0.000	0.000	0.000	(2.027)
OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	(2.027)	0.000	0.000	0.000	0.000	0.000	(2.027)

3.11.3 Cost Assumptions

The estimates were developed using internal estimating tools by Gas Systems Engineering in 2016 and through the solicitation of contractor bids by Procurement. The accuracy level of the estimate for each project is identified in table 3.11.1



US Sanction Paper

3.11.4 Net Present Value / Cost Benefit Analysis

3.11.4.1 NPV Summary Table

This is not an NPV Project.

3.11.4.2 NPV Assumptions and Calculations

N/A

3.11.5 Additional Impacts

N/A

3.12 Statements of Support

3.12.1 Supporters

The supporters listed have aligned their part of the business to support the project.

Department	Individual	Responsibilities
Investment Planner	Pensabene, Patrick M.; Quan, Philip	Endorses relative to 5-Year Business Plan or Emergent work
Resource Planning	Falls, Jonathan	Endorses Resources, cost, estimate, schedule, and Portfolio Alignment
Project Management	Fortier, Joseph Jr.	Endorses Resources, cost estimate, schedule
Gas Project Estimation	Paul, Art	Project Estimate

3.12.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

Function	Individual
Finance	Midkiff, Felicia
Regulatory	Gurry, Renee
Jurisdictional Delegate	Currie, John
Procurement	Curran, Art
Control Center	Loiacono, Paul



US Sanction Paper

4 Appendices

4.1 Sanction Request Breakdown by Project

\$M	C056104	C070527	Total
CapEx	7.671	2.085	9.756
OpEx			0.000
Removal			0.000
Total	7.671	2.085	9.756

4.2 Other Appendices

N/A

4.3 NPV Summary

N/A

4.4 Customer Outreach Plan

N/A